



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

**PROPOSED TSITSIKAMMA WIND FARM TRUST (TWFT) PIGGERY
NEAR TSITSIKAMMA, KOUKAMMA LOCAL MUNICIPALITY IN THE
EASTERN CAPE PROVINCE.**

JULY 2022

This Report should be cited as follows: *Draft Environmental Management Programme: Proposed Tsitsikamma Wind Farm Trust (TWFT) Piggery. CES. November 2022. Grahamstown Office.*

**REPORT TITLE: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)****REPORT VERSION: DRAFT****PROJECT CODE: P40700499**

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DEFINITIONS

For the purposes of this Environmental Management Programme (EMPr), the following terms, abbreviations and descriptions apply:

TERMS	DESCRIPTION
Alien Vegetation	Alien vegetation is defined as undesirable plant growth which includes but is not limited to all declared Category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) Regulations. Other vegetation deemed to be alien will be those plant species that show the potential to occupy in number, any area within the defined development footprints and immediate surrounds and which are declared to be undesirable. This includes plant species identified as Alien and Invasive Species in the National Environmental Management Biodiversity Act (NEM:BA, 2004) and the Alien and Invasive Species Regulations (2014).
Contaminated water	Contaminated water refers to water which has been contaminated by the Developer's activities such as with hazardous substances, hydrocarbons, herbicides, pesticides, fertilizers, and run-off from spills associated with the usage of farm vehicles and equipment.
Environment	Environment refers to the surroundings within which humans exist and that could be made up of: (i) The land, water and atmosphere of the earth; (ii) Micro-organisms, plant and animal life; (iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Authorisation (EA)	An Environmental Authorisation (EA) refers to a written statement from the relevant environmental Competent Authority, with or without conditions, that records the approval (partial approval or refusal) of a proposed project and the mitigating measures required to prevent or reduce the effects of environmental impacts during the lifespan of a contract.
Environmental Control Officer (ECO)	An Environmental Control Officer (ECO) refers to a suitably qualified and experienced person or entity appointed for the construction and/or operation of works, to perform the obligations specified in the EA.
Environmental Impact	An impact or environmental impact is the change to the environment or the social aspects of an area, whether desirable or undesirable, that will result from the effect of a construction or operational activity. An impact can be the direct, indirect or cumulative consequence of a construction or operational activity.
Environmental Management Plan/Programme (EMP/EMPr)	An Environmental Management Plan (EMP) or Programme (EMPr) is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning specific to a project are prevented; and that the positive benefits of the project are enhanced.
Environmental Management System (EMS)	The internationally accepted and recognized Environmental Management System (EMS) which enables companies, organizations and operations to systematically manage, prevent and reduce environmental problems and associated costs. In terms of ISO 14001 an EMS is defined as, " <i>that part of the overall management system that includes organisational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.</i> "
Environmental Policy	Environmental Policy is a statement (or statements) by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.

External Auditor	An External Auditor is a suitably qualified and experienced independent expert as per the required auditor qualifications (ISO 14012).
Interested and/or Affected Party (I&AP)	An Interested and/or Affected Party (I&AP) is contemplated in Section 24(4)(d) of the NEMA (Act No. 107 of 1998 and subsequent amendments) and which, in terms of that section, includes – (i) Any person, groups of persons, organisation interested in or affected by an activity, and; (ii) Any organ of state that may have jurisdiction over any aspect of the activity.
ISO 14001 Environmental Management System (ISO 14001)	The internationally accepted and recognised Environmental Management System as reflected in the document SABS ISO 14001: 1996; the most recent being the ISO 14001:2015.
Method Statement (MS)	A Method Statement (MS) is a written submission by the Farm Manager and/or the Developer to the ECO in response to the EMPr or to a request by the ECO, setting out the plant (construction equipment), materials, labour and method the Farm Manager and/or the Developer proposes to carry out an activity, identified by the relevant specification or the ECO when requesting the MS. The MS should be in such detail that the ECO is able to assess whether the Farm Manager's/Developer's proposal is in accordance with the EMPr and/or will produce results in accordance with the EMPr.
Mitigate/Mitigation	Mitigate (or mitigation) refers to the implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts of a particular action.
No-Go Area	A no-go area refers to an area in which construction activities are prohibited.
Pollution	According to the NEMA (Act No. 107 of 1998 and subsequent amendments), pollution can be defined as, “Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future”.
Potentially hazardous substance	A potentially hazardous substance refers to a substance, which, in the reasonable opinion of the DEDEAT or the appointed ECO, can have a harmful 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.
Rehabilitation	Rehabilitation refers to re-establishing or restoring something to its original state or to a healthy, sustainable capacity or state.
Site	The area in which the development is proposed or in which construction is taking place.
Solid waste	Solid waste refers to all solid waste materials, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Species of Conservation Concern (SCC)	Species of Conservation Concern (SCC) refers to species listed in the rare, indeterminate, or monitoring categories of the South African Red Data Books, and/or species listed in globally near threatened, nationally threatened or nationally near threatened categories (Barnes, 1998).
Threatened species	Threatened species are defined as: a) species listed in the endangered or vulnerable categories in the revised South African Red Data Books or listed in the globally threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).

Topsoil	Topsoil refers to the top 100 mm of soil and may include top material e.g. vegetation and leaf litter.
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1 INTRODUCTION

This Environmental Management Programme (EMPr) has been compiled to provide mitigation, monitoring and institutional measures to be taken during the construction and operation of the Tsitsikamma Wind Farm Trust (TWFT) Piggery Development near Tsitsikamma in the Eastern Cape Province (“the proposed piggery development”). These measures aim to eliminate, offset and/or reduce adverse environmental and social impacts.

This EMPr informs all relevant parties, in this case, the Developer, the Piggery Manager, the Environmental Control Officer (ECO) and all other staff employed by the Tsitsikamma Wind Farm Trust on the affected property as to their duties in the fulfilment of the legal requirements for the construction and operation of the proposed piggery development, with particular reference to the prevention and mitigation of anticipated potential adverse environmental and social impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the Environmental Authorisation (EA) granted by the relevant environmental permitting authority [to be included in this EMPr upon receipt]. The Competent Authority for the proposed piggery development in the Eastern Cape Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

1.1 OBJECTIVES OF THE EMPr

The general objectives of the EMPr are to:

- Ensure compliance with the regulatory authority stipulations and guidelines which could be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures which could optimise beneficial impacts;
- Create management structures that address the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the activity;
- Ensure that safety recommendations are complied with; and
- Specify time periods within which the measures contemplated in the Final EMPr must be implemented, *where appropriate*.

1.2 STRUCTURE AND FUNCTION OF THE EMPr

An EMPr is focused on sound environmental management practices, which will be undertaken to minimise adverse impacts on the environment and social setting through the lifetime of a development. In addition, an EMPr identifies measures which should be in place or will be actioned to manage any incidents and emergencies that could occur during the construction and/or operation of the proposed piggery development. The contents of this EMPr are consistent with the requirements as set out in Appendix 4 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), as listed in the table below.

Table 1: NEMA EIA Regulations EMPr Requirements in Accordance with Appendix 4.

REQUIREMENTS OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT IN TERMS OF APPENDIX 4	
(1) An EMPr must comply with Section 24(N) of the Act and include - (a) Details of – (i) The EAP who prepared the EMPr; and (ii) The expertise of the EAP to prepare an EMPr, including a <i>curriculum vitae</i> ; (b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description; (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers; (d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post closure; and (v) Where relevant, operation activities; (f) A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable include actions 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; (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable; (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f); (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f); (i) An indication of the persons who will be responsible for the implementation of the impact management actions; (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented; (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f); (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations; (m) An environmental awareness plan describing the manner in – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and (n) Any specific information that may be required by the competent authority. (2) Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	

1.3 LEGAL REQUIREMENTS

The construction and operation of the proposed piggery development must be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the contract documents, informs the Developer, or the Farm Manager on behalf of the Developer, as to their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of adverse environmental and social impacts caused by the proposed piggery development. The Developer/Farm Manager should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional

conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter must prevail.

The Developer/Farm Manager must identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the proposed piggery development must be complied with. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:

LEGISLATION	ADMINISTERING AUTHORITY	TYPE Permit/ license/ authorisation/comment
National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments)	Eastern Cape Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	Environmental Authorisation required.
National Water Act (NWA) (Act No. 36 of 1998, as amended)	Eastern Cape Department of Water and Sanitation (DWS)	General Authorisations/Water Use Licence required.
National Environmental Management: Biodiversity Act (NEM:BA, Act No. 10 of 2004)	Eastern Cape Provincial DEDEAT and the Department of Agriculture, Forestry and Fisheries (DAFF)	Plant Removal Permits and Alien Vegetation Management
Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983 and subsequent amendments)		
ADDITIONAL LEGISLATION, POLICIES AND GUIDELINES		
<ul style="list-style-type: none"> → The Constitution of the Republic of South Africa (Act No. 108 of 1996, as amended) → National Heritage Resources Act (NHRA) (Act No. 25 of 1999) → National Environmental Management: Waste Act (NEM:WA) (Act No.59 of 2008, as amended) → The Environment Conservation Act (Act No. 73 of 1989) → Occupational Health and Safety Act (OHSA) (Act No. 85 of 1993, as amended) → Cape Nature and Environmental Conservation Ordinance (Ordinance No. 19 of 1974) → National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) – Alien and Invasive Species (AIS) Regulations → Eastern Cape Biodiversity Conservation plan (ECBCP, 2007) Critical Biodiversity Areas (CBAs) → Eastern Cape Biodiversity Conservation plan (ECBCP, 2020) Critical Biodiversity Areas (CBAs) → Eastern Cape Vision 2030 Provincial Development Plan (ECDP, 2014) → All relevant provincial legislation, municipal by-laws and ordinances, including the Sarah Baartman District Municipality Integrated Development Plan 2017-22 and the Koukamma Local Municipality municipal by-laws 		

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT TEAM

2.1 EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT TEAM

EAP Team: **Mr Justin Green**
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Dr Alan Carter

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Dr Alan Carter

Project Leader & Quality Assurance

Dr Alan Carter is an Executive and the East London Branch Manager at CES. He has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 25 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and a member of the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Ms Gregory Shaw

Project Manager & Report Reviewer

Greg is a principal environmental consultant with more than 10 years' experience, who has carried out ESIA's for a variety of infrastructure developments in Africa and Europe. His experience is with development projects where there is creation or modification of infrastructure, via capital works and complex logistics. He is able to engage with the full portfolio of diverse stakeholder groups and regulators via meetings, written material, face-to-face workshops, presentation events, negotiation and discussion to achieve mutually agreeable mitigation measures and solutions. As part of many of the ESIA's he has been involved in or managed he has been responsible for the development and execution of environmental surveys (and subsequent monitoring programmes), sub-contractor management (including contracting), report writing and project management. In addition, he has been responsible for developing and auditing plans associated with managing large infrastructure projects e.g. Environmental Management Plans (EMP). Greg forms strong relationships and ensure that the team works together in an integrated way towards the clear common goal, making effective use of time and resources.

Mr Justin Green

Lead Report Writer & GIS Mapping

Justin is employed as a Senior Environmental Consultant at Coastal & Environmental Services (CES), having spent the past 8 years working on Basic Assessments, EIA's, Monitoring Programme's, RAPs, Specialist Assessments and international fieldwork. I have worked on projects in the DRC, Lesotho, Mozambique, Zambia, Cameroon, Tanzania, Malawi, Swaziland, Madagascar

and extensively throughout South Africa. Undertaking of numerous environmental management studies has resulted in a good working knowledge of environmental legislation and policy requirements. He is currently the lead GIS specialist for CES, responsible for digitizing and processing vector and raster data for BAR's, EIA's and ESHIA's both locally and internationally. I have formed part of the GIS department for the past 7 years with my primary experience working with ArcGIS software and ArcEditor for developing GIS databases, data creation and snapping tolerances. He has experience in training field teams and specialists in the use of OruxMaps and ODK collect as the primary tool for data collection. I am experienced in fieldworker training and team management resulting in the collection of field data, which can then be incorporated into GIS databases.

2.2 COMPANY PROFILE

CES has its head office in Grahamstown, where it was founded in 1990, to service a then fledgling market in the fields of Environmental Management and Impact Assessment. CES now has offices in South Africa (Cape Town, Port Elizabeth, East London and Johannesburg), the United Kingdom (Romsey) as well as a wholly owned subsidiary in Maputo, Mozambique (Coastal & Environmental Services LDa., registered as an Environmental Practitioner with the Mozambican authorities).

The Company has grown apace with the increased market demand for environmental and social advisory services in Southern Africa and further afield. Our principal area of expertise lies in assessing the risks and impacts of the development process on the natural, social and economic environments through, among other instruments, the Environmental Impact Assessment (EIA) process. We believe that by offering these services we contribute meaningfully towards sustainable development.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. This results in deliverables that are robust, defensible and credible. This is important for both the development and EIA processes, and as a result the outputs of our studies demonstrate objectivity, sincerity and professionalism. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning, and that our outputs reflect this. Our track record across twenty (20) African countries as well as in the Middle East and Asia is evidence of the value add we bring to the environmental and social advisory services we provide, and has contributed to our deep understanding of the environmental and social challenges associated with establishing and operating facilities and infrastructure in emerging markets.

In addition, CES has well-developed working relationships with a number of other individual specialists and specialist consulting companies who provide us with expertise in disciplines such as air quality impact assessments, noise impact assessments, heritage, archaeological and paleontological assessments, radiation hazard assessments, groundwater studies and health impact assessments. Generally, we have worked with the same sub-consultants for over a decade, so they understand our requirements and are willing to go the extra mile for us. Our network of environmental and social professionals across the continent has enhanced our ability to successfully execute projects outside of South Africa. In 2018 we established strategic alliances with likeminded consultancies in Oman (Middle East), Serbia (Eastern Europe) and Bangladesh in order to extend our advisory services into these regions.

3 BACKGROUND INFORMATION

3.1 PROJECT INTRODUCTION

The Tsitsikamma Community Wind Farm (TCWF) is a 95 MW wind farm comprising 31 wind turbines on the farm Wittekleibosch in the Tsitsikamma area, situated within the Koukamma Local Municipality in the Eastern Cape Province. The project was initiated by the Department of Land Affairs on behalf of the local AmaMfengu Community in Wittekleibosch – a settlement developed in the 1990's for the Mfengu people and beneficiaries of the Tsitsikamma Development Trust. The project was commissioned in September 2016.

The TCWF subsequently committed to spending 2.1% of its revenue on socio-economic development within and surrounding the agricultural community of Wittekleibosch. The proposed piggery forms part of the socio-economic development initiative funded by the TCWF.

It is important to note the following:

- The application for Environmental Authorization of the piggery is submitted by Msingxu's Piggery (Pty) Ltd on behalf of the Tsitsikamma Development Trust; and
- The project will be located on land owned by the Tsitsikamma Development Trust and the surrounding land is also owned by the Tsitsikamma Development Trust.

3.1 PROJECT DESCRIPTION

Location and access

The study area is located on a section of Portion 7 of Farm 788 (**Figure 2**), approximately 2.4 km south of Clarkson and 40 km west of Humansdorp. This area falls within the Kou-kamma Local Municipality (KLM), located in the Sarah Baartman District Municipality (SBDM) of the Eastern Cape Province. The total extent of Portion 7 of Farm 788, on which study site is situated, is 594 ha (**Figure 1**).

The site can be accessed via the R102, through the Guava Juice residential development.

Description of the Proposed Activity and Layout

The proposed facility will contain infrastructure (**Figure 3**) for:

- Project Boundary (15,000 m²);
- Bathroom facilities (6 m²);
- Administration office (12m²);
- Feed storage (36 m²);
- Pig House growing (432m²);
- Pig Housing Breeding - 50 sows, 3 boars and 500 piglets (432m²);
- Slurry dam area (1,800 m²), Volume: (5,077m³);
- Composting area (about 1,000 m²);
- Water tanks X3 (30 m²), Volume each tank (10 m³);
- A 450m gravel road, 5m wide (2,700 m²); and
- Electricity connection.

The area will be fenced off, preventing outside access, contamination, and theft of pigs.

A combination of rainwater and borehole water will be the source of water for the site. A borehole will need to be identified and drilled as the main source of water for the piggery. It is anticipated that this borehole could be sited within the site boundary or at another location within the Trusts

community, but the exact location is uncertain. The specific location has not been determined. The project expects to use 200 m³ of water per month.

The facility is expected to produce approximately 150 tons of wastewater effluent per month.

It is estimated that a piggery of this size will produce approximately 5 tons of wastewater effluent per day comprising mixture of pig manure, urine and wash water. The effluent will be stored in a slurry dam and treated through anaerobic digestion, with a portion of the solids (65m³ per month) used as compost and remaining wastewater used to irrigate planted pastures.

The solids from the piggery (manure and feed waste) and slurry dam will be composted on a hard surfaced area with an area of about 1,000 m². The compost will be sold to local farmers.



Figure 1: Locality Map of the proposed Piggery Development.

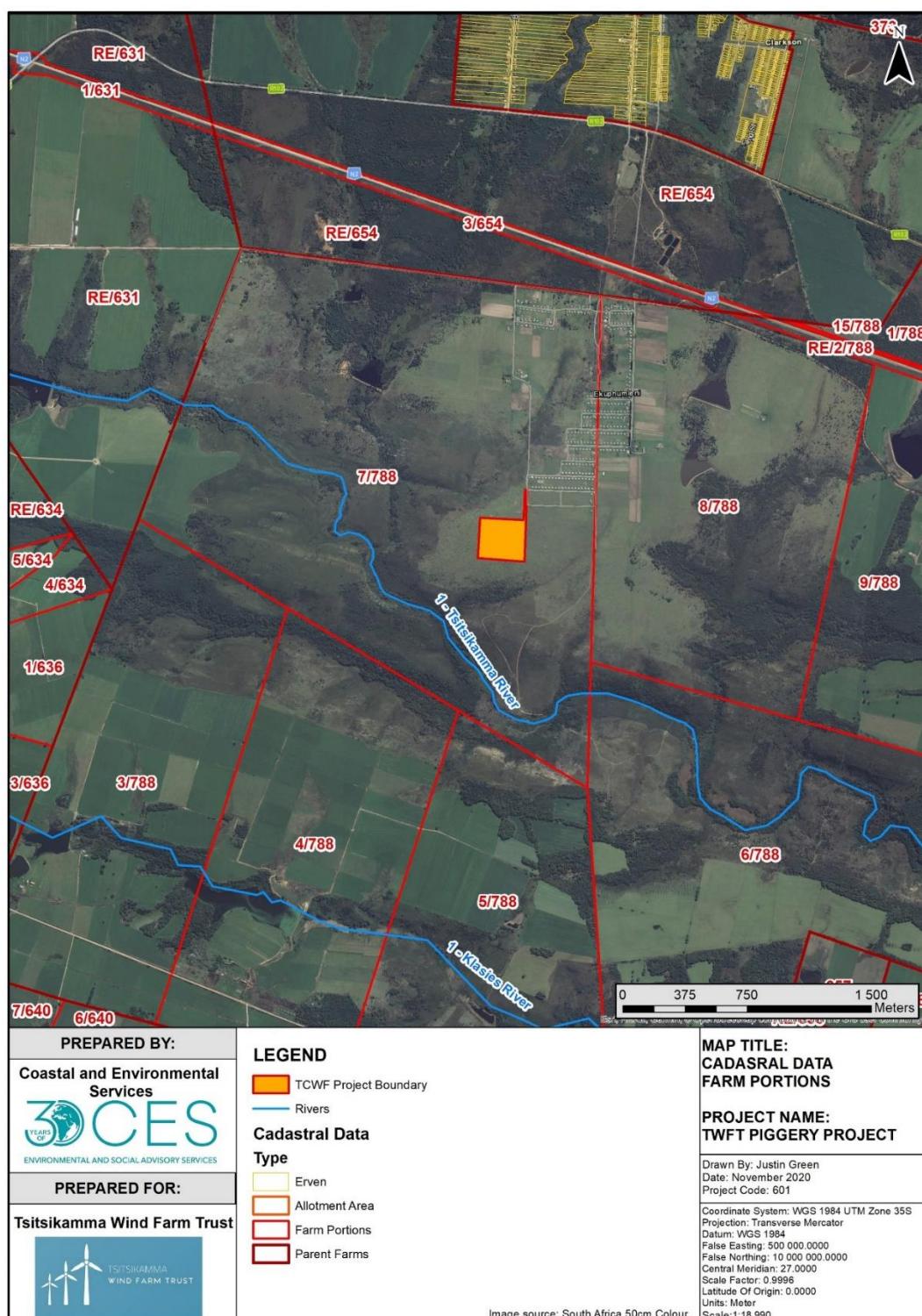


Figure 2: Cadastral Map of the proposed Piggery Development.

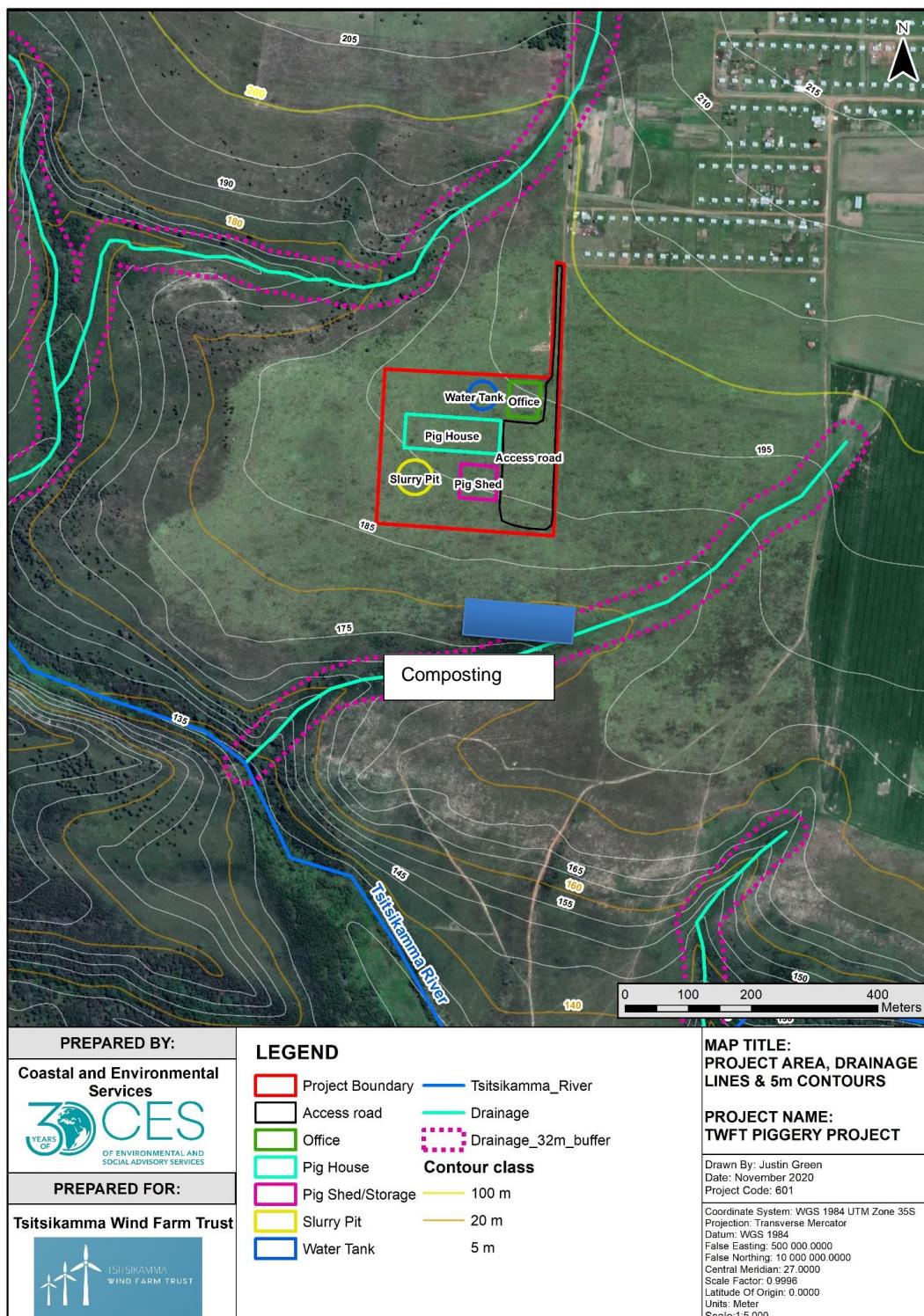


Figure 3: Layout Map of the proposed Piggery Development.

Figure 4 below shows the piggery operation process comprising the following three (3) main elements:

- Breeding unit.
- Farrowing pens where piglets are weened by sows; and
- Grow-out pens where piglets are grown to maturity prior to sale.

Any animals slaughtered on site will be removed to an offsite abattoir for preparation.

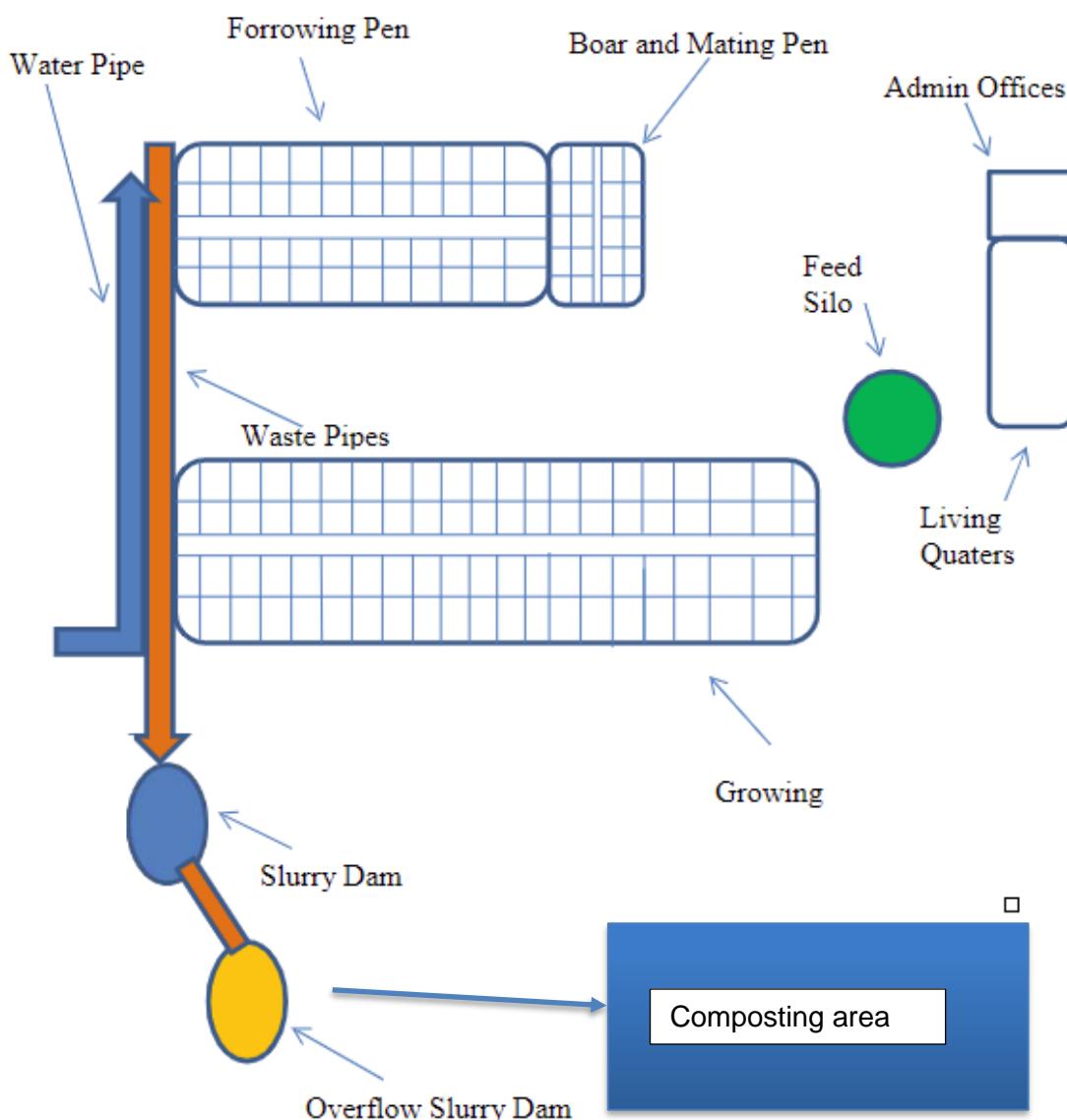


Figure 4: Pre-liminary operations flow chart depicting waste flow through the system.

WASTE STREAMS

Wastewater from the piggery

The wastewater will comprise of wash water, faeces and urine. The water will be handled by deep storage channels under slatted floors and will channelled to the slurry dam on site (about 1,800 m² area, 2.0 metres deep and volume of 3,600 m³.).

The effluent 5 m³ per day will be channelled into a purpose-built effluent dam on-site with a membrane (as per the requirements of the DWS) that will prevent seepage into the subsoil. The effluent dam will have a capacity which is sufficient for at least 6 months of effluent production for a 50-sow piggery (approximately 550 pigs). Treatment will be anaerobic. Solids from the slurry dam may also be removed for composting.

A thick (1.5mm) black HDPE geo-membrane has been selected because of its durability and UV resistance. This membrane will be laid on a blanket of geotextile (Biddim Grade A5), which in turn will lay on a 100 mm thick compacted and well-shaped foundation course of stone-less soil.

Given the fact that the farm has large areas of pastures and arable land on which the agricultural practices take place, the wastewater from the slurry dams is planned for use as irrigation water

on the crops. This will need to meet DWS standards for irrigation purposes.

Liquid waste from the associated outbuildings

Liquid waste will be generated during the operational phase from daily activities. The wastewater contains disinfectants used to wash the houses, veterinary chemicals and metals such as copper and zinc. A suitable septic tank will be installed and regularly serviced.

Solid Waste

The construction and operational phase of the proposed activity will result in the generation general and limited hazardous waste.

The construction phase will generate general solid waste (rubble, cement bags, general domestic waste etc.) which will be disposed at a general landfill site. Construction phase activities will generate small quantities of hazardous waste such as empty paint containers and oil rags. These will be disposed by contractor at the nearest suitably permitted landfill site.

The operational phase will generate both general and limited hazardous waste. General waste from various packaging and domestic waste will be collected by the municipality and disposed at general landfill site. The operational phase will generate small quantities of hazardous waste (cleaning materials, oils and other chemical solvents). All hazardous waste to be handled and disposed of at a suitably permitted landfill site.

The piggery will generate solid waste from waste feed, animal manure and carcasses. Animal feed includes pig concentrates (mainly grain) which are supplemented with various compounds (protein, amino acids, enzymes, vitamins, hormones etc.). Waste feed has the potential to contribute to stormwater contamination because of its organic matter content. Animal feed and manure waste will be used for composting.

The piggery will produce animal waste manure which contains nitrogen, phosphorus, and other excreted substances that are suitable for making high quality manure. This has the potential risk of surface and groundwater contamination through leaching and runoff. Manure also contains disease causing agents such as bacteria, pathogens, viruses and parasites which have the potential to impact soil, surface and groundwater resources. The manure waste will be used for composting.

Manure composting

Manure collection system will include slatted floors that will allow manure to drop into the storage area located beneath the floor. The manure will be flushed from the storage area and passed through a filter which separates the solids from the liquids. Waste will be separated by removing solids from the effluent before storage.

The manure solids will be composted in a dedicated composting area. An analysis of the manure will be conducted to determine the moisture and heavy metal content (e.g., Cadmium, Lead, Mercury, Arsenic, Selenium) prior to removal. The results of this analysis will be submitted as part of the fertiliser registration application process for the use of composted manure on agricultural fields. The compost will be used on the nearby agricultural lands or sold off to local farmers.

The operational phase will also result in animal carcasses which will be disposed at a licensed landfill site. Animal carcasses should be properly managed and quickly disposed of to prevent the spread of disease and odours and avoid the attraction of vectors.

Table 1 below indicates the applicable waste types and quantities expected to be disposed of and salvaged annually:

Table 1: Recovery, Reuse, Recycling, Treatment and Disposal Quantities.

TYPES OF WASTE	MAIN SOURCE (NAME OF COMPANY)	QUANTITIES		ON-SITE RECOVERY REUSE RECYCLING TREATMENT OR DISPOSAL	OFFSITE RECOVERY REUSE RECYCLING TREATMENT OR DISPOSAL	OFFSITE DISPOSAL
		TONS/MONTH	M ³ /MONTH	method & location	method location and contractor details	
Animal liquid and wash wastewater	Piggery	150	150	Liquid wastewater will be treated anaerobically in a sludge dam located on site.	NA	NA
Animal waste manure	Piggery	65	65	Manure collection system will include slatted floors that will allow manure to drop into the storage area located beneath the floor.	The collected manure will be composted on site and sold to local farmers.	Sold off site
Animal feed waste	Piggery	2	NA	As above	Animal feed waste will be included in the composting process described above.	Sold off site
Pig mortalities	Piggery	Uncertain		NA	NA	Disposal at licensed landfill site.

Table 2: Corner point coordinates of the proposed Piggery Development.

No. in Figures 3 & 4	Latitude (S) (DDMMSS)			Longitude (E) (DDMMSS)		
1	34°	2'	19.40"S	24°	20'	9.22"E
2	34°	2'	27.29"S	24°	20'	8.46"E
3	34°	2'	28.17"S	24°	20'	19.37"E
4	34°	2'	14.24"S	24°	20'	20.45"E
5	34°	2'	14.15"S	24°	20'	19.98"E
6	34°	2'	20.05"S	24°	20'	19.39"E



Figure 5: Corner Point Coordinates (1 – 6) of the Proposed Piggery Development Site.

CES was been appointed by the Applicant to undertake the required Application for Environmental Authorisation (EA). The proposed piggery development triggers a Basic Assessment Process in accordance with the NEMA EIA Regulations (2014 and subsequent 2017 amendments) Listing Notice 1 and Listing Notice 3 activities as per Table 2 below.

Listed Activities in terms of the EIA Regulations, 2014

In terms of the NEMA (Act No. 107 of 1998 and subsequent amendments) EIA Regulations (2014 and subsequent 2017 amendments), the following relevant Listed Activities will be triggered by the proposed construction of a piggery in the Tsitsikamma area.

Table 3: NEMA Listed Activities triggered by the proposed development.

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION
Listing Notice 1 (GN R. 983/ GN R. 327)	4	<p>The development and related operation of facilities or infrastructure for the concentration of animals in densities that exceed –</p> <ul style="list-style-type: none"> (i) 20 square meters per large stock unit and more than 500 units per facility; (ii) 8 square meters per small stock unit and; <ul style="list-style-type: none"> a. more than 1 000 units per facility excluding pigs where (b) applies; or b. more than 250 pigs per facility excluding piglets that are not yet weaned;
	12	<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of</i>

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION
		<p><i>indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p>a. Eastern Cape ii. Within critical biodiversity areas identified in bioregional plans.</p>
14		<p><i>The development of</i> (ii) infrastructure or structures with a physical footprint of 10 square metres or more; <i>where such development occurs—</i> (a) within a watercourse; (c) if no development setback has been adopted, within 32 m of a watercourse measured from the edge of the watercourse</p> <p>a. Eastern Cape i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPA or from the core area of a biosphere reserve;</p>
27		<p><i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for</i></p> <p>i. The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.</p>

Listed Activities in terms of the Waste Act, 2008

In terms of the Waste Act of 2008, the following relevant Listed Activities will be triggered by the proposed construction of a piggery in the Tsitsikamma area.

Table 4: Waste Act Listed Activities triggered by the proposed development.

INDICATE THE NO. & DATE OF THE RELEVANT NOTICE:	ACTIVITY NUMBERS (AS LISTED IN THE WASTE MANAGEMENT ACTIVITY LIST)	DESCRIBE EACH LISTED ACTIVITY (and not as per the wording of the relevant Government Notice):
GNR 921, 29 November 2013	Category A1 Storage of waste: - The storage of general waste in lagoons.	Wastewater comprising of wash water, faeces and urine (about 5 m ³ per day) will be stored in a slurry dam located on site (about 1,800m ² in area and a volume capacity about 3,600 m ³). The wastewater will be treated anaerobically in the dam.
	Category A12 Construction, expansion or decommissioning of facilities and associated structures and infrastructure. - The construction of a facility for a waste management activity listed in Category A of this schedule (not in isolation to the associated waste management activity).	Wastewater comprising of wash water, faeces and urine (about 5.0 m ³ per day) will be stored in a slurry dam located on site (about 1,800m ² in area and a volume capacity about 3,600 m ³). The wastewater will be treated anaerobically in the dam. Pig manure will be collected and composted in a dedicated area of about 1,000 m ² . The quantities are estimated to be about 2 tons per day. Pig mortalities will be disposed of offsite.

4 LAYOUT OF THE EMPR

In order to ensure a holistic approach to the management of environmental and social impacts associated with the proposed piggery development, this EMPR sets out the methods by which proper environmental controls are to be implemented by the Developer/Farm Manager of the TCWF Piggery and all other parties involved.

4.1 PLANNING & DESIGN PHASE

The Design EMPR is an integral component of the project life cycle and ensures that the Developer/Farm Manager is aware of the environmental constraints that must be considered and incorporated into the final design/layout of the project. The format of this design EMPR is checklist in nature to ensure that all specifications are included in the design phase. The design EMPR phase requires ongoing discussions between the Developer, the Farm Manager and the Environmental Control Officer (ECO) (if required).

4.2 CONSTRUCTION PHASE

The Construction EMPR details the Environmental Management System (EMS)/framework within which construction activities will be governed for the construction phase. The Construction EMPR consists of various actions, initiatives and systems that the Developer and/or Farm Manager will have to ensure are in place and are undertaken. The Construction EMPR consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the Developer and/or Farm Manager.

The Construction EMPR must be developed in parallel with the final design stages, and constructive input should be invited from the Developer. 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 Developer and the Farm Manager, while being bound by the EMPR, fully understand it and have had input into its final development. For this reason, the final Construction EMPR will need to be signed off prior to the initiation of construction activities.

4.3 OPERATIONAL PHASE

The Operational EMPR provides specific guidance related to operational activities associated with a particular development. Operational EMPR's are sometimes referred to as EMS. Impacts during the operational phase of a development of this nature could 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. The final Operational EMPR should be developed in conjunction with any other relevant stakeholders prior to the adoption thereof.

4.4 DECOMMISSIONING PHASE

It is unlikely that the piggery development will be decommissioned in the foreseeable future but, if the piggery is decommissioned at a later stage, the impacts associated with the decommissioning of the piggery development are likely to be similar to the impacts which have been identified for the construction phase. It is recommended that the approved EMPR is updated by a suitably qualified EAP prior to the decommissioning of the piggery development and implemented throughout the decommissioning phase.

5 MITIGATION AND/OR MANAGEMENT MEASURES

The following table sets out the environmental and social issues which could potentially occur during the various phases of the proposed piggery development.

Recommendations

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified ECO must be appointed prior to the commencement of the construction phase;
- An Erosion Management Plan/Method Statement must be developed prior to the commencement of construction activities in order to mitigate the unnecessary loss of topsoil and runoff;
- A Rehabilitation Plan must be developed and implemented during construction and operation phases;
- The necessary Water Use Licence (WUL) must be obtained prior to abstraction from a borehole (depending on volume).

Mitigation Measures

Mitigation measures identified for the various impacts associated with the proposed development.

IMPACT	MITIGATION MEASURES
PLANNING AND DESIGN PHASE	
LEGAL AND POLICY COMPLIANCE	<ul style="list-style-type: none">➤ All necessary permitting and authorisations must be obtained prior to the commencement of any vegetation clearance and/or construction activities;➤ If necessary, a suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase;➤ Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and➤ Planning for the construction and operation of the proposed development should consider available best practice guidelines.
CONSTRUCTION PHASE	
STORAGE OF HAZARDOUS SUBSTANCES	<ul style="list-style-type: none">➤ Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) and the SABS Code of Practise must be adhered to;➤ The individual(s) that will be handling hazardous materials must be trained to do so;➤ All hazardous substances such cleaning solutions must be stored in a bunded area with an impermeable surface beneath them;➤ Maintenance of any vehicles or machinery should not take place within 50 m of any watercourse and drip trays must be used;➤ Spill kits must be kept on-site and maintained; and

IMPACT	MITIGATION MEASURES
	<ul style="list-style-type: none"> ➤ The appointed ECO must determine and/or approve the precise method for the treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestives.
WASTE MANAGEMENT	<ul style="list-style-type: none"> ➤ Littering must be avoided, and sufficient waste bins must be provided on site; ➤ All general waste must be disposed of in bins or waste skips labelled general waste; ➤ All waste collected on site must be disposed of at the nearest registered landfill; and ➤ Waste must not be buried or burned on site.
NOISE IMPACTS	<ul style="list-style-type: none"> ➤ Applicable municipal by-laws relating to noise control must be adhered to; ➤ Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (06:00am – 18:00pm); and ➤ There must be a complaints register on site to register and record any complaints received from the public. The appointed ECO must be made aware of any complaints relating to the pigger development.
AIR QUALITY AND DUST CONTROL	<ul style="list-style-type: none"> ➤ During windy periods, exposed soil should be dampened down if necessary; ➤ Vegetation should be retained, where possible, to reduce dust travel; ➤ Excavations and other clearing activities must only take place during agreed working times and permitting weather conditions to avoid the drifting of dust into neighbouring areas; ➤ Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register; ➤ Construction vehicles should adhere to the recommended speed limit of 30 km/h; and ➤ Vehicles and construction plant must be serviced regularly to reduce excessive vehicle emissions.
CULTURAL HERITAGE	<ul style="list-style-type: none"> ➤ All recommendations and mitigation measures made by the Archaeological Specialist and relating to the cultural heritage within the site must be implemented/adhered to; and ➤ Should any archaeological or cultural sites or objects be located during the construction of the proposed development, they must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) or to the ECPHRA (Tel.: 043 7450888) immediately in accordance with the National Heritage Act (Act No. 25 of 1999).
TRAFFIC IMPACTS	<ul style="list-style-type: none"> ➤ Construction activities must be restricted to normal working hours (06:00 am to 18:00 pm); ➤ All surrounding landowners must be notified once construction activities commence; and

IMPACT	MITIGATION MEASURES
	<ul style="list-style-type: none"> ➤ Vehicles must adhere to the recommended speed restrictions (preferably 30 km/hr along gravel roads).
HEALTH AND SAFETY	<ul style="list-style-type: none"> ➤ Operational firefighting equipment must be present on site at all times as per the Occupational Health and Safety Act; ➤ Employees should be trained in basic fire hazard control and firefighting techniques; ➤ The Proponent should provide the employees with all relevant emergency contact details; and ➤ Burning of construction waste or debris must not occur onsite.
VISUAL AND AESTHETIC IMPACTS	<ul style="list-style-type: none"> ➤ Vegetation clearance must be restricted to the demarcated development footprints; and ➤ Any disturbed areas should be rehabilitated as soon as possible.
CREATION OF EMPLOYMENT OPPORTUNITIES	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in proximity to the proposed development should be contracted for unskilled and semi-unskilled employment opportunities.
EROSION	<ul style="list-style-type: none"> ➤ An Erosion Management Plan or method statement must be compiled indicating what measures will be implemented during the construction phase; ➤ Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion; ➤ Disturbed areas must be rehabilitated as soon as possible after construction; and ➤ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.
LOSS OF INDIGENOUS VEGETATION	<ul style="list-style-type: none"> ➤ The clearance of vegetation at any given time should be kept to a minimum; ➤ Employees must not make fires and/or harvest plants within or adjacent to the development site; ➤ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase; ➤ Only indigenous species must be used for rehabilitation purposes; and ➤ As far as practically possible, existing roads should be utilised.
LOSS OF BIODIVERSITY	<ul style="list-style-type: none"> ➤ The clearance of vegetation at any given time must be kept to a minimum and restricted to demarcated development areas; ➤ Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas; ➤ Employees must not make fires and/or harvest plants within or adjacent to the development site; ➤ Any alien vegetation, which establishes during the construction phase, must be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien

IMPACT	MITIGATION MEASURES
	<p>plant seedlings must take place throughout the construction phase;</p> <ul style="list-style-type: none"> ➢ Only indigenous species must be used for rehabilitation purposes; and ➢ As far as practically possible, existing roads must be utilised.
HABITAT LOSS/FRAGMENTATION	<ul style="list-style-type: none"> ➢ The clearance of vegetation at any given time should be kept to a minimum; ➢ Vegetation clearance and trampling should be avoided in areas demarcated as no-go areas; ➢ Employees must not trap, hunt, handle or remove any faunal species from the site; and ➢ As far as practically possible, existing roads must be utilized.
LOSS OF SPECIES OF CONSERVATION CONCERN	<ul style="list-style-type: none"> ➢ The supervisor must ensure that manure is appropriately removed; ➢ The owner must ensure that pig houses have enough windows to allow cooling for manure and pig; ➢ The personnel trained for removing manure must prevent water drinking troughs from spilling into solid manure as flies, mosquitoes and rodents are attracted to the wet manure; and ➢ The supervisor must carefully manage the stockpiles of manure to maintain a healthy population of the microorganisms used to degrade the manure.
ESTABLISHMENT OF ALIEN PLANT SPECIES	<ul style="list-style-type: none"> ➢ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase.
SURFACE WATER FEATURES	<ul style="list-style-type: none"> ➢ The construction site must be managed in a manner that prevents the contamination or sedimentation of the surface water features.
WILDLIFE MORTALITIES	<ul style="list-style-type: none"> ➢ Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality; ➢ Train all staff on site regarding the proper management and response should animals be encountered; and ➢ Animals must not be injured or killed by construction activities, where possible.
LOSS OF CBA	<ul style="list-style-type: none"> ➢ If there is an opportunity for the consideration of a "set-aside" this should be investigated and implemented.
INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	<ul style="list-style-type: none"> ➢ A Rehabilitation Plan must be developed and implemented during and post-construction; ➢ All temporary disturbed areas that do not form part of the development, must be rehabilitated using only indigenous vegetation; and ➢ All impacted areas must be restored as per the EMPr requirements.
OPERATIONAL PHASE	

IMPACT	MITIGATION MEASURES
GENERAL WASTE MANAGEMENT	<ul style="list-style-type: none"> ➤ All waste generated on site must be stored in a designated waste area in lidded bins; ➤ Any hazardous chemicals must be stored in a designated hazardous waste area which is bunded and clearly labelled; ➤ Any hazardous waste must be removed in an appropriate manner and disposed of at a suitably registered waste site; and ➤ General waste must be disposed of at the nearest registered landfill.
WASTE / PIG MANURE AND CARCASSES	<ul style="list-style-type: none"> ➤ The composting of pig manure should adopt the National Norms and Standards for Organic Waste Composting (2021) in terms of design, construction and operation of the composting site. Particular attention must be paid to implementing an impermeable composting surface and management of liquid run-off. ➤ Pig carcasses must be disposed of in a licenced landfill site.
USE OF HAZARDOUS SUBSTANCES	<ul style="list-style-type: none"> ➤ The application and use of cleaning products must adhere to the information displayed on the product label to avoid the misuse of these products and reduce their impact on the environment.
CREATION OF EMPLOYMENT OPPORTUNITIES	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in the nearby communities should be contracted for unskilled and semi-unskilled employment.
EROSION	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms; ➤ Natural vegetation must be retained where possible to avoid soil erosion; and ➤ Any cleared areas, which are not used for the development, should be rehabilitated post-construction using only indigenous plant species.
LOSS OF INDIGENOUS VEGETATION	<ul style="list-style-type: none"> ➤ The proposed vegetation clearing or soil required for the development must be restricted to the development footprint; and ➤ Vehicles should make use of existing farm roads and must refrain from driving through surrounding indigenous vegetation.
ESTABLISHMENT OF ALIEN PLANT SPECIES	<ul style="list-style-type: none"> ➤ Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide.
SURFACE WATER FEATURES	<ul style="list-style-type: none"> ➤ The development must be managed in a manner that prevents the contamination or sedimentation of surface water features.
HUMAN AND ANIMAL HEALTH	<ul style="list-style-type: none"> ➤ The owner must ensure that carcasses are appropriately and effectively contained and disposed of at the approved site; ➤ The supervisor must monitor and control carcasses disposal site;

IMPACT	MITIGATION MEASURES
	<ul style="list-style-type: none"> ➤ The supervisor must ensure that disease treatment and control procedures are carried out as instructed; ➤ The supervisor must make sure that sick or injured pigs are cared for in line with veterinary advice and ensure that all relevant hygiene requirements are implemented; ➤ The supervisor must ensure that the piggery is controlled and monitored in order to maintain an optimal environment for pigs; ➤ The supervisor must Implement Integrated Pest Management (IPM) strategies; ➤ The supervisor must ensure that pre-operation checks and services of pest control equipment are completed according to industry standards and relevant legislation; ➤ The supervisor must ensure that PPE is worn at all times; ➤ The supervisor must ensure that relevant OHS legislation and codes of practice are clearly explained to farm workers; ➤ The manager must implement and monitor the involvement of workers in maintaining the health and safety in the workplace; and ➤ The manager must implement the farm procedures for dealing with emergencies affecting health and safety of workers.
INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site; ➤ All erosion control mechanisms must be regularly maintained; ➤ Vegetation must be retained where possible to avoid soil erosion; and ➤ Any cleared/disturbed areas, which are not used by the development, should be rehabilitated post-construction using only indigenous plant species.
AIR QUALITY AND DUST CONTROL	<ul style="list-style-type: none"> ➤ Fugitive/nuisance dust can be reduced by implementing a speed limit of 30km/h must not be exceeded on gravel roads; ➤ The supervisor must ensure that feeders are checked for cleanliness and freshness and contaminated pig food and pig manure removed; ➤ The supervisor must ensure that drinkers are checked for correct operation, desired flow rates achieved, and malfunctions reported; ➤ The supervisor must ensure that contaminated food and other operational waste are appropriately and effectively contained and disposed of at the approved site; and ➤ Pigs are fed at the correct time and rate.

6 ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

6.1 MANAGEMENT STRUCTURE

In line with this EMPr, the Developer and/or Farm Manager should prepare a document clearly outlining and demonstrating the environmental responsibilities, accountability and liability of the Developer's employees.

6.2 ROLES & RESPONSIBILITIES

6.2.1 THE DEVELOPER

The Developer (Applicant) is the responsible entity for monitoring the implementation of the EMPr and compliance with the Environmental Authorisation. However, if the Developer assigns the duties to the Farm Manager or Foreman of the farm to implement the proposed mitigation measures, documented in this EMPr, on their behalf then the Farm Manager's/Foreman's responsibilities are outlined as per the section that follows.

6.2.2 THE FARM MANAGER/FOREMAN

The Farm Manager/Foreman will:

- Be responsible for the finalisation of the EMPr in terms of methodologies which are required to be implemented to achieve the environmental specifications contained herein and the relevant requirements contained in the EA.
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of the Developer and the EA.
- Ensure that all third parties, who carry out all or part of the Farm Manager's/Foreman's obligations under the contract, comply with the requirements of this EMPr.
- Ensure that the appointment of the ECO, if required by the Competent Authority, is subject to the approval of the Developer.

6.2.3 ENVIRONMENTAL CONTROL OFFICER (ECO) – IF REQUIRED IN THE ENVIRONMENTAL AUTHORISATION

The EA could stipulate the requirement for the appointment of an ECO to undertake site audits to monitor the implementation of this EMPr. The EA will stipulate the frequency of these site audits (if any). Should this be a requirement, the ECO will be responsible for the monitoring, reviewing and verifying of compliance with this EMPr and conditions of the EA by the Developer/Farm Manager/Foreman. The ECO's duties in this regard will include, *inter alia*, the following:

- Confirming that all the authorisations and permits required in terms of the applicable legislation have been obtained.
- Monitoring and verifying that the EMPr, EA and any other conditions are always adhered to and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Inspecting the site and surrounding areas to determine compliance with the EMPr, EA and any other conditions.
- Ensuring that activities on site comply with all relevant environmental legislation.
- Undertaking an internal review of the EMPr and submitting any changes to the Developer and the authority for review and approval as applicable.
- Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance.

- Reporting all incidences of non-compliance.
- Recommending additional environmental protection measures, should this be necessary.
- Providing feedback on any environmental issues at site meetings (if required).

The appointed ECO must have:

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

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

6.3 COMPLIANCE MONITORING & CORRECTIVE ACTION

Non-compliance with the conditions of the EMPr could include the following:

- There is evidence of contravention of the EMPr or its environmental specifications within the boundaries of the proposed site.
- Construction-related activities take place within the affected property without authorisation from the relevant authorities.
- Environmental damage ensues due to negligence.
- The Developer/Farm Manager/Foreman fails to comply with corrective or other instructions issued by the ECO within a specific time.
- The Developer/Farm Manager/Foreman fails to respond adequately to complaints from the public or authorities.

Where rehabilitation is required, rehabilitation must be undertaken to the satisfaction of the ECO and the Competent Authority.

6.4 EMERGENCY PREPAREDNESS

The Developer/Farm Manager must develop environmental emergency response procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents which will cause environmental or social impacts. Such activities may include, *inter alia*:

- Accidental discharges to water and land;
- Accidental exposure of employees to hazardous substances;
- Accidental fires;

- Accidental spillage of hazardous substances; or
- Specific environmental and ecosystem effects from accidental releases or incidents.

6.5 ENVIRONMENTAL INCIDENT MANAGEMENT

A report should be completed for all incidents, and appropriate action taken where necessary to minimise any potential impacts. DEDEAT must be informed of any environmental incident, in accordance with legislative requirements, should this be necessitated by a major environmental incident.

6.6 RECORD KEEPING – IF REQUIRED IN THE ENVIRONMENTAL AUTHORISATION

The ECO must monitor the adherence to the approved impact prevention procedures and the ECO must issue the Developer/Farm Manager/Foreman with a notice of non-compliance if transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance should be documented and reported to the Developer. These reports must be made available to the DEDEAT if/when requested.

7 ENVIRONMENTAL AWARENESS

7.1 ENVIRONMENTAL TRAINING

The Developer/Farm Manager/Foreman must ensure that their employees and any third party, who carries out all or part of the obligations, is adequately trained regarding the implementation of the EMPr and the general environmental legal requirements and obligations.

The ECO (if required) should ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr. The training records must verify each of the targeted personnel's training experience.

The Developer/Farm Manager/Foreman must ensure that adequate environmental training takes place. All employees must be made aware of:

- The importance of conformance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities.
- Environmental legal requirements and obligations.
- Details regarding floral and faunal SCC and protected species.
- Details regarding the identification and reporting of archaeological resources.
- The importance of not littering.
- The importance of using supplied ablution facilities.
- The need to use water sparingly.
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.

7.2 MONITORING OF ENVIRONMENTAL TRAINING

The Developer/Farm Manager/Foreman must monitor the performance of workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO (if required) should be called to the site to further explain aspects of environmental or social behaviour that are unclear.

8 CONCLUSIONS

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental and social standards, which would be required to minimise the negative impacts and maximise the positive benefits of the TCWF Piggery as detailed in the BAR and specialist reports. The EMPr could thus change daily, and if managed correctly lead to a successful construction and operational phases.

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

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

APPENDIX A

Please insert a copy of the Environmental Authorisation here (if/when received).

APPENDIX B

Please insert a copy of the Water Use Authorisation(s) here (if/when received).

APPENDIX C

EXAMPLE OF AN ENVIRONMENTAL EDUCATION COURSE OUTLINE FOR ALL FARM WORKERS



www.webweaver.nu/clipart/environmental.shtml

Reasons why should we look after the environment

-  We have a right to a clean environment
-  A clean environment is essential to healthy living
-  All our basic needs come from the environment
-  A contract has been signed – development vs the environment
-  Penalties / fines could be issued

How to look after the environment

-  Report issues
-  Teamwork
-  Follow the set rules and guidelines (EA, EMPr, Method statements etc.)
-  Conserve, reuse and recycle

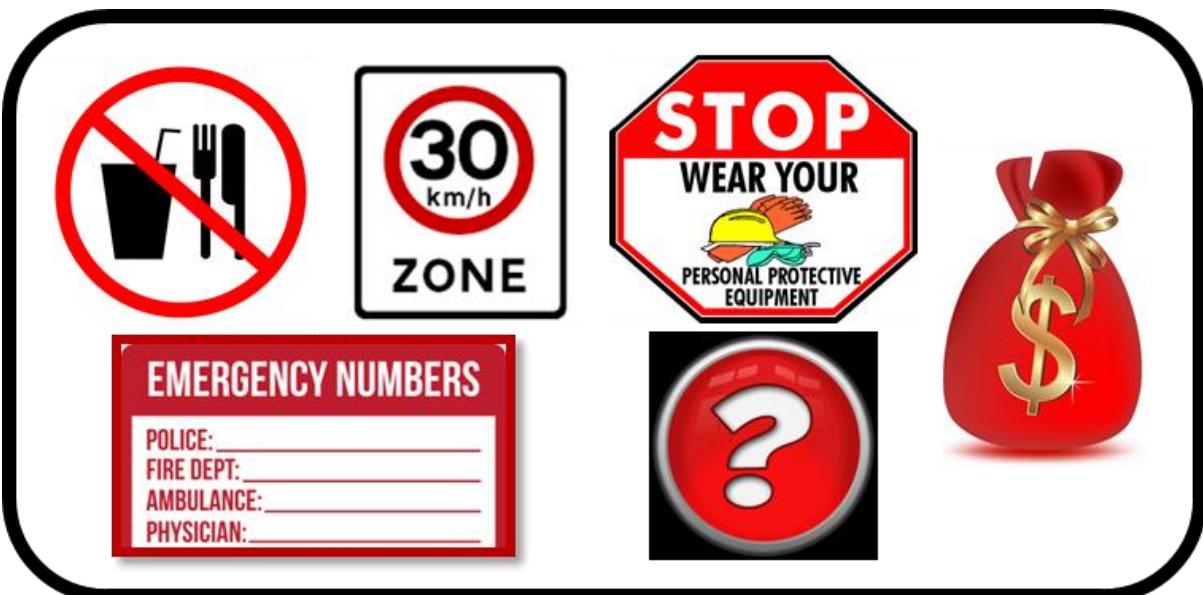
Tips and Guidelines

-  Workers and equipment should not be allowed outside demarcated areas
-  No swimming or polluting of water bodies allowed
-  No damage / disturbance to vegetation or water bodies without consent / permits
-  No disturbance allowed in no-go areas
-  No hunting of animals
-  Report all fires
-  No burning or burying of waste
-  No smoking near hazardous materials
-  Training on fire fighting equipment
-  Hazardous materials to be stored in designated and bunded areas
-  Spill kits and drip trays a must
-  Report all spills
-  Control dust and Noise
-  Maintain construction vehicles
-  Availability and maintenance of sanitation facilities



Tips and Guidelines

-  Only eat in designated areas
-  Do not litter
-  Vehicles to remain on approved tracks and adhere to speed limit
-  Ensure emergency phone numbers are available
-  Ensure PPE is worn
-  Report fires, leaks and injuries
-  Ask if unsure



APPENDIX D

METHOD STATEMENT DESCRIPTION

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

Method Statements can be used to cover applicable details with regards 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 could occur;
- Timing and location of activities;
- Compliance/non-compliance with the specifications/conditions, and
- Any other information deemed necessary by the DWS regarding the development near a watercourse.

The Developer should abide by these approved Method Statements (if any), and any activity covered by a Method Statement must not commence until the appointed ECO has approved it. Any Method Statements, which are required, should be submitted to the ECO not less than twenty (20) days prior to the intended date of commencement of the activity, or as directed by the ECO.

EXAMPLE OF A METHOD STATEMENT

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

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

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

Start Date:	End Date:

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

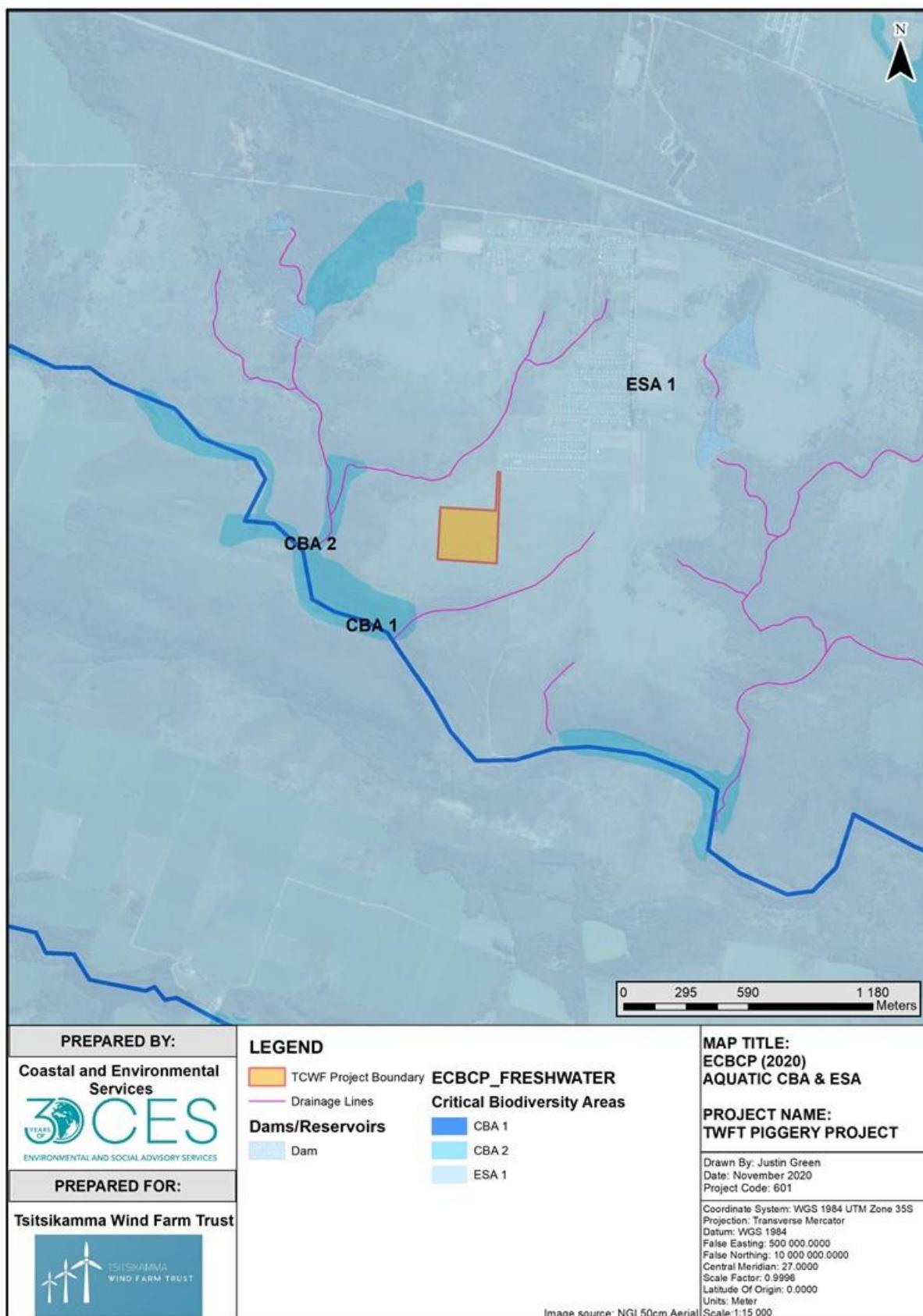
I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed)

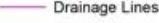
(Print name)

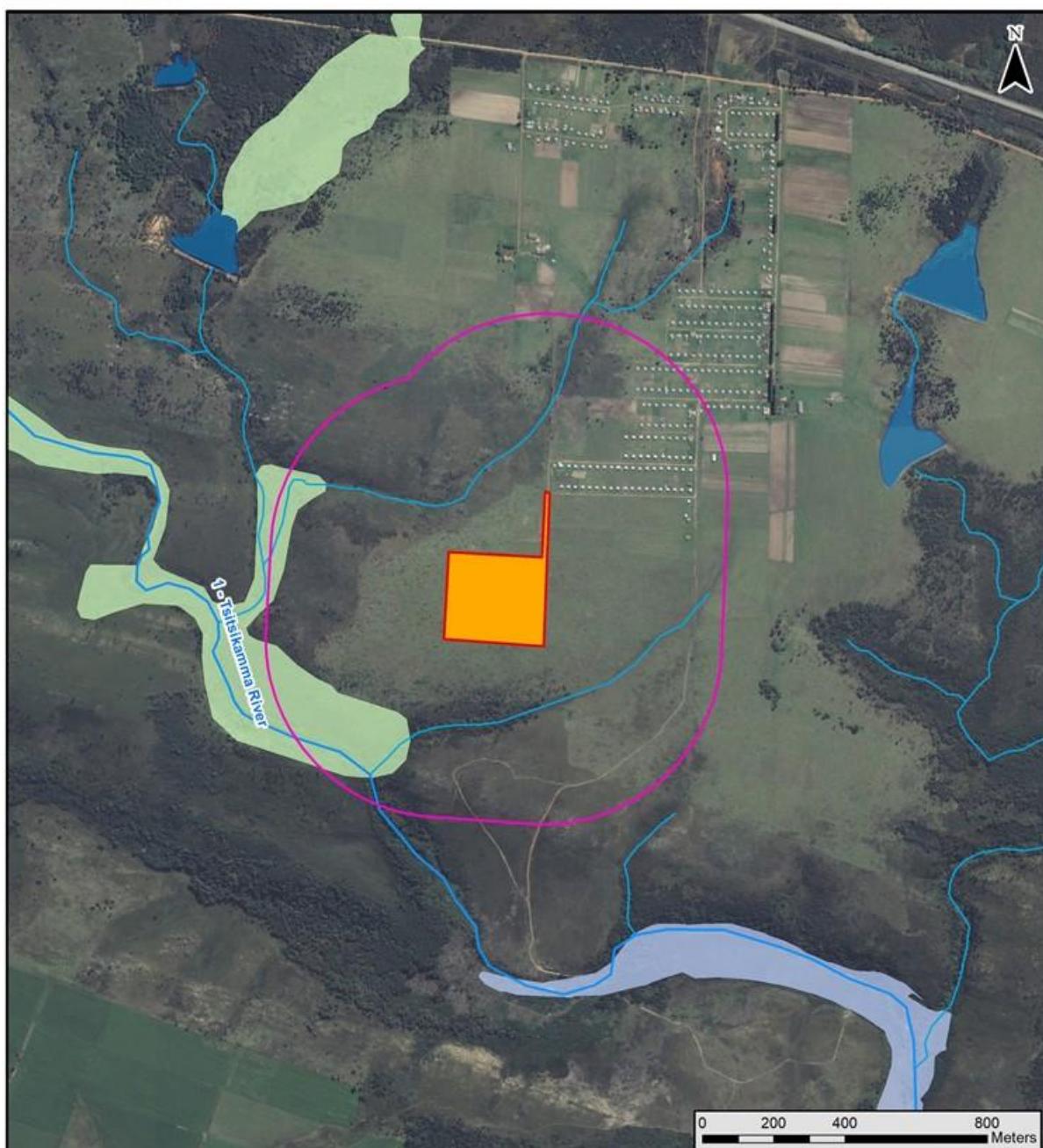
Dated: _____

APPENDIX E**SENSITIVITY MAPS**





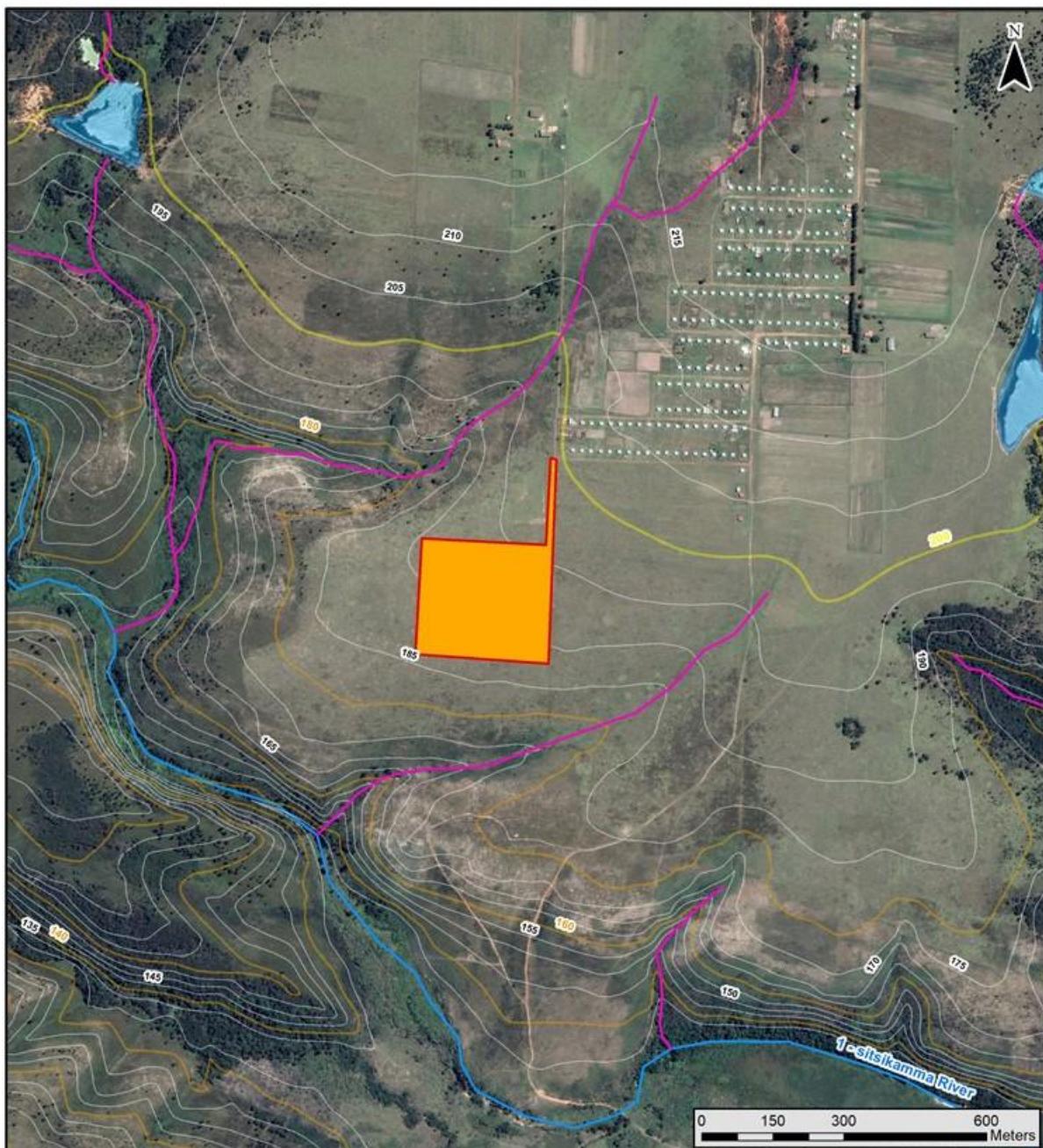
PREPARED BY:	LEGEND	MAP TITLE:
Coastal and Environmental Services  ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES	ECBCP_TERRESTRIAL  TCWF Project Boundary Rivers DWA  Rivers  Drainage Lines Dams/Reservoirs  Dam	ECBCP (2020) TERRESTRIAL CBA & ESA
PREPARED FOR:		PROJECT NAME:
Tsitsikamma Wind Farm Trust 		TWFT PIGGERY PROJECT
		Drawn By: Justin Green Date: November 2020 Project Code: 601
		Coordinate System: WGS 1984 UTM Zone 35S Projection: Transverse Mercator Datum: WGS 1984 False Easting: 500 000.0000 False Northing: 10 000 000.0000 Central Meridian: 27.0000 Scale Factor: 0.9996 Latitude Of Origin: 0.0000 Units: Meter Scale: 1:15 000
		Image source: NGI 50cm Aerial



PREPARED BY:	LEGEND	MAP TITLE:
Coastal and Environmental Services  ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES	Rivers DWA Set  TFWT Project Boundary  TFWT Project Boundary 500m Buffer  Rivers  Drainage Lines	NBA2018 National Wetland Map5 NWM52_L4A
PREPARED FOR:	Dams/Reservoirs  Dam	PROJECT NAME: TFWT PIGGERY PROJECT
Tsitsikamma Wind Farm Trust 		Drawn By: Justin Green Date: November 2020 Project Code: 601
		Coordinate System: WGS 1984 UTM Zone 35S Projection: Transverse Mercator Datum: WGS 1984 False Easting: 500 000.0000 False Northing: 10 000 000.0000 Central Meridian: 27.0000 Scale Factor: 0.9998 Latitude Of Origin: 0.0000 Units: Meter Scale: 1:10 000
		Image source: South Africa 50cm Colour



PREPARED BY: Coastal and Environmental Services 30 CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES	LEGEND	MAP TITLE: NBA (2018) National Vegetation Map
PREPARED FOR: Tsitsikamma Wind Farm Trust	National Vegetation Map 2018 <ul style="list-style-type: none"> TCWF Project Boundary (Yellow) FFb 6 Eastern Coastal Shale Band Vegetation (Dark Purple) FFh 9 Garden Route Shale Fynbos (Light Purple) FFs 20 Tsitsikamma Sandstone Fynbos (Magenta) Rivers DWA <ul style="list-style-type: none"> Rivers (Blue) Drainage Lines (Pink) Dams/Reservoirs <ul style="list-style-type: none"> Dam (Light Blue) 	PROJECT NAME: TWFT PIGGERY PROJECT
		Drawn By: Justin Green Date: November 2020 Project Code: 601
		Coordinate System: WGS 1984 UTM Zone 35S Projection: Transverse Mercator Datum: WGS 1984 False Easting: 500 000.0000 False Northing: 10 000 000.0000 Central Meridian: 27.0000 Scale Factor: 0.9996 Latitude Of Origin: 0.0000 Units: Meter Scale: 1:15 000



PREPARED BY:	LEGEND		MAP TITLE: PROJECT AREA, DRAINAGE LINES & 5m CONTOURS
Coastal and Environmental Services  ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES		PROJECT NAME: TWFT PIGGERY PROJECT	
PREPARED FOR:		Drawn By: Justin Green Date: November 2020 Project Code: 601	
Tsitsikamma Wind Farm Trust 		Coordinate System: WGS 1984 UTM Zone 35S Projection: Transverse Mercator Datum: WGS 1984 False Easting: 500 000.0000 False Northing: 10 000 000.0000 Central Meridian: 27.0000 Scale Factor: 0.9996 Latitude Of Origin: 0.0000 Units: Meter Scale: 1:7 500	
Image source: GoogleEarth (TM) 2019-01			

APPENDIX F

CURRICULUM VITAE

Name of Company	CES – Environmental and Social Advisory Services
Designation	Grahamstown Branch
Profession	Senior Environmental Consultant; GIS Specialist; and Aquatic Specialist
Years with firm	8 Years
E-mail	J.Green@cesnet.co.za / Justin.Green@eoh.co.za
Office number	+27 (0)46 622 2364
Nationality	South African
Professional Body	<ul style="list-style-type: none"> ➤ SACNASP, South African Council for Natural Scientific Profession, Professional (Pending) ➤ African Journal of Aquatic Science ➤ IAIA: Member of the International Association for Impact Assessments South Africa ➤ Geographic Information Systems (GIS) ➤ Wetland Assessment ➤ Surface Water & Aquatic Assessment
Key areas of expertise	

PROFILE

Mr Justin Green

Justin is employed as a Senior Environmental Consultant at Coastal & Environmental Services (CES), having spent the past 8 years working on Basic Assessments, EIA's, Monitoring Programme's, RAPs, Specialist Assessments and international fieldwork. I have worked on projects in the DRC, Lesotho, Mozambique, Zambia, Cameroon, Tanzania, Malawi, Swaziland, Madagascar and extensively throughout South Africa. Undertaking of numerous environmental management studies has resulted in a good working knowledge of environmental legislation and policy requirements.

He is currently the lead GIS specialist for CES, responsible for digitizing and processing vector and raster data for BAR's, EIA's and ESHIA's both locally and internationally. I have formed part of the GIS department for the past 7 years with my primary experience working with ArcGIS software and ArcEditor for developing GIS databases, data creation and snapping tolerances. Typical GIS projects include watershed analysis, viewshed analysis, infrastructure layouts, RAP data implementation, Sentinel-2 processing and specialist field data extraction. Projects have been completed for numerous international projects all up to African Bank, IFC and World Bank standards.

He has experience in training field teams and specialists in the use of OruxMaps and ODK collect as the primary tool for data collection. I am experienced in fieldworker training and team management resulting in the collection of field data, which can then be incorporated into GIS databases. Tablet based questionnaires are also used by these field teams to conduct surveys to collect information on project affected persons that are capable of linking to the spatial data collect. All survey data can then efficiently and accurately be captured in a Microsoft Access database for evaluation.

He is also specialized in Water Resources Management and Aquatic Biomonitoring and Assessment using the South African Scoring System (SASS5) methodology and am an accredited SASS5 practitioner. His experience in this field has included numerous large-scale mining, industrial, wastewater and agricultural EIA's that have required the construction of dams, pipelines and reservoirs. Many of these projects have also required the application for WULA's to be assessed.

EMPLOYMENT EXPERIENCE	<p>Coastal & Environmental Services, Grahamstown, South Africa</p> <p>Senior Environmental Consultant <i>January 2020 – Present</i></p> <ul style="list-style-type: none"> ➤ Senior Consultant ➤ GIS Specialist ➤ Surface Water & Aquatic Specialist ➤ Wetland Specialist <p>Coastal & Environmental Services, Grahamstown, South Africa</p> <p>Environmental Consultant <i>April 2012 – December 2019</i></p> <ul style="list-style-type: none"> ➤ Consultant ➤ GIS Specialist ➤ Surface Water & Aquatic Specialist ➤ Wetland Specialist
ACADEMIC QUALIFICATIONS	<ul style="list-style-type: none"> ➤ Bachelor of Science: Zoology and Entomology, Rhodes University, Grahamstown, 2006 - 2010 ➤ Post-Graduate Diploma in Enterprise Management Rhodes University, Grahamstown, 2011
COURSES	<ul style="list-style-type: none"> ➤ Rhodes University and CES - EIA Short Course. 2012. ➤ IMBEWU - Contaminated Land Workshop. 2013. ➤ GroundTruth - SASS5 Aquatic Biomonitoring Training Course. 2015. ➤ Rhodes University - Tools for Wetland Assessment. 2017. ➤ ESRI - Do-It-Yourself Geo Apps – 2020 ➤ ESRI - Going Places with Spatial Analysis - 2020
CONSULTING EXPERIENCE	
WETLANDS, SURFACE WATER & AQUATIC ASSESSMENTS SOUTH AFRICA & INTERNATIONAL	<ul style="list-style-type: none"> ➤ Triton Nicanda Hills Graphite Mine, Mozambique (2014) ➤ Sasol Nhangonzo Mozambique Biodiversity Assessment (2015) ➤ Alphamin Resources Mining ESIA, DRC (2015) ➤ GK Ancuabe Graphite Mine S.A. , Mozambique (2016) ➤ Murrimo Macadamias, Potatoes and Grains Project, Mozambique (2016) ➤ Kenmare Pilivili Mine, Mozambique (2017) ➤ Kenmare Road upgrade, Mozambique (2018) ➤ Triton Ancuabe Graphite Mine, Mozambique (2017) ➤ Triton Ancuabe Graphite Mine Monitoring, Mozambique (2018) ➤ JCM Cameroon Solar PV, Cameroon (2017) ➤ Suni Balama Graphite Mine, Mozambique (2018) ➤ CGA Siyahluma Citrus Farm, South Africa (2019) ➤ CGA Nomzamo Citrus Farm, South Africa (2019) ➤ Transnet Telecomms towers (x4), South Africa (2020)
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) INTERNATIONAL	<ul style="list-style-type: none"> ➤ Environmental Impact Statement: Sentinel Deposit, North Western Province, Zambia (2012) ➤ Mooi-Mgeni Transfer Scheme – Phase 2, Kwazulu-Natal Province, South Africa (2013) ➤ Syrah Balama Graphite Project: Pre-feasibility and Environmental Scoping Report, Mozambique (2013) ➤ Kamiesberg Project, Namakwaland, South Africa (2013) ➤ Belmont Valley Golf Course and Makana Residential Estate (EIA) (2013) ➤ Environmental and Social Impact Assessment Ranobe Mine Project, Southwest Region, Madagascar (2013) ➤ RHDHV – Biofuel ESIA Disclosure, Sofala Province, Mozambique (2014) ➤ London Mining Marampa Iron Ore Sierra Leone (2014) ➤ Proposed Upgrade of the Maroua Oil Mill in the Republic of Cameroon (2014) ➤ Proposed Upgrade of the Garoua Oil Mill in the Republic of Cameroon (2014)

	<ul style="list-style-type: none"> ➤ Green Resources Medium Density Fibreboard Production, Niassa Province, Mozambique (2014) ➤ Eastern Cape Biofuels Production (SEA) (2016) ➤
MINING PROJECTS INTERNATIONAL	<ul style="list-style-type: none"> ➤ Toliara Mineral Sands Rehabilitation and Offset Strategy Report, Madagascar (2014) ➤ Syrah Resources, Cabo del Gado, Mozambique (2014) ➤ Baobab Mining, Tete, Mozambique (2014) ➤ Triton Minerals Nicanda Hill Graphite Mine, Cabo del Gado, Mozambique (2014) ➤ Alphamin Resources TIN Mine ESIA, DRC (2016) ➤ Kenmare Pilivili Heavy Minerals Mine ESIA, Moma, Mozambique (2017) ➤ Metals of Africa Graphite Mine, Ancuabe, Mozambique (2017) ➤ Triton Minerals Ancuabe Graphite Mine, Cabo del Gado, Mozambique (2017)
RESSETLEMENT ACTION PLANS (RAP)	<ul style="list-style-type: none"> ➤ Murrimo Macadamias, Potatoes and Grains Project, Mozambique (2015) ➤ Kenmare Moma Mine, Moma, Mozambique (2017) ➤ Kenmare Pilivili Mine, Moma, Mozambique (2019) ➤ Total East Africa Midstream B.V - East African Crude Oil Pipeline (EACOP), Tanzania (2018-2019) ➤ Millennium Challenge Account (MCA) RAP Audit, Malawi, (2019) ➤ EEC Transmission RAP, Swaziland (2020)
WIND ENERGY PROJECTS (EIA) SOUTH AFRICA	<ul style="list-style-type: none"> ➤ MakanaOne Wind Energy Project (2012) ➤ Middleton Wind Energy (2012) ➤ Mossel Bay Wind Energy Project (2012) ➤ Plan 8 Wind Energy Project (2012) ➤ Grassridge Wind Energy Project (Coega) (2013) ➤ St Lucia Wind Energy Project (2013) ➤ Cookhouse Wind Energy Project (2013) ➤ Dassiesridge Wind Energy (2014) ➤ Inyanda-Roodeplaats Farm Wind Energy (2015)
SOLAR ENERGY PROJECTS (EIA) SOUTH AFRICA	<ul style="list-style-type: none"> ➤ MakanaOne Brack Kloof Photovoltaic Solar Energy Project, RSA (2012) ➤ MakanaOne Hilton Photovoltaic Solar Energy Project, RSA (2012) ➤ MakanaOne Table Hill Photovoltaic Solar Energy Project, RSA (2012) ➤ MakanaOne Watt Hill Photovoltaic Solar Energy Project, RSA (2012) ➤ JCM Solar PV Project, Cameroon (2017)
BASIC ASSESSMENT (BAR) SECTION 24G RECTIFICATIONS REPORTS SOUTH AFRICA	<ul style="list-style-type: none"> ➤ Resort Development on Portion 17 of Farm Gorah 398 (2012) ➤ Walmer 17th Avenue 132KV Powerline (2012) ➤ SANRAL Grahamstown to Fish River Road Upgrade (2013) ➤ Rehabilitation of R61 Section 2 Elinus Farm (Km42.2) To N10 (Km85), Cradock, Eastern Cape) (2013) ➤ Rehabilitation of N10 Section 3 between Riet River Bridge (km 45.2) and Tarka Bridge (km 68.5), Cradock, Eastern Cape (2013) ➤ Uhambiso Glenhurd Road Upgrade & Baakens River Bridge (2015) ➤ Innowind Ukomoleza & Olifantskop Substations and Overhead Powerlines (2015) ➤ Grahamstown Fairewood Estate Development (2015) ➤ Zirco Kenhardt Prospecting Application (2015) ➤ Justin Le Roux S24G, RSA (2018) ➤ Ramotshere Berg Housing, RSA (2020) ➤ Ramotshere kort Housing, RSA (2020) ➤ Adcock Housing Development S24G, RSA (2020) ➤ Oudtshoorn Cemetery S24G, RSA (2020) ➤ TCWF Piggery BAR, RSA (2020)

MONITORING PROGRAMMES	<ul style="list-style-type: none"> ➢ Innowind Waainek Wind Farm (2017) – 12 Month Bat Monitoring ➢ Triton Ancuabe Graphite Mine (2019) – 12 Month Water Monitoring ➢ Kenmare Pilivili (2020) – Mangrove Monitoring ➢ ELIDZ (2020) – Water Monitoring Plan
ADDITIONAL EXPERIENCE	<p>Faunal Assessments</p> <ul style="list-style-type: none"> ➢ Lesotho Highlands Water Project ESIA, Lesotho (2014) <ul style="list-style-type: none"> ➢ Mammal component for Faunal specialist study (trapping and identification), assistant to Faunal specialist. <p>Ecological Assessments</p> <ul style="list-style-type: none"> ➢ Borrow Pit in Libode, Eastern Cape Province (2014) ➢ LHDA Botanical Survey and Impact Assessment, Lesotho (2014) ➢ Kenmare Terrestrial Monitoring Program, Specialist Survey, MOMA, Mozambique (2014 & 2016) ➢ Doorndraai Citrus Ecological Assessment, Bedford, South Africa (2017) <p>Due Diligence</p> <ul style="list-style-type: none"> ➢ Coega Brick Due Diligence (2012) ➢ MCA Malawi Millenium RAP Audit Review (2019) <p>Environmental Auditing</p> <ul style="list-style-type: none"> ➢ Strowan Mine Environmental Auditing (2013) ➢ Grahamstown Municipal Dump Auditing (2017) ➢ Lalibela Lentaba Lodge Construction auditing (2017) ➢ Construction Audit: Biotherm Energy Access Road and Power Line, South Africa (2019) ➢ Construction Audit: Biotherm Energy Golden Valley-Kopleegte 132kV Power Line, South Africa (2019) ➢ Construction Audit: Amstilite Golden Valley Wind Energy Facility, South Africa (2019) <p>Policy and Guidelines</p> <ul style="list-style-type: none"> ➢ Water use licence applications for various river crossings for Rehabilitation of R61 Section 2 Elinus Farm (Km42.2) To N10 (Km85), Cradock, Eastern Cape (BAR) (2013) <p>Mining applications</p> <ul style="list-style-type: none"> ➢ Mining Application for Hard Rock Quarry and borrow pits for N10-3 road upgrade (2013) ➢ Mining Application for Hard Rock Quarry and borrow pits for R61-2 road upgrade (2013) ➢ Mining Application for Hard Rock Quarries and borrow pits for N2 road upgrade (2013)

Languages	Speak	Read	Write
English	Excellent	Excellent	Excellent
Afrikaans	Satisfactory	Satisfactory	Satisfactory

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

**JUSTIN GREEN**

Date: November 2020

Name of Company	CES
Designation	Grahamstown Branch
Profession	Principal Environmental Consultant
Years with firm	3 Years
E-mail	g.shaw@csenet.co.za
Office number	+27 (0)46 622 2364
Nationality	South African
Professional Body	SACNASP, South African Council for Natural Scientific Profession, Professional (Pending)
Key areas of expertise	<ul style="list-style-type: none">➤ Marine Ecology➤ Environmental and Social Impact Assessment (ESIA)➤ Environmental Management and Monitoring➤ Project Management

PROFILE

Mr Gregory Shaw

Greg is a principal environmental consultant with more than 10 years' experience, who has carried out ESIA's for a variety of infrastructure developments in Africa and Europe. His experience is with development projects where there is creation or modification of infrastructure, via capital works and complex logistics.

He is able to engage with the full portfolio of diverse stakeholder groups and regulators via meetings, written material, face-to-face workshops, presentation events, negotiation and discussion to achieve mutually agreeable mitigation measures and solutions. As part of many of the ESIA's he has been involved in or managed he has been responsible for the development and execution of environmental surveys (and subsequent monitoring programmes), sub-contractor management (including contracting), report writing and project management. In addition, he has been responsible for developing and auditing plans associated with managing large infrastructure projects e.g. Environmental Management Plans (EMP).

Greg forms strong relationships and ensure that the team works together in an integrated way towards the clear common goal, making effective use of time and resources.

ACADEMIC
QUALIFICATIONS

November 2016 - Present:
Principal Consultant (EOH Coastal & Environmental Services)
Grahamstown, South Africa

January 2008 – October 2016:
Senior Consultant (Royal HaskoningDHV)
Peterborough, United Kingdom

January 2004 – January 2007:
Part-time consultant (Public Process Consultants)
Port Elizabeth, South Africa

Nelson Mandela Metropolitan University, Port Elizabeth
MSc (Botany)
2005 – 2007

Nelson Mandela Metropolitan University, Port Elizabeth
BSc (Hons) (Environmental Management)
2004

University of Port Elizabeth, Port Elizabeth
BSc (Natural Sciences)
2000 - 2003

COURSES

- 2013 Royal HaskoningDHV Accelerated Development Programme
- 2012 First Aid
- 2012 Handling Conflict
- 2011 Client Relationships
- 2011 Financial Management
- 2010 Report Writing
- 2010 Project Management
- 2010 Effective Communication
- 2010 Knowing Your Business
- 2010 Phase I Ecological Surveying Techniques and Taxonomy
- 2009 CIWEM Structured Training
- 2009 Project Management
- 2008 Sustainable Construction
- 2006 South African Association of Botanists - Annual Seminar
- 2005 Resource Directed Measures
- 2005 Training in Integrated Environmental Management
- 2005 Integrated Water Resource Management Workshop

CONSULTING
EXPERIENCE

Environmental consulting experience as project manager or team member is broad and covers a number of key industry sectors (ports, nuclear, renewable energy). The majority of the international ESIA's were conducted in accordance with international standards including the IFC Performance Standards and have been reviewed by international Development Finance Institutions.

South Africa

- Nirove Paint Stripping Facility [Project manager]
- Wison Coal to Urea EIA [Project manager]
- St Francis Bay EIA [Project Manager, Marine specialist]
- EOH Powerstation Feasibility Assessment [Project manager]
- Richard's Bay breakwater refurbishment [Marine specialist]
- KBK Engineers (Sanral) Basic Assessment [Project manager]
- Bayview Wind Energy Facility [Project director]
- Rushmere Noach Attorneys [Project manager and marine specialist]
- TNPA East London Quay 3 Assessment [Environmental specialist]

- TNPA Ballast Water Management Plan [Environmental specialist]
- Fairwood Estate Environmental Authorisation [ESMP author]
- Environmental Scoping Report cc. Erf 2387, Port Elizabeth. Baobab Agencies. [Environmental specialist].
- Proposed Hybrid Residential Development Scoping Report, Port Elizabeth. [Environmental specialist].
- Ingleside Development, Port Elizabeth. [Specialist Review].
- Port of Ngqura Marine Biomonitoring Programme. Coega Development Corporation. [Surveyor / research assistant].
- Construction and Operation of the Deepwater Port of Ngqura EIA. Coega Development Corporation. [Specialist review].

Africa

- Kenmare Mangrove Baseline Assessment (Mozambique) [Lead surveyor]
- Sphinx Energy Solar PV Facilities in Guider & Maroua (Cameroon) [Project manager]
- Olam Cocoa Plantation ESIA (Tanzania) [Project manager, ESIA manager]
- MCA-Malawi RAP Audit [Project Manager, Lead Auditor]
- JCM Power ESMS [Project manager]
- JCM Power Solar Power Station ESIA [Project Manager, Report Author]
- Suni Resources Traffic Impact Assessment [Report author]
- NCCL Isanye Dam EPB (Zambia) [Project manager]
- NCCL Ngoli Dam EPB (Zambia) [Project manager]
- NCCL Kasama Dam ESIA (Zambia) [ESIA manager]
- JCM Power Solar PV ESIA (Cameroon) [ESIA manager]
- Tete Iron Ore Project ESIA (Mozambique) [ESMP]
- Triton Ancuabe ESIA (Mozambique) [Specialist coordination, ESMP]
- Badagry Greenfield Port Development ESIA including management plans (Nigeria) [ESIA and marine specialist]
- Saly Coastal Protection Project ESIA (Senegal) [Marine specialist]
- Port Mole Waterfront Development ESIA including management plans (Gabon) [ESIA manager and marine specialist]
- Bulk Handling Facility ESIA including management plans (Conakry Guinea) [ESIA manager and marine specialist]
- Kamsar Container Terminal ESIA including management plans (Conakry Guinea) [ESIA manager and marine specialist]
- Port of Ziguinchor ESIA including management plans (Senegal) [Marine specialist / Reviewer]
- Eko Atlantic Shoreline Protection ESIA including management plans (Nigeria) [Marine specialist]
- Eko Atlantic Topsides Infrastructure ESIA (Nigeria) [ESIA manager]
- Construction of a Jetty Facilitating Transfer of Petroleum Products from Ship to Shore (Eritrea) [Environmental Clerk of Works]

United Kingdom

- Thamesport Phase IV Quay Extension EIA [Reviewer]
- East Lane, Bawdsey Coast Defence Works [Environmental Clerk of Works]
- Kilkeel Offshore Wind Farm Feasibility and Scoping Report [Project manager]
- Wells Channel Deepening and Jetty Construction EIA [EIA and marine specialist]
- Wells Channel Deepening and Jetty Construction Environmental Monitoring Programme (2010-2016) [Project manager and marine specialist]
- Trinity III Enhancement Monitoring Programme (2008 – 2011) ([Marine specialist]
- Trimley Ecological Monitoring Programme (2008 – 2011) [Marine specialist]

- SEAs for the Eastern England Shoreline, required for Shoreline Management Plans [Marine specialist]
- River Habitat Survey, Tributary of Car Dyke [Field work and report writing]
- Hinkley Point C Environmental Impact Assessment [EIA coordinator and marine specialist]
- Harwich Haven Annual Environmental Reporting (2009 – 2011) [Project manager and marine specialist]
- Environmental Monitoring and Mitigation Plan / Habitat Regulations Assessment East Lane [Project manager and marine specialist]
- Thanet Offshore Wind Farm [Environment Manager]
- The Wash Tide Gauge [Consent advisor and marine specialist]
- Dogger Bank Creyke Beck A&B, Teesside A&B EIA [Marine specialist]
- Kentish Flats Offshore Wind Farm Extension [Consent advisor / environment manager]
- Royal National Lifeboat Institute (RNLI) Feasibility [Project manager and marine specialist]
- Bacton Gas Terminal Coast Protection Works and Offshore Borrow Area EIA [Consent and marine specialist]
- Newhaven East Quay and Port Expansion Area EIA [Marine specialist]
- Sizewell C New Nuclear Build Habitats Regulations Assessment [Project manager]
- DNV Subsea Cable Installation Guidelines [Marine and Consenting expert]
-

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

GREGORY SHAW

Date: January 2020