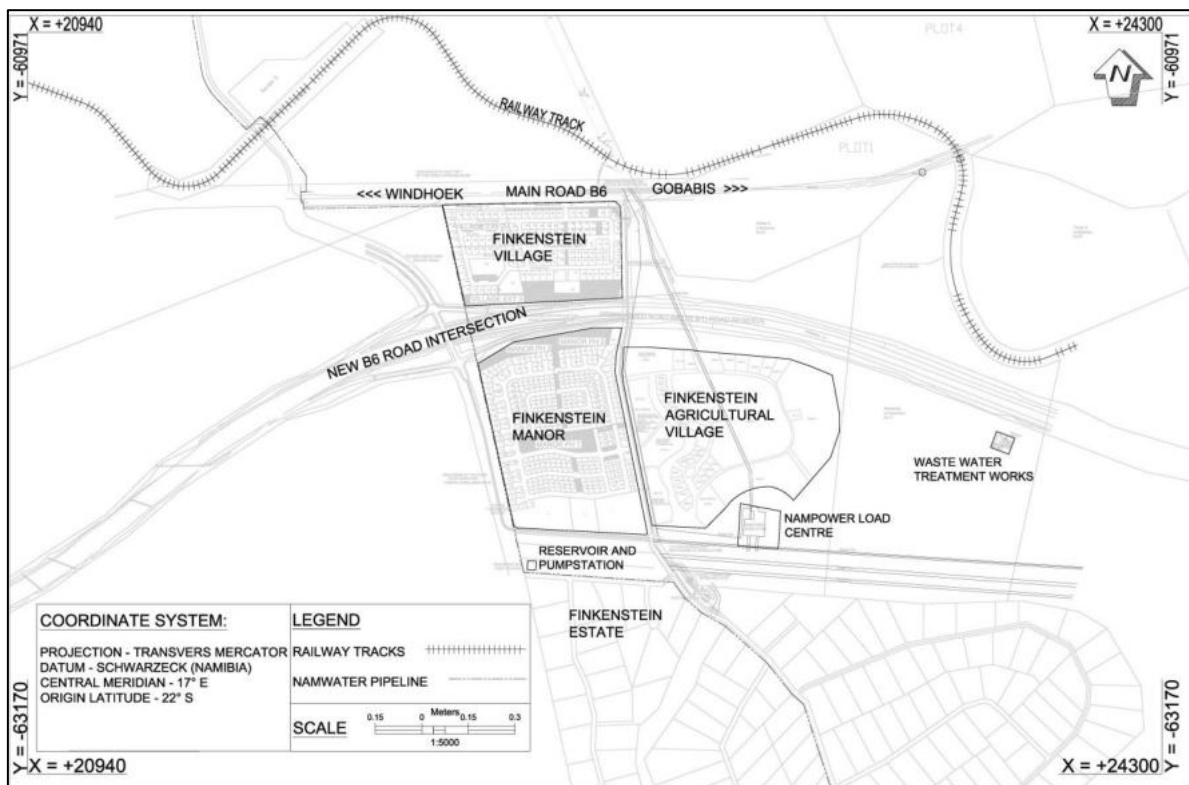


**IMPLEMENTATION OF AND COMPLIANCE WITH THE ENVIRONMENTAL
MANAGEMENT PLAN FOR THE FINKENSTEIN RETIREMENT VILLAGE
PHASES 1 (FINKENSTEIN MANOR) AND 2 (FINKENSTEIN VILLAGE) AND THE
AGRICULTURAL VILLAGE (FINKENSTEIN GREEN) ON FARM FINKENSTEIN
NO. 526, KHOMAS REGION, NAMIBIA**



19 October 2022

Prepared by:



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LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ASE	Aqua Services & Engineering (Pty) Ltd
CIF	Construction Industry Federation (of Namibia)
CoW	City of Windhoek
DEA	Directorate of Environmental Affairs
DWA	Department of Water Affairs
EAPAN	Environmental Assessment Professionals of Namibia
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
FAO	Food and Agriculture Organization
FHA	Finkenstein (Estate) Homeowners Association
FMHA	Finkenstein Manor Homeowners Association
FPTT	Finkenstein Portion Three Trust
FSMS	Food Safety Management System
FVHA	Finkenstein Village Homeowners Association
GG	Government Gazette
GN	Government Notice
GRN	Government of the Republic of Namibia
HA	Homeowners Association
HIV	Human Immunodeficiency Virus
HVAC	Heating, Ventilation, and Air Conditioning
I&APs	Interested and Affected Parties
IDC	International Development Consultancy
IEMA	Institute of Environmental Management and Assessment
INM	Integrated Nutrient Management
IPM	Integrated Pest Management
MANWU	Metal and Allied Workers Union
MAWF	Ministry of Agriculture, Water and Forestry
MAWLR	Ministry of Agriculture, Water and Land reform
MET	Ministry of Environment and Tourism
MEFT	Ministry of Environment, Forestry and Tourism
MFMR	Ministry of Fisheries and Marine Resources
MHSS	Ministry of Health and Social Services
MSDS	Material Safety Data Sheet
NamPower	Namibian Power Corporation
NamWater	Namibian Water Corporation
NBRI	National Botanical Research Institute
NCE	Namibia Chamber of Environment
PM	Particulate Matter
PMP	Pesticide Management Plan
PPE	Personal Protective Equipment
PS	Permanent Secretary
SA	South Africa
STIs	Sexually Transmitted Infections
TB	Tuberculosis
UK	United Kingdom
UNAM	University of Namibia
VOC	Volatile Organic Compound
WHO	World Health Organization
WWTP	Wastewater Treatment Plant
cm	centimetre
CO	carbon monoxide
CO ₂	carbon dioxide
ha	hectare

m ²	square metre
km/h	kilometre per hour
l	litre
m	metre
m ³	cubic metre
NO _x	nitrogen oxides
SO ₂	sulphur dioxide

1 Introduction

1.1 Background

In 2010, LM Environmental Consulting was appointed to conduct an Environmental Impact Assessment (EIA) and prepare an Environmental Management Plan (EMP) on behalf of Finkenstein Portion Three Trust (FPTT) for the development of the Finkenstein Retirement Village Phases 1 and 2, Khomas Region, Namibia (Maartens, 2010). Environmental Clearance was obtained from the Office of the Permanent Secretary (PS), Ministry of Environment and Tourism (MET), on **24 November 2010**.

The Commencement of the Environmental Management Act (EMA), 2007 (Act No. 7 of 2007) (Government Notice (GN) No. 28), the Listed Activities that may not be undertaken without an Environmental Clearance Certificate (ECC) (GN No. 29), and the EIA Regulations (GN No. 30) were published in the Government Gazette (GG) (Government of the Republic of Namibia (GRN), 2012) on 06 February 2019. Finkenstein Portion Three Trust (FPTT) subsequently applied (under the new legislation) to the Office of the Environmental Commissioner, Directorate of Environmental Affairs (DEA), MET for an ECC on 05 December 2012. The ECC was issued by the Office of the Environmental Commissioner, MET on **26 April 2013** and was valid for three (3) years, i.e. until 25 April 2016.

In January 2016, FPTT proposed the development of an Agricultural Village on Farm Finkenstein No. 526 (see Figure 1), as well as the development of a Construction Worker Camp on the Remainder of Portion 7 of Farm Hoffnung No. 66. The MET requested that an amendment to the existing EIA and EMP for the Finkenstein Retirement Village Phases 1 and 2 be done, and including Public Consultation (Mr Simon Hangula, Snr Conservation Scientist, and Mr Damian Nchindo, Nature Conservation Scientist, Ministry of Environment and Tourism, pers. comm., 25 January 2016).

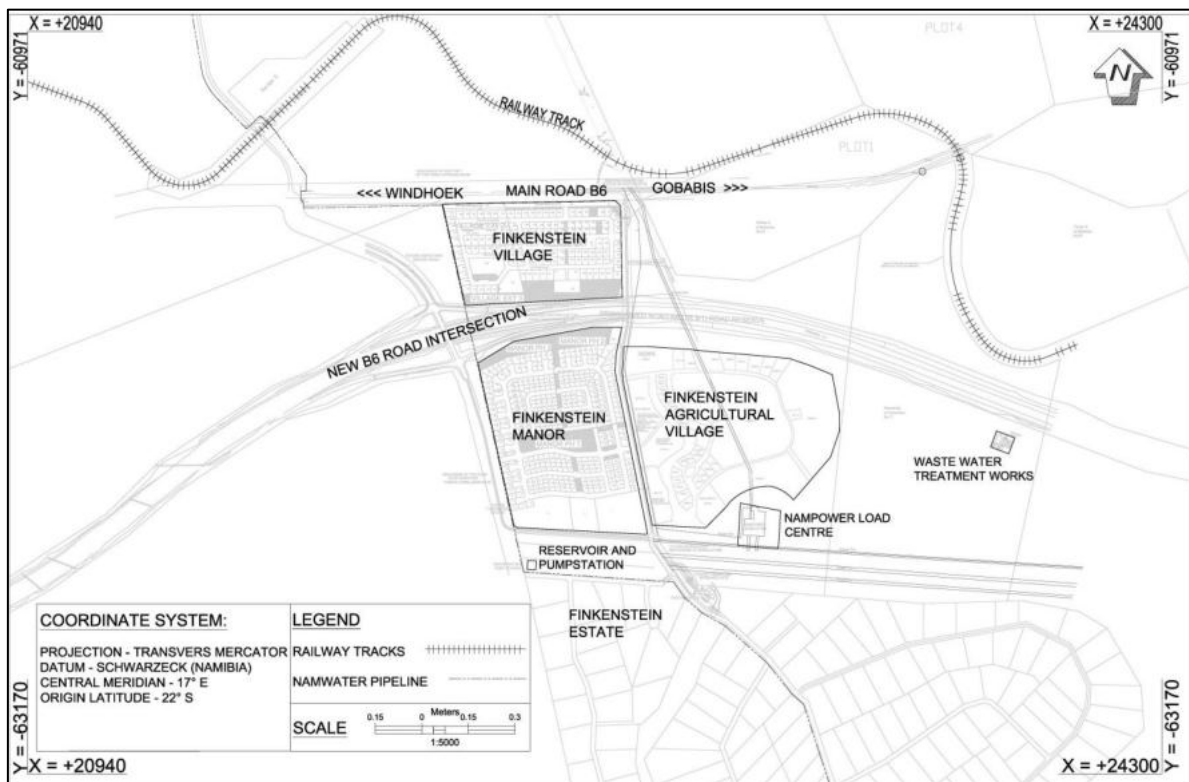


Figure 1: Map showing the location of the Finkenstein Manor and Village, and the Finkenstein Agricultural Village/Finkenstein Green (Source: Finkenstein Portion Three Trust).

A Public Consultation Process was carried out between 29 January and 19 February 2016; during this time (8 February 2016), the owner of Farm Hoffnung No. 66 rejected FPTT's application to house the construction workers on the Remainder of Portion 7 of Farm Hoffman No. 66.

On 10 March 2016, FPTT applied to the Environmental Commissioner, MET, for the following: i) renewal of the ECC for the EIA and EMP for the Finkenstein Retirement Village Phases 1 and 2, Khomas Region, Namibia; a document entitled *Implementation of and Compliance with the Environmental Management Plan for the Finkenstein Retirement Village Phases 1 and 2, Khomas Region, Namibia* (see Maartens, 2016a) accompanied the application; ii) application of transfer of the ECC from the International Development Consultancy (IDC) to FPTT; and iii) amendment to the existing EIA and EMP for the Finkenstein Retirement Village Phases 1 (Finkenstein Manor) and 2 (Finkenstein Village) and the Agricultural Village, Farm Finkenstein No. 526, Khomas Region, Namibia (see Maartens, 2016b). An ECC was issued by the Office of the Environmental Commissioner, MET on **14 November 2016** and was valid for three (3) years, i.e. until 13 November 2019.

In July 2019, LM Environmental Consulting was again appointed by FPTT to prepare a report, illustrating the implementation of and compliance with the EMP (see Maartens, 2019), in aid of the application for the renewal of the ECC for the Finkenstein Retirement Village Phases 1 (Finkenstein Manor) and 2 (Finkenstein Village) (see Figure 1) and the Agricultural Village, Farm Finkenstein No. 526, Khomas Region, Namibia. The relevant documents were submitted to the Office of the Environmental Commissioner, MET, on 14 August 2019 (APP-00389) and an ECC (00233), valid until 17 October 2022, was issued by the Office of the Environmental Commissioner, MET on **17 October 2019**.

Since October 2019, five (5) Bi-Annual Environmental Reports have been submitted to the Office of the Environmental Commissioner, MET (now Ministry of Environment, Forestry and Tourism (MEFT)) (see Maartens, 2020; 2021a; 2021b; 2021c; and 2022).

1.2 Development of Infrastructure: Finkenstein Retirement Village Phases 1 (Finkenstein Manor) and 2 (Finkenstein Village) and the Agricultural Village (Finkenstein Green)

The **Civil Works** (roads, water, electricity, sewage, and storm water) commenced at the beginning of March 2015 and was completed by June 2016 (handover of the township services took place end-June 2016; the construction of the Wastewater Treatment Plant (WWTP) was also completed in June 2016).

Construction of houses at the Finkenstein Manor and Finkenstein Village commenced in June 2016. In 2019, it was anticipated that the construction phase (Finkenstein Manor and Village) would be completed in five to six years' time, i.e. by 2024/5 (see Maartens, 2019). However, it was decided by FPTT to, going forward (and starting in 2021), sell erven only, and for the owners to then appoint their own building contractors to build their houses (see Maartens, 2021a). Building work at Finkenstein Manor and Village, as well as Finkenstein Green, will thus be ongoing.

Finkenstein Manor is being developed in three phases (see Figure 2) and will consist of 260 full title units (114 units have been built to date; five units are under construction), ~90 sectional title units (14 units have been built to date) (construction of the 11 single garages was completed in 2020), a Frail Care Centre, a kitchen/dining room complex, and a Neurological Clinic. The latter, to be developed by an independent developer, will be the first of its kind in Namibia and will cater for Alzheimer's, Dementia, Parkinson's, etc. patients from all over the Country (see Maartens, 2019; Mr Leon Basson, Trustee, Finkenstein Portion Three Trust and Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm., 10 October 2022).

During 2020, one of the houses was converted into a Healthcare Centre (and until the Frail Care Centre is developed) (see Maartens, 2021a).



Figure 2: Locality Plan: Finkenstein Manor and Village (Source: Finkenstein Portion Three Trust).

The **Finkenstein Village** (see Figure 2) will consist of 125 full title units (66 units have been built to date; five units are under construction) and 71 sectional title units (40 units have been built to date) (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust and Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm., 10 October 2022).

Finkenstein Green will be developed on land to the east of the existing Finkenstein Estate access road and bordering Finkenstein Manor (see Figure 1). It was proposed that Finkenstein Green will contain: a business area (shops and offices); a Lifestyle Centre and Recreational Area; Offices and Workshops for a Central Management Body; a Church; a junior Primary School; a Memorial Wall; and development that will provide secure garages, carports, etc. At the time, it was also proposed to plant animal fodder crops (area of 116,920 square metres (m²) or 11.692 hectares (ha)) and to irrigate the area with water from the Wastewater Treatment Plant (WWTP) (see Maartens, 2016b).

On **09 September 2019**, the Minister of Urban and Rural Development approved the subdivision of the Remainder of the Farm Finkenstein No. 526 into Portion 235, Portion 236 (road, free of conditions), Portion 237 (free of conditions), Portion 239 to 240, and the Remainder, and the need and desirability for township establishment.

The Townships Board (Ministry of Urban and Rural Development) subsequently approved the establishment of the townships Finkenstein Extensions 4 (on Portion 239 of Farm Finkenstein No. 526) and 5 (on Portion 240 on Farm Finkenstein No. 526) on **09 September 2020** (see Maartens, 2021a). All planning processes must be complied with within two years; the latter is ongoing.

Finkenstein Extension 4 was proclaimed a township (under the Urban and Regional Planning Act of 2018) (see GRN, 2021). The township comprises 60 erven (numbered 427 to 486), private road reserves, and the remainder private open spaces; Erf 482 is reserved for parastatal purposes (NamPower). The land use breakdown and layout plans for Extensions 4 and 5 can be seen in Table 1 and Figures 3 and 4.

Table 1: The proposed land use breakdown for Finkenstein Green, Farm Finkenstein No. 526, Khomas Region, Namibia (Source: Winplan Town & Regional Planning Consultants).

Land Use	Extension 4		Extension 5	
	Erven (#)	Total Area (m ²)	Erven (#)	Total Area (m ²)
Residential	40	37,532	41	39,092
Gen. Residential	8	23,325		
Business	5	19,328		
Institutional	2	20,804		
Private Open Space	5	48,038	4	33,099
Parastatal	1	14,309		
Total	61	163,336	45	72,191

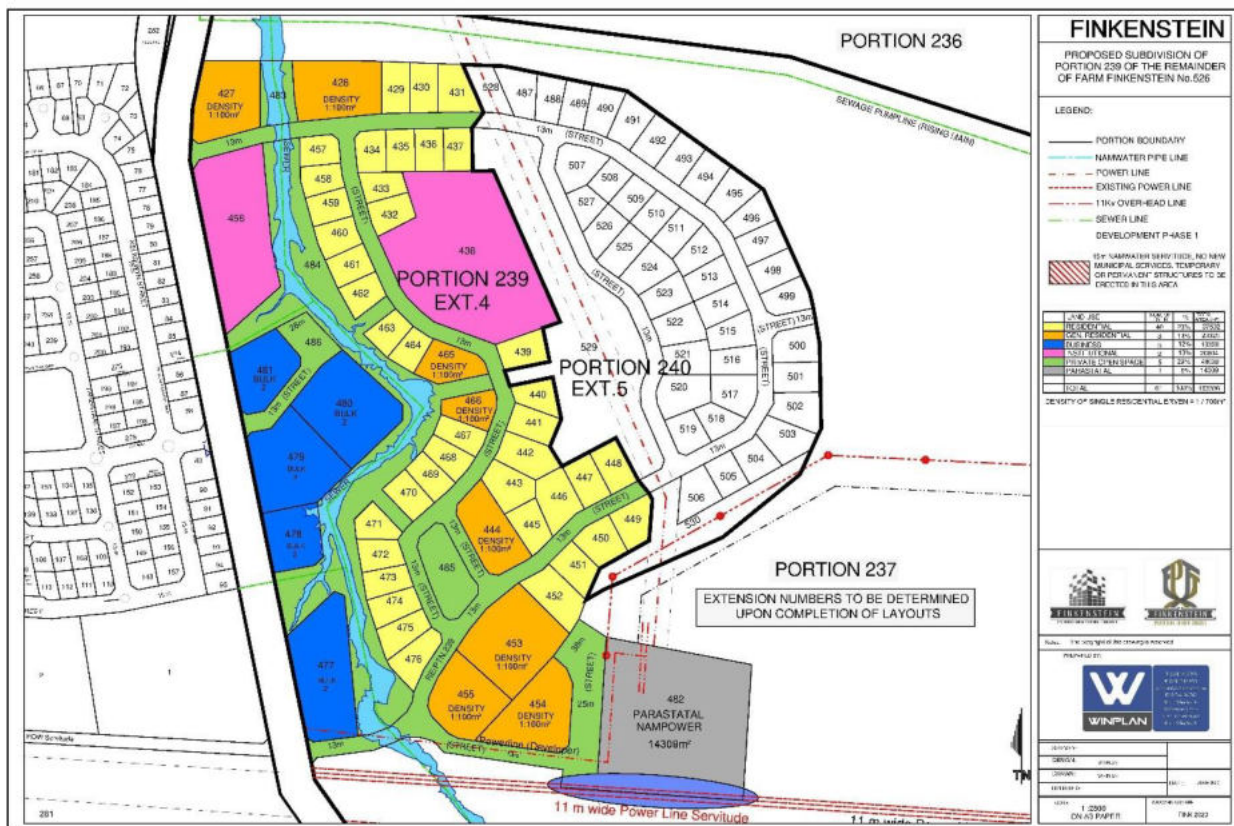


Figure 3: Layout Plan: Extension 4 (on Portion 239 of Farm Finkenstein No. 526) (Source: Winplan Town & Regional Planning Consultants).

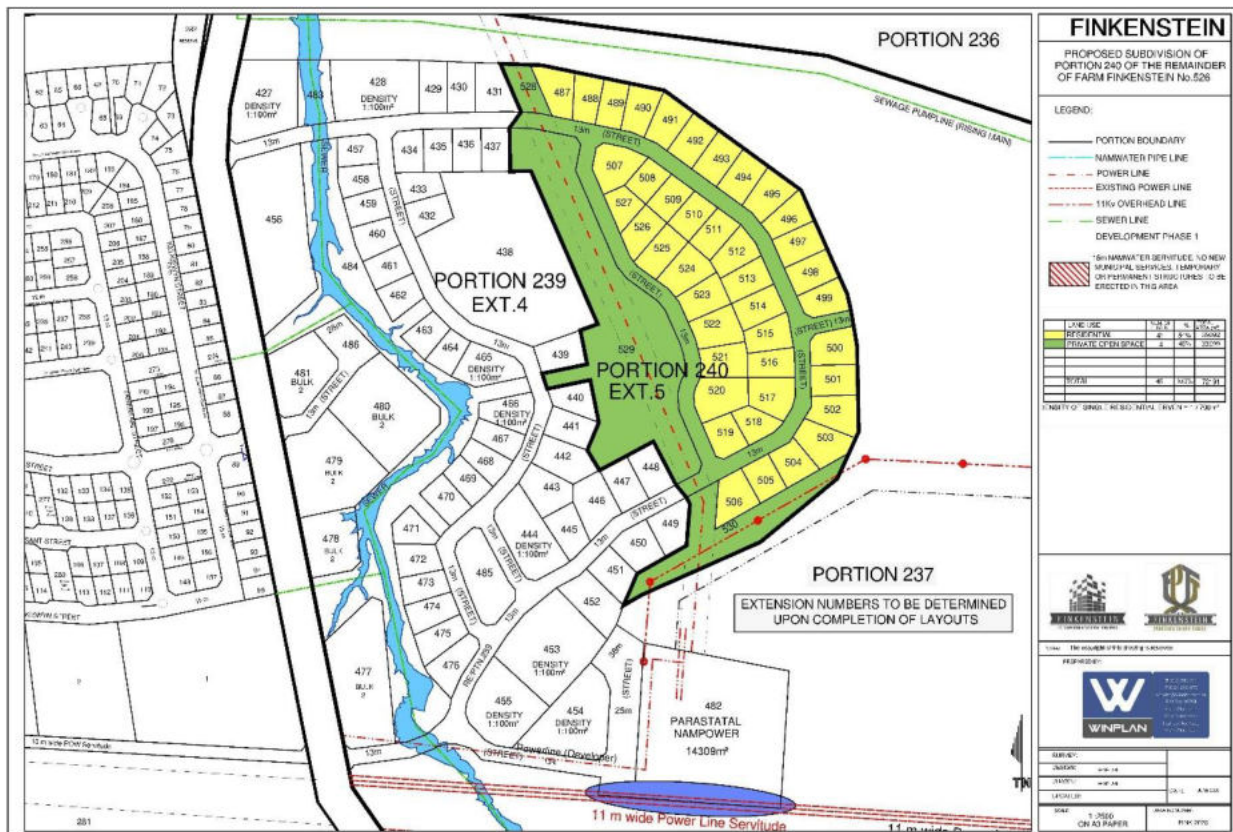


Figure 4: Layout Plan: Extension 5 (on Portion 240 of Farm Finkenstein No. 526) (Source: Winplan Town & Regional Planning Consultants).

Please note: **Finkenstein Three Holdings Trust** consist of **Finkenstein Portion Three Trust** (PFTT; Finkenstein Manor and Finkenstein Village) and **Finkenstein Portion Five Trust** (Finkenstein Green (Agricultural Vilage) and “Green Extra”). An Application for *Transfer of Environmental Clearance Certificate* (ECC) – from Finkenstein Portion Three Trust to Finkenstein Three Holdings Trust - will be submitted to the Office of the Environmental Commissioner once the current **ECC-00233** has been renewed.

The specific purpose of the subdivision of the Remainder of the Farm Finkenstein No. 526 into Portions 235 to 240 and the Remainder can be seen in Table 2 and Figure 5. Please note that only the activities on Portions 239 and 240 and the Wastewater Treatment Plant (WWTP) are covered under the current ECC.

Table 2: Planning actions for the subdivision of the Remainder of the Farm Finkenstein No. 526 into Portions 235 to 240 and the Remainder (Source: Mr Louis Esterhuizen, Winplan Town & Regional Planning Consultants, 13 October 2022).

Portion	Size (hectares)	Purpose of Portion	Additional Planning Steps Applied For
235	22.2906	Future Township Development	Need and Desirability for Township Establishment (Future Development)
236	12.2210	Road Reserve: National Freeway	None
237	76.8773	Future Township Development and accommodating existing wastewater treatment plant and related infrastructure	Need and Desirability for Township Establishment (Future Development)
238	0.3083	Finkenstein Estate Entrance Gate	None
239	14.9027	New Township Development	Need and Desirability for Township Establishment (Extension 4)
240	7.2191	New Township Development	Need and Desirability for Township Establishment (Extension 5)

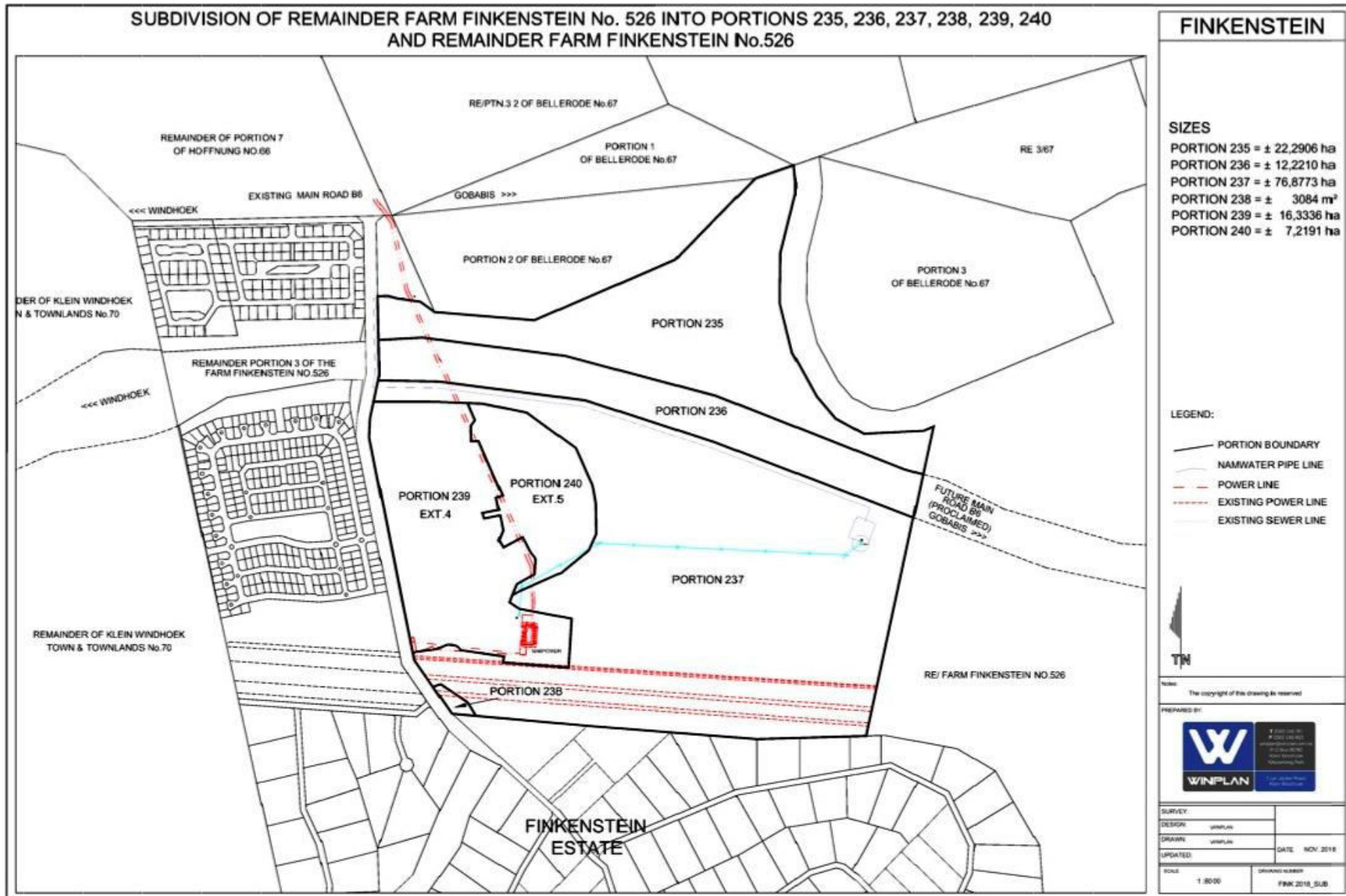


Figure 5: Layout plan showing the subdivision of the Remainder of the Farm Finkenstein No. 526 into Portions 235 to 240 and the Remainder (Source: Winplan Town & Regional Planning Consultants, November 2018).

1.3 Terms of Reference

LM Environmental Consulting was appointed by Finkenstein Portion Three Trust to prepare a report, illustrating the implementation of and compliance with the EMP, in aid of the application for the renewal of the ECC for the Finkenstein Retirement Village Phases 1 (Finkenstein Manor) and 2 (Finkenstein Village) and the Agricultural Village (Finkenstein Green), Farm Finkenstein No. 526, Khomas Region, Namibia, in September 2022.

1.4 Environmental Assessment Practitioner

The author of this Report is Dr Lima Maartens who has more than 29 years' experience in natural resource management (she gained her doctorate (Ph.D.) in Fisheries Science from Rhodes University, South Africa (SA) while working for the Namibian Ministry of Fisheries and Marine Resources (MFMR) in 2000, lecturing (University of Namibia (UNAM)), environmental science and management (De Beers Marine Namibia and the Canadian Forsys Metals Corp), and consulting). Dr Maartens is registered as a Lead Practitioner and Reviewer with the Environmental Assessment Professionals of Namibia (EAPAN) (she served on the Executive Committee during 2016/17), an Associate Member and Environmental Auditor with the Institute of Environmental Management and Assessment (IEMA) in the United Kingdom (UK), an Full Member of the Namibia Chamber of Environment (NCE), and a Member of the Namibia Scientific Society. LM Environmental Consulting was established by Dr Maartens in October 2009.

2 Environmental Management Plan: Implementation and Compliance

2.1 Introduction

As part of the EMP performance review, the following actions were carried out:

- A meeting was held on 10 October 2022; the following persons attended the meeting:
 - Mr Deon Gous, Trustee, Finkenstein Portion Three Trust (FPTT);
 - Mr Leon Basson, Trustee, Finkenstein Portion Three Trust (FPTT);
 - Mr Diekie Gous, Trustee, Finkenstein Portion Three Trust (FPTT)
 - Mrs Elmi Brand; Financial Consultant, Finkenstein Three Holdings Trust;
 - Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust;
- A site visit was undertaken together with Mr Dirk Lourens on 12 October 2022;
- The following information was made available by Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust and Mrs Elmi Brand; Financial Consultant, Finkenstein Three Holdings Trust:
 - Finkenstein Manor Homeowners Association (FMHA) and Finkenstein Village Homeowners Association (FVHA) House Rules;
 - Finkenstein Manor Homeowners Association Construction Regulations (Annexure “E”; 01 August 2020) (similar construction regulations are in place for the Finkenstein Village);
 - Finkenstein Manor Homeowners Association Design Manual (Annexure “F”; 01 August 2020) (a similar design manual is in place for the Finkenstein Village);
 - Finkenstein Manor Homeowners Association Building & Planning Procedures (Annexure “G”; n.d.);
 - Signed Proposal of Annual Agreement for Service and Maintenance (by Aqua Services & Engineering (Pty) Ltd) of Finkenstein Estate Sewage Treatment Plant (14 June 2022);
 - Test Report (Effluent Water) from Analytical Laboratory Service (23 June 2022); and
 - Test Report (Effluent Water) from Analytical Laboratory Service (26 October 2022).

The following companies, at least but not limited to, have been appointed by FPTT to plan and develop Finkenstein Manor, Finkenstein Village, and the Agricultural Village/Finkenstein Green:

Company	Task	Status
Burmeister & Partners (Pty) Ltd	Consulting Engineers	Ongoing
Winplan cc	Town and Regional Planning Consultants	Ongoing
Namibbeton (Pty) Ltd (including sub-contractors, e.g. KL Construction (Pty) Ltd; Nexus Group; and Mr E.R. Hansen T/A Electro Contact)	Contractor: Civil and Electrical Services Infrastructure	Work Completed
Claud Bosch Architects	Design: Buildings Finkenstein Manor	Ongoing
Lock-Mans Architects	Design: Buildings Finkenstein Village	Ongoing
Nexus Group Holdings (Pty) Ltd (Nexus)	Wastewater Treatment Plant (WWTP); Building Contractor: Buildings Finkenstein Manor and Village	Work Completed (WWTP); Contract Completed (2019) (<i>the Latent Defects Liability Period of five years is still ongoing</i>)
J Groenewald Properties cc	Building Contractor(s): Finkenstein Manor	Ongoing
Longa Shoye Contractors cc		
Quartz Constructions Pty Ltd		
Holm's Construction		
Veld Street Building Contractors	Building Contractor(s): Finkenstein Village	Work Completed (Finkenstein Village Houses)
Ngwali Construction cc		Ongoing
APN Investment CC		
Afrideca Construction Namibia (Pty) Ltd	Building Contractor: Finkenstein Manor Sectional Title Units / Clubhouse	Work Completed (Finkenstein Manor Sectional Title Units)

In order to illustrate compliance with the revised Environmental Management Plan (EMP; see Table 3) for FPTT's current (i.e. the Finkenstein Manor and Village; see Maartens, 2010), and planned Developments (i.e. the Agricultural Village) (see Maartens, 2016b; 2019; 2020; 2021a; 2021b; 2021c; and 2022; also see IFC, 2007a, b, and c), the following colour codes were applied:

	Compliance/completed
	In Progress/ongoing
	Non-compliance
	Not (yet) applicable (N/A)
	Suggested additions/changes to the EMP

Table 3: Compliance with the Environmental Management Plan (2nd Revision) for the Finkenstein Manor and Village, and the Agricultural Village (Finkenstein Green), Farm Finkenstein No. 526, Khomas Region, Namibia.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
Finkenstein Portion Three Trust (FPTT): Social and Environmental Performance					
Management and monitoring	Social and Environmental Performance	Adhere to all Namibian Legislation, including Best Practice Guidelines.	Not confirmed during the site visit (02 February 2016).	Ongoing	Ongoing
		Ensure that all aspects related to the Environmental Management Plan (EMP) are implemented during the planning, construction and operational phases.	Compliant and ongoing (Namibbeton and Nexus Group) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing	Ongoing
		Hold regular site meetings/inspections. Make provision in the minutes of the meetings for reporting on all aspects of the EMP related to the planning, construction and operational phases.		A site meeting is held monthly; Mr Anton Jordaan, FPTT, is in charge of quality control, and is on site on a daily basis (and reports on matters of concern) (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; Finkenstein Portion Three Trust (FPTT) to ensure, via the Finkenstein Manor Homeowners Association (FMHA) and Finkenstein Village Homeowners Association (FVHA) (and as applicable for Finkenstein Green) that the EMP is made available to all (new) Contractors, and that the Contractors comply with all the provisions in the EMP. Contractors to sign a document/register that they have read and understand the contents of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
Consultation and disclosure	Social and Environmental Performance	Maintain open and direct lines of communication between the Developer (FPTT), the Authorities (e.g. the City of Windhoek (CoW), the Ministry of Agriculture, Water and Forestry (MAWF) (now the Ministry of Agriculture, Water and Land Reform (MAWLR)), the Namibian Water Corporation (NamWater), the Namibian Power Corporation (NamPower)), and Interested and Affected Parties (I&APs) (e.g. the Finkenstein Homeowners Associations (Finkenstein Manor Homeowners Association (FMHA) and Finkenstein Village Homeowners Association (FVHA)) and Residents) with regards to environmental matters. Consult with I&APs throughout the project process and adequately incorporate I&APs' concerns.	Regular meetings are held with the Contractor and his Sub-Contractors (Mr Sakkie Engelbrecht, Site Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.). Ongoing	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; the Chairpersons (FMHA and FVHA) meet in person on an <i>ad hoc</i> basis (attendees of the meeting, pers. comm., 10 October 2022) (also see 2020; 2021a; 2021b; 2021c; and 2022).
Grievance mechanism	Social and Environmental Performance	Implement a grievance mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance throughout the project life cycle. Inform all I&APs about the mechanism. Address concerns promptly and transparently and in a culturally appropriate manner. Keep a register of all concerns/issues received from I&APs, as well as the measures taken to address these.	The Finkenstein (Estate's) Homeowners Association (FHA) meets monthly and the Chairman of the FHA shares offices with the FPTT. Grievances will thus be reported immediately so that it can be resolved (Mr Deon Gous, Trustee, Finkenstein Portion Three Trust, pers. comm.).	Ongoing; offices are not shared anymore, but the three Chairpersons (Finkenstein (Estate) FHA, FMHA and FVHA) are in e-mail contact and meet two to three times per year in person (to discuss matters of concern) (Mr Meiring Kunz, Finkenstein Manor and Village Estate Manager, Finkenstein Construction Trust, pers. comm.).	Ongoing; the Chairpersons (FMHA and FVHA) meet in person on an <i>ad hoc</i> basis (attendees of the meeting, pers. comm., 10 October 2022) (also see 2020; 2021a; 2021b; 2021c; and 2022).
Training, including awareness and inductions	Social and Environmental Performance	Train employees and contractors in matters related to the project's social and environmental performance and Namibia's regulatory requirements.	Compliant and ongoing; daily Toolbox Talks are held (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing; a site handover meeting was held with the two new building contractors (where do's and don't's were discussed) and the EMP was also made available to them (by FPTT) (Mr Sakkie Engelbrecht, Site	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), that the EMP is made available to all (new) Contractors, and that the Contractors comply with all the
		Ensure adequate environmental awareness training for all senior site personnel.			
		Give environmental induction presentations to all site personnel prior to work	Environmental inductions are given by the Junior Site Agent,		

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		commencement; attendance lists to be signed by all who attended the presentation(s).	Me Marsha Januarie (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	(Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	provisions in the EMP. Contractors to sign a document/register that they have read and understand the contents of the EMP.
		Conduct regular in-service training in order to maintain quality care service provision (Finkenstein Manor: Frail Care Centre and Neurological Clinic) (operational phase).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	Not (yet) applicable (N/A)
Employment and procurement opportunities	Social and Environmental Performance	Include the EMP in the tender documents so that tenderers can make provision for the implementation of the EMP.	Compliant (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.). Included in the tender documents (Mr Deon Gous, Trustee, Finkenstein Portion Three Trust, pers. comm.).	A clause, noting that contractors have to adhere to the EMP, was included in the tender documents (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Penalties for non-compliance with the stipulations of the EMP should be agreed upon (and can be included in the tender documents).	Not confirmed during the site visit (02 February 2016).		Ongoing; penalties for non-compliance with the rules and regulations of the FMHA and FVHA are imposed (as per <i>Finkenstein Manor Homeowners Association Construction Regulations</i> , 01 August 2020).
		Tender policy to give preference to medium and small construction companies in order to maximise job opportunities.	Namibbeton (Pty) Ltd was appointed as the Contractor for the Civil Works; Nexus Group was appointed as the Building Contractor (Mr Deon Gous, Trustee, Finkenstein Portion Three Trust, pers. comm.).	See Section 2.1	Ongoing (attendees of the meeting, pers. comm., 10 October 2022).
		Only accept tenders from members of the Construction Industry Federation (of Namibia) (CIF) who have a collective agreement with the Metal and Allied Workers Union (MANWU).	Compliant (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing; J Groenewald Properties cc is a member of CIF (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				Groenewald Properties cc., pers. comm.).	
		Ensure that tender proposals received are scrutinised to ensure that minimum wages have been adhered to in the costing.	Not confirmed during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	
		Ensure that contractors adhere to the Namibian Labour, Social Security, Health and Safety, and Affirmative Action laws (by means of a contractual requirement for the submission of monthly proof re. the payment of minimum wages to workers, listing of the workers' Namibian Identification Numbers (IDs), and payment of Social Security).	Compliant (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	
		Tender documents/contracts to stipulate that all contractors have an HIV/AIDS Workplace Policy and Programme in place.			
		Ensure local recruitment (of registered contractors or qualified and certified personnel, registered and certified with the appropriate statutory authorities) and procurement to maximize benefit to region.	Compliant and ongoing	Ongoing	
		Source maximally from local resources to ensure maximum economic beneficiation of local businesses in terms of new business sales.	Not confirmed during the site visit (02 February 2016).	Ongoing	
		Allow residents to run small business operations from their homes (in accordance with the Kappsfarm Town Planning Scheme, Section 5.5.3 (operational phase)).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	Compliant and ongoing; there is a privately run gymnasium at the Finkenstein Village, as well as several administrative offices at the Finkenstein Manor and Village (attendees of the meeting, pers. comm., 10 October 2022).
Labour and working conditions	Social and Environmental Performance	Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed.	Ongoing	Ongoing; Uliano Marthinussen handles all labour-related issues on behalf of FPTT (Mr Sakkie Engelbrecht, Site	Ongoing; Mr Jaap Blaauw handles all labour-related issues on behalf of FPTT (Mr Leon Basson, Trustee, FPTT,

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		<p>Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour.</p> <p>Promote safe and healthy working conditions and the protection and promotion of worker health.</p> <p>Document and communicate the Working Conditions and Terms of Employment.</p> <p>Respect Collective Agreements and the right of workers to organize and bargain collectively.</p> <p>Implement a Grievance Mechanism.</p>		(Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	pers. comm.).
Occupational and Community Health and Safety and Security	Social and Environmental Performance	Adhere to all Namibia's Health and Safety Regulations (Labour Act, 1992: Regulations Relating to the Health and Safety of Employees at Work).	Compliant and ongoing; daily Toolbox Talks are held (Namibbeton) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing; Mr Ashlee Groenewald is a trained Superintendent and Heath and Safety Representative (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Occupational Health and Safety Training to be provided to all employees.		Ongoing; two persons have been sent for training this year (as Heath and Safety Representatives) (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	
	Ensure that qualified first aid can be provided at all times.	There is a First Aid Kit on site; sick or injured personnel are taken (by Namibbeton) to the Roman Catholic Hospital (Mr	Mr Pieter van Jaarsveld is in charge of security, firefighting, and is also a trained paramedic (Mr	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for	

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
			Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	<p>Van Jaarsveld resides at the Finkenstein Manor.</p> <p>FPTT is in the process of procuring a nurse that will be located at the Finkenstein Manor (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).</p> <p>Sick or injured personnel are taken to the Khomas Medical Centre (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).</p>	<p>Finkenstein Green), compliance with the stipulations of the EMP.</p> <p>A nurse, Me Petro Greeff was appointed by the FMHA (<i>and not FPTT</i>); she is located at the Finkenstein Manor (see Maartens, 2020) and will also be in charge of the Healthcare Centre (see Maartens, 2021a).</p>
		Comply with all safety regulations re. electricity supply.	Not confirmed during the site visit (02 February 2016).	Handled by Edward Hansen T/A Elektro Contact and Mr Ronald Kubas, Chairman, Managing Director and Electrical Engineer, Burmeister & Partners (Pty) Ltd (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Handled by Megatron and RT Electrical (Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm.).
		Ensure that employees are trained in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times.	Not confirmed during the site visit (02 February 2016).	Mr Pieter van Jaarsveld is in charge of security, firefighting, and is also a trained paramedic (Mr Van Jaarsveld resides at the Finkenstein Manor). FPTT keeps a 1,000 litre "firefighting trailer" on site (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners	Emergency Services (Disaster Management, Ambulance Services and Fire Brigade) are to be provided by the CoW (as Finkenstein now falls under the Local Authority Area of Windhoek). FPTT does keep a 1,000 litre "firefighting trailer" on site (see Maartens, 2019;

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				(Pty) Ltd, pers. comm. and pers. observ., 23 July 2019). Emergency Services (Disaster Management, Ambulance Services and Fire Brigade) are to be provided by the CoW (as Finkenstein now falls under the Local Authority Area of Windhoek).	2020; 2021a; 2021b; 2021c; and 2022).
		Provide and ensure the active use of Personal Protective Equipment (PPE).	Compliant and ongoing	Ongoing	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		<p>Make suitable arrangements, as far as practicable, for the maintenance of health, the prevention and overcoming of outbreaks of disease (e.g. Tuberculosis (TB)) and of adequate first aid services.</p> <p>Prevent communicable disease (e.g. Sexually Transmitted Infections (STIs) such as HIV transmission): provide surveillance and active screening and treatment of employees; prevent illness among employees (through health awareness and education initiatives); ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers; and promote immunization.</p> <p>Implement measures to protect the entire team (including contractors) against the SARS-CoV-2 Virus that causes COVID-19. Train employees in the COVID-19 regulations. Provide adequate handwashing and hand sanitizing facilities;</p>	<p>Ongoing</p> <p>HIV/AIDS awareness training is contracted out to an external company (Me Hulenga) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).</p>	<p>Ongoing</p> <p>HIV/AIDS is discussed during Toolbox Talks and staff is given time off twice a month to go to the clinic to collect antiretroviral drugs (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).</p>	<p>Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.</p> <p>It was observed that both Finkenstein Portion Three Trust and J Groenewald Properties cc have procedures in place to deal with the</p>

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		maintain the required physical distance and wear a face mask if applicable. Stay up-to-date on current COVID-19-related regulations in the Region and Country.			SARS-CoV-2 Virus that causes COVID-19 (see Maartens 2021a; 2021b; 2021c).
		Ensure that security arrangements are in place.	The FHA, Finkenstein Estate, is contracted by FPTT to provide e.g. Security Services (provided by Mr Johan Kellerman).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services. Mr Frans Jooste was appointed by Homestar as their full time Security Manager. Private staff have to be registered and obtain access cards to enter through the respective gates at the Finkenstein Manor and/or the Finkenstein Village (see Maartens, 2019; 2020; 2021a; 2021b; 2021c; and 2022).
		Prepare and submit a Health and Safety Plan and an Emergency Preparedness and Response Plan.	Namibbeton (Pty) Ltd has Health and Safety and Emergency Preparedness and Response Plans in place (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.). Emergency Services (Disaster Management, Ambulance Services and Fire Brigade) are to be provided by the CoW (as Finkenstein now falls under the Local Authority Area of Windhoek).	Ongoing FPTT to ensure that the newly appointed contractors have Health and Safety Plans in place. Emergency Services (Disaster Management, Ambulance Services and Fire Brigade) are to be provided by the CoW (as Finkenstein now falls under the Local Authority Area of Windhoek).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP. Emergency Services (Disaster Management, Ambulance Services and Fire Brigade) are to be provided by the CoW (as Finkenstein now falls under the Local Authority Area of Windhoek). FPTT does keep a 1,000 litre "firefighting trailer" on site (see Maartens, 2019; 2020; 2021a; 2021b;

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		Ensure that the building designs (including fixtures and fittings) are elderly-friendly (e.g. wider doors for wheelchair mobility, bathroom doors opening outwards or sliding doors, handrails, raised toilets, and lever taps) (Planning Phase).	Compliant and ongoing	Compliant (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	2021c; and 2022). Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Buyers should not be allowed to alter the design if it removes any of the elderly-friendly features (operational phase).	N/A during the site visit (02 February 2016).	As per Section 11.1.2.3 of the Constitution of the Finkenstein Manor Owners Association " <i>no building or erection of structures shall be commenced with in the Development and no additions or alterations to approved buildings shall be effected until the Trustees or anyone to whom the Trustees have delegated this particular function, have approved in writing the design and construction plans, including material and colour of any construction.</i> "	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Implement a wellness programme for staff (operational phase).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
		Maintain a secure fence, controlled entrances, and 24-hour security (operational phase).	N/A during the site visit (02 February 2016).	Compliant and ongoing	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services. Mr Frans Jooste was appointed by Homestar as their full time Security Manager. Private staff have to be registered and obtain access cards to enter through the respective gates at the Finkenstein Manor and/or the

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
					Finkenstein Village (see Maartens, 2019; 2020; 2021a; 2021b; 2021c; and 2022).
		Residents' private staff should hand in their official ID at the respective gates and obtain temporary IDs for the day (operational phase).	N/A during the site visit (02 February 2016).	Private staff have to be registered and obtain access cards to enter through the respective gates at the Finkenstein Manor and/or the Finkenstein Village (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	See Maartens (2019).
		All elderly residents residential units should have intercoms in the rooms, as well as panic buttons for the elderly residents (operational phase).	N/A during the site visit (02 February 2016).	In progress (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019). Telecare units will be installed in all Finkenstein Manor sectional title units (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).	Compliant, also with regards to the TeleCare Namibia units (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
					

Figure 6: Picture showing the TeleCare™ Namibia system (Source: L. Maartens, 12 October 2022).

Finkenstein Manor and Village and Agricultural Village: Fauna and Flora					
Planning, Construction, and Operational Phases	Negative impact on faunal species	<p>Maintain the proposed “green spaces” (e.g. the drainage lines and pan areas) as these can serve as corridors for the movement of fauna.</p> <p>Incorporate the area on Extension 1 (immediately south of the existing Finkenstein Nature Estate Entrance Gate) into the Development (so that it remains protected) (in this area water temporarily collects after the rains and bigger <i>Acacia karroo</i> and <i>Tarconanthus camphoratus</i> trees and shrubs, that serves as roosting and breeding sites for various birds (e.g. Guineafowl) and food and shelter for ungulates such as Kudu and Steenbok, can be found).</p>	See Maartens (2016a: Figures 2, 3 and 4).	Compliant (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Planning, Construction, and Operational Phases	Negative impact on faunal species	<p>Conduct a “sweep and collect” survey of unique fauna (e.g. tortoises) using scholars/students and/or interested people.</p> <p>Relocate any collected fauna/tortoises to a similar habitat, e.g. to Moltkeblick farm.</p> <p>Do not allow the collection of firewood for own use or resale (dead wood is often a unique habitat to a variety of fauna, as well</p>	Ongoing	Compliant (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		as an important part of the ecological process).			
Planning, Construction, and Operational Phases	Negative impact on floral species	Survey and mark (red and white tape) the larger protected tree specimens i.e. <i>Acacia erioloba</i> , <i>Boscia albitrunca</i> , <i>Searsia (Rhus) lancea</i> and <i>Ziziphus mucronata</i> and <i>Aloe litoralis</i> and <i>Aloe zebrine</i> and incorporate these specimens into the layout (and building) designs.	The engineering plans were changed to accommodate some of the larger and protected tree species (Mr Gerhard Fourie, Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Compliant and nothing new to report (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Should some protected tree species have to be removed during the construction phase, permits would have to be obtained from City of Windhoek, prior to the removal.	A letter (dated 15 January 2015) re the removal of certain trees was submitted to Mr Martin Shikongo, City of Windhoek (CoW), by Mr Kallie Venzke. Mr Shikongo visited the area and approved the removal of (some of) the proposed trees, with the exception of those on erven 344 and 186 (Mr Kallie Venzke, Manager, Moltkeblick Game Farm, pers. comm., 11 February 2015; Mr Martin Shikongo, pers. comm., 01 February 2016).		
		Conduct a “sweep and collect or mark” survey of unique flora (e.g. smaller aloe species like <i>Aloe zebrine</i>) using scholars/students and/or interested people. Should any Aloes have to be removed, a permit needs to be obtained from the Ministry of Environment and Tourism (MET).	The work was carried out by Mr Kallie Venzke, Manager, Moltkeblick Game Farm (Mr Deon Gous, Trustee, Finkenstein Portion Three Trust, pers. comm.).	Compliant and nothing new to report (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Relocate the collected e.g. Aloes to a similar habitat, e.g. to Moltkeblick farm (any Aloes could also be returned to the area after the construction phase, or marked and included in the landscaping of the area).			
		Implement a policy of reintroducing two specimens for every one individual removed (seedlings to replace the removed	Ongoing	Ongoing; to date, FPTT (via Namibia Landscapes) has planted	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		trees could be obtained from the National Botanical Research Institute (NBRI) in Windhoek or the Forestry Nursery in Okahandja).		290 of the following species in the general area: <i>Acacia erioloba</i> ; <i>Dombeya rotundifolia</i> ; <i>Searsia lancea</i> ; <i>Ziziphus mucronate</i> ; <i>Acacia galpini</i> ; <i>Combretum erythrophyllum</i> ; <i>Combretum krausii</i> ; <i>Olea Africana</i> ; and <i>Acacia caffra</i> (Mr Meiring Kunz, Finkenstein Manor and Village Estate Manager, Finkenstein Construction Trust, pers. comm.).	applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Do not allow the collection of flora (e.g. <i>Aloe</i> and <i>Commiphora</i> spp.) for personal use, or the ornamental market.	Compliant and ongoing	Compliant and ongoing	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Construction Phase	Disturbance of fauna and flora and habitat alteration	Minimize the removal of native plant species; no vegetation may be removed/damaged without direct instruction.	Not confirmed during the site visit (02 February 2016).	As per Sections 11.1.2.4 of the Constitutions of the Finkenstein Manor Owners Association and Finkenstein Village Owners Association “each Registered Owner shall take care of any trees on an erf registered in his name, and he shall not remove or cut down, or cause to be removed or cut down any trees, without the prior written consent of the Trustees;”	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		No trees or natural vegetation may be removed for the making of fires.	Ongoing	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the
		No animal may be injured, fed, trapped, hunted or harmed in any way.			
		No off-road driving will be allowed.			
No trespassing on adjoining properties is					

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		<p>allowed and no livestock/game/vegetation is to be interfered with.</p> <p>Restrict construction activities to previously demarcated areas (e.g. borrow pits, access roads construction camp, etc.); all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land.</p>	Not confirmed during the site visit (02 February 2016).	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	EMP.
Operational Phase	Disturbance of fauna and flora and habitat alteration	<p>No native plant species may be removed or damaged.</p> <p>No wild animal may be injured, fed, trapped, hunted or harmed in any way.</p> <p>No off-road driving to be allowed.</p>	N/A during the site visit (02 February 2016).	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Operational Phase: Residents and the keeping of pets and/or the introduction of invasive alien plants	Negative impact on local fauna and flora	Encourage home owners not to introduce domestic cats to the area (as these may breed with the African Wild Cats in the area and cause genetic pollution (e.g. interbreeding) of the Namibian population); alternatively, the cats (and dogs) should be spayed.	N/A during the site visit (02 February 2016).	<p>As per Sections 11.1.2.10 of the Constitutions of the Finkenstein Manor Owners Association and Finkenstein Village Owners Association "dogs and other household pets (excluding cats) may be allowed at the sole discretion of the Trustees who may withdraw such concession on one(1) month written notice to that effect should such pets create a nuisance for other Members or visitors and all pets shall be kept in a proper enclosure and shall be on a leash whenever allowed outside of the said enclosure".</p> <p>Unfortunately, during one of the Annual General Meetings (AGMs), it was agreed that residents</p>	See Maartens (2019).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				may keep cats (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	
		Encourage home owners not introduce any alien invasive species (e.g. <i>Lantana camara</i> , <i>Opuntia</i> spp., <i>Pennisetum setaceum</i> , <i>Prosopis</i> spp., <i>Tecoma stans</i> , etc.) to the area as these could easily "escape" into the surrounding area, especially the uniquely floristic Auas Mountains.	N/A during the site visit (02 February 2016).	As per Sections 11.1.2.5 of the Constitutions of the Finkenstein Manor Owners Association and Finkenstein Village Owners Association "each Registered Owner may establish a garden in the courtyard on the erf registered in his name in accordance with directions by the ASSOCIATION"; a list of banned trees and scrubs are available (Mr Meiring Kunz, Finkenstein Manor and Village Estate Manager, Finkenstein Construction Trust, pers. comm.).	See Maartens (2019) (and as per <i>Finkenstein Manor Homeowners Association Design Manual</i> , 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Operational Phase: Residents	Negative impact on fauna and flora / Pollution of biophysical environment (soil and water)	Limit/minimize the use of pesticides (including herbicides) / apply environmental friendly methods instead.	N/A during the site visit (02 February 2016).	No record could be found in the House Rules of the Finkenstein Manor Homeowners Association (FMHA) and/or the Finkenstein Village Homeowners Association (FVHA) (re encouraging owners/tenants to limit/minimize the use of pesticides/herbicides).	See Maartens (2019).
Finkenstein Manor and Village and Agricultural Village: Archaeological Material					
Planning Phase	Potential loss of archaeological material	Preserve the south-western corner of Portion 3 (that falls within the designated green zone); a small thicket of <i>Catophractes alexanderii</i> approximately 20m in diameter (33K 0727972 7502998, or S22.56448 EO17.21708) was found; isolated thickets of this kind usually	See Maartens (2016a: Figures 1 and 2). It was advised during the site visit (02 February 2016) to cordon off the area.		Ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		indicate high local soil phosphorus levels, possibly resulting from the presence of old animal enclosures.			
Construction Phase	Loss of or damage to archaeological material	Implement the Chance Finds Procedure (see Annexure D); should any archaeological material, e.g. graves, be found during trenching or other excavation work, work should immediately cease and the National Heritage Council of Namibia in Windhoek informed.	Ongoing; to date, no additional archaeological material was found (during the course of the civil works) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing; to date, no additional archaeological material has been found (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.). It is advised that the Chance Finds Procedure be made available to the newly appointed building contractors.	See Maartens (2019). It is advised that the Chance Finds Procedure be made available to the newly appointed building contractors. FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Finkenstein Manor and Village and Agricultural Village: Soil erosion					
Construction Phase	Soil erosion	<u>Sediment mobilization and transport:</u> reduce or prevent soil erosion (schedule activities to avoid heavy rainfall periods; contour and minimize length and steepness of slopes; mulching to stabilize exposed areas; re-vegetate areas promptly; and design channels and ditches for post-construction flow). <u>Road design:</u> limit access road gradients to reduce run-off induced erosion; provide adequate road drainage based on road width, surface material, compaction and maintenance. <u>Structural (slope) stability:</u> provide effective short-term measures for slope stabilization, sediment and subsidence control until long-term measures (during operations) can be implemented; provide adequate drainage systems to minimize and control infiltration.	Ongoing	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.). Areas where stormwater erosion has taken place were observed. It is advised to inspect/monitor and address/maintain any stormwater and soil erosion.	Ongoing; areas where stormwater erosion has taken place were observed (Finkenstein Green-area). It is advised to inspect/monitor and address/maintain any stormwater and soil erosion.
Finkenstein Manor and Village and Agricultural Village: Construction General					
Construction Phase: Contractor site camp	Pollution of biophysical environment (air, soil and	No fires will be allowed, unless a specific area has been identified and set aside for the cooking of food.	Compliant and ongoing (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers.	Compliant and ongoing; the construction workers bring their own food to site on a daily basis (Mr	Compliant and ongoing (as per <i>Finkenstein Manor Homeowners Association Construction</i>

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
	water)		comm.).	Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	<i>Regulations</i> , 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Vehicle maintenance/servicing/washing not to be allowed anywhere on site.	This takes place at Namibbeton (Pty) Ltd's Workshop in Brakwater (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Compliant and ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	
		Portable toilets to be provided and used at the site.	Mobi Loo provides portable toilets and removes the contents (of the portable toilets) on a weekly basis (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Portable toilets, linked to the main sewer line, are provided (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019)	
		Enforce proper waste (hazardous and non-hazardous) management practices (as per Waste Management Plan to be submitted by the Contractor) – waste and litter to be disposed of in scavenger and weatherproof bins and the refuse to be collected by the contractor and disposed of at least once a week.	Compliant and ongoing (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	The newly appointed contractors to submit Waste Management Plans to FPTT; the latter to incorporate these into the overall Integrated Waste Management Plan for the Finkenstein Manor, Village, and ultimately the Agricultural Village.	
Construction Phase: Contractor site camp	Occupational Health and Safety	No fires will be allowed, unless a specific area has been identified and set aside for the cooking of food.	No fires are allowed for the cooking of food (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Compliant and ongoing; the construction workers bring their own food to site on a daily basis (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners	Compliant and ongoing (as per <i>Finkenstein Manor Homeowners Association Construction Regulations</i> , 01 August 2020).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				(Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Ensure that employees are trained in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times.	Fire extinguishers are available on site (at the diesel tanks) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	J Groenewald Properties cc, for example, do not have any fire extinguishers on site (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	
		Supply potable water for human consumption and other domestic uses.	Potable water is obtained, via the Finkenstein Estate, from NamWater (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Potable water is supplied by NamWater.	See Maartens (2019).
		Ensure that security arrangements are in place.	The FHA, Finkenstein Estate, is contracted by FPTT to provide e.g. Security Services (provided by Mr Johan Kellerman) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services. Mr Frans Jooste was appointed by Homestar as their full time Security Manager. Private staff have to be registered and obtain access cards to enter through the respective gates at the Finkenstein Manor and/or the Finkenstein Village (see Maartens, 2019; 2020; 2021a; 2021b; 2021c; and 2022).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
Construction Phase	Change in land use from "Nature Estate" to "Township"	Restrict construction activities to demarcated areas; all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land.	Ongoing	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Compliant and ongoing (as per <i>Finkenstein Manor Homeowners Association Construction Regulations</i> , 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Construction Phase: Increased traffic, presence and movement of machinery, and the establishment of soil stockpiles	Air quality (dust or Particulate Matter (PM) pollution)	<p>Minimize the area in which the movement of construction machines will take place to reduce the effects of dust pollution.</p> <p>Minimize dust from material handling sources (e.g. conveyors and bins) by using covers and/or control equipment (e.g. water suppression).</p> <p>Minimize dust from open area sources, including storage piles, by using control measures (install enclosures and covers, and increase the moisture content).</p> <p>Avoid the excavation, handling and transport of erodible materials under high wind conditions or when a visible dust plume is present.</p> <p>Maintain the road surface to preserve surface characteristics (e.g. texture and roughness).</p> <p>Use dust control/suppression methods, such as applying water to minimize dust (oil and oil by-products is not a recommended measure to control road dust).</p>	<p>Ongoing</p> <p>Water is applied sparingly (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).</p>	<p>Ongoing; fresh water is used for dust control (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).</p>	<p>Compliant and ongoing (as per <i>Finkenstein Manor Homeowners Association Construction Regulations</i>, 01 August 2020).</p> <p>FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.</p>



Figure 7: Pictures showing the dust (particulate matter) pollution in the area due to the construction of the new B6 road (Source: L. Maartens, 12 October 2022).

<p>Construction Phase: Presence of construction teams, increased traffic, presence and movement of machinery</p>	<p>Noise pollution</p>	<p>Construction activities to cease at 18h00. Enforce a speed limit of 40 kilometres per hour (km/h). Large construction vehicles to be fitted with silencers.</p>	<p>Compliant and ongoing; construction activities take place between 07h30 and 17h30 during week days (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).</p>	<p>Compliant and ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).</p>	<p>Compliant (<i>restricted to 07h00-17h00 during weekdays and 08h00-12h00 on Saturdays</i>) and ongoing (as per <i>Finkenstein Manor Homeowners Association Construction Regulations</i>, 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein</p>
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Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)			
					Green), compliance with the stipulations of the EMP.			
Construction Phase: Increased traffic, presence and movement of machinery (exhaust from diesel engines)	Air quality & Occupational and Community Health and Safety	Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon monoxide (CO), Carbon dioxide (CO ₂), Nitrogen oxide (NO _x), Sulphur dioxide (SO ₂), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).	Ongoing	Compliant and ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Compliant and ongoing; FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.			
Construction Phase: Increased traffic, movement of machinery	Occupational and Community Safety	Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers; improve driving skills and require licensing of drivers; adopt limits for trip duration; avoid dangerous routes and times of day; and use speed control devices.	Ongoing (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).			
		Regularly maintain vehicles and use manufacturer approved parts.						
		Use locally sourced materials (where possible) to minimize transport distances.						
		Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.						
		Heavy construction vehicle warning signs to be put up at the turnoff from the B6 main road.						
		The existing Finkenstein Nature Estate Gate to only function as an Access Gate.				Namibbeton (Pty) Ltd and their sub-contractors use a separate entrance (to the west of the Finkenstein Nature Estate Gate) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).		See Maartens (2019).
		The construction of separate Security Gates for the Finkenstein Nature Estate, the Retirement Manor and Extension 1.				To be completed during 2016 (Mr Deon Gous, Trustee, Finkenstein Portion Three Trust, pers. comm.).	Compliant (pers. observ., 23 July 2019); the construction of the gates were completed in	See Maartens (2019).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				August 2017 (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).	
Construction Phase: Use of a Troxler (soil density gauge containing a radioactive source)	Occupational Health and Safety	Register the Troxler and apply for a permit from the Ministry of Health and Social Services (MHSS). Implement controls and monitoring requirements as per those prescribed by the MoHSS for the safe handling, transportation and storage of the device.	Compliant (Mr Gerhard Fourie, Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	N/A (and this item can be deleted from the EMP); all roads have been completed (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Construction Phase: Presence of construction teams	Community safety	Ensure increased security for the Finkenstein Nature Estate.	The FHA, Finkenstein Estate, is contracted by FPTT to provide e.g. Security Services (provided by Mr Johan Kellerman) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	Security services to Finkenstein Manor and Village is supplied by Homestar Security Services. Mr Frans Jooste was appointed by Homestar as their full time Security Manager. Private staff have to be registered and obtain access cards to enter through the respective gates at the Finkenstein Manor and/or the Finkenstein Village (see Maartens, 2019; 2020; 2021a; 2021b; 2021c; and 2022).
		Provide a separate access to the construction site.	Namibbeton (Pty) Ltd and their sub-contractors use a separate entrance (to the west of the Finkenstein Nature Estate Gate) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Compliant and ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Compliant and ongoing

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)

Figure 8: Pictures showing: a) the southern entrance gate for contractors; and b) the northern entrance gate for contractors (Source: L. Maartens, 12 October 2022).

Construction Phase: Presence of construction teams	Community safety	Transport all workers to and from the site.	Approximately 100 workers are transported daily (using two buses) to and from the site (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Compliant and ongoing; J Groenewald Properties cc's staff, for example, are transported to site via bakkies on a daily basis (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Enforce a strict ban on the recruitment of construction workers at the gate and on visitors gaining entry to the construction workers on site.	Ongoing (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Not confirmed during the site visit (23 July 2019).	Ongoing (pers. observ.).
		Fence the construction site and have a lock-in system that allows only authorised people to enter the site.	The site is not entirely fenced. Staff are searched daily (spot checks) (by the Security Company) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	The site is not entirely fenced. Staff are searched (spot checks) (by the Construction and Security Companies) (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				Groenewald Properties cc., pers. comm.).	
		Enforce strict controls to prevent workers from leaving the site during breaks/to get lifts home.		Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).
		All workers to be issued with Company ID tags while at work; these can be switched with their official IDs every day to prevent Company IDs from getting into the wrong hands.	IDs are issued by the Security Company to all the staff (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Compliant and ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Notice or information boards relating public safety hazards and emergency contact details should be put up at the gate(s).	It is advised that Namibbeton (Pty) Ltd (and Nexus Group) puts up emergency contact details at the main entrance(s).	Note that new notice or information boards relating public safety hazards and emergency contact details to be put up at the various gates when Nexus Group Holdings (Pty) Ltd take down their boards (end-July 2019).	



Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
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Figure 9: Pictures showing the contractor's information boards, including contact details (Source: L. Maartens, 12 October 2022).

Finkenstein Manor and Village and Agricultural Village: Bowls Court and Fodder Crops

Irrigation (using the final effluent from the Wastewater Treatment Plant (WWTP) after disinfection) of the bowls court and fodder crops	Occupational and Community Health and Safety	<p>Ensure that the treated sewage water is free from helminth eggs (the eggs can survive on plants and soil for many months) and other parasites and pollutants before it is used for irrigation purposes: sand filtration (to remove fine suspended solids), ultraviolet (UV) disinfection, Granular Activated Carbon (GAC) filtration, and final disinfection with chlorination.</p> <p>Ensure that the sludge from the WWT is disposed of in compliance with local regulatory requirements (or consistent with</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	<p>N/A</p> <p>Ongoing</p>
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Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		protecting human health and safety and the conservation of water and land resources).			
Water Management: Bowls court and fodder crops	Resource use (water)	<p>Avoid midday irrigation to reduce evaporation.</p> <p>Avoid over and under-irrigation to decrease potential for soil salinization.</p> <p>Maintain a water management logbook that records rainfall and evaporation, as well as time and amounts of water applied, in order to develop an understanding of long-term trends in water use.</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Soil Management: Fodder crops	Loss of productive soil capacity	<p>Avoid nutrient depletion and/or accumulation through practising Integrated Nutrient Management (INM) (see International Finance Corporation (IFC), 2007b).</p> <p>The type of fodder crops to be suited or adapted to the local climate and soil conditions.</p> <p>Consider adding lime to soil to compensate for acidification, caused by acid deposition and fertilizers, and to maintain stable pH levels.</p> <p>Assess potential impacts of waste materials such as manure and sludge to soils and water resources due to the presence of contaminants (e.g. heavy metals, nitrogen, phosphorus, and diseases-causing agents) prior to use for soil enhancement.</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Use of pesticides (including herbicides): Bowls court and fodder crops	Pollution of biophysical environment	<p>Implement an Integrated Pest Management (IPM) strategy and document it in a Pesticide Management Plan (PMP).</p> <p>Consider alternatives (non-chemical methods) to pesticide application (see IFC, 2007b).</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		<p>Pesticide application (see IFC, 2007b): avoid the use of pesticides that fall under the World Health Organization (WHO) Recommended Classification of Pesticides by Hazard Classes 1a and b, and by Hazard Class II. Also those that are listed in Annexes A and B of the Stockholm Convention (except under the conditions noted in the convention). Only use pesticides that are manufactured under license, registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization's (FAO) International Code of Conduct on the Distribution and Use of Pesticides. Only use pesticides that are labeled in accordance with international standards and norms. Pesticide application equipment to be maintained and calibrated in accordance with manufacturer's recommendations.</p> <p>Pesticide storage and handling (see Hazardous Materials Management and IFC, 2007b).</p>			
Use of pesticides (including herbicides): Bowls court and fodder crops	Occupational Health and Safety	<p>Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these.</p> <p>Provide and ensure the active use of Personal Protective Equipment (PPE).</p> <p>Follow hygiene practices (in accordance with the FAO and PMP (also see IFC, 2007b)).</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Use of pesticides (including herbicides): Bowls court and fodder	Community Health and Safety	<p>Avoid, if feasible, the aerial application of pesticides.</p> <p>Use, if feasible, biological or safe products.</p> <p>Ensure that animals and unauthorized</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
crops		people are not present in the areas where pesticides are handled and/or applied.			
Use of fertilizers (e.g. chemical, manure, sewage sludge): Bowls court and fodder crops	Pollution of biophysical environment	<p>Conduct regular soil testing (to establish nutrient needs) in order to determine fertilizer application rates/correct doses.</p> <p>Store fertilizers in their original packaging in a dedicated, locked area, with proper signage, and with access limited only to authorised personnel.</p> <p>Use slow-release and/or natural organic fertilizers. Manure can be an alternative, but if over applied it may also cause pollution.</p> <p>Prepare a management plan covering the measures for containment, storage and ultimate destruction of obsolete fertilizers in accordance to the FAO guidelines (and consistent with country commitments under the Stockholm, Rotterdam and Basel Conventions).</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Use of fertilizers (e.g. manure, sewage sludge): Bowls court and fodder crops	Community Health and Safety	<p>Store manure as far away from dwellings as possible; use measures (e.g. covering the manure) to reduce odours and atmospheric emissions.</p> <p>Do not apply manure to the fodder crops (and bowls court) if the wind direction is toward nearby dwellings.</p>	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Finkenstein Manor and Village and Agricultural Village: Resource Use					
Energy Management	Resource use (e.g. coal) / depletion of natural resources	Building designs to reduce energy use (maximum use of natural ventilation and sunlight; renewable energy use e.g. passive solar design, chilled beam air conditioning) (Planning Phase).	For example, all full title houses will be fitted with the latest technology in energy saving solar systems for heating water (see http://www.finkensteinmv.com/).		Ongoing; at Finkenstein Manor, solar geysers have been installed (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).
Energy Management	Resource use (e.g. coal) / depletion of natural resources	Promote the sustainable use of energy (that will result in the reduction of use and cost reductions) (e.g. energy efficient light sources).	N/A during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	The installation of a Solar PV (photovoltaic) Plant is under consideration (Mr Diekie Gous, Trustee, Finkenstein Portion

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		<p>Raise awareness amongst the residents, staff (and contractors).</p> <p>For reduction of energy consumption associated with heating, ventilation, and air conditioning (HVAC), lighting, and cooking and refrigeration equipment (see IFC, 2007c).</p>			Three Trust, Pers. comm.).
Water-efficient design features	Resource use (water) / depletion of natural resources	Use, where feasible, water saving equipment including ultra-low-flush toilets, spray nozzles, urinals, faucet aerators, and low-flow showerheads, infrared and ultrasonic sensors, water spigots, and pressure-control valves (Planning and Construction Phases).	N/A during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).
Water Management	Resource use / depletion of natural resources	Conduct hydrogeological testing to prescribe the best abstraction scenario (to protect the groundwater system). Set baseline values prior to abstraction and install water level monitoring devices to record water levels (it is important that a certain level be determined and that the water level should not be allowed to decline beyond this level).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019); no groundwater is abstracted for use at the Finkenstein Manor and/or Village.	<p>N/A; no groundwater is currently abstracted for use at the Finkenstein Manor and/or Village (Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm.).</p> <p>Should water be abstracted from the boreholes (to e.g. water the communal gardens at the Finkenstein Manor), FPTT to ensure, via the FMHA, compliance with the stipulations of the EMP.</p>
		Ensure prudent use of water in all activities.	N/A during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).
		Water storage tanks to be insect and animal-proof and to be covered to reduce evaporation.	N/A during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).
		Implement a water conservation program, promoting the continuous reduction in water consumption.	Compliant and ongoing	Compliant and ongoing; households at the Finkenstein Estate, Finkenstein Manor and Finkenstein Village use	Ongoing (see Maartens 2020; 2021a; 2021b; 2021c; and 2022).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
				on average 28, 12, and 15-16 cubic metres (m ³) per month, respectively (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).	
		Promote and enforce a policy on landscape and garden designs that minimise water consumption e.g. the use of indigenous plants.	N/A during the site visit (02 February 2016).	As per Sections 11.1.2.5 of the Constitutions of the Finkenstein Manor Owners Association and Finkenstein Village Owners Association "each Registered Owner may establish a garden in the courtyard on the erf registered in his name in accordance with directions by the ASSOCIATION"; a list of banned trees and scrubs are available (Mr Meiring Kunz, Finkenstein Manor and Village Estate Manager, Finkenstein Construction Trust, pers. comm.).	See Maartens (2019) (and also as per <i>Finkenstein Manor Homeowners Association Design Manual</i> , 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Raise awareness amongst the residents, staff (and contractors) re the importance of saving water.	Not confirmed during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	Not confirmed during the site visit (12 October 2022).
Finkenstein Manor and Village and Agricultural Village: Hazardous Materials Management					
Hazardous Materials Management	Social and Environmental Performance	Establish hazardous materials management priorities (based on hazard analysis of risky operations). Avoid, or minimize the use of hazardous materials. Prevent uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that may result in fire or explosion. Implement management controls	Ongoing	Ongoing; hazardous materials include mainly petrol and diesel, and Premise 200 (to control ants and to protect buildings against subterranean wood destroying termites) (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, Mr Hannes Groenewald, Sole	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		(procedures, inspections and training, communication and drills) to address residual risks.		Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	
Hazardous Materials Management	Pollution of biophysical environment (soil and water)	<p>Implement prevention and control measures for the use, handling and storage of hazardous materials:</p> <p><u>Materials transfer</u>: regularly inspect, maintain and repair fittings/pipes/hoses; make use of drip trays/other drip containment measures at connection/possible overflow points;</p> <p><u>Overfill protection</u>: use trained filling operators; install gauges on tanks to measure the volume inside; make use of dripless hose connections (vehicle tanks) and fixed connections (storage tanks); use a catch basin/drip tray around the fill pipe to collect spills;</p> <p><u>Reaction, fire, and explosion prevention</u>: hazardous materials to be stored in marked containers and separate (from non-hazardous materials); incompatible hazardous materials (acids, bases, flammables, oxidizers, reactive chemicals) to be stored in separate areas and with containment facilities separating material storage; smoking or working with open flames not to be permitted in the presence of these substances; limit access to hazardous waste storage areas and clearly label and demarcate the area; conduct regular inspections of the areas and document the findings; prepare and implement spill response and emergency plans; train employees in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times.</p> <p><u>Secondary containment</u>: use bunding (made of impervious, chemically resistant material) that can contain the larger of</p>	Ongoing	Ongoing	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
			Namibbeton is in possession of a Consumer Installation Certificate for the storage of ~23,000 litres of diesel on site (on a concrete floor and in a bunded area) (Mr Nico Badenhorst, Director / Contracts Manager,	J Groenewald Properties cc store 200 litres of diesel and 20 litres of petrol only on site (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J	

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		<p>110% of the largest tank or 25% of the combined tank volumes for above-ground tanks with a total storage volume equal or greater than 1,000 litres (l).</p> <p>Train workers on the correct transfer and handling of fuels and chemicals and the response to spills.</p> <p>Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills; in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.</p>	Namibbeton (Pty) Ltd, pers. comm.).	Groenewald Properties cc., pers. comm.).	
Hazardous Materials Management	Occupational Health and Safety	<p>Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDSs)) to make employees aware of workplace chemical hazards and how to respond to these.</p> <p>Provide and ensure the active use of Personal Protective Equipment (PPE).</p>	It is advised that Namibbeton (Pty) Ltd re-addresses this as part of their daily Toolbox Talks.	Ongoing (Mr Hannes Groenewald, Sole Member, and Mr Ashlee Groenewald, Project Manager, J Groenewald Properties cc., pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Finkenstein Manor and Village and Agricultural Village: Waste Management					
Waste Management: Solid	Air quality	Avoid the open burning of waste (whether hazardous, or non-hazardous).	Cement bags are burnt in a drum (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.). It is advised that a grid be put onto the drum and that no burning of waste (cement bags) takes place unsupervised.	Compliant (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Waste Management: Non-hazardous and hazardous	Pollution of biophysical environment	Prepare an Integrated Waste Management Plan . The generation of waste should be avoided as far as practicable; where it cannot be avoided, waste should be reduced, re-used and recovered (including recycling and composting) (e.g. set up collection points for the recycling of solid waste); where	Compliant (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Ongoing; household waste is collected by Rent-a-Drum (Finkenstein falls under the Local Authority Area of Windhoek). It is advised that FPTT	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		waste cannot be reduced, re-used and/or recovered, it should be disposed of in an environmentally sound manner.		prepares an Integrated Waste Management Plan.	
		Waste reduction can be achieved by: buying in bulk quantities; using refillable, bulk dispensers (e.g. toiletries) (vs. individually packaged products); working with suppliers in order to limit the use of, and establishing recycling for, product packaging; avoiding the use of polystyrene foam altogether; using glass/durable plastic rather than disposable plastic items (straws/cups); providing in-room recycling procedures and appropriate receptacles.	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
		Raise awareness amongst residents, staff and contractors (to reduce, re-use and recover waste).	Not confirmed during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Institute and maintain good housekeeping and operating practices; littering is not allowed.	Compliant and ongoing (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Housekeeping at Nexus Group Holdings (Pty) Ltd's work sites is not of a very high standard (see Section 3: Recommendations).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Non-hazardous and hazardous waste to be collected and stored separately.	Not confirmed during the site visit (02 February 2016).	Not confirmed during the site visit (23 July 2019).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Non-hazardous waste to be transported by an approved contractor to and disposed of, with prior permission from the Windhoek Municipality, at the waste disposal site outside Windhoek.	Non-hazardous waste are collected in refuse bins and transported to the Namibbeton (Pty) Ltd Workshop in Brakwater (for disposal) (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Not confirmed during the site visit (23 July 2019).	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
		Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect	For example, old oil is stored in 200 litre drums on site; when	Not confirmed during the site visit (23 July 2019).	FPTT to ensure, via the FMHA and FVHA (and as



Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		and recycle batteries and print cartridges. The remainder to be transported by an approved contractor to a recognized hazardous waste disposal site (Kupferberg), with prior permission from the Windhoek Municipality.	full, the drums are transported to the Namibbeton (Pty) Ltd Workshop in Brakwater, from where it is collected by Oil Tech (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).		applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Waste Management: Sanitary	Pollution of biophysical environment	Portable chemical toilets (1 toilet per 30 employees; preferred 1:15) to be provided; spillages/leakages to be cleaned up immediately; contents to be collected by an approved contractor and disposed of at an approved sewage site (with prior permission from the Windhoek Municipality) (Construction Phase).	Mobi Loo provides portable toilets and removes the contents (of the portable toilets) on a weekly basis (Mr Nico Badenhorst, Director / Contracts Manager, Namibbeton (Pty) Ltd, pers. comm.).	Portable toilets, linked to the main sewer line, are provided (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm. and pers. observ., 23 July 2019).	Compliant and ongoing (as per <i>Finkenstein Manor Homeowners Association Design</i> , 01 August 2020). FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.
Wastewater Treatment Plant (WWTP)	Visual Impact	Consider reducing the visual impact of the WWTP, if feasible, by means of vegetation (indigenous species) screens.	Underway (Barnard Mutua Architects) and also with regards to the Namibian Power Corporation (NamPower) Substation.	Ongoing (to be considered at a later stage) (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).	Ongoing.
WWTP	Pollution of biophysical environment	A permit is required from the Department of Water Affairs (DWA), Ministry of Agriculture, Water and Forestry (MAWF) for wastewater and effluent disposal (from the WWTP).	Underway (via the CoW) (Mr Gerhard Fourie, Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).		The Ministry of Agriculture, Water and Land Reform (MAWLR) issued an exemption permit (11 May 2021; Permit Number 771) for Domestic and Industrial Wastewater Purification and Effluent Disposal to the Municipal Council of Windhoek (The Council) (see Maartens, 2021b, c). The Council subsequently (30 August 2021) notified FPTT that the Finkenstein WWTP was granted exemption and is required to comply

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
					with the conditions under the permit (see Maartens, 2021c: Annexure A).
		Ensure that the plant is well maintained to allow effective operation (operational phase).	N/A during the site visit (02 February 2016).	Ongoing; Mr Barend Lottering from Aqua Services & Engineering (Pty) Ltd conducts the monthly monitoring and reports to the CoW on an annual basis (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	See below:

Aqua Services & Engineering (Pty) Ltd (ASE) was responsible for the design, supply and construction of the mechanical, electrical and control works for a WWTP for the Finkenstein Township Development. The plant was sized to accommodate 400 cubic metres of effluent per day (m³/d), and with a final effluent conforming to the General Standard as laid out in the Government Gazette Regulation R553 of 5 April 1962, in Section 21(1) and 21(2) of the Water Act No 54 of 1956.

The plant functional description is as follows:

- **Inlet works:** screening facility consisting of a static bar screen and drip tray;
- **Primary treatment - three-compartment septic tank** (anaerobic digestion): solids and sludge will settle out and be digested in the first compartment of the tank; the second compartment will contain mainly grey water; anaerobic conditions in this tank will ensure BOD (Biochemical Oxygen Demand) removals of at least 35% up to 50%; sludge from the secondary settler (see below) is recycled to the inlet of this tank, to be further digested; occasional desludging of the septic tank is required;
- **Recycle sump** (anoxic zone) (including three open impeller submersible pumps): here, oxygen deficient effluent from the septic tank is mixed with aerated, nitrate-rich effluent that is recycled from the sump of the trickling filter; denitrification (breakdown of nitrates (NO₃) to nitrites (NO₂) and then NO₃ to nitrogen gas) occurs in this section of the system;
- **Trickling filter:** a bed of highly permeable medium, which serves as host for micro-organisms to attach to and grow on, and form a biological film; the wastewater is sprayed over and percolates through the media; organic material in the wastewater is absorbed by the micro-organisms growing as a biological film on the media; in the outer portion of the film, aerobic organisms degrade organic material, whereas anaerobic organisms exist deeper into the biological film, i.e. near the surface of the media; the water, after percolating through the media, is collected in the trickling filter basin; carbonaceous reduction occurs in this manner along with nitrification (ammonia conversion to nitrites and then nitrates);
- **Solids removal (secondary settling) - secondary clarifier:** biological solids that have become detached from the packing media have to be removed before the effluent can be disinfected and finally discharged; water from the trickling filter basin will be pumped into the secondary settling tank fitted with lamella (if there is inflow into the plant); sludge is continually withdrawn from the bottom of the clarifier;
- **Disinfection (chlorination):** clarified water from the settling tank is discharged into two, 10,000 litre chlorine contact tanks; the effluent is disinfected utilising liquid chlorine in the form of sodium hypochlorite (NaOCl);
- **Sludge drying beds:** sludge stabilisation and digestion take place in the septic tank (see above); the latter is inspected annually and if the sludge at the bottom of the first compartment of the septic tank has accumulated to a height of ~2,500 millimetres (mm) the sludge has to be emptied (pumped) into sludge drying beds (Aqua Services & Engineering (Pty) Ltd, 2016; 2022; Servaas de Kock, General Manager: Engineering Services, Aqua Services & Engineering (Pty) Ltd, pers. comm.).

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
<p>Water from the WWTP will be used to water the gardens at Finkenstein Green (private open spaces; see Figures 3 and 4) (and/or irrigating fodder crops as was anticipated in 2016), and later also the private open spaces at the Finkenstein Manor and Village (see Maartens, 2021a).</p> <p>The Ministry of Agriculture, Water and Land Reform (MAWLR) issued an exemption permit (11 May 2021; Permit Number 771) for Domestic and Industrial Wastewater Purification and Effluent Disposal to the Municipal Council of Windhoek (The Council) (see Maartens, 2021b, c). The Council subsequently (30 August 2021) notified FPTT that the Finkenstein WWTP was granted exemption and is required to comply with the conditions under the permit (see Maartens, 2021c: Annexure A).</p> <p>On 02 December 2021, FPTT (via LM Environmental Consulting) requested the Executive Director, MAWLR, and the Acting Chief Executive Officer (CEO), City of Windhoek, to consider a <i>Relaxation of the Limit on Distance – Dwelling/Occupied Building to WWTP</i>. The MAWLR did not approve the granting of relaxation of the distance to Finkenstein Township WWTP (see Maartens, 2022: Annexure A Letter from the MAWLR to LM Environmental Consulting, dated 11 May 2022). The Ministry pointed out that the WWTP is not functioning / operated properly and again requested Finkenstein Township to comply with all the permit conditions (of Permit Number 771).</p> <p>FPTT has since taken and submitted a water sample to Analytical Laboratory Services (10 June 2022); the final effluent does not meet the recommended limits for industrial effluents (Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm.). Also, a meeting, attended by FPTT, ASE, and LM Environmental Consulting, re how to solve the challenges related to the WWTP (parameters: COD (Chemical Oxygen Demand) as O₂, Ammonia as N, and Nitrates as N; ASE, 2022) was held on 13 June 2022.</p> <p>ASE (2022) proposed to: i) remove the timer from the Trickling filter; ii) ensure sufficient chlorination is occurring; iii) ensure the tanks are cleaned regularly; and iv) monitor current inflow to gauge current plant loads and take a composite inlet sample to get a more accurate understanding of the quality of inflow. For the long-term, it was proposed to: i) partition the trickling filter and to install an air trap on the recycle line and settler feed (in order to solve the issues related to the Nitrates, the plant being underloaded and meaning that there is too much oxygen (O₂) left after the trickling filter (see Maartens, 2022).</p> <p>On 20 July 2022, a Service Level Agreement (SLA) was signed between PFTT and ASE. The SLA commenced with the first assessment that was completed in August 2022 and with weekly inspections conducted. The ASE maintenance team de-sludged the first tank into the drying bed for sludge drying. When dried, ASE will remove the dried content to the municipal waste site and proceed with the next sump. The sumps will be de-sludged progressively due to the size of the plant drying ponds not allowing a complete plant de-sludge in one operation (Mr Zahua T Tjiyahura, General Manager: Operations and Maintenance Aqua Services & Engineering (Pty) Ltd, pers. comm.).</p>					
					

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
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Figure 10: Pictures showing: a) screening facility; b) sludge drying beds (left; the presence of the water is the result of a faulty sensor (abnormal condition)) and septic tank (right); c) three-compartment septic tank (closed and in the foreground); d) trickling filter; e) control room; here the chemicals (sodium hypochlorite) are stored; and f) two, 10,000 litre chlorine contact tanks (Source: L. Maartens, 12 October 2022).

FPTT has since taken and submitted a second water sample to Analytical Laboratory Services (13 October 2022). The final effluent does/does not meet the recommended limits for effluents, but the results have improved: COD of 99 (26 October 2022) vs 158 (23 June 2022) (recommended maximum limit of 75) and Ammonia as N of 14 (26 October 2022) vs 16 (23 June 2022) (recommended maximum limit of 10) (Mr Dirk Lourens, Manager: Manor & Village, Finkenstein Builders Trust, pers. comm.).

Wastewater Management	Pollution of biophysical environment	Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or stormwater to land conform to the regulatory requirements (General Standards as laid out in the Government Gazette Regulation R553 of 5 April 1962, Section 21(1) of the Water Act 54 of 1956)	Compliant and ongoing	Ongoing	See above:
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Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		(also see the DWAF Water Quality Standards for Effluent (2008) – <i>not yet implemented</i>). Control the consumption of cleaning materials. If feasible, substitute cleaning materials with biodegradable products. Avoid/minimize the use of cleaning agents that contain phosphates, nitrilotriacetic acid or any of its salts, ethylene diaminetetraacetic acid and ethylene dinitrilotetraacetic acid or any of their salts, alkylphenol ethoxylate, halogenated organic solvents, butoxy-ethanol, and (Volatile Organic Compounds (VOCs) in excess of 10 percent by mass.			
			N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Wastewater Management	Occupational and Community Health and Safety	Ensure that the treated sewage water is free from helminth eggs (the eggs can survive on plants and soil for many months) and other parasites and pollutants before it is used for irrigation purposes: sand filtration (to remove fine suspended solids), ultraviolet (UV) disinfection, Granular Activated Carbon (GAC) filtration, and final disinfection with chlorination. Ensure that the sludge from the WWTP is disposed of in compliance with local regulatory requirements (or consistent with protecting human health and safety and the conservation of water and land resources).	N/A during the site visit (02 February 2016).	Ongoing; Mr Barend Lottering from Aqua Services & Engineering (Pty) Ltd conducts the monthly monitoring and reports to the CoW on an annual basis (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	N/A See above (SLA with ASE).
Wastewater Management - Stormwater Management	Soil erosion	Regular inspection and maintenance of permanent erosion and runoff control features.	Ongoing (<i>ad hoc</i> inspections)	Ongoing (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	Areas where stormwater erosion has taken place were observed. It is advised to inspect/monitor and address/maintain any stormwater and soil erosion.
FPTT / Homeowners Association: Social Responsibility					
Provision of transport to residents (Finkenstein	Social Responsibility	Provide a regular bus service for residents (for shopping/appointments in town) as part of the monthly levy, or at a non-profit rate.	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
Manor: Frail Care Centre and Neurological Clinic)					
Provision of transport to staff	Social Responsibility	Arrange transport and safe pick-up/drop-off points for staff.	N/A during the site visit (02 February 2016).	Ongoing; residents can buy tickets for N\$30 for the transport of their domestic workers/gardeners between Windhoek and Finkenstein (Mr Sakkie Engelbrecht, Site (Resident) Engineer, Burmeister & Partners (Pty) Ltd, pers. comm.).	The service is currently delivered by Mrs Daleen Meyer who has several mini-buses (Mr Leon Basson, Trustee, Finkenstein Portion Three Trust, pers. comm.).
Homeowners Association	Social Responsibility	Establish and foster a strong social (neighbourhood) sense of community (management and inhabitants). Active residents (Finkenstein Manor: Frail Care Centre and Neurological Clinic) should be given the opportunity to run the residents' committee and e.g. all social events (as this will maximize the benefits to all the residents).	N/A during the site visit (02 February 2016).	Ongoing N/A during the site visit (23 July 2019).	Ongoing N/A
Finkenstein Manor and Village and Agricultural Village: Occupational and Community Health and Safety					
Food quality	Occupational and Community Health and Safety	Apply international standards/implement systems re. the handling, preparation and storage of food, e.g. SANS 10049:2001 (Food Hygiene Management) and/or ISO (International Organization for Standardization) 22000:2018 (Food Safety Management System (FSMS)).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Indoor air quality	Occupational and Community Health and Safety	Use low VOC-emitting products. Avoid, where possible, the use of aerosols, sprays and air fresheners. Housekeeping and cleaning products to be used during unoccupied hours. HVAC system: conduct periodic, preventive maintenance (incl. cleaning drain pans and	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A

Aspect	Impact	Mitigation and Management Measures	Compliance (Maartens, 2016a)	Compliance (Maartens, 2019)	Compliance (October 2022)
		changing filters); keep duct lining dry; ensure clean mechanical rooms; and fix leaks and clean spills immediately (see IFC, 2007c).			
Swimming pools	Community Health and Safety	Implement a pool water sanitization programme; the programme should include the monitoring of water quality (also see World Health Organization (WHO), 2006).	N/A during the site visit (02 February 2016).	N/A during the site visit (23 July 2019).	N/A
Finkenstein Manor and Village and Agricultural Village: Rehabilitation					
Rehabilitation	Social and Environmental Performance	<p>Remove all equipment, waste, temporary structures, etc. from the camp and work sites.</p> <p>Reshape all disturbed areas (including stockpiles, borrow pits, and temporary detours and turnouts) to their original contours.</p> <p>Manually rip disturbed areas, where compaction has taken place.</p> <p>Replant any previously removed native plant species in disturbed areas.</p> <p>Reintroduce two specimens for every one individual that had to be removed (seedlings to replace the removed trees could be obtained from the NBRI in Windhoek or the Forestry Nursery in Okahandja).</p> <p>Indigenous plant species should be used in the final landscaping of the proposed Developments.</p>	Ongoing	Ongoing (see Section 3: Recommendations)	FPTT to ensure, via the FMHA and FVHA (and as applicable for Finkenstein Green), compliance with the stipulations of the EMP.

2.2 Compliance: Monitoring and Reporting

In order to illustrate compliance with the proposed “monitoring and reporting” (see Maartens, 2016b; 2019), the following colour codes were applied:

	Compliance/completed
	In Progress/ongoing
	Non-compliance
	Not (yet) applicable
	Suggested additions/changes to the EMP

Type	Parameter	Frequency	Compliance & Comments
Abstraction boreholes	Volumes of groundwater abstracted	Daily; monthly abstraction returns to be forwarded to the Law Administration Division of the Department of Water Affairs (DWA) on a quarterly basis (or as per water abstraction permit requirement)	Not yet applicable
	Rest and Pump Water Levels	Once a week (or as per water abstraction permit requirement)	
Wastewater Treatment Plant (WWTP)	Weekly inspections: i) clean, inspect and ensure that all the mechanical equipment, electrical and control systems are functional; ii) report any defects on the installed equipment; iii) repair minor faults when possible; iv) check the quality and status of chlorine disinfection and the quantity of operational chemicals on stock; v) check the sludge level in primary septic tank; vi) check and evaluate the proficiency of the local operator of the plant and give advice on daily operation of plant if necessary; and vii) provide detailed service report on completion, stating all defects with pricing for materials, equipment, spares used and the replenishment of chemicals.		Ongoing (as per Service Level Agreement with Aqua Services & Engineering (Pty) Ltd) (<i>and in line with the permit conditions as referred to in the Ministry of Agriculture, Water and Land Reform's Exemption Permit (11 May 2021; Permit Number 771) for Domestic and Industrial Wastewater Purification and Effluent Disposal issued to the Municipal Council of Windhoek (and by the latter to Finkenstein Portion Three Trust)</i>)
	Quarterly: desludging of septic tank and discarding of dried sludge.		
	Bi-annual: process specialist inspection and summary report		
	Annual: service of WWTP		
WWTP: Effluent	Bi-annual: analysis of set of samples (raw and final water) (in line with the permit conditions as referred to in the Ministry of Agriculture, Water and Land Reform's Exemption Permit (11 May 2021; Permit Number 771) for Domestic and Industrial Wastewater Purification and Effluent Disposal issued to the Municipal Council of Windhoek (and by the latter to Finkenstein Portion Three Trust))		The final effluent does not meet the recommended limits for effluents (Mrs Carew, Analytical Laboratory Services, 26 October 2022)
Fodder crops - Irrigation water	Pesticides, nitrates, coliform or other potential agricultural contaminants. <u>Guideline value:</u> Concentrations should not exceed national irrigation water quality standards or, in their absence, internationally recognized guidelines (e.g. World Health Organization (WHO) Water Guidelines applicable to irrigation water quality) (see International Finance Corporation (IFC), 2007b and http://www.who.int/water_sanitation_health/wastewater/gsuweg2/en/index.html).		Not yet applicable
Fodder crops - On-site water supplies (if applicable)	Pesticides, nitrates, coliform or other potential agricultural contaminants. <u>Guideline value:</u> Concentrations should not exceed national drinking water quality standards or, in their absence, internationally recognized guidelines (e.g. WHO)		Not yet applicable

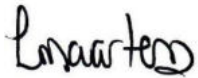
Type	Parameter	Frequency	Compliance & Comments
	Irrigation or Drinking Water Guidelines for compounds potentially present in on-site groundwater wells or surface waters) (see IFC, 2007b and http://www.who.int/water_sanitation_health/dwg/en/)		
Fodder crops - On-site soil	Nutrient balance. <u>Guideline value</u> : Nutrient surpluses should remain stable; nitrogen surplus should be preferably below 25kg/ha/yr (see IFC, 2007b and http://themes.eea.europa.eu/Sectors_and_activities/agriculture/indicators/nutrients/nutrients.pdf)		Not yet applicable
Fodder crops - On-site soil and produce (if applicable)	Pesticides. <u>Guideline value</u> : Below applicable tolerance levels. Examples of potentially applicable pesticide tolerance requirements include the Food and Agriculture Organization Codex Alimentarius' Maximum Residue Limits in Foods and the US Code of Federal Regulations Title 40, Part 180 — Tolerances and Exemptions from Tolerances for Pesticide Chemicals in Food, the latter of which applies to crops sold in the United States (see IFC, 2007b).		Not yet applicable
Hazardous materials management	Hydrocarbon spills of more than 200 litres (l)	<i>Ad hoc</i> ; inform the Minister, Ministry of Mines and Energy, by completing form PP/11 (Petroleum Products Regulations 2000)	Ongoing / N/A
Swimming pool water sanitization	Monitor the water quality to establish treatment need and frequency	<i>Ad hoc</i>	Not yet applicable
Alien invasive plant species	Identification and removal of any alien invasive species	Three-monthly monitoring	
Stormwater and soil erosion	Soil erosion rates	<i>Ad hoc</i> (rainy season)	
Environmental Management Plan	Environmental performance / corrective measures to be taken as or when required	Internal audits (monthly) External audits (bi-annual)	See Maartens (2020; 2021a; 2021b; 2021c; and 2022) (external audits only)

3 Conclusions and Recommendations

Finkenstein Portion Three Trust, the Finkenstein Manor Homeowners Association, the Finkenstein Village Homeowners Association, and all Contractors should implement and observe the Environmental Management Plan on an ongoing basis.

The following, at least but not limited to, is advised (that):

1. The Environmental Management Plan (and Chance Finds Procedure (Archaeological Material)) is made available to all (new) Contractors; the latter to sign a document/register that they have read and understand the contents of the Environmental Management Plan;
2. Building contractors make the following documents available for scrutiny to the Finkenstein Portion Three Trust (via the Finkenstein Manor Homeowners Association and the Finkenstein Village Homeowners Association):
 - a. HIV/AIDS Workplace Policy and Programme;
 - b. Health and Safety Plan;
 - c. Waste Management Plan;
3. Conduct three-monthly monitoring for and remove any alien invasive plant species in the area;
4. Inspect/monitor and address/maintain any stormwater and soil erosion;
5. Permit conditions are complied with (Ministry of Agriculture, Water and Land Reform's Exemption Permit (11 May 2021; Permit Number 771) for Domestic and Industrial Wastewater Purification and Effluent Disposal issued to the Municipal Council of Windhoek (and by the latter to Finkenstein Portion Three Trust));
6. Internal monitoring of environmental performance to take place on monthly basis and that corrective measures are taken as or when required (also see Maartens, 2019).



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