Structural, Civil and Transportation Engineers

TOWNSHIP ESTABLISHMENT APPLICATION OF PORTION 5 & 6 OF THE FARM SUNRELLA AGRICULTURAL HOLDING

OUTLINE SCHEME REPORT
WATER AND SANITATION

REPORT 2019-094-21 Rev-1

JUNE 2025

CLIENT: GROWTHPOINT & APETURE PROPERTIES

PREPARED BY:
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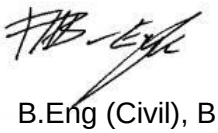
Outline Scheme Report Information Sheet

Report number	:	2019-094-21-Rev-1
Local authority	:	City of Johannesburg Metropolitan Municipality
Proposed change	:	Township Establishment Application
Development type	:	Industrial 3, Warehouses
Property description	:	Portion 5 and Portion 6 of the farm Sunrella Agricultural Holdings (Lanseria ext 79, erf 976 and erf 977)
Development description	:	Lanseria Extension 5 & 6

Report undertaken by:

Name	:	D.H. van der Merwe
Signature	:	
Qualifications	:	B.Eng (Civil)
Email address	:	dean@edseng.co.za

Report reviewed by:

Name	:	F.H.B van Eyk Pr. Eng
Signature	:	
Qualifications	:	B.Eng (Civil), B.Eng (Hons) (Water Resources)
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PORTIONS 5 & 6 OF THE FARM SUNRELLA A/H
OUTLINE SCHEME REPORT
WATER AND SANITATION

CONTENTS

1 INTRODUCTION

EDS Engineering Design Services (Pty) Ltd (EDS Engineers) was appointed to compile an Outline Scheme Report for the township application of Erf 976 and Erf 977, Lanseria Extension 79 on Portion 5 and Portion 6 of the farm Sunrella Agricultural Holding (A/H).

The application site is located in Lanseria and falls under the jurisdiction of the City of Johannesburg Metropolitan Municipality.

This report describes the existing civil engineering services in proximity to the application site, and the expected demands as a result of the change of the zoning rights and evaluates the capacity of the existing networks to accommodate the expected demands.

2 DETAILS OF THE APPLICANT

The details of the applicant:

Company Name:	GROWTHPOINT PROPERTIES
Physical Address:	The place 1 Sandton Drive Sandton Gauteng 2196
Contact Person:	Polla Scholtz
Telephone Number:	(011) 944 6050

Company Name:	APERTURE PROPERTIES
Physical Address:	89 Bute Lane, Sandown Sandton South Africa
Contact Person:	Hilton Carty
Telephone Number:	(079) 916 3982

The details of the town planner:

Company Name:	The Town Planning Hub cc
Physical Address:	Lombardy Corporate Park Block B, Unit M, Cole Rd, Shere Pretoria
Contact Person:	Adele Coertze
Telephone Number:	(012) 809 2229

3 SITE INFORMATION

3.1 SITE LOCATION

The site is located within the municipal boundaries of the City of Johannesburg, on Portion 5 and Portion 6 of the farm Sunrella A/H.

The site details are as follows:

Site		Portion 5 and Portion 6 of the farm Sunralla A/H
Size		*3.879 ha
Boundaries	North	Side Avenue
	East	Main Avenue (Proposed K215)

*Property size exclude the servitude for the future K215

The location of the proposed township is shown in **Annexure A, Figure 1**.

3.2 PROPERTY DESCRIPTION

The application site is on portions 5 and 6 of the farm Sunrella A/H.

The physical combined size of portions 5 and 6 of the farm Sunrella A/H is 3.879 ha. A request to the city of Johannesburg Metropolitan Municipality for the approval of the township establishment of Lanseria Extension 79 consisting of Erf 976 and Erf 977 measuring 3.879 ha in extent has been submitted.

Erf 976 and Erf 977 of Lanseria Extension 79 will be consolidated. The proposed township layout is included in **Annexure B**.

4 DEVELOPMENT INFORMATION

4.1 EXISTING LAND-USE RIGHTS

Portion 5 and Portion 6 of the farm Sunrella A/H is currently zoned “Agriculture” permitting land and building use for any bona fide farming activity. A copy of the zoning certificate is included in **Annexure C**.

The existing land use rights are summarised in **Table 4.1.1** below.

Table 4.1.1: Existing land use rights

Erf nr	Existing zoning	Size (ha)	Density	Coverage	FAR	Height (m)
Portions 5 and 6, Sunrella A/H	Agriculture	3.879	N/A	N/A	N/A	N/A

4.2 PROPOSED LAND-USE RIGHTS

The zoning of the application site will change to “Industrial 3”.

The schedule of rights as well as an extract of the motivation memorandum as submitted by the town planner, indicating the proposed development controls, are included in **Annexure D.**

The proposed land use rights are summarised in **Table 4.2.1** below.

Table 4.2.1: Proposed land use rights

Erf nr	Proposed zoning	Size (ha)	Density	Coverage	FAR	Height (m)
Erf 976 & 977 (Lanseria Extension 79)	Industrial 3	3.879	N/A	60%	0.6	25

5 WATER RETICULATION

5.1 EXISTING WATER RETICULATION NETWORK

The existing water reticulation consists of the following:

- A reservoir located at position 25°57'12.87"S (Latitude) and 27°55'25.03"E (Longitude).

The following assumptions were made regarding existing water infrastructure:

- The existing reservoir and water tower have sufficient capacity to accommodate the proposed development.
- The proposed site is lower than the reservoir hence it was assumed that enough pressure is available to the site.
- Construction drawings have been submitted to Joburg Water for the installation of a new bulk water line under Extension 11 and Extension 12.

The existing water information was received from Johannesburg Water and is included in **Annexure E**, page 2.

5.2 ESTIMATED WATER DEMAND

The estimated water demand for the existing zoning rights is shown in **Table 5.3.1** below.

Table 5.3.1: Estimated water demand for existing zoning rights

Erf nr	Current Zoning	Site area (ha)	FAR	Water demand (kl/ha gross site area)	AADD (kl/day)	Peak factor	Peak flow (l/s)
Portions 5&6, Sunrella A/H	Agriculture	3.879	N/A	3.6	14	1	0.04

The estimated water demand for the proposed zoning rights is shown in **Table 5.3.2** below.

Table 5.3.2: Estimated water demand for proposed zoning rights

Erf nr	Proposed Zoning	Site area (ha)	FAR	Water demand (kl/ha gross site area)	AADD (kl/day)	Peak factor	Peak flow (l/s)
Erf 976 & 977 (Lanseria X79)	Industrial 3	3.879	0.6	13.75	53.3	4	2.46

The fire flow requirement for *Moderate Risk Business* development is minimum flow of 50 l/s.

5.3 PROPOSED EXTERNAL WATER UPGRADES

The overall development requires the installation of a 200mmØ uPVC water main from the existing reservoir to provide connection points for townships of Lanseria Extensions 11, 12 and 79. The water main will supply multiple erven and it is proposed that the development charges from each township be offset against construction costs. All three townships mentioned above will contribute to the installation cost.

It is proposed that Extension 79 development charges be offset for the construction portion of the 200mmØ uPVC water main which has an approximate length of 733m.

The proposed connection points with supply infrastructure are indicated in **Annexure F, Figure 3**.

The estimated construction costs for the 200mmØ main and 110mmØ water connection are shown in Table 5.5.1 below.

Table 5.5.1: Estimated cost of water upgrades for Lanseria Extension 79

Item no	Description	Extent (m)	Size (mm Ø)	Cost (R/m)	Cost (Excluding VAT)
1	Install new pipe HDPE Class 16	10	110	1 500	R 15 000.00
2	Install new pipe HDPE Class 16	737	200	2 000	R 1 474 000.00
Sub-Total					**R 1 489 000.00**
3	Preliminary & General (20%)				R 297 800.00
4	Contingencies (5%)				R 74 450.00
Sub-Total					**R 1 861 250.00**
5	Professional Fees (12%)				R 223 350.00
Total					**R 2 084 600.00**

The water upgrade cost is estimated at around R 2 084 600.00 (Excl. VAT).

5.4 PROPOSED INTERNAL UPGRADES AND CONNECTION POINT

Internal water reticulation and fire hydrants are to be installed by the developer and will be connected to the external municipal water main.

The proposed water connection points are indicated in **Annexure F, Figure 3**.

5.5 ESTIMATED BULK CONTRIBUTIONS FOR WATER

The estimated bulk contribution for water is calculated based on a contribution rate of R 11 553.43 /kl.

The increase in water demand from “Agricultural” to “Industrial 3” for the proposed development of Portion 5 and Portion 6 of the farm Sunrella A/H is as follows:

- Water demand for “Agricultural” = 3.6 kl/day
- Water demand for “Industrial 3” = 53.2 kl/day
- Increase in water demand = 49.5 kl/day

The bulk contributions for water payable in respect of the township are estimated to be R 572 383.50 (Excl. VAT).

However bulk contributions will be deducted from the upgrade cost for water network as indicated below.

- External Upgrade Cost = R 572 383.50 (Excl. VAT)
- Bulk Contributions = R 2 084 600.00 (Excl. VAT)
- Remaining Cost Payable to Council = R 0.00 (Excl. VAT)

The water networks remaining payable contribution in respect to the township is estimated to be R 0.00 (Excl. VAT)

6 SEWER RETICULATION

6.1 EXISTING SEWER RETICULATION NETWORK

There are no existing municipal sewer services in the vicinity of the development.

The internal sewer treatment works operated by Lanseria are closed off to the surrounding sites.

The existing sewer information was received from Johannesburg Water and is included in **Annexure E, page 1.**

6.2 PROPOSED INTERNAL UPGRADES AND CONNECTION POINT

Internal sewer reticulation would consist of 110mm and 160mm Ø sewer pipes and are to be installed by the developer.

The sewer connection points for the application site are indicated in **Annexure F, Figure 2**.

6.3 EXPECTED SEWER OUTFLOW

The estimated sewer effluent for the existing zoning rights is shown in **Table 6.3.1** below**.**

Table 6.3.1: Estimated sewer effluent for existing zoning rights

Erf nr	Current Zoning	Site area (ha)	FAR	Demand (kl/holding)	ADDWF (kl/day)	Peak factor	Peak flow (l/s)
Portions 5&6, Sunrella A/H	Agriculture	3.879	N/A	2.2	2.2	1	0.03

The estimated sewer effluent for the proposed zoning right is shown in **Table 6.3.2**.

Table 6.3.2: Estimated sewer demand for proposed zoning rights

Erf nr	Proposed Zoning	Site area (ha)	FAR	Demand (kl/ha gross Area)	ADDWF (kl/day)	Peak factor	Peak flow (l/s)
Erf 932 & 933 (Lanseria Extension 11)	Industrial 3	3.879	0.6	9	34.91	2.1	0.85

ADDWF – Average Daily Dry Weather Flow (*Guidelines and Standards for the Design and Maintenance of Water and Sanitation Services* published by Johannesburg Water)

6.4 WETLAND INTEGRATION AND SEWER MANAGEMENT STRATEGY

A fragmented and degraded unchannelled valley bottom wetland occurs on site. The wetland is clearly impacted by anthropogenic activities including housing, alteration of flow paths and historical use of the site for intensive livestock rearing. The Lanseria Airport has also altered the hydrology of the aquatic ecosystems within 500m of the site. The affected wetland system is currently in an Ecological Category E, representing a seriously modified state. This classification reflects a high level of disturbance, with substantial alteration of natural ecosystem processes, and a significant loss of indigenous biota and habitat integrity across most components assessed — particularly in vegetation, hydrology, and water quality. The ecological importance and sensitivity of the system is also *low*, representing an aquatic ecosystem that is not ecologically important and sensitive at any scale.

EDS Engineers and Galago Environmental worked together to encompass sections of the unchannelled valley bottom wetland, with a single attenuation pond in the northern corner of the site. The *mitigative aspect* of the loss of the wetlands, due to the proposed development, will be the *improvement of the wetland ecological services in the artificial wetland (AW) and attenuation structure.* Galago Environmental recommends that the principles of emulating current wetland ecological goods and services are incorporated into the core design (flood attenuation, stream flow, sediment trapping, erosion control, etc) to ensure *functionality remains and is improved.*

To ensure compliance with environmental legislation, the development will adhere to the **National Environmental Management Act (NEMA), Act No. 107 of 1998**, and the **National Water Act (NWA), Act No. 36 of 1998**.

In terms of sewer infrastructure, a **package treatment plant** will be implemented to service the development. The plant will be strategically located **outside the footprint of the newly constructed wetland** to prevent any ecological disturbance. The **treated effluent will be discharged into the external stormwater network**, and the treatment process will ensure that the effluent quality complies with the **General Authorisations under the NWA** and **Johannesburg Water's discharge standards**, particularly where discharge may indirectly affect sensitive downstream ecosystems. For more details on the discharging effluent of the package plant, refer to **Section 6.5** of the Outline Scheme Report.

6.5 PROPOSED EXTERNAL SEWER UPGRADES

A Sewer package / treatment plant will be implemented on site until Johannesburg Water municipal bulk sewer lines are available.

The sewer package plant will be maintained by the developer according to Johannesburg Water and Water Affairs (Guideline Document: Package Plant for the Treatment of Domestic Wastewater) guidelines.

The package plant will be decommissioned once a bulk municipal connection becomes available. The decommissioning will happen within three months after the bulk connection is operational.

The Sewer Package plant will conform to all required specifications and standards including:

- Joburg Water requirements as per the “GUIDELINES FOR THE INSTALLATION OF PRIVATELY OWNED PACKAGE PLANTS AND OTHER “ON-SITE” DOMESTIC SEWERAGE TREATMENT SYSTEMS. WERE THE TREATED WASTEWATER IS TO BE DISCHARGED TO A NATURAL SURFACE WATER COURSE”, dated March 2006.
- Department of Water Affairs’ “GUIDELINE DOCUMENT: PACKAGE PLANTS FOR THE TREATMENT OF DOMESTIC WASTEWATER” dated December 2009, undertaken as part of the Water Research Commission’s project K5/1869 for the National Department of Water Affairs.

The applicant is in the process of applying for the approvals required in terms of:

- National Environmental Management Act (Act 107 of 1998) (part of the EIA applications)
- National Water Act (Act 36 of 1998) (Water Use Licence Application)
- Approvals as required by Joburg Water

The design of the sewer treatment plant will include appropriate measures to ensure efficient operation of the plant, early detection of issues related to the functioning and quality of the treated effluent and containment of any pollution in the unlikely event that the treatment plant does not perform as required.

The design will include the following elements:

- Septic tank / Conservancy tank to pre-treat the sewer prior to treatment in the package plant. This also allows for foreign objects to be collected in the septic tank prior to entering the package plant.
- Backup power to the package plants to ensure continuous operation during power outages and load shedding.
- Monitoring schedule to ensure that the treated effluent meets the required standard in accordance with the approvals. The frequency of monitoring will be done in accordance with Annexure 7 of the Joburg Water guideline

document.

- The treated effluent will be discharged into a vertical reed bed system on site for post-treatment. The wetlands systems are effective for polishing treatment prior to discharging the effluent into the wetland system. Some of the treated effluent will be used for irrigation of the landscaping on site.

The vertical reed bed as a post-treatment system as mentioned above will be contained in a bund area that will be used to contain sewer effluent in the event of the system not functioning as designed. This will provide a barrier against severe impacts on the receiving water.

- A series of containers arranged to form a vertical read bed purification system as shown in the concept in Figure 1 below. This system requires virtually no maintenance apart from occasional thinning out of the plants. The system treats the effluent prior to discharge into the natural environment. The system achieves the following:
    - Reduction of the coliform levels
    - Reduction in the nitrate levels
    - Reduction of the chemical and biological oxygen demand
    - The system treats the effluent in a similar manner to natural wetlands
    - Evaporation and transpiration from the system reduces the discharge downstream of the reed bed system with minimal discharge expected during the winter months.
    - The effluent from the system is treated to standards that allow the effluent to be discharged into the natural environment in terms of current environmental regulations.

Figure 1: Typical arrangement for a vertical reed bed post purification.

The effluent will be treated to the standards required in Table 22 of the "GUIDELINE DOCUMENT: PACKAGE PLANTS FOR THE TREATMENT OF DOMESTIC WASTEWATER" as required for effluent to be discharged into a listed water resource. This will conform to the General / Special Limits included in the Joburg Water Guideline document and as per the National Water Act (Act 36 of 1998) (Water Use Licence Application) approval.

Table 22: Treated wastewater quality monitoring requirements

Constituent (mg/ℓ unless stated)	Irrigation volumes (m^3/d)*			Additional requirements**		Discharge to a water resource (m^3/d)					
	<2 000	<500	<50	1	2	Not listed	Listed	Not listed	Listed	Not listed	Listed
						10-100		100-1 000		1 000-2 000	
Faecal coliforms (FCU/100 mℓ)	<1 000	<100 000	<100 000	1 000	0	<1 000	0	<1 000	0	<1 000	0
Chemical Oxygen Demand (COD)	<75	<400	< 5 000	75*	30*	-	-	< 75	<30	< 75	<30
pH (pH units)	5.5-9.5	6-9	6-9	5,5-9,5	5,5-7,5	5.5-9.5	5.5-7.5	5.5-9.5	5.5-7.5	5.5-9.5	5.5-7.5
Ammonia (as N)	6[1/]	-	-	6	6	-	-	<6	<2	<6	<2
Nitrate/Nitrite as N	15	-	-	15	1,5	-	-	-	-	15	1.5
Chlorine as free chlorine	0.25	-	-	0,25	0.25	-	-	-	-	0.25	0
Suspended solids	25	-	-	25	25	-	-	25	10	25	10
Electrical conductivity (mS/m)	<70 above intake to a max of 150	<200	<200	70 mS/m above intake to a maximum of 150 mS/m	50 mS/m above background receiving water, to a maximum of 100 mS/m	<70 above intake to a max of 150	<50 above background receiving water to a max of 100	<70 above intake to a max of 150	<50 above background receiving water to a max of 100	<70 above intake to a max of 150	<50 above background receiving water to a max of 100
Ortho-phosphate as P	10	-	-	10	10	-	-	-	-	10	1 (med) 2.5 (max)
Fluoride	1	-	-	1	1	-	-	-	-	-	-
Soap, oil or grease	2.5	-	-	2,5	0	-	-	-	-	-	-
SAR for biodegradable industrial wastewater	-	5	5			-	-	-	-	-	-

Figure 2: Standards for discharge quality.

The treated effluent will be discharged into the stormwater system on the applicant's property. As indicated, the treated effluent will also be used for irrigation on site reducing the volume of discharge. The low-volume continuous discharge into the wetland is considered ideal to ensure a constant flow of water into the wetland. The applicant will obtain the required approvals in terms of the National Environmental Management Act (Act 107 of 1998) and the National Water Act (Act 36 of 1998) (Water Use License Application) as stated above. The final location for the sewer treatment plant and outflows will be submitted for approval. The package plant checklist is included in Annexure G and the required Sewer package/treatment plant technical specifications sheet for stages 2 and 3 are included in **Annexure G, Annexure H, Annexure I, and Annexure J.**

6.6 ESTIMATED BULK CONTRIBUTIONS FOR SEWER

No bulk contributions will be payable due to no sewer infrastructure networks in the surrounding areas.

Bulk Contributions will be paid once a connection point becomes available.

7 CONCLUSIONS AND RECOMMENDATION

It is proposed that water will be obtained from the water tower south-west of the proposed development. A link pipeline will be required to service the proposed development.

No connection to the municipal sewer is available and therefore a package plant is proposed.

It is furthermore recommended that the Outline Scheme report be approved by Johannesburg Water.

F.H.B van Eyk Pr. Eng. (20160826)

Annexures:

- Annexure A: Site location Map
- Annexure B: Proposed Township Layout
- Annexure C: Existing Zoning Certificates
- Annexure D: Conditions of Establishment
- Annexure E: Existing Water and Sewer Information
- Annexure F: Services Layout Drawings
- Annexure G: Package Plant Checklist
- Annexure H: Stage 2 - Sewer Treatment Plant Technical Specification
- Annexure I: Stage 3 - Sewer Treatment Plant Technical Specification
- Annexure J: Title Deeds

ANNEXURE A: SITE LOCATION MAP

GENERAL NOTES:

1. REFER TO ALL RELEVANT DRAWINGS & SPECIFICATIONS, DO NOT SCALE ANY DIMENSIONS.
2. WHERE DISCREPANCIES OCCUR BETWEEN THE PROJECT DRAWINGS OR SPECIFICATIONS, THESE SHOULD BE REPORTED IMMEDIATELY TO THE PRINCIPAL AGENT.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ARCHITECTS DRAWING BEFORE CONSTRUCTION COMMENCES.
4. ALL WATERPROOFING AND EARTH POISONING DETAILS TO BE IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATION AND INSTRUCTIONS.

Rev. No:	Date:	Revision Details:	By:
A	26/11/'24	FOR INFORMATION	KB

Client:

Architect:

e•d•s

Structural, Civil and Transportation Engineers

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Project:

LANSERIA PROJECT RUNWAY

Description:

LOCALITY PLAN (FIGURE 1)

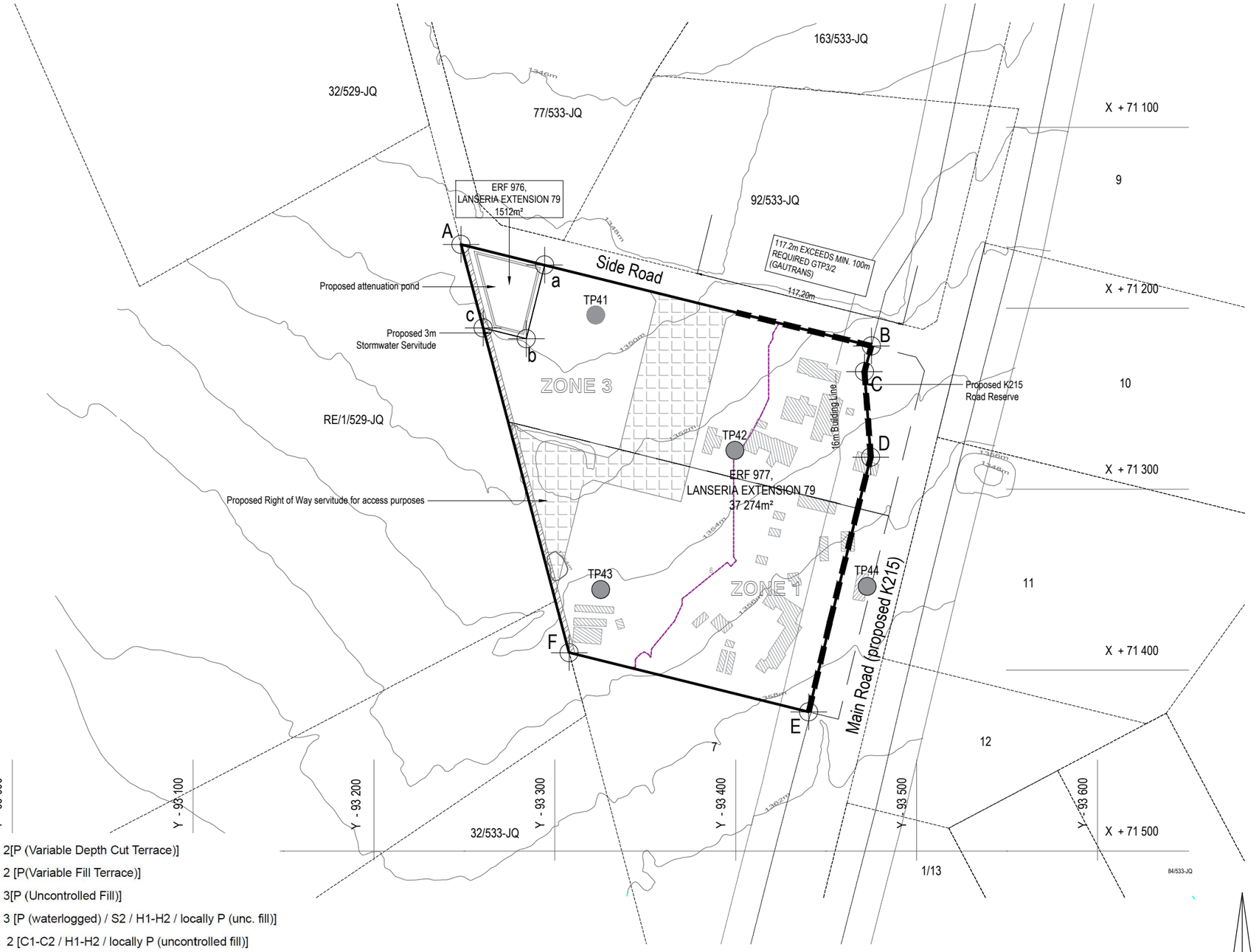
Paper size:	Drawn:	Checked:	Designed:
A3	KB	D vd M	D vd M

Scale:	Project Number:	Drawing Number:	Revision:
1:5000	2019-094	0050	A

ANNEXURE B: PROPOSED TOWNSHIP LAYOUT

NOTES continued:

6. Erven 976 and 977 are affected by a servitudes as indicated.
7. All existing buildings to be demolished.
8. Line of no access indicated by ■ ■ ■ ■



Zone 6: 2[P (Variable Depth Cut Terrace)]
Zone 5: 2 [P(Variable Fill Terrace)]
Zone 4: 3[P (Uncontrolled Fill)]
Zone 3: 3 [P (waterlogged) / S2 / H1-H2 / locally P (unc. fill)]
Zone 2: 2 [C1-C2 / H1-H2 / locally P (uncontrolled fill)]
Zone 1: 2 [C1-C2 / locally P (uncontrolled fill)]

IT IS HEREBY CERTIFIED THAT THE TOWNSHIP LAYOUT HAS BEEN COMPILED IN ACCORDANCE WITH THE FINDINGS LISTED IN THE GEOTECHNICAL INVESTIGATION REPORT NUMBER GGE/23031/2 DATED APRIL 2024

PR. SCI NAT. REG NO. _____ DATE _____

LOCALITY PLAN

SCALE 1 : 50 000

0m 250m 500m 1km 2km 3km

NOTES:

1. The township boundaries are indicated by points ABCDEFA.
2. Proposed K215 Provincial Road Alignment and line of no access indicated.
3. Erf 976 is indicated by points AabcA and measures 1 512m² in extent.
4. Erf 977 is indicated by points aBCDEFcba and measures 37 274m² in extent.
5. All areas and distances are estimated, subject to final survey for General Plan purposes.

PROPOSED TOWNSHIP: **LANSERIA EXTENSION 79**

SITUATED ON: **HOLDINGS 5 AND 6**

OF THE FARM: **SUNRELLA AGRICULTRUAL HOLDINGS**

LOCAL AUTHORITY: **CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY**

LAND USE TABLE

USE	AREA	OF TOWNSHIP	# OF ERVEN	ERF NUMBERS
"INDUSTRIAL 3"	38 786m²	100.00 %	2	976 - 977
"ROADS"	0 m²	0.00 %		
TOTAL	38 786m²	100 %	2	976 - 977

SIZE OF ERVEN

USE	MINIMUM	RULING

STREETS

MINIMUM GRADIENT: N / A
MAXIMUM GRADIENT: N / A
TOTAL LENGHT: N / A

SCALE: **1 : 2500 on A 3**

LA VEW: **CPD/LSA X79/1**

DATE	SUBMISSION / AMENDMENT
12.2024	1/SUBMISSION

CONTOUR INTERVAL:	2m
GEODETIC SYSTEM:	WGS 84
CONTOUR SURVEY:	City of Johannesburg GIS
DESIGNED BY:	B. Oosthuizen
APPLICANT:	B.E. Fletcher

tph THE TOWN PLANNING HUB cc *changing landscapes*

IT IS HEREBY CERTIFIED THAT THE PROPERTY SHOWN ON THIS DRAWING IS NOT AFFECTED BY FLOODWATER 1:50 AND 1:100 YEAR RECURRENCE INTERVAL EVENT DETERMINED IN ACCORDANCE WITH SECTION 144 OF THE NATIONAL WATER ACT (ACT 36 OF 1998).

INITIAL AND SURNAME _____ PR. ENG. REG NO. _____ DATE _____

ANNEXURE C: EXISTING ZONING CERTIFICATES

ZONING INFORMATION
CERTIFICATE PAD
FOR APPLICATION SUBMISSIONS

a world class African city

Date: 12/03/2024

Requested by:	Sandy Ngwenya
Town Planning Scheme:	City of Johannesburg Land Use Scheme 2018
Name of Applicant:	THE TOWN PLANNING HUB CC
Erf/Holding Name/Farm Portion:	Holdings 5 and 6
Township/Holding Name/Farm Name:	Sunrella A.H.
Street Name and No:	Main avenue
ZONING INFORMATION	
Use Zone:	Undetermined
Height Zone:	A (As per attached table 4)
Floor Area Ratio:	As per attached table 6
Coverage:	As per attached table 5
Density:	No Density
Building Line:	As per attached table 7
Parking:	As per scheme
AMENDMENT SCHEME APPLICABLE:	N/A
Served By:	Sandy Ngwenya

Terms and Conditions:
The Town Planning Scheme is open for inspection on the 8th Floor 158 Loveday Street Braamfontein between 8:00 and 15:30 weekdays. The applicant must verify the information contained herein by inspection of the scheme. Whilst the utmost is done to ensure accuracy the City of Johannesburg does not accept responsibility for any incorrect information given on this form. The applicant's attention is drawn to the general provisions of the Town Planning Scheme. It should be noted that the provisions of the Town Planning Scheme do not override any restrictive conditions that may be contained in the Title Deeds. PLEASE NOTE: No Information will be given telephonically due to the technical and interpretive complications.

ANNEXURE D: CONDITIONS OF ESTABLISHMENT

STATEMENT OF THE CONDITIONS UNDER WHICH THE APPLICATION MADE BY GROWTHPOINT PROPERTIES LIMITED (REGISTRATION NUMBER 1987/004988/06) (HEREINAFTER REFERRED TO AS THE TOWNSHIP OWNER) IN TERMS OF THE PROVISIONS OF PART 3 OF CHAPTER 5 OF THE CITY OF JOHANNESBURG MUNICIPAL PLANNING BY-LAW, 2016 (AS AMENDED 2023) (HEREINAFTER REFERRED TO AS THE BY-LAW), FOR PERMISSION TO ESTABLISH A TOWNSHIP ON HOLDINGS 5 AND 6, SUNRELLA AGRICULTURAL HOLDINGS, GAUTENG PROVINCE, HAS BEEN APPROVED.

1. CONDITIONS TO BE COMPLIED WITH PRIOR TO THE OPENING OF THE TOWNSHIP REGISTER AND THE DECLARATION OF THE TOWNSHIP AS AN APPROVED TOWNSHIP.

(1) CANCELLATION OF EXISTING CONDITIONS OF TITLE

The township owner shall at its own costs, cause the following restrictive conditions and/or servitudes to be cancelled or the township area to be freed there from:

T53698/2024 (Holding 5 Sunrella Agricultural Holdings)

A.(a); A.(b); A.(c); A.(c)(i); A.(c)(ii); A.(d); A.(d)(i); A.(d)(ii); A.(d)(iii); A.(d)(iv); A.(d)(v); A.(d)(vi); A.(e); A.(f); A.(g); A. (h); A.(i); A.(j); A.(j)(i); A.(j)(ii); A.(j)(iii); A.(j)(iv)

T27363/2024 (Holding 6, Sunrella Agricultural Holdings)

A.(a); A.(b); A.(c); A.(c)(i); A.(c)(ii); A.(d); A.(d)(i); A.(d)(ii); A.(d)(iii); A.(d)(iv); A.(d)(v); A.(d)(vi); A.(e); A.(f); A.(g); A.(h); A.(i); A.(j); A.(j(i); A.(j)(ii); A.(j)(iii); A.(j)(iv)

(2) GENERAL

(a) The township owner shall, prior to approval of the General Plan, make arrangements with Corporate Geo-Informatics (CGIS) for the allocation of a street name to the public road (or street names to the public roads) in the township (to be indicated on the layout plan so that it forms part of the General Plan).

(b) The local authority shall, after approval of the General Plan, make arrangements with Corporate Geo-Informatics (CGIS) for the allocation of street numbers to the newly created erven in the township.

(c) Excision in terms of section 69 of the By-law

The holding on which the township is being established has been excised and the description of the land has been submitted as being farmland.

(d) A satisfactory geo-technical report (in triplicate) shall be submitted to the local authority and the Amendment Scheme shall not be considered/approved by the local authority until such time as the comments on the said report, have been obtained and included in the mentioned Amendment Scheme.

(e) The township owner shall submit acceptable proof that all outline scheme reports have been submitted to the Municipal Entities (Johannesburg Water and Johannesburg Roads Agency).

(f) Authorisation/exemption to establish the township in terms of the National Environmental Management Act (No 107 of 1998) shall be obtained from the Department of Agriculture and Rural Development and shall be submitted to the local authority.

(g) The comments of the South African National Roads Agency Limited on the establishment of the township, shall be obtained and shall be submitted to the local authority.

(h) The comments of the Department: Mineral Resources on the establishment of the township, shall be obtained and shall be submitted to the local authority.

(i) The comments of the Department of Roads and Transport (Gauteng Provincial Government) on the establishment of the township, shall be obtained and shall be submitted to the local authority.

(j) The township owner shall obtain and submit a certificate from Eskom that electricity supply to the township, is available. Provided that if supply is not available and the township has been approved by the local authority 5 years or more than 5 years ago, a letter from Eskom shall be submitted confirming that supply is not available.

(k) The township owner shall, after approval of the General Plan of the township, submit the relevant Amendment Scheme to the local authority for approval, in order that it can be published simultaneously with the declaration of the township as an approved township.

(l) The township owner shall comply with the provisions of sections 28(5), (9), (10) and (11) of the By-Law.

2. CONDITIONS OF ESTABLISHMENT

(1) NAME

The name of the township is **Lanseria Extension 79**.

(2) DESIGN

The township consists of erven and roads as indicated on layout plan CPD/LSAX79/1.

(3) DESIGN AND PROVISION OF ENGINEERING SERVICES IN AND FOR THE TOWNSHIP

The township owner shall, to the satisfaction of the local authority, make the necessary arrangements for the design and provision of all engineering services of which the local authority is the supplier.

(4) ELECTRICITY

The local authority is not the bulk supplier of electricity to or in the township. The township owner shall in terms of Chapter 6 Part 1 of the By-law make the necessary arrangements with ESKOM, the licensed supplier of electricity for the provision of electricity.

(5) GAUTENG PROVINCIAL GOVERNMENT (DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT)

Should the development of the township not been commenced with before …… the application to establish the township, shall be resubmitted to the Department of Agriculture and Rural Development for exemption/authorisation in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended.

(6) GAUTENG PROVINCIAL GOVERNMENT (DEPARTMENT OF ROADS AND TRANSPORT)

(a) Should the development of the township not be completed before ….. the application to establish the township, shall be resubmitted to the Department of Roads and Transport for reconsideration.

(b) If however, before the expiry date mentioned in (a) above, circumstances change in such a manner that roads and/or PWV routes under the control of the said Department are affected by the proposed layout of the township, the township owner shall resubmit the application for

the purpose of fulfilment of the requirements of the controlling authority in terms of the provisions of Section 48 of the Gauteng Transport Infrastructure Act, 2001 (Act 8 of 2001).

(c) The township owner shall comply with the conditions of the Department as set out in the Department's letter dated ……...

(7) NATIONAL GOVERNMENT (DEPARTMENT: MINERAL RESOURCES)

Should the development of the township not been completed before …….. the application to establish the township, shall be resubmitted to the Department: Mineral Resources for reconsideration.

(8) ACCESS

Access to or egress from the township shall be provided to the satisfaction of the local authority and/or Johannesburg Roads Agency (Pty) Ltd and/or the Department of Roads and Transport.

(9) ACCEPTANCE AND DISPOSAL OF STORMWATER DRAINAGE

The township owner shall arrange for the stormwater drainage of the township to fit in with that of the adjacent road/roads and all stormwater running off or being diverted from the road/roads shall be received and disposed of.

(10) REFUSE REMOVAL

The township owner shall provide sufficient refuse collection points in the township and shall make arrangements to the satisfaction of the local authority for the removal of all refuse.

(11) REMOVAL OR REPLACEMENT OF EXISTING SERVICES

If, by reason of the establishment of the township, it should be necessary to remove or replace any existing municipal, TELKOM and/or ESKOM services, the cost of such removal or replacement shall be borne by the township owner.

(12) DEMOLITION OF BUILDINGS AND STRUCTURES

The township owner shall at its own costs cause all existing buildings and structures situated within the building line reserves, side spaces or over common boundaries to be demolished to the satisfaction of the local authority, when requested thereto by the local authority.

(13) OBLIGATIONS WITH REGARD TO THE CONSTRUCTION AND INSTALLATION OF ENGINEERING SERVICES AND RESTRICTIONS REGARDING THE TRANSFER OF ERVEN

(a) The township owner shall, after compliance with clause 2.(3) above, at its own costs and to the satisfaction of the local authority, construct and install all engineering services including the internal roads and the stormwater reticulation, within the boundaries of the township. Erven and/or units in the township may not be transferred into the name of a purchaser, prior to the local authority certifying to the Registrar of Deeds that these engineering services had been constructed and installed.

(b) The township owner shall fulfil its obligations in respect of the installation of electricity, water and sanitary services as well as the construction of roads and stormwater drainage and the installation of systems therefor, as agreed between the township owner and the local authority in terms of clause 2.(3) above. Erven and/or units in the township, may not be transferred into the name of a purchaser, prior to the local authority certifying to the Registrar of Deeds that sufficient guarantees/cash contributions in respect of the engineering services have been submitted or paid to the said local authority.

(14) OBLIGATIONS WITH REGARD TO THE PROTECTION OF ENGINEERING SERVICES

The township owner shall, at its costs and to the satisfaction of the local authority, survey and register all servitudes required to protect the constructed/installed services. Erven and/or units in the township may not be or transferred into the name of a purchaser, prior to the local authority certifying to the Registrar of Deeds that these engineering services had been or will be protected to the satisfaction of the local authority.

(15) CONSOLIDATION OF ERVEN

The township owner shall, at its own costs, after proclamation of the township, submit an application for consent to consolidate Erven 976 and 977, to the local authority for approval.

3. DISPOSAL OF EXISTING CONDITIONS OF TITLE.

All erven shall be made subject to existing conditions and servitudes, if any:-

4. CONDITIONS OF TITLE

(A) Conditions of Title imposed by the local authority in terms of the provisions of Chapter 5 Part 3 of the By-Law

(1) ALL ERVEN

(a) Each erf is subject to a servitude, 2m wide, in favour of the local authority, for sewerage and other municipal purposes, along any two boundaries other than a street boundary and in the case of a panhandle erf, an additional servitude for municipal purposes 2m wide across the access portion of the erf, if and when required by the local authority: Provided that the local authority may dispense with any such servitude.

(b) No building or other structure shall be erected within the aforesaid servitude area and no large rooted trees shall be planted within the area of such servitude or within 2m thereof.

(c) The local authority shall be entitled to deposit temporarily on the land adjoining the aforesaid servitude such material as may be excavated by it during the process of the construction, maintenance or removal of such sewerage mains and other works as it, in its discretion may deem necessary and shall further be entitled to reasonable access to the said land for the aforesaid purpose subject to any damage done during the process of the construction, maintenance or removal of such sewerage mains and other works being made good by the local authority.

(2) ERVEN 976 AND 977

The erven are subject to a 3m wide servitude for stormwater services in favour of the local authority, along the western boundary as indicated on layout plan CPD/LSA X79/1.

5. CONDITIONS TO BE INCORPORATED IN THE TOWN PLANNING SCHEME IN TERMS OF SECTION 54 OF THE BY-LAW, IN ADDITION TO THE PROVISIONS OF THE CITY OF JOHANNESBURG LAND USE SCHEME, 2018.

(1) ERVEN 976 AND 977

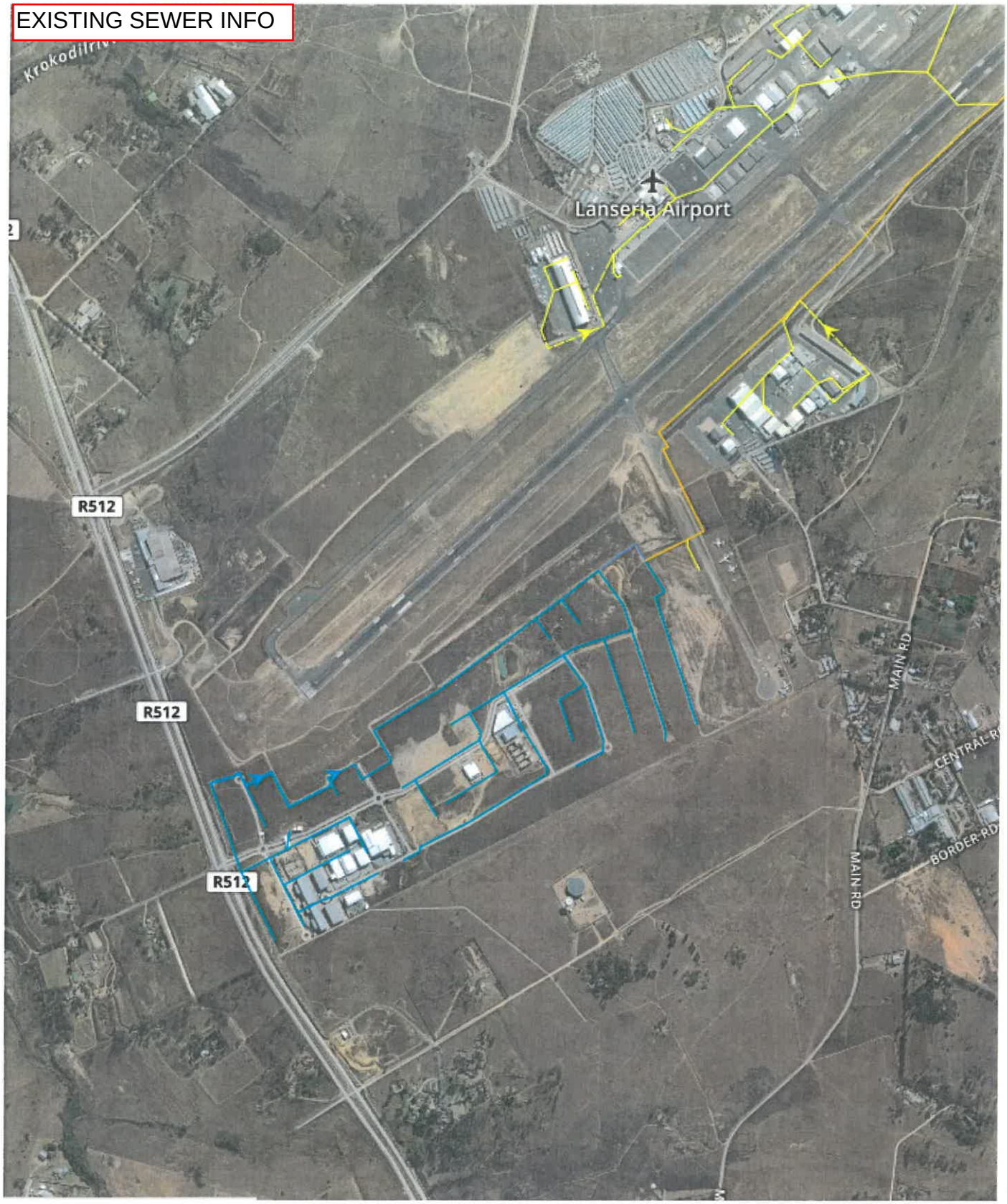
COLUMN 1: USE ZONE

"Industrial 3"

COLUMN 2:	DESCRIPTION OF PORTION OF LAND Erven 976 and 977, Lanseria Extension 79
COLUMN 3:	PRIMARY RIGHTS As per Scheme, Industrial purposes, commercial purposes, business purposes (excluding restaurants, motor showrooms, showrooms, medical consulting rooms, domestic service industries), builders yard, building material storage.
COLUMN 4:	USES WITH CONSENT (LAND USE TABLE 2) As per Scheme
COLUMN 5:	USES NOT PERMITTED (LAND USE TALBE 2) As per Scheme
COLUMN 6:	WIDTH OF SERVITUDE AREA 3m Stormwater Servitude along the western boundary
COLUMN 7:	STOREYS OR HEIGHT IN METERS 25m (3 storeys)
COLUMN 8:	COVERAGE As per Scheme, 60%
COLUMN 9:	F.A.R OR FLOOR AREA As per Scheme, 0.6 Offices restricted to 2500 m^2
COLUMN 10:	PARKING PROVISION As per Scheme, Adequate, paved parking spaces, together with the necessary manoeuvring area, shall be provided on the erf to the satisfaction of the Council, in the following ratios: Commercial: 0.3 bays per 100m^2 Offices: 2 bays per 100m
COLUMN 11:	DENSITY Not applicable
COLUMN 12:	BUILDING LINE PROVISION As per Scheme Street: 3m Main Road (K215): 16m (may be relaxed to 10m with approval)
COLUMN 13:	GENERAL PROVISIONS 1. A Site Development Plan to the satisfaction of the council, shall be submitted for evaluation and approval prior to the submission of building plans and/or the development of the erf.
COLUMN 14:	AMENDMENT SCHEME NUMBER

ANNEXURE E: EXISTING WATER & SEWER INFORMATION

EXISTING SEWER INFO



Disclaimer

Disclaimer

ANNEXURE F: SERVICES LAYOUT DRAWING

SEWER: LAYOUT
SCALE: 1:500

GENERAL NOTES:

1. REFER TO ALL RELEVANT DRAWINGS & SPECIFICATIONS, DO NOT SCALE ANY DIMENSIONS.
2. WHERE DISCREPANCIES OCCUR BETWEEN THE PROJECT DRAWINGS OR SPECIFICATIONS, THESE SHOULD BE REPORTED IMMEDIATELY TO THE PRINCIPAL AGENT.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ARCHITECTS DRAWING BEFORE CONSTRUCTION COMMENCES.
4. ALL WATERPROOFING AND EARTH POISONING DETAILS TO BE IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATION AND INSTRUCTIONS.

NOTES: SEWER

1. THE STANDARD SPECIFICATION SANS 1200 A, D, DB, G, LB AND LD (EXCLUDING PAYMENT CLAUSES) IS APPLICABLE.
2. UNPLASTICIZED POLY (VINYL CHLORIDE) (PVC-U) PIPES TO COMPLY WITH THE RELEVANT REQUIREMENTS OF SANS 791:2014.
3. THE COMPLETE INSTALLATION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL AUTHORITIES BY-LAWS AND REGULATIONS, THE NATIONAL BUILDING REGULATIONS, AND TO THE SATISFACTION OF THE ENGINEER.
4. ALL WORK TO BE CARRIED OUT BY OR UNDER THE DIRECT SUPERVISION OF LICENSED PLUMBERS AND DRAIN LAYERS.
5. ALL DRAIN PIPES BELOW GROUND TO BE DPI CORFLO UPVC AND INSTALLED TO DPI PLASTICS PUBLISHED RECOMMENDATIONS (UNLESS OTHERWISE SPECIFIED).
6. ALL DRAIN PIPES IN BASEMENT AREA TO BE PLAIN ENDED CAST IRON WITH SSN COUPLINGS AND FIXED WITH APPROVED BRACKETS TO CONCRETE WALL AND CEILING.
7. ACCESS TO BE PROVIDED AT THE FOOT OF ALL STACKS.
8. RODDING EYES (CE) SHALL BE IN CAST IRON, ENCASED IN CONCRETE AND INSTALLED COMPLETELY FLUSH ON THE GROUND OR PAVING LEVEL.
9. ALL MANHOLES SHALL BE CONSTRUCTED IN CIRCULAR PRECAST CONCRETE UNITS AS PER DETAIL.
10. INSPECTION TESTS SHALL BE CARRIED OUT ON DRAINS IN STAGES AS WORK PROCEEDS. THE INSPECTION TEST SHALL BE BY MEANS OF A SMOOTH BALL HAVING A DIAMETER 12MM LESS THAN THE INTERNAL DIAMETER OF THE PIPE TO BE TESTED, WHICH SHALL, WHEN INSERTED AT THE HIGHER END OF THE PIPE, ROLL DOWN WITHOUT ASSISTANCE OR INTERRUPTION TO THE LOWER END OF THE PIPE.
11. FOR MANHOLES WITHIN ROAD RESERVES, THE MANHOLE COVERS MUST BE FLUSH AND ACCORDING TO THE SLOPE OF THE PAVEMENT OR THE ROAD SURFACE
12. EXISTING INVERTS AND POSITIONS AT CONNECTION POINTS TO BE CONFIRMED ON SITE BEFORE ANY CONSTRUCTION COMMENCE.
13. THE ENGINEER MUST BE NOTIFIED TO DO INSPECTIONS ON ALL PIPE BEDDING PRIOR TO INSTALLATION OF PIPES.
14. THE ENGINEER MUST BE NOTIFIED TO DO INSPECTIONS ON ALL BLANKET AROUND PIPE PRIOR TO BACKFILLING ON TOP OF BLANKET.
15. INSPECTOR FROM LOCAL AUTHORITY TO BE NOTIFIED TO DO INSPECTIONS OF PIPE AND MANHOLES INSTALLED BEFORE ANY BACKFILLING IS DONE.

SEWER LEGEND:

- MANHOLE
- EXISTING MANHOLE
- CE — CLEANING EYE
- LH — LAMP HOLE
- SEWER LINE
- EXISTING SEWER LINE
- HOUSE CONNECTION

Rev. No:	Date:	Revision Details:	By:

Client:

Architect:

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Structural, Civil and Transportation Engineers
Sussex Office Park
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Project:

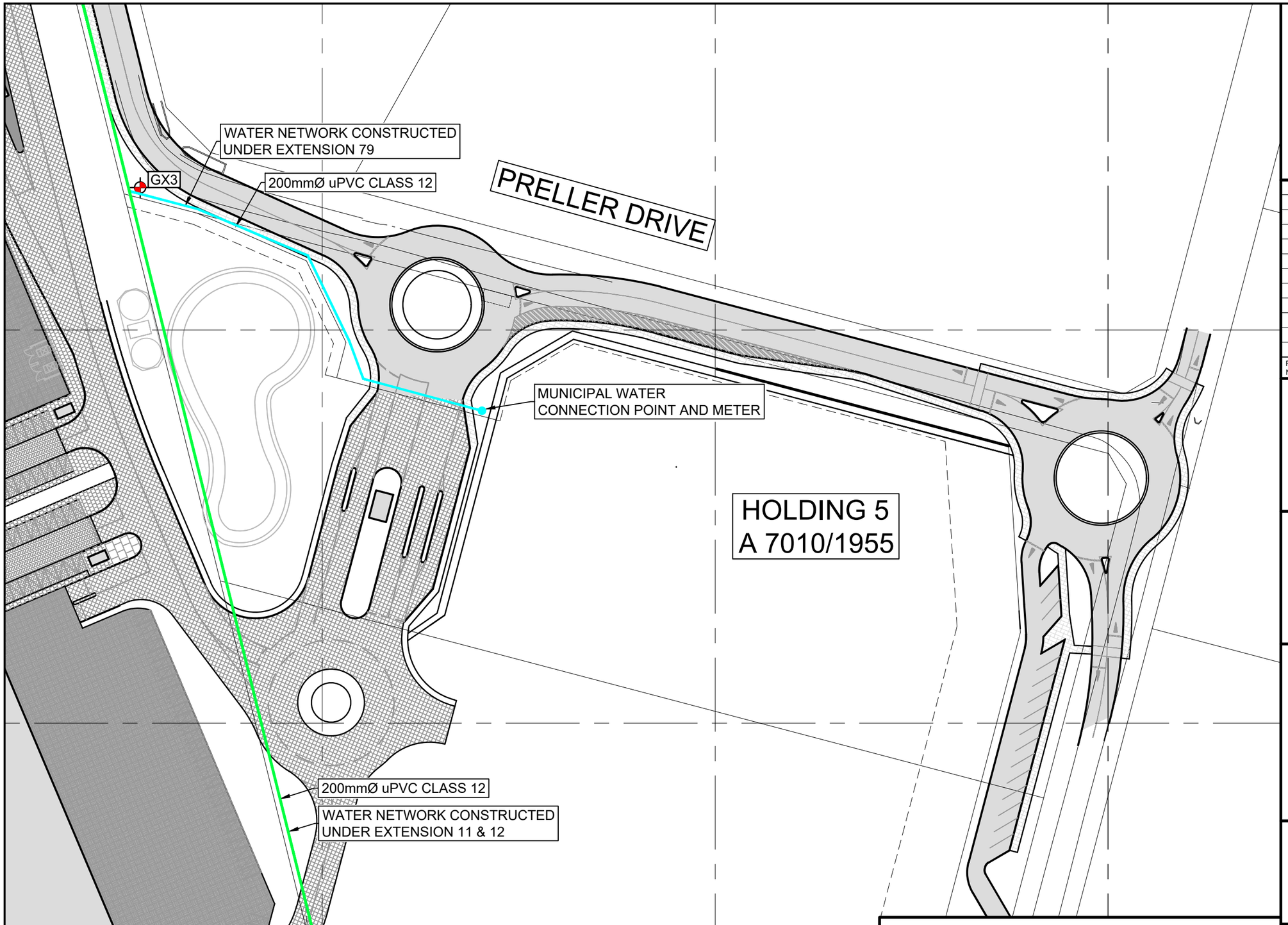
LANSERIA

Description:

SEWER:
LAYOUT

Paper size:	Drawn:	Checked:	Designed:
A0	KB	GvdW	GvdW

Scale:	Project Number:	Drawing Number:	Revision:
500	2019-094	4413	A



GENERAL NOTES:

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Rev. No:	Date:	Revision Details:	By:
A	03/12/'24	FOR INFORMATION	DvdM

Client:

Architect:

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Tel: 012 991 1205
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e-mail: info@edseng.co.za

Project:

LANSERIA
PROJECT RUNWAY

Description:

WATER LAYOUT
(FIGURE 3)

WATER LEGEND:

- 110mmØ uPVC CLASS 12
- 200mmØ uPVC CLASS 16
- 200mmØ uPVC CLASS 16 INSTALLED BY X11 & X 12

Paper size:	Drawn:	Checked:	Designed:
A3	KB	DvdM	DvdM

Scale:	Project Number:	Drawing Number:	Revision:
1000	2019-094	0052	A

ANNEXURE G: PACKAGE PLANT CHECKLIST

Stage 1 Minimum Requirements			
Parameter	**Minimum requirements**		**Reference number**
Motivation for installation of a package plant	Reasons for use of a package plant. Some typical reasons include:		Section 6.1
	· Remote area;		
	· No municipal sewer connection planned;	X	
	· Existing municipal sewer/municipal wastewater treatment works does not have adequate capacity; and		
	· Reuse of treated effluent for water conservation reasons.		
Location	Description of the proposed location of the plant.	X	Section 6.2 Figure 2 Figure 4
	Exclusion areas include:		
	· Natural wetlands;		
	· Below the 100 year flood line, or less than 100 metres from the edge of a water resource;		
	· Land overlying a major aquifer (identification of major aquifers are available from the Department of Water Affairs on written request);		
	· Listed water resources as set out in the latest version of the General Authorisations;		
	· A sewer connection is available; and		
	· High density residential areas.		
Land use	· Zoning certificate	X	Annexure D Annexure E
Developer details	· Name of the developer;	X	Section 2
	· Address of the developer;	X	Section 2
	· Business registration number of the developer;	X	Annexure K
	· Title deeds information; and	X	Annexure K
	· Name, address and professional registration number of professional consultant to the project.	X	Section 2

Stage 2 Minimum Requirements		
Parameter	**Minimum requirements**	**Reference number**
Relating to the catchment in which the development is taking places	· Details of the catchment including nearest surface water resource;	Figure 2 Figure 4
	· Specific requirements in terms of:	
	o discharge to a water resource:	Section 6.3
	§ specialist study on quality and quantity impacts on the resource; and	Section 6.4
	§ specialist study on cumulative impacts if already other dischargers up- or downstream of the discharge point;	N/A
	o storage of treated effluent in unlined dams:	N/A
	§ specialist study on the potential impacts from seepage on groundwater;	N/A
	o irrigation of effluent:	N/A
	§ specialist study on the potential impacts from seepage on groundwater; and	N/A
	§ specialist study on the impacts of irrigation on soils.	N/A
	§ Where irrigation is chosen as the method of disposal of the final effluent, a minimum of 7 days storage must be provided where the volume to be irrigated exceeds 2500 m^3/day.	N/A
	At least one of the following specialists must be consulted to undertake the above studies:	
	· Hydrologist;	Annexure E
	· Geo-hydrologist; and	
	· Soil scientist.	
Relating to the proposed development	Characterization of the development in terms of the following:	
	· Physical Address of property/subdivision;	Section 3
	· Property description and size;	Section 3
	· Number of dwelling units proposed on the site;	Section 4
	· Description of dwelling unit type (s) such as:	Section 4
	o Densely Populated settlement (> 40 houses per hectare);	N/A
	o Upper income development (eg. golf estate);	N/A
	o School;	N/A
	o Shopping centre (must give an indication of the types of shops expected and what measures will be put in place eg. grease/fat traps; chemicals from hairdressers and laundries; increased flows from laundries etc.)	N/A
	o Fuel station;	N/A
	o Industrial undertaking:	Section 4
	o Mine/industry/police camp/prison/hospital residential area; and	N/A
	o Holiday resort.	N/A
	· Anticipated daily quantity (m^3/d) of domestic wastewater that will be generated on the development site;	Section 6.3
	· Anticipated daily quantity (m^3/d) of non domestic wastewater that will be generated on the development site; and	N/A
	· Plans showing:	
	o Position of all buildings; and	Figure 2
	o Position of package plant and final disposal point and route of the treated wastewater.	Figure 2 Figure 4

Relating to the package plant		
Details of the package plant manufacturers/ suppliers	NOTE: All process and plant design work must be undertaken by a Professional Engineer or Professional Technologist and at least three package plant design / process alternatives must be presented. The preferred option should be highlighted but the final decision on the process / plant selection will be determined by the Developer, Designer / Consultant and Johannesburg Water. Johannesburg Water will not do testing on any of the alternatives. Best practice criteria including design parameters are included in Section 6 of the DWA 2009 guideline.	Annexure I
	· Names and addresses of the manufacturers/suppliers of the main components of the package plant;	
	· Contact numbers of the manufacturers/ suppliers; and	
	· Company registration number of the manufacturers/suppliers.	
Characterisation of the package plant	NOTE: Johannesburg Water will not endorse any specific type of package plant.. Details of the various package plant types are included in Section 2 of the DWA 2009 guidelines.	Annexure I
	· Characterisation according to Section 2 and Table 2 of the DWA 2009 guideline:	
	o Activated Sludge Plant;	
	o Submerged Bio-Contactors;	
	o Rotating Bio-Contactors;	
	o Trickling Filter Plants; and	
	o Membrane bio-reactors.	
	· Installed capacity;	
	· Estimated cost of design, supervision, installation, construction and commissioning of the package plant (the actual total cost is to be certified at time of commissioning)	
Flow characteristics	Wastewater characterisation in terms of:	Annexure I
	· Typical loads per person per day (see chapter 6 of DWA 2009); For Johannesburg, the highest pollutant concentrations recommended in chapter 6 must be used in the design of any plant.	
	· Expected diurnal flows;	
	· Estimated maximum instantaneous peak rate of inflow to the treatment plant;	
	· Expected seasonal flows;	
	· Typical domestic wastewater characteristics (see Table 10 of DWA 2009); and	
	· Typical wastewater characteristics of any commercial or industrial wastewater that may contribute to the raw wastewater stream.	
Package plant lifespan	· Life of plant as per manufacturers specification;	Annexure I
	· Proof that a South African National Standards (SANS) approved material is used in the process	
Process failure measures	Measures to be taken to:	Annexure I
	· provide for mechanical, electrical operational or process failure and malfunction of the package plant and associated infrastructure (such as pumps and pipelines) including details of all back-up systems; and	
	· avoid or mitigate nuisance(s) or complaint(s) arising from the operation of the package plant and associated infrastructure (such as pumps and pipelines) and to ensure protection of public health and safety, including the proposed method of disposal of solid waste materials (sludge, detritus, and screenings).	
Operation and maintenance contract	The expected operation and maintenance contract to be put in place in line with the types of contracts described in Table 5 below (the actual signed contract is to be in place at the time of construction/installation).	Annexure I
	· Details (including co-ordinates) of:	
	· Storage for reuse:	N/A
	o Capacity of storage facility (m^3); and	N/A
	o Volume disposed to the storage facility per day (m^3/d)	N/A
	· Irrigation:	N/A
	o Type of crop/pasture irrigated; and	N/A
	o Volume irrigated per hectare (m^3/ha)	N/A
	· Discharge:	Figure 2 Figure 4
	o Discharge point details	Figure 2 Figure 5
	o Volume discharged (m^3/d) (max; minimum and average expected per day).	Annexure G
	NOTES:	

Disposal of final effluent	· Discharge of treated wastewater from a plant via a municipal curb-side street drain will not be permitted; and	
	· Discharge of treated wastewater from a plant via a municipal storm water drain will only be considered under exceptional circumstances if:	
	o No alternative of direct discharge to a watercourse is reasonably available;	
	o Irrigation of crops or pasture within the property is not possible; or	
	o Irrigation of crops or pasture within an adjacent property (in terms of an agreement written into the Title Deeds) is not possible.	
	· Treated wastewater discharging into a constructed open channel storm water drain will be visually unacceptable and unlikely to meet approval;	
	· Application for treated wastewater to discharge into a constructed storm water channel or drain must be accompanied by a certificate from the City of Johannesburg Metropolitan Municipality's Roads Agency that the constructed channel or drain has sufficient capacity to accept the additional effluent discharge or the accumulation of wastewater discharges at design storm flows;	
	· For discharge to storm water JW may require additional monitoring; and	
	· Any privately owned pipe crossing an adjacent property to discharge to a storm water system (or to a watercourse) shall require an agreement written into the Title Deeds.	
Disinfection	Details of the type of disinfection system to be put in place.	Annexure I
	NOTES:	
	Disinfection is the final step in the treatment process and it is essential that the water is adequately treated prior to this step in order to ensure that the disinfection step is effective.	
	Common methods of disinfection include:	
	· Chlorination (disinfection using chlorine gas will not be permitted);	
	· Ozonation; and	
	· Ultraviolet radiation.	
	Other disinfection methods are available but are not practical for package plants due to the hazardous nature of the chemicals used or the complexity of the process.	
Disposal of sludge	Details of sludge disposal such as:	
	· Sludge collection by a tanker for disposal to the nearest municipal wastewater treatment works; or	N/A
	· Disposal or reuse of sludge in accordance with the latest sludge guidelines; especially for beneficial use	Annexure I
	NOTES:	
	Where sludge is collected for disposal the relevant correspondence/contracts must be included.	
Classification of the package plant	Class of package plant according to tables 8 and 9 of the DWA guideline (DWA, 2009).	Annexure I
Financial guarantee	Any approval which might be given will be subject to the Developer lodging a bank guarantee in favour of Johannesburg Water, a sum equivalent to the following inclusive of the cost of design, supervision, installation, construction and commissioning of the package plant.	Annexure I
	Up to 0.10 Ml per day treatment capacity requires a bank guarantee of 3.00 x total cost of construction	
	> 0.10 to 0.25 Ml per day treatment capacity requires a bank guarantee of 2.50 x total cost of construction	
	> 0.25 to 0.50 Ml per day treatment capacity requires a bank guarantee of 1.00 x total cost of construction	
	> 0.50 to 0.75 Ml per day treatment capacity requires a bank guarantee of 0.50 x total cost of construction	
	> 0.75 to 2.0 Ml per day treatment capacity requires a bank guarantee of 0.25 x total cost of construction	
	The Developer will be responsible for the provision of the bank guarantee.	
	The financial guarantee is to be re-assessed every 5 years commencing from the date of completion of successful commissioning of the plant.	
	The purpose of the bank guarantee is to hold the Developer and subsequent owners responsible for the performance of the plant. In the event that there is inadequate compliance the sum held under the bank guarantee may be used by Johannesburg Water to alter or replace all or part of the installed plant.	
	In addition to the aforesaid, such guarantee shall cover and indemnify Johannesburg Water against all losses, claims and damage arising from any failure in or in relation to the proposed system, its operation and the performance of any work undertaken in respect of installation, commissioning, operating, maintenance and/or decommissioning of such plant by any person employed by or acting on the instructions or on behalf of the developer or the owner of the plant, howsoever arising.	

Stage 3 Minimum Requirements

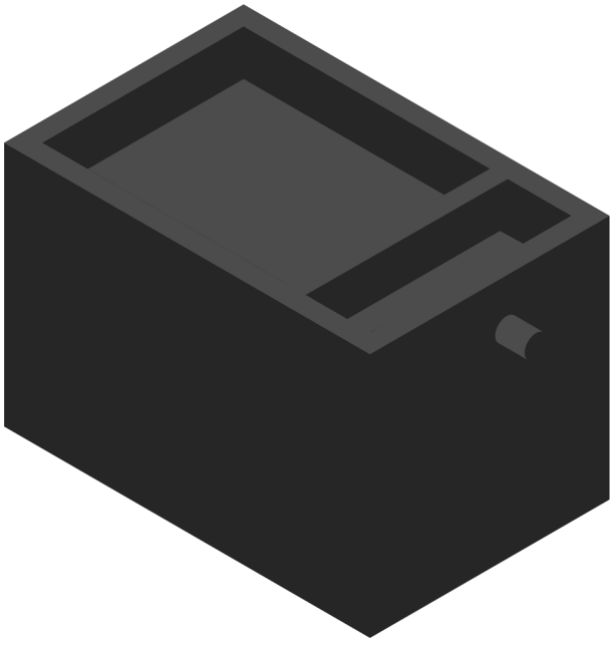
Parameters to be considered in Stage 3		Minimum requirements	Reference number
Installation of the package plant		Installation must be according to: · Specifications of the package plant; · Conditions of the RoD; · National Building Regulations; and · Municipal by-laws, policies and practices.	**ANNEXURE J:** ATTACHMENT 1: FACT SHEET PROVIDED
Operation and maintenance contract options			
Option 1: Leased/hired with an operation and maintenance contract; or Option 2: Purchased by the owner and supplier operates and maintains the plant; or Option 3: Purchased by the owner and a sub-contractor undertakes the operation and maintenance; or Option 4: Purchased by the owner and the owner undertakes the operation and maintenance, if agreed to by Johannesburg Water.		NOTE: the operation and maintenance contract must be in place prior to construction/installation. In all cases the following must be included: · Name of supplier; · Name of contractor/sub-contractor; · Period (timeframe[1]) of contract; and · Conditions of contract that must include that the operation of the plant is in accordance with the RoD, the water use authorisation, the terms and conditions of the Municipal approval and any by-laws, policies or guidelines and relevant provincial ordinances. The contract must allow for at least: · monthly inspection of the package plant; · sampling according to Section 5 of this document; · call-out as necessary from the staff member on site; and · maintenance as necessary. Daily[2] · pH; · Electrical conductivity; and · Dissolved oxygen	**ANNEXURE J:** ATTACHMENT 2: SERVICE AND MAINTENANCE CONTRACT PROVIDED - WITH MAINTENANCE SCHEDULE FOR L SERIES SYSTEMS - INCLUDES MONTHLY INSPECTIONS, WATER SAMPLES, AND REPORTING.
Responsibilities	Owner[3][4]	· Get operation and maintenance contract drafted; · Understand and sign operation and maintenance contract if Options 1, 2 or 3; and · Employ appropriately qualified technician in full-time capacity if Option 4.	N/A
	Supplier	· Provide training and operational manual; · Specifications plate; · Sign operation and maintenance contract if Options 1 or 2;	**ANNEXURE J:** ATTACHMENT 3: OPERATION MANUAL PROVIDED ATTACHMENT 4: COMMISSIONING DETAIL PROVIDED
	Contractor/sub-contractor	Sign operation and maintenance contract if Options 1 or 3;	
Water use authorisation	Water use registration and authorisation[5]	· Contact the relevant DWA Regional Office (or relevant regulator) to discuss which water use authorisation is applicable; · Complete relevant water use forms currently available from the web-site: http · Submit application to the DWA Regional Office.	In Proccess for Approval
Construction	· Specification plate · Controlled access · Warning signs	· The specifications plate must contain: o Power usage; o Capacity of plant; and o Contact numbers of the responsible company as per the contract. · The package plant area must have suitable fencing and a lockable gate. · Warning signs relating to the hazardous nature of the domestic wastewater must be in several conspicuous places on the fence and gate.	**ANNEXURE J:** ATTACHMENT 1: FACT SHEET PROVIDED
Commissioning		· Commissioning of the plant shall mean that: o electrical and mechanical equipment is operating correctly; o pumps, aerators and the disinfection system are operating correctly/accurately; · the following testing is undertaken: o six representative samples are taken and analysed over a two-week period; o relevant limits as described in Table 6 are achieved; and o the system is tested for robustness to shock loading.	**ANNEXURE J:** COVERED IN COMMISSIONING DETAIL, INSTALLATION, & OPERATIONAL MANUAL.
Start-up Period		A reasonable start-up period to a maximum of 21 days will be permitted and is to be agreed in writing with Johannesburg Water. The agreed period will take into account the type of plant and the phased occupation of the development. During such period Johannesburg Water will allow effluent which does not necessarily comply with the set standards to be discharged from the plant. The preferred methods of disposal during the start-up period are: · Tanker services; · Septic tank/conservancy tank and soak away if conditions are acceptable; and · Irrigation under very strict conditions. Direct discharge to a water resource during this period will only be permitted under exceptional conditions and with the written permission of Johannesburg Water who will require that strict monitoring and reporting takes place to ensure no unacceptable risk to human health and the environment. Staged development Where a development is to take place in several stages, a septic- or conservancy tank must be included upfront of the package plant to cope with staged inflow.	**ANNEXURE J:** COVERED IN COMMISSIONING DETAIL & OPERATIONAL MANUAL.
Daily operational monitoring		Operational checks must be done as follows to pick up potential problems before they become incidents: · Daily: o power supply[6];	REMOTE MONITORING ALARM SYSTEM ON SITE SUPERVISER REPORTING USING KAACKAI CHECKLIST / REAL TIME DATA ACQUISITION TRAINING & COMMISSIONING HANDOVER DOC

ANNEXURE H: STAGE 2 – SEWER TREATMENT PLANT SPECIFICATION

KaacKai

L Series

Fact Sheet

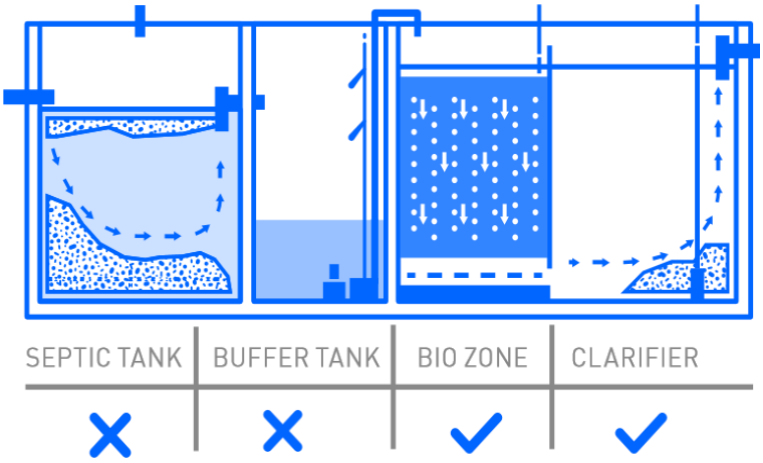


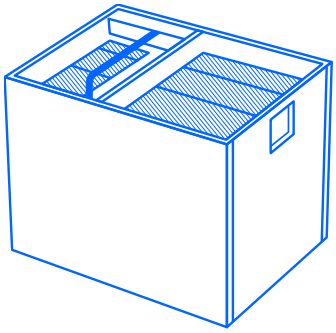
L Series Fact Sheet

Overview

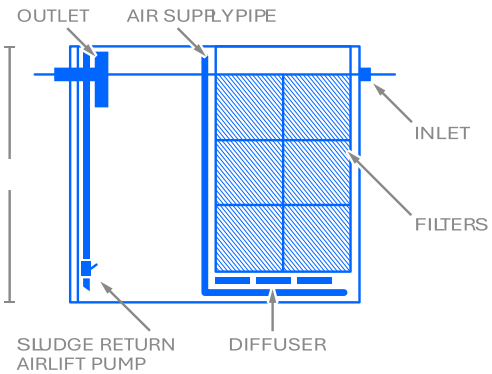
KaacKai L Series systems are mostly used for treating wastewater from hotels, residential estates, smaller communities, and cities with daily inlet values of up to 250 m³/d. The L Series systems are typically installed underground after a conservancy tank and a buffer tank.

INTEGRATED TREATMENT STEPS

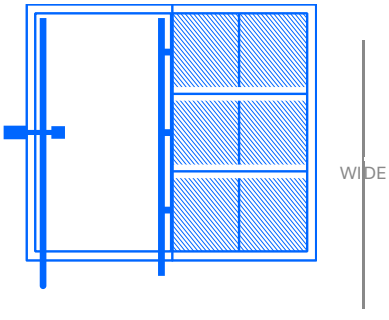




3D VIEW OF A KAACKAI L SERIES



PROFILE VIEW OF A KAACKAI L SERIES



TOP VIEW OF A KAACKAI L SERIES

L Series Fact Sheet

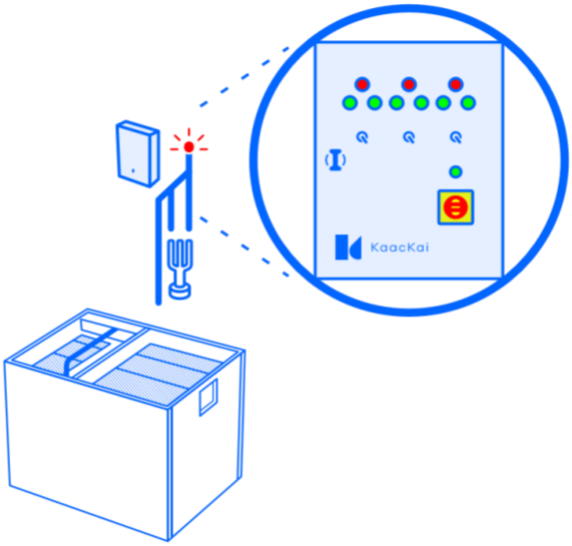
Model Specifications

	L2 25	L3 50	L4 75	L5 100
Height (mm)	2,215	2,215	2,215	2,215
Wide (mm)	2,160	2,160	2,160	2,160
Length (mm)	2,800	3,300	3,950	5,450
Weight (kg)	600	900	1,350	1,550
Weight with water (kg)	12,454	14,871	18,073	24,623
Power consumption (kwh/day)	29.7	40.3	60.4	63.7
Inlet/Outlet Pipe Diameter (mm)	110/110	110/110	160/160	160/160
Diameter Air Pipes (mm)	50	50	50	50
Tank Material, outer rank + Cover	Polypropylene	Polypropylene	Polypropylene	Polypropylene
Piping Material	PVC	PVC	PVC	PVC
Sludge return Pipe (mm)	110	110	110	110
Water load (m3/day/unit)	10-40	18-60	25-80	35-110
No. of electrical Phases Required	3	3	3	3

*Each system is engineered to order, and for South African countries, at least two chambers in-series will be required to meet the strict ammonia requirements.

L Series Fact Sheet

Control Unit



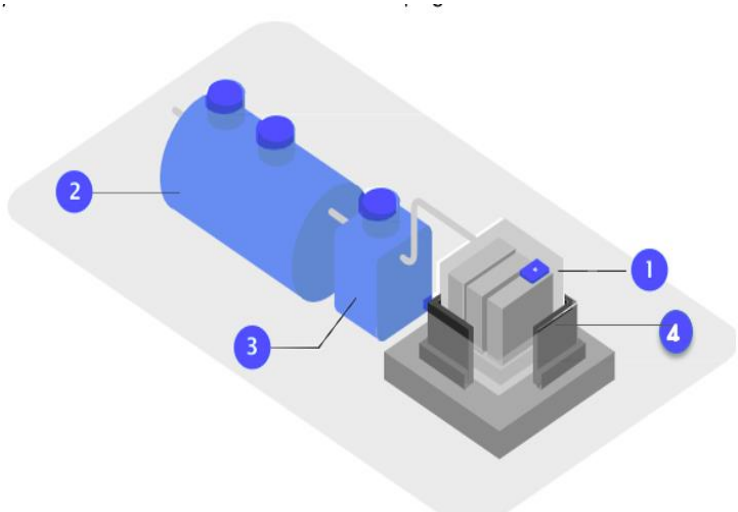
All electrical components in the L Series system e.g. blowers, pumps, and UV units, are integrated and connected to the KaacKai standard Control Box, from where the power is distributed and controlled.

The Control Box is placed in an external weather-protected shed (see drawing).

The plant is normally powered with a 340 Volt, 3-phase power supply.

Sy
su L Series system with standard Control Box.

Installation Principles and Components



A full L Series is typically installed below ground after a conservancy tank and buffer tank.

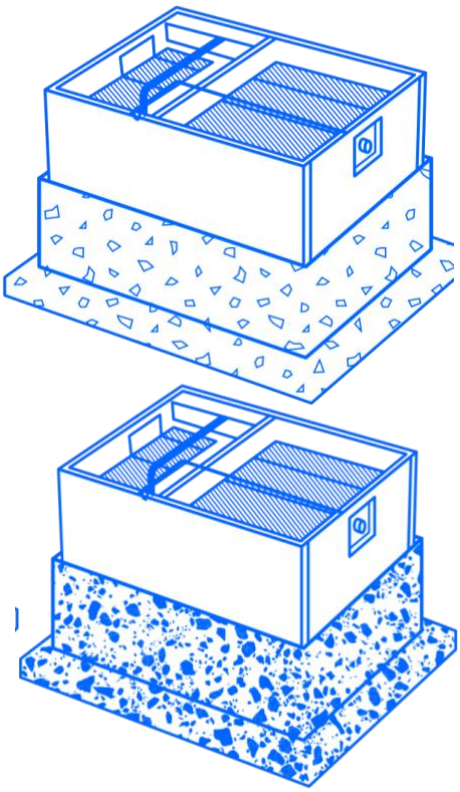
The conservancy tank and buffer tank can be plastic or cast onsite in concrete.
Installation typically consists of the following major parts and cleaning steps.

1. Shed with Control Box and Blower
2. Conservancy Tank
3. Buffer Tank
4. KaacKai L Series Treatment Unit

A complete modular system can consist of multiple L Series units installed in parallel or in series.

L Series Fact Sheet

Backfilling



Each L Series system is typically installed below ground, allowing for a concrete and a non-concrete-based installation.

Option A

Requires a compressed gravel floor on which the KaacKai L Series is placed. Further compressed gravel is used as backfilling supporting walls.

Option B

Requires concrete casted floor on which the KaacKai L Series is placed, followed by concrete as backfilling supporting the walls to a certain height depending on the required strength. Compressed gravel is used as backfilling for the rest of the installation.

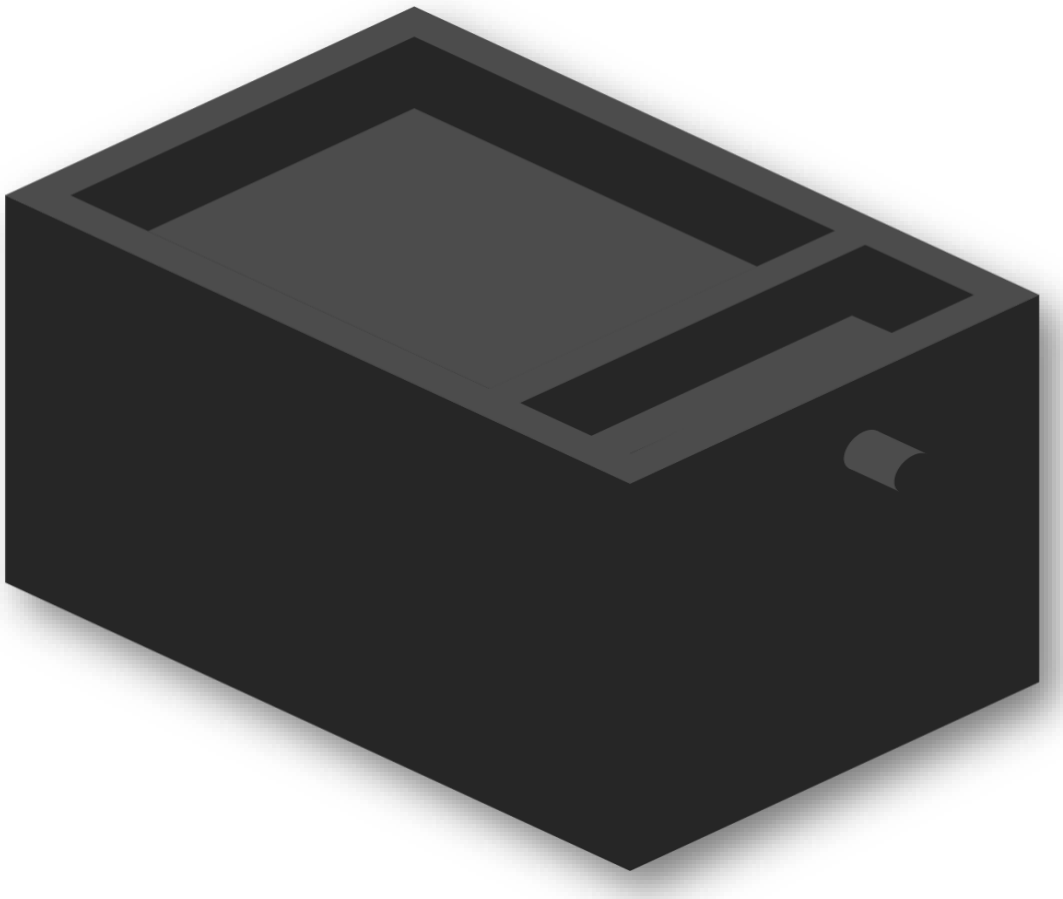
Option C

For above-ground installations, a steel reinforcing casing will be required. KaacKai to advise with engineering firms on-site.

KaacKai

KaacKai

Operation Manual: KaacKai L System



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1 Table of Contents

1. Introduction

This manual describes the operation and maintenance principles for the KaacKai L system (Above Ground) system. The plant is equipped with a control system set to run automatically without continuous monitoring and operation by a person. However, regular checks and inspections must be done as described in this document.

The KaacKai L System is specifically designed to treat domestic sewage, and black and grey water, from hotels, malls, residential and commercial developments, and even smart cities. Any other waste is not permitted for disposal into these systems.

2. Water Sampling

To ensure that the plant performs according to specification, it is important to measure the water quality at the outlet.

To achieve an as correct sample as possible, ensure that sample bottles are clean and that the sample is obtained in the last settling zone minimum of 10 cm below the surface. Bottles with water samples must be stored cold, preferably in a freezer or alternatively in a refrigerator, until they are analysed or frozen as quickly as possible. Analyses are done in a laboratory. Samples must be obtained as the first part of the maintenance procedure prior to functionality control.

The oxygen level shall be > 70 % in all chambers and is expected to increase through the system.

The pH shall be > 6,5 and <8,5 in all chambers and is expected to fall only a little through the plant.

3. Safety Precautions

Wastewater is classified as hazardous as it contains harmful contaminants and microorganisms that can cause illness and disease. Therefore, precautions must be taken to protect personnel from contact with sewage. Personnel protective equipment (PPE) must always be worn, and safety procedures must be followed when handling sewage. These are described below:

Personnel protective equipment (PPE):

- Latex or nitrile gloves
- PVC boots
- Eye protection
- Overalls

Note: always wash PPE thoroughly with heavy-duty detergents after each use. High-temperature washers can be used for overalls.

- Personnel should also take the following precautions:
- Wash gloves before removing them.
- Wash hands thoroughly after any related activity
- Keep PPE and equipment out of the eating areas.
- Keep work clothes and domestic clothes separate.
- Shower and change when changing from PPE to domestic clothes.
- Treat all cuts or abrasions as having been in contact with a hazardous material. Flush them with large amounts of clean, running water and soap, and bandage them with a sterile dressing.
- Personnel should have a tetanus booster every ten years. Personnel who have never been vaccinated for polio should consult a physician about getting a vaccination.
- Personnel should receive the hepatitis A vaccination and should be aware that working with wastewater may contain fresh blood and other potentially harmful wastes.
- Equipment contaminated with sewage should be washed frequently.

4. Operation & Maintenance

4.1. Control box

4.1.1. Operation and functionality

The parts inside the KaacKai L System Control Box Cabinets are shown below:

Cabinet 1

Equipment included:

1. Controller and integrated control distribution system for the pumps, blowers and level-control system
2. Main power distribution system and isolater switch
3. 2 x Secoh JDK-S 400 blowers and air pipe connections for BioZone 1

Cabinet 2

Equipment included:

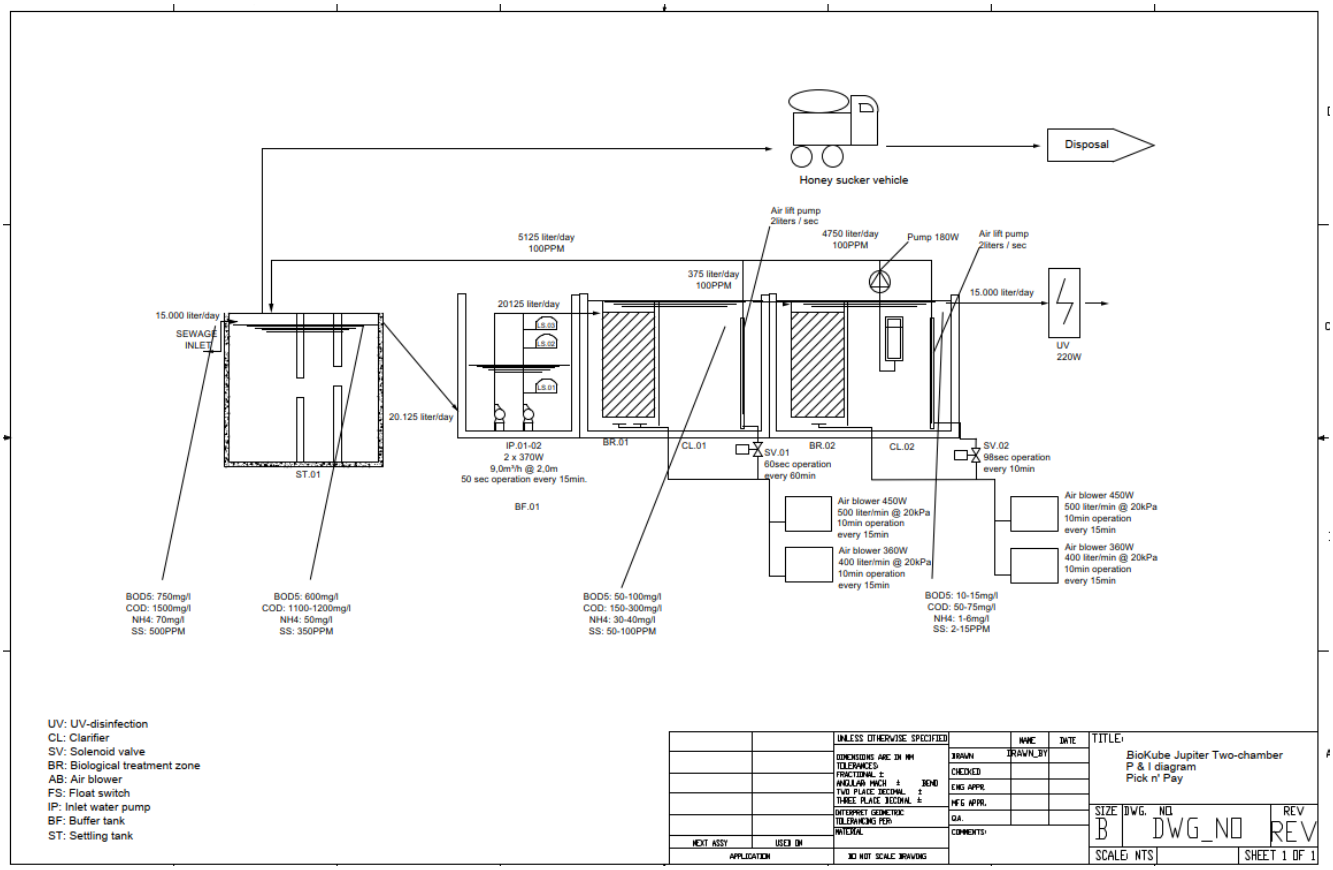
1. Controller and integrated control distribution system UV-treatment
2. 2 x Secoh JDK-S 400 blowers and air pipe connections for BioZone 2

Control Box

The “KaacKai Standard Control Box” contains the control logic for the KaacKai wastewater treatment system. Further, the Standard Control Box serves as a main power switch and is therefore, the only component which needs external power. The image and table below give an overview of the control panel’s functionality.

Label No.	Component controlled	Switch / indication Functionality
1	Power	On/off
2	Inlet Pump 1	Man= Component runs constantly O = Component switched off Aut = Pre-set program (normal operational mode)
3	Inlet Pump 2	Man= Component runs constantly O = Component switched off Aut = Pre-set program (normal operational mode)
4	Blower	Man= Component runs constantly O = Component switched off Aut = Pre-set program (normal operational mode)
5	UV Light	Man= Component runs constantly O = Component switched off Aut = Pre-set program (normal operational mode)
6	Alarm	Turns alarm indicator (sound + visual) on/off.

The system control logic is shown in the picture below:



The control sequence for the normal operation of the plant is summarised as follows:

1. The controller detects if there is a liquid level above the lowest level switch and the middle level.
2. If the requirement in step 1 above is fulfilled, the inlet pumps are activated where the liquid is transferred into the bio-zone – this sequence lasts for a total of 15s.
3. Once the inlet pumps deactivate, the blowers activate, and air is discharged through the diffuser plates in the bio-zone – this sequence is defined by the controller programming and can change.
4. When the blower sequence ends, valves 1 and 2 activate to divert additional air into the airlift system, activating the air lift pumps to transfer sludge in the clarification zones into the sludge return.
5. The sequence then restarts.

The checks listed are according to the picture below of the control box unit:

Functionality test

Ensure the control box is connected to the main power (1) is in the "On" position, the plan and that the green lamp for "control box on" glows before following the below sequence:

1. Ensure that switch (4) is in the "On" position and check that the blowers activate by observing if you can audibly hear the blowers operating.
2. Ensure that pump switches (2) and (3) are in the "On" position and that the pumps are operating by checking that the water inlet to the bio-zone has flow when the pump activates per the control sequence.
3. Ensure that valves 1 and 2 activate in sequence and that the airlift systems activate per the sequence described in the previous section.

4.1.2. Maintenance

The control box does not require any regular scheduled maintenance. However, worn-out components must be replaced with identical components or generics of equal quality. Pump relays should be replaced annually with every major service.

Functionality tests, as described above, must be performed at each monthly maintenance inspection and are recorded in a separate Excel sheet by

maintenance personnel.

4.2. Inlet pumps

4.2.1. Pump operation and functionality

Check that the buffer tank inlet pumps are submerged in liquid prior to commencing the checks in this section. The checks listed are according to the picture below of the control box unit:

Functionality test

Turn on the main switch (1) and observe that the green lamp for the "control box on" glows before following the below sequence:

1. Turn the switch (2) from Aut. to Man. to force the inlet pump to start and check that liquid is transferred into the bio-zone.
2. Check that the green lamp for "Manual mode" glows and that the lamp for "Aut./controller mode" switches off. The main inlet pump 1 will now run continuously. Ensure the placement of pump 1 in the buffer tank is as needed.
3. Perform the same operation with inlet pump 2 to check that its functionality and placement in the pump well/buffer tank are adequate.
4. Turn the switch back to the auto lamp for 'auto' glows; the pump is now controlled by the control box automatic sequence control system.

5. To ensure that both pumps are running, check inflow into the buffer zone and look for any vibrations in the inlet pump transfer lines.
6. Lift the pump from the buffer zone and check if the pump wheel rotates in the right direction. An arrow on the pump housing shows the correct direction of rotation.
7. Check if there are no blockages in the pump wheel housing.

4.2.2. Maintenance

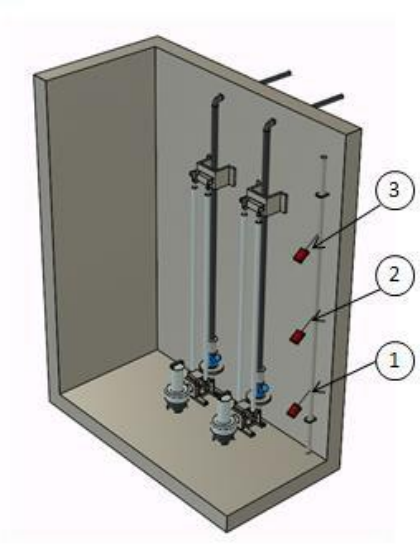
Pumps do not require regular servicing but must be checked during each monthly inspection for functionality, as described in the previous section.

Any blockages in the pump wheel housing or transfer pipeline must be removed/fixed and recorded as needed.

Functionality tests, as described above, must be performed at each monthly maintenance inspection and are recorded in a separate Excel sheet by maintenance personnel.

4.3. Level control switches

4.3.1. Level control philosophy checks



The diagram above provides a visual indication of the checks that are described in the table below to check the control sequence on the system float switches. These checks are done during normal operation of the plant:

1. Lift upper most float switch shown as (3) above so that it is in the 'on' position - pump 2 will start, and an audible alarm is heard indicating the emergency function is activated, and the duty standby pump is activated. This is the 100% fill level for the tank.
2. Lift the middle float switch shown as (2) above so that it is in the 'on' position - pump 1 will run continuously. This is the 75% fill level for the buffer tank, and the tank should not fill beyond this point.
3. Lift the middle float switch shown as (3) so that it is in the 'on' position - pump 1 will run in its scheduled normal operation sequence (wait up to 15 min to see if the pump activates). This float switch is located 40cm from the bottom of the buffer tank.

4.4. Blowers

4.4.1. Blower functionality

Functionality test

The checks listed below are according to the picture below of the control box unit.

Turn on the main switch (1) and observe that the green lamp for the "control box on" glows before following the below sequence:

1. Prior to turning on the blower, ensure that all valves on the air line are open.
2. Turn the switch (3) from "Off" to "On" and push the start button on the frequency transformer. (Soft Starter of Blower). The blower begins to produce air flow, the sound of which is very distinct.
3. Check to see that aeration in the treatment tank has started as per the picture below:

4. If the blower produces an unusual or loud sound, it may indicate a mechanical fault and must be inspected.
5. Ensure airlift systems operate as required in all clearing chambers by inspecting the airlift pump and recording the frequency at the airlift pump is activated during normal operation. Check that all airlift systems are connected to the blower and the recirculation system.

4.4.2. Maintenance

Blower oil levels and air filters must be checked during each monthly check and should be replaced yearly during each major service. The blower relays in the control box must be checked for wear during each monthly check and replaced yearly. Blower lubrication must be checked yearly.

When checking air filters, look for any clogging, and if dirty, rinse with water and dry before replacing. Each blower is equipped with an audible alarm. If the alarm is heard, the filter must be replaced immediately. Instructions are included in the manufacturer's manual for the blower.

Functionality tests, as described above, must be performed at each monthly maintenance inspection and are recorded in a separate Excel sheet by maintenance personnel.

A summary of check frequency is shown below:

Item	Monthly Check	Yearly Check/Replacement
Oil levels	✓	✓
Air filters	✓	✓
Relays	✓	✓
Lubrication	x	✓

4.5. Ancillary Equipment

As described, all checks and inspections in this section must be performed at each monthly maintenance inspection and are recorded in a separate Excel sheet by maintenance personnel.

4.5.1. Inlet piping

Check that the connection pipe between the pre-treatment, the biological treatment plant and all other interconnections are installed, intact and affixed correctly.

4.5.2. Connection between middle chambers

Check that the pipe is fixed and securely fastened to the next chamber.

4.5.3. The outlet from the first chamber and from the final chamber to the recipient

Ensure that the outlet pipe is affixed correctly and that the water flows freely to the recipient chamber.

4.5.4. Airlift system

Ensure airlift systems are installed in all clarifying chambers and connected to blow piping and the recirculation system. See the picture below:

4.5.5. Inspection of the sludge return system.

As an important part of the treatment process, treated water and biological sludge are removed from the treated water. This prevents biological sludge from accumulating in the treatment plant.

Two recirculation pipelines exit the side of the plant from the clarification zones via a Ø110mm PVC pipe. The recirculation pipe is installed so that the water gravitates downward at an angle of 25% (1/40).

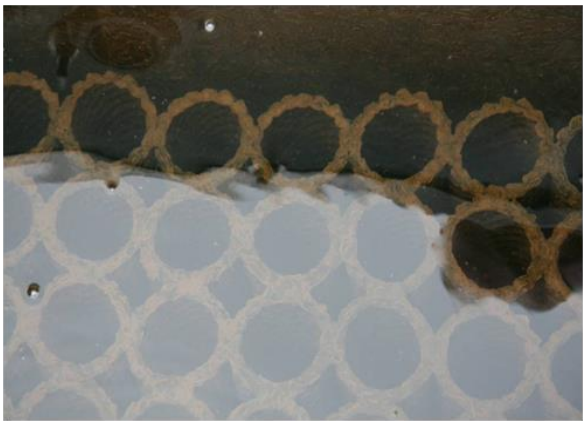
The sludge return pump is an airlift pump controlled by a solenoid valve installed at the blower outlet pipeline.

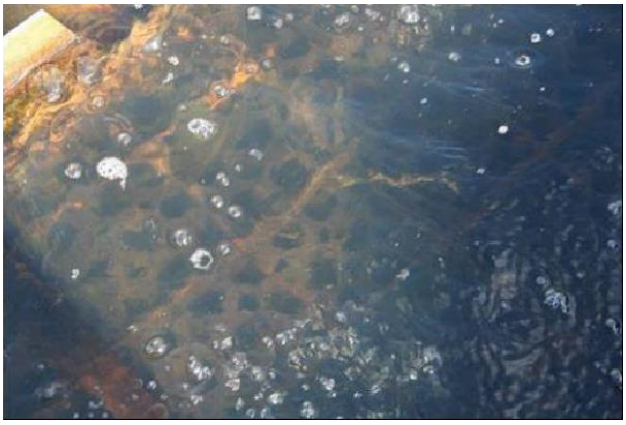
Check the functionality of the “sludge return function” by observing and timing the airlift pump into the sludge return pipe.

The sludge return system pumps the biological sludge produced by the bacteria out of the treatment tank. This ensures optimal performance of the plant and is an important functionality. Ensure no more than 20 cm of sludge has accumulated on the bottom of the clarification tank. If the level increases above 20 cm, contact a KaacKai representative.

4.5.6. Bio-zone

The KaacKai system will treat the sewage biologically. The technology is based on bacterial growth on the submerged aerated filter blocks; see the picture below:





The bacterial load originates from the content of the sewage. A healthy bacterial load, like in the images shown above, will ensure the system will treat to the required standard. Check the filters regularly during each monthly maintenance to ensure the bacterial film is healthy.

The biological treatment of sewage is secured by bacteria cultures that build up on the filter media in the treatment tank.

The aeration of the bio-zones ensures the build-up of bacteria.

To ensure the system's overall functionality, it is important to pay special attention to the aeration process. When the blower is in operation, the air is led to diffusers in the bottom of the bio-zone. The air is evenly distributed to the system if you observe equally sized air bubbles all over the treatment chamber. See the picture below:

On start-up, you will notice that not all diffusers are operational. It may take up to 30 minutes for sufficient pressure to build in pipework, and operating pressure is

reached. This is to be expected when the plant has been idle or off for an extended period.

It is normal to find foam in the bio-zone from time to time, particularly when the bacterial load is growing, as per the picture below:

5. Troubleshooting Section

5.1. Poor aeration in the bio-zones

Poor aeration in the KaacKai L system is often associated with the failure of the blower, controller, air pipes and diffusers or system overload. Oxygen levels must remain above 70%. Follow the checks below.

First, check to see if full aeration of the bio-zone occurs. If yes, there is a possible overload of the system, i.e. too much inflow into the system.

If no, do the following:

1. Make sure the blower is operational and that the blower produces no unusual sound. If needed, check the blower output pressure (this should lie between 0.25 and 0.7 bar)
2. Check that the pipework from the blower to the diffusers is securely fastened and free of blockages and leaks.
3. Check that all diffusers are operating correctly – if not, close all other valves in the air distribution pipework to force air to the single diffuser and clear any blockages.
4. Check that no bio-media filters are clocked – if clocked filters are detected, follow the previous step or use a tool to un-clock the filters.

When the problem is found and solved, remove any accumulated sludge and return the system to its normal operation of the system can continue.

5.2. Excess sludge in the clarifiers

Excess sludge of more than 20cm in the KaacKai L system clarification zone can affect the system's functionality. If excess sludge is detected in the clarifier, follow the steps below.

First, check to see if the airlift pump is operating normally. If yes, the settings on the airlift pump must be adjusted to operate the pump for a longer period and remove excess sludge

If no, do the following:

1. Check that the control box and its components are functioning correctly.
2. Check that the solenoid valve on the blowers operates correctly per sequence.
3. Check that there are no blockages to the airlift pump and its piping.

When the problem is found and solved, remove any accumulated sludge, and return the system to its normal operation of the system can continue.

5.3. High or low tank levels

It is important that the buffer tank does not overfill and that inlet flow to the septic and buffer zones is distributed equally. Excess water problems can occur when large volumes of water are pumped into the system over a short period or if pipes are clogged.

If the buffer zone is continuously full, or the bio-zones and calcification zones are empty or below the surface of the filters, follow the steps below.

First, check if all pipework is free of debris or obstructions. If yes, remove any obstructions.

If no, do the following:

1. Checks must be done on pumps to ensure they are operating correctly. Faulty pumps will lead to a low rate of transfer from the buffer zone to the bio-zone:
    a. If pumps run in manual mode but not in the automatic sequence, this may indicate a faulty pump relay in the control box or a faulty float switch.
    b. If the pump does not run, it may be damaged and will need to be replaced.
2. Checks must be performed on all float switches to ensure they are operating correctly:
    a. If the middle or bottom float switch is faulty, for example, the controller will not detect that the buffer zone is full and will not activate the pump leading to an accumulation of water in the buffer zone. Check that all

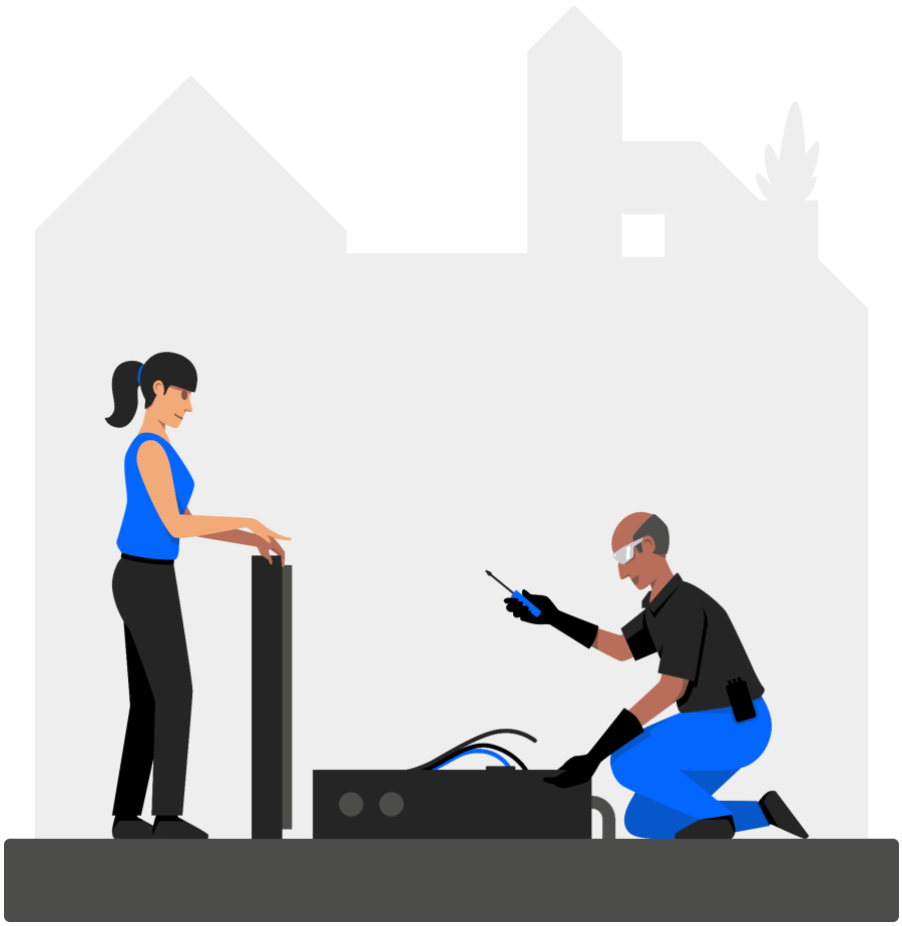
float switches are operational.

3. If no components are operational, this may indicate an issue with the control box:
    a. Check that all lamps glow when the main switch is in the “On” position.
    b. Check all fuses and electrical wiring in the control box.

When the problem is found and solved, remove any accumulated sludge, and return the system to its normal operation of the system can continue.

KaacKai

Post-installation and Commissioning



Introduction

KaacKai is a market leader in smart wastewater recovery Pods and larger systems and is the preferred choice for homeowners, hotels, retailers, property developers, and cities when looking for premium, reliable, and sustainable onsite wastewater treatment to treat sewage and generate clean water for non-potable reuse.

Commissioning

This document serves as the official commissioning record for the installed KaacKai wastewater treatment pod and systems.

It outlines the commissioning process undertaken by KaacKai to ensure the KaacKai L Series systems are performing optimally and compliant with regulatory standards, confirming that the wastewater treatment systems are fully operational and ready to meet the client's wastewater management needs.

Item	Description	Value
1	Project Name	Lanseria X11 Botesdal Lanseria LX12 Bultfontein
2	Project Phase	Planning
3	Project Manager	Ryan Meiring +27 72 175 6388

Post Installation and Commissioning

1. Operation of Plant After Commissioning

1. Within 4-8 weeks after commissioning, the bacteria culture will build up on the submerged filters to meet the specified parameters.
2. The duration may vary depending on temperature and concentration of sewage and may take a few weeks. During this period you may observe foam from the treatment plant.
3. This is normal and not hazardous.

2. Water Sampling

1. Around 4 weeks after commissioning the first water samples are taken by the client or KaacKai (subject to the service and maintenance plan) and submitted to an independent, certified laboratory.

2. KaacKai works with a number of laboratories, as well as Stellenbosch University for water testing and water sampling. Please contact KaacKai directly for assistance in identifying a suitable Independent Inspection Authority. (a member of the Association of Inspection Authorities)

3. The water testing schedule for each Pod is provided in the Service and Maintenance plan.

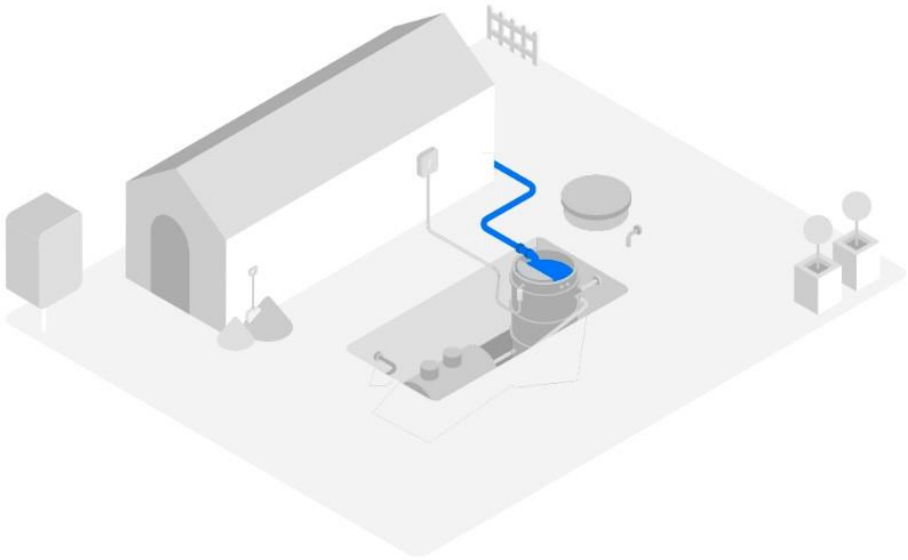
3. Water Results

1. After receiving the water test results from the laboratory, KaacKai will analyze the results of each water sample.
2. Regular water test results serve as a monitoring mechanism to verify that the treated wastewater is meeting the discharge design criteria and should be carried out throughout the lifetime of the Pod.

4. Service & Maintenance Overview

Once commissioning is complete a Service and Maintenance contract will be provided separately.

1. Replacement of spare parts will fall under the service and maintenance contract, if applicable to the plan chosen.
2. The trained personnel will be provided with a service and maintenance checklist to use as a guide when conducting service and maintenance on your system.
3. The trained personnel will form part of the KaacKai installer network.
4. The installer network is a platform for sharing knowledge amongst the KaacKai installers within the Southern African region. These installer network meetings are conducted monthly, and installers can connect and share knowledge in a WhatsApp group chat and contact each other individually.
5. Bi-annual site visits will be conducted by a KaacKai representative.
6. A Service & Maintenance report will be shared with every site visit.
7. Dredging of the conservancy tank, based on the dredging schedule in the service and maintenance plan, is the responsibility of the client.



KaacKai L Series Below-Ground

Installation Manual

KaacKai L Series Below-Ground Wastewater Treatment Plant Installation Manual

Table of Contents

KaacKai L Series Below-Ground Wastewater Treatment Plant Installation Manual

1. Description of the Installation

Introduction

The L Series system is designed to treat ordinary household sewage having a broad range of people expectancy. You may not lead any water other than grey and black household sewage to the treatment plant unless specifically approved by KaacKai.

Maximum Load

The KaacKai L Series systems are designed to treat ordinary household sewage. The plant allows for fluctuations in both concentrations and volume of the incoming water. However, if the average daily load exceeds the designed performance, a larger system must be installed.

2. Occupational safety and risk while working with Wastewater

This manual is for all personnel involved in servicing and maintaining the KaacKai L Series system. A risk assessment has been carried out. Submitted risk assessment and all precautions described herein, as well as the instructions from this manual listed under the specific maintenance points, must be complied with at all times while working with the plant. At the same time, special attention must be paid to the general dangers that exist when working with wastewater.

Protective Equipment for direct contact with Wastewater

Along with "good" microorganisms that break down the nutrients in wastewater, wastewater also contains disease-causing bacteria, viruses, fungi and parasites. In the event that service personnel cannot avoid direct contact with wastewater, the following protective equipment should be used:

- Elbow-length rubber gloves
- Rubber trousers and jackets
- Protective goggles
- Disposable mask to be worn in dusty mud areas or areas with heavy aerosols
- Efficient industrial washing machines that wash at high temperature must be used when washing work clothes

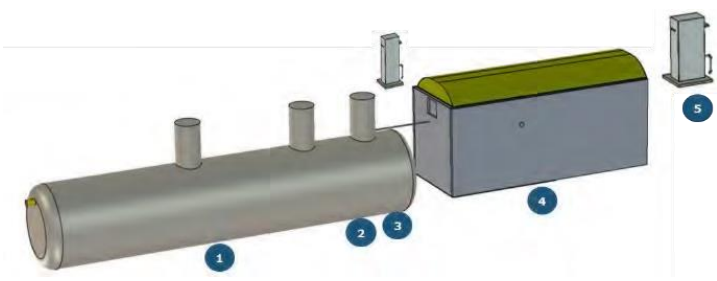
Personnel involved in working with wastewater should take the following precautions:

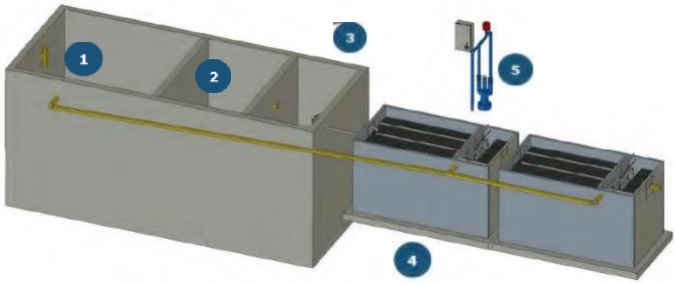
- Wash gloves before removing them.
- Wash hands before smoking and eating after contact with wastewater.
- Never store protective clothing and equipment near eating areas.
- Keep workwear protective gear and daily clothes in separate cabinets.
- Take bath and change into daily clothes before heading home.
- In the event of cuts or wounds sustained during the operation of the plant, rinse with large amounts of clean, running water and soap, followed by disinfection with alcohol gel.
- Service technicians must have a tetanus booster vaccination every 10 years, and workers who have never been vaccinated for polio should consult a physician for the purpose of acquiring it.
- Workers should receive Hepatitis-A vaccination. Workers working in sewers that may contain fresh blood or come into regular contact with used syringes or body parts should receive the Hepatitis-B vaccination.
- Trucks carrying sewage-contaminated materials must be washed frequently.
- Records of worker’s major or minor illnesses, complaints of irritation and discomfort should be kept.

Seek medical attention when you have diarrhea or are ill. As physicians are often unaware of the links between work area and illnesses, make sure to inform your personal physician about the work exposure to wastewater.

3. Main Components & Description

Single L Series Unit with plastic/fibreglass septic tank and buffer tank	Double L Series Unit in series and Buffer Tank with concrete septic tank





Note: L Series units can have multiple configurations based on customer requirements

#	Description	Function
1	Septic Tank	Solids, fat, oil and grease are separated and permit the clarified wastewater continue for further treatment.
2	Pump well / Buffer Tank	The time-controlled pumping from the pump well / buffer tank evens out peaks in the incoming flow.
3	Inlet Pump System	The inlet pumps installed in the pump well pumps the water to the biological treatment zone. If the main pump fails, the duty stand-by pump kicks in.
4	KaacKai Treatment Plant	The solution consists of L Series purification unit, containing (A) biological chamber and (B) clearance zone.
		A. In the biological chamber microorganisms, bacteria, treats the incoming wastewater. The bacteria lives on the aerated bioblocks in the system and will reduce the organic content of the water to the specified requirements.
		B. From the clarifier the biological sludge is pumped back to the septic tank: 1) Biological sludge, settled on the bottom of the clarifier and collected at the top, is pumped back to the septic tank using air lift pumps and a top sludge skimmer. This ensures a minimum of suspended matter in the effluent and continuous removal of bio sludge. 2) A small part of the treated wastewater is to the septic tank with the settled sludge ensuring stable operation - even during periods of low or no load - and Hydrogen Sulfide(H_2S) and other odors are eliminated from the Septic tank.
5	Control Cabinet with blowers and control box	Consists of air blowers and electric control unit.

4. Detailed Component Description – Biozone and Clarifier

BioZone 1.

Aerated chamber filled with BioBlocks. In this chamber, the primary reduction of BOD and COD with the organic soluble substances takes place.

Inlet via inlet pumps

The wastewater is pumped from the pump well via the two inlet pumps

Clarifier 1

In the Clarification tank, sedimentation of solid particles and bio sludge occurs from the Biological Purification from Biozone 1. From this chamber, the contents are returned to the septic tank via airlift pumps

Bio Zone 2.

Aerated chamber filled with BioBlocks. In this chamber, nitrification and conversion of Ammonium / Ammonia to Nitrate takes place.

Clarifier 2

In Clarifier 2, a mechanical sedimentation of solid particles and bio-sludge occurs from the biological purification by Biozone 2. These fall to the bottom and are flushed back to the Septic tank via airlift pumps

Note: The image shows a L Series with 2 Biozones with 2 clarifiers. Number of biozones and clarifiers can vary based on project configurations

Top Sludge Pump

The top sludge pump pumps at specified frequencies, sludge floats back via the return flush pipe, to the septic tank.

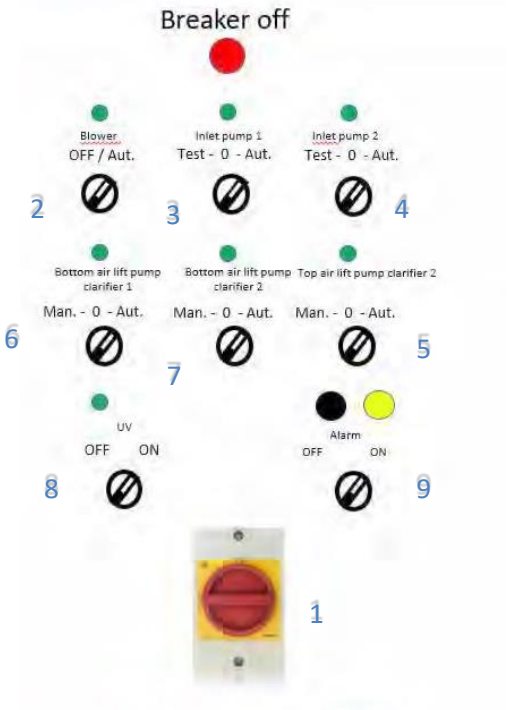
Outlet

From the Clarifier, the waste water gravitates through the outlet hole where it is pumped back into the initial tank of the Jupiter plant. The sludge is usually consists of dead bacteria and other denser particles.

5. Detailed Component Description - Control Panel with alarms

Components in Control Panel

The “KaacKai Standard Control Box” contains the control logic for the KaacKai wastewater treatment system. Further, the Standard Control Box serves as a main power switch and is therefore the only component which needs external power.



Note: Control Panel can have multiple configurations based on customer requirements

No.	Component controlled	Switch Functionality
1	Main Switch	On/off
2	Blower	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
3	Inlet Pump 1	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
4	Inlet Pump 2	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
5	Top skimmer	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
6	Return valve 1	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
7	Return valve 2	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
8	UV Light	Man= Component Runs constantly
		O = Component switched off
		Aut = Pre-set program (normal operational mode)
9	Alarm	Turns alarm indicator (sound + visual) on/off.

6. Detailed Component Description – Blower Types

The Air supply system is designed to supply air to a KaacKai biological treatment plant. KaacKai will supply all required pipes for the specific project provided that the distance from the blower to the treatment plant does not exceed 10m.

Pipe dimensions should be according to directions provided in the "Project dimensioning and layout manual" or the detailed specific project layout. Pipe dimensions will vary depending on the number of treatment chambers and distances to the blower(s), but a connection to the blower will be as default.

Diaphragm blowers can be used for smaller systems upon request. As standard, root blowers will be used*.

Root Blower in sound proof cabinet

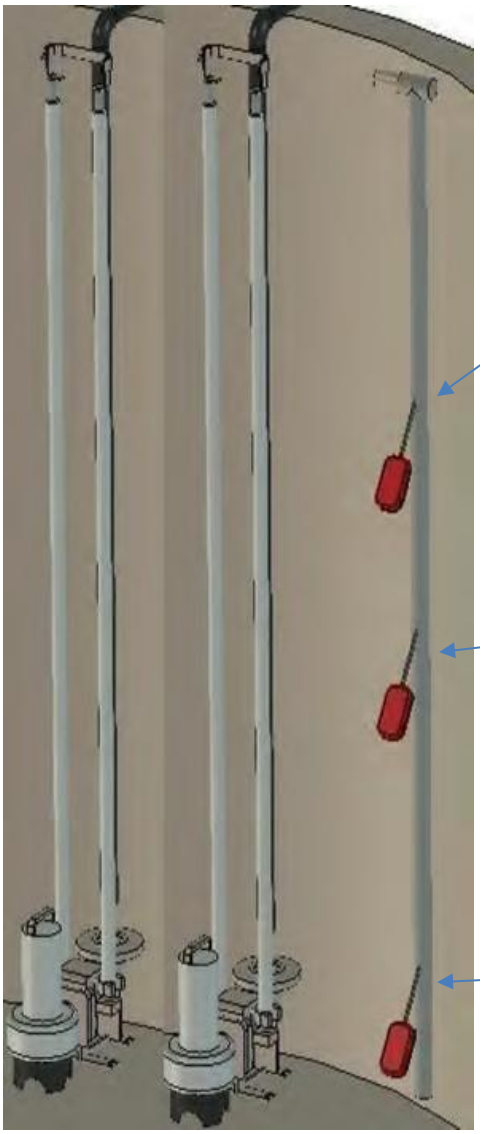
Membrane Blower

***Note: Blower units can have multiple configurations based on customer requirements**

7. Detailed Component Description - Pump well and inlet pumps

From the Septic tank, the water flows to the pump well. The pump well is approx. 10-25% of daily flow and constitutes the system's buffer volume. The submersible pumps operate for a pre-set time, which is usually 15 minutes. This smoothens the hydraulic load on the system. The level in the pump well is adjusted with three floats. At high water levels, pumping to the treatment zone increases by itself.

The pump's timing and frequency are controlled by the PLC in the control box. Should the PLC become defective, the emergency system takes over.



Float 3 - Top Float

Location: At the absolute maximum permissible water height in the pump well.

Function: When this float activates, pump 2 run constantly until the float is reactivated as a result of lowered water level. Pump 2 runs directly on the flow switch, and is not connected to the control PLC

Float 2 – Middle Float

Location: At 75% of the maximum permissible water height in the pump well.

Function: When this float activates, pump runs constantly until the float reactivates as a result of lowered water level. If float is active for 5 minutes, high water level alarm is activated.

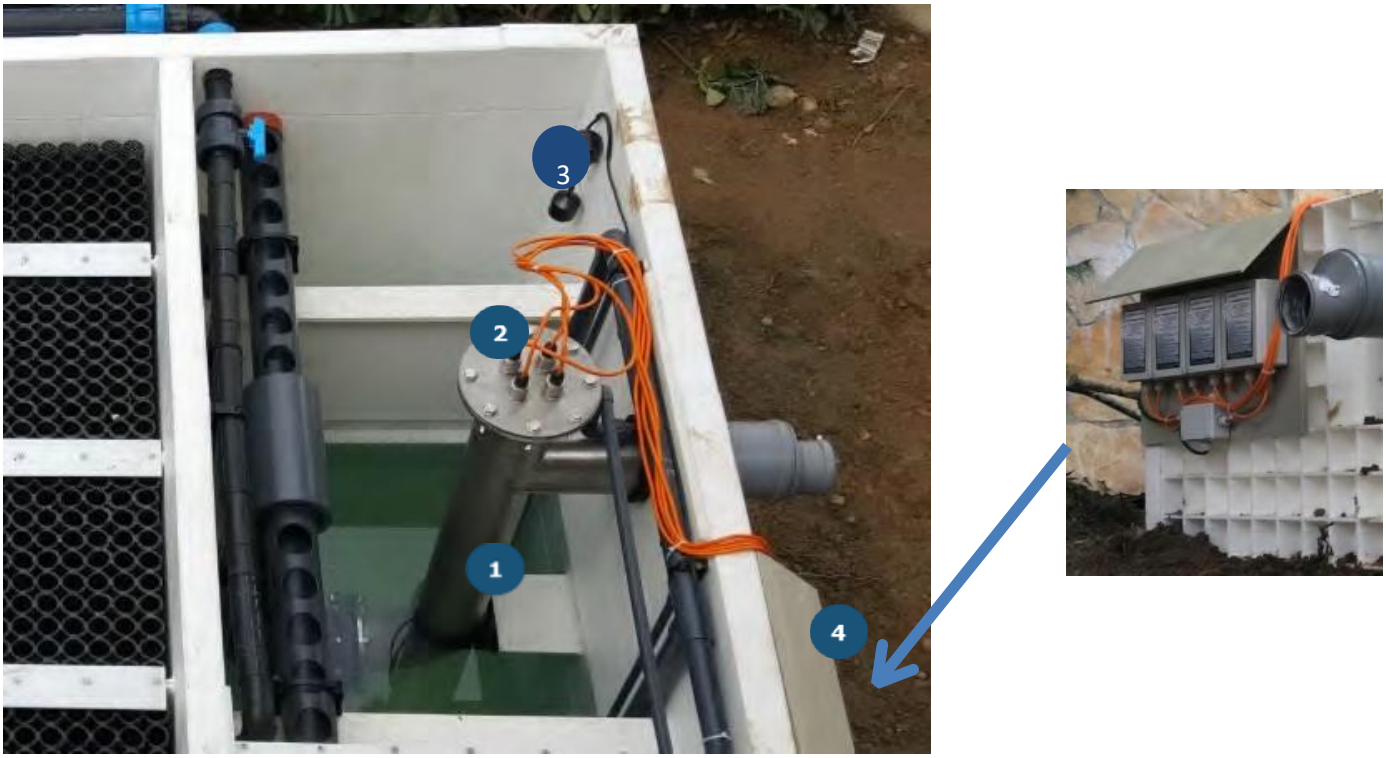
Float 1 - Bottom Float

Location: Located 40 cm from the bottom of the pump well.

Function: By activating this float, pump 1 is activated and runs according to pre-set setting in the plc-controller. When the float is de-activated the pump is protected from running dry.

8. Detailed Component Description – UV Systems (Optional)

Ultraviolet water purification is the most effective method for disinfecting bacteria from water. Ultraviolet (UV) rays penetrate harmful pathogens in the water and destroy illness-causing microorganisms by attacking their genetic core (DNA). The UV system can be integrated into the L Series outlet as required.



Item	Part	Function
1	SS radiation chamber	UV radiation take place
2	UV manifold bracket	The Quartz´s are fixed into “SS radiation chamber”
3	UV level switch	Prevent the UV lamps to overheat if no water in system.
4	UV-ballast rack	Ballasts are installed on the rack and is powered up here

KaacKai

Address: 28 Akademie Street, Franschhoek, Western Cape, South Africa, 7690

Email: Hi@KaacKai.com

Phone: +27 82 210 4725

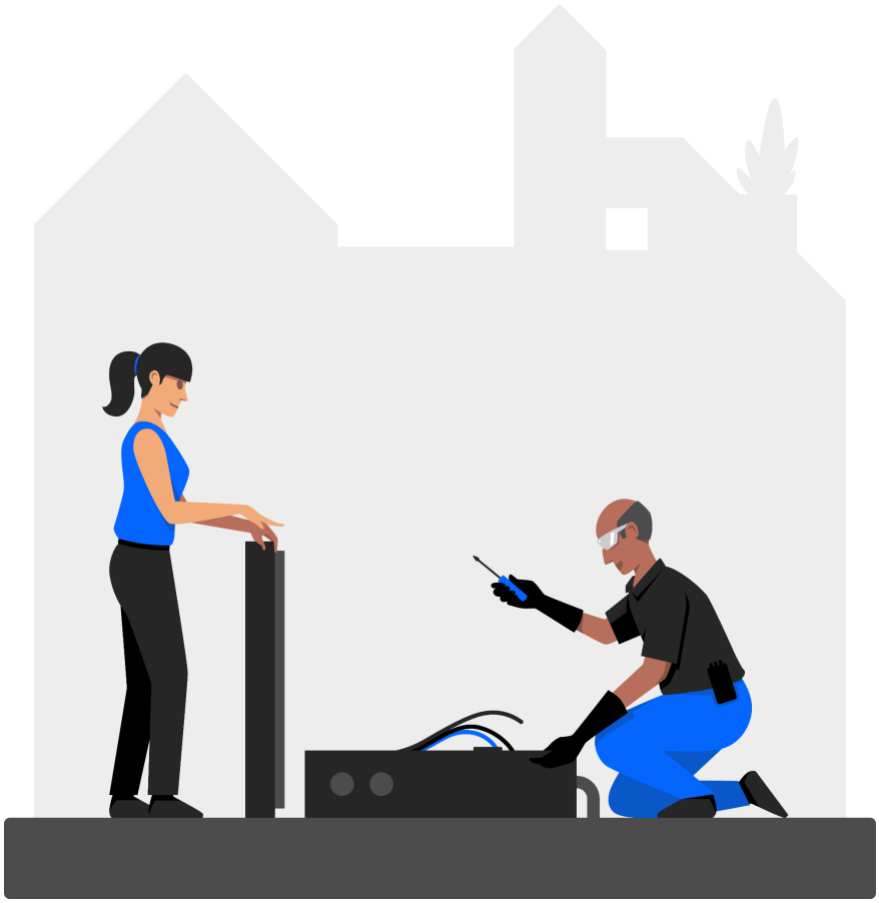
KaacKai

Contact | Ryan Meiring
+27 72 175 6388

Service and Maintenance Agreement

EDS Engineering

Service and Maintenance Agreement for the KaacKai L Series below-ground systems at Lanseria X11 Botesdal and LX12 Bultfontein.



Service and Maintenance Agreement

Overview

This Service and Maintenance Agreement is between KaacKai and the Client, the details of which are stipulated in the table below:

Item	Information
Technology Provider	KaacKai
Contact Person KaacKai	Ryan Meiring +27 72 175 6388
KaacKai Pod Type	Lanseria X11 - Botesdal 1. 2 X fully equipped KaacKai L5 100 below-ground systems. 2. 2 X fully equipped KaacKai L4 75 below-ground systems Lanseria X12 - Bultfontein 1. 2 X fully equipped KaacKai L5 2C below-ground systems. (2 in series)
Client Name	EDS Engineering
Service Provider	KaacKai • Technology • Service and Maintenance

Service and Maintenance Pricing Schedule

Pricing is subject to an annual increase which is implemented after the initial agreement length expires. Increases will be based on CPI and current inflation values. The maintenance pricing schedule describes the cost and inclusions of this agreement.

Service and Maintenance Plan

Plan	Premium
Description	Premium Service & Maintenance Plan carried out by the KaacKai preferred installer, KaacKen. • 2 X site visits and maintenance per month. • Site visit report after every visit based on standard checklist. • 1 X water sample collection per month by the preferred installer, KaacKen, including water test results reports. • The costs of the delivery and submission of the water samples are included in the Premium Package.
Duration	Annual renewal.

Service and Maintenance Works Schedule

The maintenance works schedule describes the scope and activities that are included in the agreement:

1. In the event of a fault or alarm, contact these helpline numbers:
    a. KaacKai
        i. Ryan Meiring +27 72 175 6388
        ii. Jo-Anne Moshoeshoe +27 64 797 1642
    b. KaacKai Preferred Installers
        i. Clulow Muller +27 82 847 8407
        ii. Dave Robertson +27 72 430 8861
2. Our team will do what is reasonably possible to:
    a. Organise for a KaacKai representative to provide remote support where possible.
    b. Setup a call-out to the site whereby a full inspection and fault diagnosis will be done to resolve the issue if it cannot be done remotely.
    c. Visit the site to inspect the KaacKai Pod.
3. A report of works completed at the site will be communicated to the Client via email to the contact person after each Service and Maintenance visit.
4. KaacKai may do complimentary visits to the site whenever a representative is in the area, this will be communicated to the Client at least 24 hours in advance.
5. KaacKai to provide a Service & Maintenance Checklist, a summary of the activities is described on the following page.
6. Water samples are required to be taken at least twice a year and are collected from the clean water outlet and submitted to an Independent Inspection Authority, (a member of the Association of Inspection Authorities), and the result is reviewed by KaacKai.)
7. Water sampling and water testing can be done by KaacKai and Blackpuck, the client will pay for the associated costs when the water sampling is done.
8. Conservancy tank de-sludge is recommended at least once a year, using a sludge removal truck which will be contracted by the Client.
9. A checklist will be used to conduct Service & Maintenance on the Pod, the checklist template will be shared as a separate document for the Client's reference.

KaacKai Service and Maintenance Schedule

Period	Activity	Description
Bi-Monthly (Every Two Weeks)	Standard Check	○ Inspection of the correct functioning of the KaacKai Pod control box. ○ Test the inlet pumps, blowers, and alarms for correct functionality. ○ Inspection of the aeration in the biozones to ensure even aeration in the system's treatment chambers. ○ Water checked at site for dissolved oxygen and pH. ○ Inspection of the sludge return of the treated wastewater into the conservancy tank. ○ Check Biofilm growth. ○ Test the UV system for functionality. ○ General and visual inspection of the entire system. ○ If necessary, remove any floating sludge that may have formed in the treatment chambers. ○ Test the Inlet pumps, blowers and alarms for correct functionality.
Monthly	Water Tests	○ Water samples are collected and delivered to an accredited laboratory, (a member of the Association of Inspection ○ Authorities). ○ The costs of the delivery and submission of the water samples are included in the Premium Service and Maintenance package and are paid for by KaacKai.
6 Monthly	Standard Check	○ Inspection of the correct functioning of the KaacKai Pod control box. ○ Test the Inlet pumps, blowers, and alarms for correct functionality. ○ Test the UV system for functionality. ○ Inspection of the aeration in the biozones to ensure even aeration in the system's treatment chambers. ○ Inspection of the sludge return of the treated wastewater into the conservancy tank. ○ Air filter service. ○ Conservancy tank sludge level check. ○ Clarifier sludge level checks. ○ General and visual inspection of the entire system. ○ If necessary, remove any floating sludge that may have formed in the treatment chambers.

Yearly	Comprehensive Service	○ Inspection of the correct functioning of the KaacKai Pod Control Box. ○ Test the Inlet pumps, blowers, and alarms for correct functionality. ○ Inspection of the aeration in the biozones to ensure even aeration in the system's treatment chambers. ○ Inspection of the sludge return of the treated wastewater into the conservancy tank. ○ Test the UV system for functionality. ○ Air filter service. ○ Conservancy tank sludge level check. ○ Clarifier sludge level checks. ○ Conservancy tank desludging, contracted by the client. ○ General and visual inspection of the entire system. ○ If necessary, remove any floating sludge that may have formed in the treatment chambers. ○ Replacement of spare parts for preventive maintenance where required.

Warranty and Exclusions

The maintenance warranty schedule describes the inclusions of the warranty on parts in the KaacKai system. KaacKai provides a standard manufacturers warranty that covers all parts in the KaacKai system for manufacturers defect for 12 Months from installation date. All parts are covered for the Warranty Period provided below, subject to the continuation of this agreement and only where installation, commissioning and service and maintenance are done by our preferred Service Provider.

Acceptance of the Agreement

By signing on the signatory page to follow you agree to the terms as stipulated in this agreement and are assured that the KaacKai system will operate efficiently for the duration this agreement is in place.

Date of the agreement:

Signed at: _____on this _____day of_____2024.

Signatory**:**
Capacity:

For:

Signed at: _____on this _____day of_____2024.

Signatory:
Capacity:

ANNEXURE I: STAGE 3 – SEWER TREATMENT PLANT SPECIFICATION

ATTESTATION

Attestation of a treatment efficiency test of the small wastewater treatment plant

BioKube Venus

BioKube A/S

Attestation No. 397B07.A01

Aachen, 5 July 2022

PIA GmbH
Prüfinstitut für Abwassertechnik
Hergenrather Weg 30
52074 Aachen
GERMANY

Dipl.-Ing. Martina Wermter

Head of department "European Testing"

Prüfinstitut für
Abwassertechnik GmbH
Geschäftsführung
Dr.-Ing. Elmar Dorgeloh
Amtsgericht Aachen
HRB 12841
Ust-ID: DE 226980614
Steuer-Nr. 201/5915/1852

Notified Body
No. 1739

The company

BioKube A/S
Centervej Syd 5
4733 Tappernøje
Denmark

assigned the

PIA Prüfinstitut für Abwassertechnik GmbH (hereinafter referred to as "PIA GmbH")
Hergenrather Weg 30
52074 Aachen
Germany

To install an additional UV module to the BioKube Venus – small wastewater treatment plant and perform a practical evaluation of the pathogen removal efficiencies. This additional operation proceeded a regular 38-week-testing according to the standard EN 12566-3:2005+A2:2013, Annex B on the BioKube Venus without UV equipment on PIA premises, which was conducted in 2021. After end of the testing the system was continuously loaded with a hydraulic flow of 750 l/d domestic wastewater.

The pathogen removal testing comprised of three sampling days between 24 and 31 March 2022. The individual results of all parameters are presented below in Table 1. Any additional information on the system without UV module can be taken from the report No. PIA2021-397B07.

PIA GmbH has a certified quality management system according to EN ISO 9001:2015 for the field "testing of wastewater equipment". PIA GmbH is accredited as testing laboratory based on EN ISO/IEC 17025:2018 and is approved by the European Commission as a testing laboratory "Notified Body" (NB 1739) according to the Construction Products Regulation (CPR) for small wastewater treatment systems for up to 50 PT according to EN 12566 Part 1, 3, 4, 6 and 7.

Table 1: Test results from 24.03.2022 – 31.03.2022

Test schedule	Loading	100 %	100 %	100 %
	Date	24.03.2022	29.03.2022	31.03.2022
Air Temperature min/max	[°C]	1 / 16	6 / 17	2 / 11
Influent:				
Temperature	[°C]	11.2	12.9	17.2
COD_{hom}	[mg/l]	815	914	799
BOD_5	[mg/l]	331	333	289
NH_4-N	[mg/l]	41.7	27.6	35.6
TN_b	[mg/l]	61	49.0	57
P_{tot}	[mg/l]	8.3	7.1	6.8
pH	[-]	7.7	7.4	7.85
Conductivity	[µS/cm]	925	921	872
SS	[mg/l]	410	-	396
Sett. $solids_{120}$	[ml/l]	21	23	24
Turbidity	[FNU]	233	207	184
Effluent primary treatment:				
Temperature	[°C]	8.8	12.6	13.5
COD_{hom}	[mg/l]	107	130	117
BOD_5	[mg/l]	45	45	45
NH_4-N	[mg/l]	17.9	18.1	18.4
TN_b	[mg/l]	24	22	22
P_{tot}	[mg/l]	2.0	1.4	1.4
pH	[-]	7.3	7.3	7.3
Conductivity	[µS/cm]	807	800	814
SS	[mg/l]	42	37	39
Sett. $solids_{120}$	[ml/l]	0.1	< 0.1	< 0.1
Turbidity	[FNU]	28.9	32.1	30
Effluent:				
Temperature	[°C]	8.7	13.2	12.2
COD_{hom}	[mg/l]	24	24	28
BOD_5	[mg/l]	5	< 3	< 3
NH_4-N	[mg/l]	0.5	0.6	0.6
NO_3-N	[mg/l]	15.0	-	13.0
TN_b	[mg/l]	17	18	15
P_{tot}	[mg/l]	0.2	0.3	0.3

Test schedule	Loading	100 %	100 %	100 %
	Date	24.03.2022	29.03.2022	31.03.2022
pH	[-]	7.5	7.4	7.6
Conductivity	[µS/cm]	713	717	707
SS	[mg/l]	< 5	< 2	5
Sett. solids$_{120}$	[ml/l]	< 0.1	< 0.1	< 0.1
Turbidity	[FNU]	1.2	1.3	0.9
Total coliforms	[1/100ml]	< 1	< 1	< 1
E. coli	[1/100ml]	< 1	< 1	< 1
Biology:				
Temperature Ch. 1	[°C]	9.5	10.5	10.7
Temperature Ch. 2	[°C]	9.5	10.6	10.9
O_2 Bioreactor	[mg/l]	8.8	7.4	8.1
O_2 Bioreactor Ch. 2	[mg/l]	11.9	10.7	10.5

BIOKUBE
Centervej Syd 5, 4733 Tappernøje
Tel. 55989800 Fax 55989801
WWW.BioKube.dk

Tappernøje January 2024

EC – DECLARATION of CONFORMITY

Machine Directive of 1 May 2006 – 2006/42/EC with additional regulations

Manufacturer:	Biokube Ltd.
Address:	Centervej Syd 5, DK 4733 Tappernøje Denmark
Phone:	(+45) 55 98 98 00
Danish Registration (CVR) No.:	28 49 23 83
www	www.biokube.com

I, the undersigned hereby declare that BioKube modular designed biological Wastewater Treatment Plants type
BioKube BioReactor 50, 75, 100, 150, 200, 250 & 300
BioKube Jupiter 15, 25, 50, 75 & 100
BioKube Jupiter Combi 3, 4, 5, 6, 7, 8, 9
BioKube Orion 150. 200,250, 300,350 & XL
BioKube BioContainer 20 & 40 foot
BioKube Hercules
BioKube standard systems small systems model Pluto, Venus and Mars

All are produced in accordance with the following directives:

Directive of 2006/42/EC with additional regulation (Machine Directive) Directive 2006/95/EC with additional regulations (Low Voltage Directive) Directive 2004/108/EC with additional regulations (EMC – Directive)

All electrical and mechanical components used in the machines are individually CE-marked.

BioKube wastewater treatment plants must not be commissioned until the installation of the BioKube above mentioned components has been installed as part of the complete system.

Signature:

Name: Henrik Jönsson Bebe

Title: CTO

BIOKUBE INTERNATIONAL LTD. www.biokube.com

KAACKAI ADDITIONAL INFORMATION PACKAGE PLANT LANSERIA EXT 11-12

1. Contact numbers of the manufacturers/ suppliers

1.1 Manufacturer

BioKube
Address: Centervej Syd 5
DK - 4733 Tappernoje, Denmark

Contact: Henrik Bebe +45 20 27 12 81
Danish Registration CVR number: 28 49 23 83

1.2 Company registration number of the supplier.

Exclusive Distributor: KaacKai
Address: 28 Akademie Street, Franschhoek, Western Cape
Contact: Emma Muller +27 76 958 2560
Company Registration: 2020/062312"

2. Installed Capacity and Cost

2.1 Lanseria X11 – Botesdal

System	Capacity	Cost
2 X fully equipped KaacKai L5 100 below-ground systems	76 m3/day	R 2,660,000
2 X fully equipped KaacKai L4 75 below-ground systems		R 2,240,000
Installation & Commissioning		Ca. R 250,000
Annual Service & Maintenance Plan		R 147,600

2.2 Lanseria X12 - Bultfontein

System	Capacity	Cost
2 X fully equipped KaacKai L5 2C below-ground systems. (2 in series) Jupiter 1002c systems	45 m3/day	R 2,545,000
Installation & Commissioning		Ca. R 180,000
Annual Service & Maintenance Plan		R 147,600

3. Characterisation of the package plant

3.1 Technology

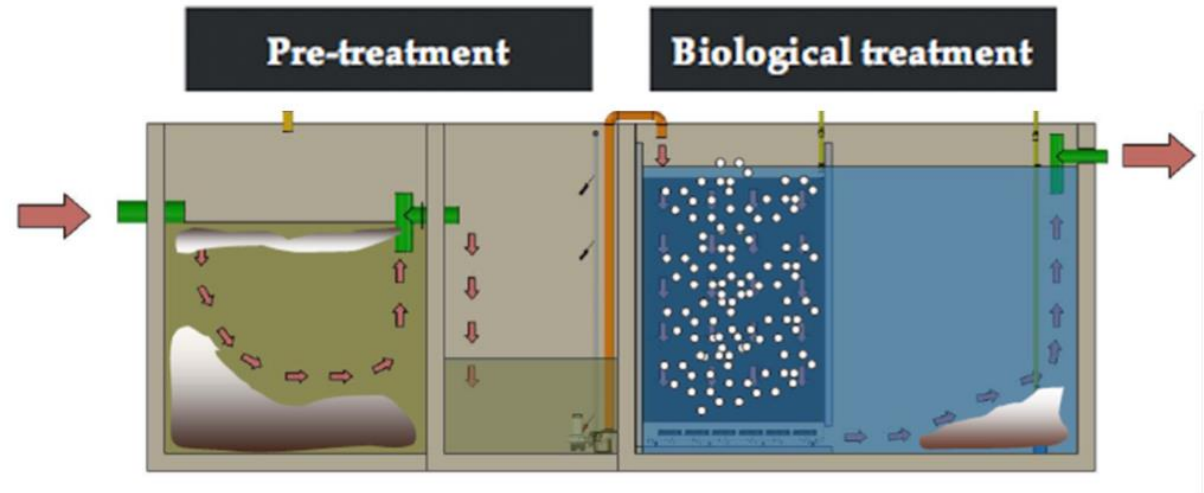
KaacKai's wastewater treatment solution applies natural occurring bacteria that degrade organic content over time when it is supplied with sufficient oxygen.

3.2 SAF – Submerged Aerated Filters

KaacKai systems are based on SAF (Submerged Aerated Filters) as the preferred technology, especially if the requirement is for reduction of organic material in the water (BOD and COD reduction) or if the requirement is for reduction of Ammonium NH4).

SAF is characterized by

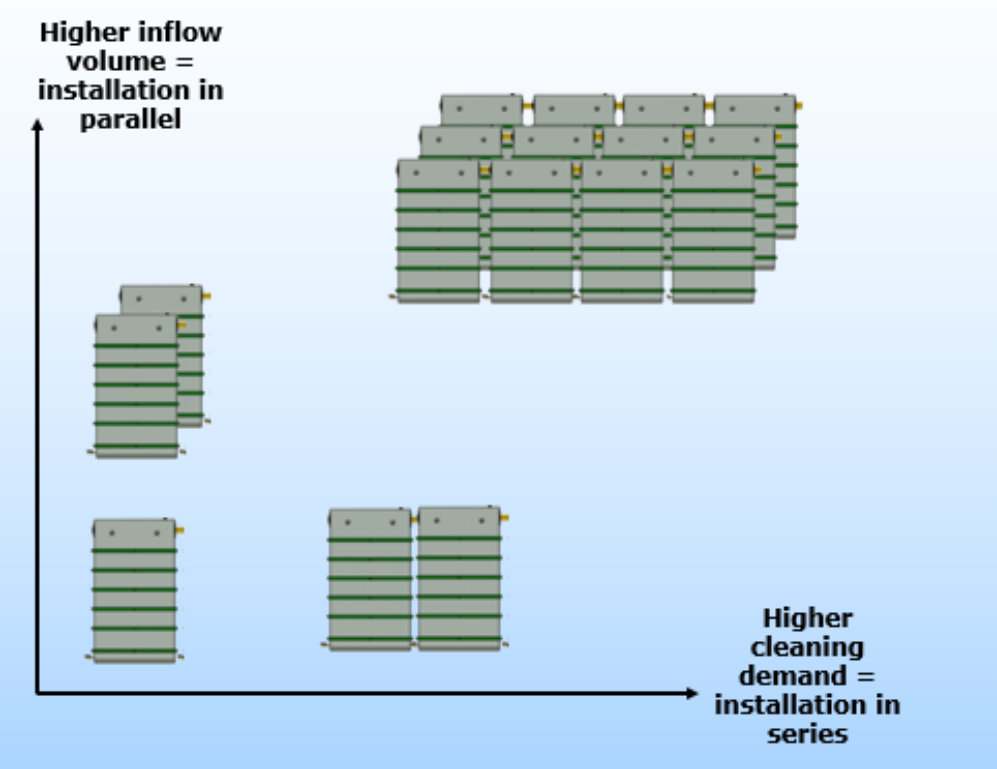
- Very stable cleaning process with low requirement for maintenance
- Tolerant towards fluctuations in the incoming water (especially in connection with the patented technology)
- Low energy consumption
- Very efficient, with very small footprint



3.3 KaacKai systems overview

KaacKai offers a range of sizes of wastewater systems. The systems range in size from single household units(1m³/day) up to systems cleaning 2,000 m³/day.

All KaacKai systems are based on the same technology allowing for modular build up and applications for any cleaning demands, volumes and requirement.



3.4 Key advantages KaacKai wastewater treatment solutions:

- Modular plug-play solution, very fast construction time.
- No noise & No smell, easy operation and easy maintenance.
- Intelligent on-line control system.
- Superior bio-media with consistent high performance. The Super bio-media is an open strong bio structure and non-degradable.

3.5 Application Fields

KaacKai's wastewater treatment solution could be installed in local area without a municipality infrastructure support for the waste water treatment. The solution is targeted:

- Households
- Commercial and residential developments
- Holiday resorts
- Hotels
- Restaurants
- Decentralized community waste water treatment.

3.6 Process description for submerged aerated filter treatment plants

In order to remove fat, oil, grease and settable solids, the influent domestic wastewater runs through a septic tank. The septic tank must contain a minimum of two compartments and fulfil the local requirements. The septic tank shall also work as sludge storage.

A buffer tank shall be provided to even out the flow of wastewater running through the system. The inlet pumps must be controlled by a timer, making sure that the flow is evened out throughout the day.

The treatment unit shall consist of fixed aerated filters with a clarifier for settling of bio sludge. The treatment system shall consist of a chamber with a bio zone followed by a clarifier. Depending on the requirements and daily flow the system shall be modular allowing more treatment units to be placed in series, and more systems to be placed in parallel.

Bacteria will grow on the filters feeding from the wastewater and thereby treat the water. Excess bacteria shall be collected in the clarifiers and returned to the septic tank in fixed intervals, summing up to a return flow of minimum 10% of daily volume being returned to the septic tank at the inlet. The wastewater shall be able to gravitate through the system, from inlet to outlet.

3.7 Equipment description

3. 7.1 Septic / Conservancy tank

The septic tank shall fulfil local requirements and consist of minimum two compartments. It can be casted in concrete or be supplied in plastic. The volume of the septic tank shall minimum be equal to 50% of the daily flow or larger. The septic tank shall be able to keep sludge for a minimum of 100 days. The septic tank shall be odorless.

3. 7.2 Buffer tank

The buffer tank shall have a volume of minimum 20% of the daily flow. There shall be placed two pumps in the buffer tank serving as inlet pumps to the biological treatment zone. The inlet pumps shall be controlled by a timer and three float switches placed in the buffer tank.

- The bottom float will have the primary pump run according to preset timer when activated. When deactivated the float will prevent the pumps from running, when the buffer tank is empty.
- The middle float switch controls the primary inlet pump and has it running continuously when activated.
- The top float switch shall activate both inlet pumps and have them running continuously. When the top float is activated for more than five minutes and alarm should go off.

Normal flow shall be kept when water level is between the bottom and middle float switches, where the primary inlet pump shall be running in fixed timed intervals.

3.8 Biological treatment

The biological treatment shall be based on a non-degradable fixed film media which is continuously aerated. The submerged media shall have a known surface area between 100-150m^2/m^3 and be made from Polyethylene. The media shall have void space of 65-95% and be open allowing the water to run in both horizontal and vertical directions.

The loading rate shall be based upon proven loading removal rates of 20g/BOD/m^2/d and additionally 1,78gNH_4/m^2/d at the desired effluent BOD and NH_4 concentrations respectively. Both values based on minimum wastewater temperatures. Carbonaceous and nitrifying zones shall be separated into specific dedicated compartment each with separate settlement zones to ensure separation of biological cultures.

Aeration supply in the biological zones shall be no less than 8$m^3/h/m^2$ tank area. The media shall be placed in a plastic tank containing the entire biological treatment zone. The flow through the treatment zone shall be controlled by gravitation, leading the water from top to bottom. The aeration shall be supplied by diffusers placed at the bottom of the plastic tank. Aeration from the diffusers shall be able to tear off dead bacteria's from the media. The dead bacteria's shall be collected as bio sludge in the settlement tank which shall be placed in extension to the biological treatment chamber. The size of the settlement tank shall ensure that the uplift velocity is no more than 1-1,2m/h. The flow direction in the settlement tank is bottom to top. The bio sludge shall be pumped back to the septic tank in fixed time intervals. The return of bio sludge shall be no less than 10% of daily flow.

3.9 Biological treatment unit

The integral biological and settlement tanks shall be made from polypropylene.

The media shall be polypropylene structured media of uniform design to eliminate clogging. Random media shall not be acceptable. The specific surface area of the media shall not exceed 100 m^2/m^3 media volume for the first zone. Media with Specific surface area greater than 150 m^2/m^3 shall not be allowed.

The media must be suitable for in-situ water jet or brush cleaning for the whole depth of the tank, but must also be removable and replaceable for out of tank cleaning if required. The media must have a minimum life of 20 year without requiring replacement or top up.

3.10 Control Requirements

The unit shall be operated in a fully automatic and minimizing operator intervention. The control panel shall provide the following function as minimum:

- Fully automatic operation with duty/standby pump cycling
- Auto-start of second pump in case water exceed higher than threshold level in the pump well
- Shall control all aspects of the treatment system
- Shall be timer controlled, e.g., PLC and operator adjustable to allow process changes to be made
- Alarm system for treatment plant malfunction and shutdown

3.11 Installation

The treatment system shall be housed in a civil structure suitable to support the integrity of the plastic tank. The controller and blowers shall be placed in a fully weatherproof housing. External equipment, blower, control panels shall not be accepted.

3.12 Additional equipment

UV-treatment to reduce E-coliform and ensure disinfection shall be supplied by integrated UV-lamps kept underwater at all times, even when there's no flow through the system.

3.13 System requirements

The system shall be fully automatic with the following functions being a part of the system.

- Inlet in fixed intervals from primary inlet pump.
- Activation of secondary pump when float switch number to and three are activated.
- Stop of both pumps when float switch number one is activated.
- Flush return from clarifiers to the septic tank in fixed timed intervals.
- All timed interval settings must be changeable through the PLC.
- Aeration by circular membrane diffusers placed below the bio media

3.14 Process requirements

Following requirements shall be fulfilled and documented:

- BOD_5 treatment capacity shall be documented
- Total suspended solids (TSS)treatment capacity shall be documented
- Nitrification capacity shall be documented
- Water level in buffer tank throughout the day
- The media used in the bio zones shall have a lifetime of minimum 20 years
- The media in first chamber shall have a surface area of 125m2/m3
- Outline and load drawings shall be supplied
- Two examples of sensitive projects systems proofing no-odor or noise nuisance
- Showing at least three similar designed projects installed and running for at least three years

The Contractor shall be able to show effluent water quality after six to eight weeks, proving that requirements are met for five consecutive days.

4. **Package plant lifespan**
   20 years

   Technical Certifications enclosed.

5. **Process failure measures**
   Incident plan attached

6. **Sludge Management**
7. Sludge Management Plan attached.

Sludge Management Plan

1. Introduction

This document is to be used as a guide for the management of sludge on site. This is ultimately the responsibility of the client.

The sludge has the potential to affect the functioning of the system if not removed per the advice/recommendation from KaacKai. KaacKai cannot be held liable for nonconforming water quality discharged from the plant.

The wastewater treatment facility, or packaged plant, is designed to treat the wastewater produced by the site and its activities. The design of the plant incorporates a septic system with three separate chambers for solids separation. The packaged plant will cover

- Give overall design of the plant.
- Indicate how sludge is produced in the plant and stored in the septic zone only.
- Describe the purpose of the sludge management plan to ensure accurate measurement of settled and floating sludge, assist personnel with the proper methodology for measuring sludge levels and the safe discharge.
- Sludge will not be treated/processed on site.

2. Characterisation of Sludge

The primary source of collected sewage is domestic activities, including waste. These include the site ablutions, cleaning and organics for example, greases from restaurants. Grease traps are implemented on-site.

The sludge will comprise a mixture of faecal matter, organic and inorganic material. However, trace elements of heavy metals, solvents and petroleum products may enter the treatment facility and remain in the sludge portion.

3. Storage, Treatment and Disposal of Sludge

Heavier particles will settle and sink to the bottom of the septic zone and collects as a sludge blanket along with a floating sludge portion.

When the thickness of the sludge blanket becomes too thick, and the volume of the septic zone is reduced. The nutrient and contaminant content in the sludge will increase, and the sludge must be removed from the septic zone by vacuum tanker and disposed of at the nearest wastewater treatment works or landfill as required by the local municipality.

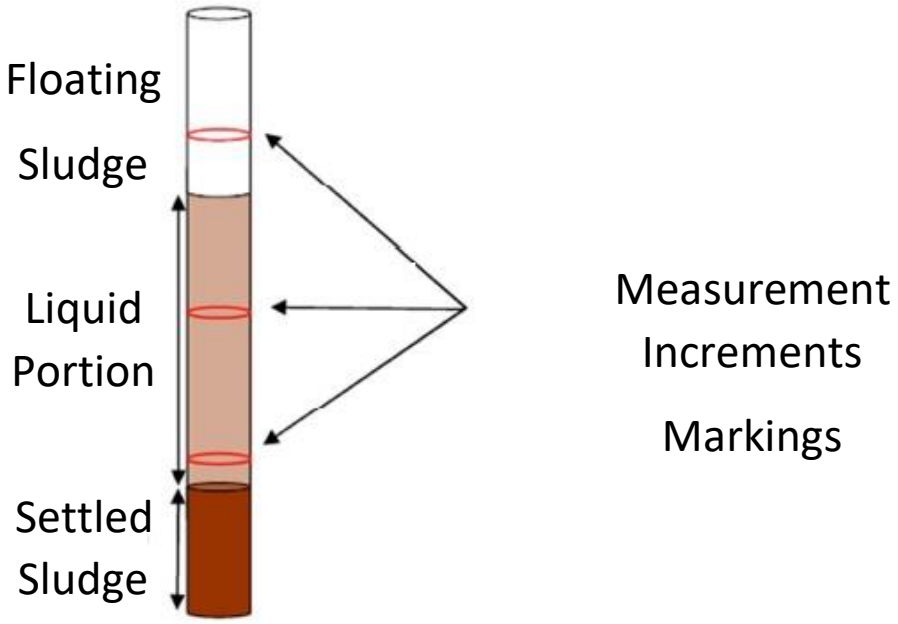
4. Methods for Performing Sludge Depth Measurements

Sludge depth is used to measure the accumulation level of sludge in the septic tank. The frequency of sludge depths are monitored monthly during each site inspection/ maintenance visit as stipulated in the maintenance contract by a certified KaacKai personnel.

Sludge depths are measured at four points in the septic tank through each manhole opening per the design drawing and are measured at the same point during each visit.

A sludge collecting tube made of clear plastic is used to measure the sludge depth by submerging the tube into the sludge and liquid portion of the septic tank and then removed. The clear tube allows the personnel measuring the sludge to see the liquidsludge separation and depth Equipment needed:

1. Sludge measuring tool (clear plastic tube etc.)
2. Personnel protective equipment (PPE)
    a. Latex or nitrile gloves
    b. PVC boots
    c. Eye protection
    d. Overalls
3. Recording pens and notepad Steps needed to take a sample:
4. Slowly lower the sludge receptacle/tube tool into the septic tank zone until the tool reaches the bottom of the septic tank.
5. Seal the tool and begin to lift the tube from the septic tank.
6. Compare the liquid and sludge portions, if the settled sludge or floating sludge portion is within 10cm of the outlet, the sludge must be removed:
    a. First chamber (chamber where inlet is located):
        1. maximum height of 755 mm for the settled sludge.
        2. maximum height of 1745 mm for the floating sludge portion.
    b. Second chamber:
        1. maximum height of 1155 mm for the settled sludge.
        2. maximum height of 1345 mm for the floating sludge portion.
    c. Third chamber:
        i. maximum height of 1590 mm for the settled sludge ii. maximum height of 910 mm for the floating sludge portion.
7. Empty contents back into the septic tank.
8. Clean the tool once it is finished.



5. Method for De-sludging

When the sludge has exceeded its maximum ratio to the liquid portion, as described in section 2.0 of this document, the sludge must be removed by a vacuum tanker by a contracting organisation contracted by the client.

The characterisation and disposal of this sludge is the responsibility of the client and the contracting organisation responsible for the removal from the client's property and disposal.

Additionally, the procedure for removing the sludge is the responsibility of the contracting organisation contracted by the client.

Any contracts for de-sludging are between the client and the contracting organisation responsible for this process.

6. Sludge Sampling

If sludge sampling is required, sludge sampling is the responsibility of the contracting organisation contracted by the client.

Incident management plan

1. Introduction

Emergency response planning and preparedness is an important element in managing a wastewater treatment facility and collection system. The client relies upon wastewater treatment operators for protection against unexpected events that may jeopardize public health and safety. Wastewater treatment plant service providers and operators expect to be protected from the consequences of natural or man-made disasters affecting the wastewater treatment system. Preparation for the unexpected is necessary and requires an emergency plan to be in place and functional to handle a variety of situations.

2. Purpose

Events can occur at any time, and in any combination, that may require an immediate emergency response. Emergencies can be localized in nature or widespread, affecting the treatment plant, a pump station, or the entire facility. The following events will be discussed in this planning guide:

- Power failures
- Natural disasters such as flooding, snow/ice storms, freezing, hurricanes, high winds, tornadoes, and earthquakes.
- Fires
- Explosions
- Chemical spills
- Hydraulic overloading, ruptures and sewer blockages
- Sewer overflows
- Intentional or accidental release of chemical or flammable substances into the collection system
- Security threats, vandalism, terrorism
- Loss of SCADA system or alarm functions
- Construction accidents
- Equipment failure
- Process upsets
- Personnel injury

3. Emergency Contact Information

Name	**Contact**	**Function**	**Location**

Kim Kennedy	+27 60 508 7084	Chief operator, Service and Maintenance provider	Western Cape
Sean	+27 69 724 6072	Junior operator, Service and Maintenance provider	Western Cape
Albertano Mabunda	+27 81 382 7969	KaacKai Technical Engineer	Gauteng
Raymond Herron	+27 84 822 2415	KaacKai CFO	Western Cape

3.1. Western Cape Emergency Contacts

Emergency function	**Contact**
Report water leaks/burst pipes	0860-103-089
City of Cape Town Emergency Services (When life or property is endangered by fire, accidents and natural disasters)	021-480-7700 Or dial 107 from landline
Report cable theft	0800-222-771
Police	10111

4. Emergency response procedures for specific events

Each unusual event or emergency will have its own specific action plan, depending upon the severity and its potential impact. An incident report template must be completed by the KaacKai service provider and all involved stakeholders, in a case of any events. The following are some examples of response procedures for events that may occur:

Power failure – Power failures may be caused by an interruption of service originating at the power utility company; storm damage and/or vehicle accidents resulting in downed power lines; vandalism; or equipment malfunction at the wastewater treatment plant.

- To ensure the reliability of back-up power, the following items should be done: perform regular preventative maintenance on the generator unit; regularly exercise generators under load; always ensure an adequate supply of fuel is on hand (this applies to portable generators as well); ensure all generator related alarms are functioning.
- Assess the status of all equipment during an outage. Know which equipment needs to be manually restarted or reset during a power failure as well as after the resumption of normal power. Keep a record in a log book of all activities. If emergency lasts longer than a few days, replacement personnel will need to know the status of equipment when they replace co-workers.
- At the outset of a power failure, try to determine the cause and expected duration of the event.
- Create a refueling plan and fuel supplier contact information easily accessible.

Floods – The Western Cape has experienced a number of significant flooding events in recent years. Floods can be caused by swollen rivers due to excessive rain, combined rainfall and snowmelt, ice jams,

or the failure of dams. Localized street flooding may occur because the capacity of storm drainage systems is exceeded. Flooding can impact an entire treatment plant. High river water has been known to back-up through effluent discharge pipes and flood process tankage.

Flood preparations

- Monitor the weather regularly through local news channels and the National Weather Service .
- Determine facility vulnerability for flooding. Know your flood risk and the elevation above which flooding occurs.
- Have an evacuation route planned that avoids flood prone roads. If necessary, have a boat available to ferry people in and out of the plant.
- Have sand bags ready to protect flood prone areas.
- Procure or have on hand portable pumps and generators.
- To avoid the possibility of electrocution, disconnect the power to flooded buildings. If possible, cut off power before flooding begins.
- Permanent flood proofing measures that can be taken are:
- Installing check valves to prevent river water from backing up into the effluent discharge line;
- Building watertight walls or barriers around equipment, work areas, doorways, windows, ventilation shafts or other openings that are subject to flooding; Moving electrical equipment above the anticipated water level in flood prone areas of the plant;
- Sealing walls to prevent or reduce seepage;
- Installing permanent pumps to remove floodwaters; and
- Store chemicals and hazardous materials in non-flood locations. Make sure propane and fuel oil tanks are secure.

After a flooding event

- Perform a thorough inspection of the plant and/or pump stations. Watch out for potential electrocution and slip and fall hazards.
- Inspect for settling and/or erosion to building foundations, roadways, culverts and other structures.
- Clarifiers and other flooded tanks may be filled with sand, silt and grit which will need to be removed before operation.
- Cabinets, motor control centres, and walls will need to be dried out to prevent odours and mold.
- Be aware of chemical and biological contamination in flooded areas.
- Inspect chemical storage tanks for damage and contamination.
- Equipment motors will need to be dried out and pump bearings may need to be purged to eliminate moisture.
- Check electronic equipment for damage.
- Plants may get inundated with grit and sludge, requiring extra handling and sludge dewatering, and inspection to assess damage to equipment.

Hydraulic overloading – Hydraulic overloading is considered as any amount of flow that exceeds the design capacity of the plant to effectively treat that amount of flow. Hydraulic overloading is most

often associated with storm events. It is also commonly observed during the springtime when combinations of spring rains and melting snow lead to high groundwater tables resulting in infiltration/inflow problems. Hydraulic overloading can have many serious consequences: decreased plant performance; short-term and/or long-term effluent quality violations; mechanical breakdowns; overflows; and grit and sludge accumulation from the scouring of sewer lines.

- To effectively treat high flows, every plant should have a wet weather operating plan. The weather should be monitored continuously through the local news channels or the National Weather Service.

Preparations for a wet weather event

- Make sure all equipment is operable.
- Be prepared to place all unused tankage into service.
- Ensure there is an adequate supply of chlorine if used for disinfection.
- Ensure all UV bulbs are clean and in working order if ultraviolet disinfection is used. Make sure all banks and units are operable.
- Make sure there is adequate room in grit and screenings containers. Make sure all valves are operable.

During a high flow event

- Run grit and screenings removal continuously, especially during the first flush of the sewer lines
- Work in two person teams for safety assuredness.
- Be prepared for high grit, BOD and suspended solids loadings during the first flush
- Place unused tankage on-line as necessary.
- Increase chlorine dosage to make up for a decrease in disinfection contact time.
- Minimize recycle flows through the plant.
- For activated sludge plants, minimize solids loading on the secondary clarifiers by operating in step feed or contact stabilization mode.
- Increase monitoring of clarifier sludge blankets.
- Consider cycling aeration on and off to keep solids in the aeration tanks.
- Consider the use of polymers as a settling aid.
- Increase process monitoring and lab testing.
- Consider throttling plant influent gate if so equipped and use the collection system as storage as long as backups do not occur in houses or the streets.

After the wet weather event

- Reorder spent chemicals.
- Catch up on sludge dewatering.
- Return to conventional operating modes.
- Review wet weather operation and make adjustments to the plan as necessary.

Blockages, ruptures, overflows and construction accidents – Blockages and ruptures could occur at any time. A blockage is typically caused by grease buildup or root penetration resulting in an interruption of flow,

often resulting in an overflow from a manhole or within a business or residential basement. A blockage may also be caused by an object making its way into the sewer system and lodging within a pipeline. Physical settlement of the pipeline can cause a misalignment of joints, resulting in a blockage. Sand or sludge accumulation can form an impenetrable blockage in slow moving areas of the sewer system. Overflows can occur at pump stations or low-lying manholes due to the failure of the pumping system or being overwhelmed by rainfall. Accumulations of air at high points of force mains can reduce discharge flow from pump stations. Intended or unintended closure of a valve could also cause simple blockage. Sewer force mains are prone to breakage, resulting in the large-scale release of raw, untreated wastewater. Construction activities can result in breakage. Construction debris can be left in pipelines, causing blockage or restrictions in flow. These events are not only unpleasant, but they can affect public health.

In the event of any release of wastewater, whether at the plant, pump station, collection system or a sewer backup resulting in an overflow into someone's basement, proper notification must be made to the EPA and the NHDES. This involves a telephone call within 24 hours followed by a written submission within 5 days. If a spill or overflow reaches surface waters, downstream notification must be made.

To prevent blockages, overflows and construction related accidents

- Perform annual televising and cleaning of the sewer lines and remove blockages when found. Problem areas must be flushed more frequently.
- Enforce sewer use ordinances for oil and grease.
- Address I/I problems.
- Inspect new sewer lines during construction for appropriate slope and bedding and removal of any construction debris.
- Ensure Dig-Safe is called prior to initiating construction activities. Be aware that the only companies required to belong to Dig Safe are gas, electric, telephone, cable television and public water companies. Municipalities owning their own water and sewer lines are not required to join and may be responsible for locating their own utilities. Make sure an operator is on-hand whenever road work is taking place around sewer lines. Have as-built plans available.
- Monitor and clean siphons on a regular basis.
- Perform regular maintenance of pump stations. Keep wet wells free of grease and sludge build-up. Ensure that emergency power and alarm systems are fully functional.
- Periodically walk the sewer line in remote areas. Inspect the ground for the formation of sink holes around manholes and pipe runs for evidence of erosion and lost or shifting pipe bedding material. Check for vandalism and popped manholes.

During an overflow event or other disruption of service

- Bypass the affected portion of the line if possible to minimize the amount of spillage. Emergency bypass pumping from one manhole to another or around an affected pump station may be utilized. Septage haulers may be utilized also.

- Notify people in the affected area to avoid coming into contact with the spill. Notify swimmers or other recreational users to stay away from affected areas if the spill enters surface waters. Post information on local access cable TV stations.
- Conduct sampling during and after the event. Estimate the amount of wastewater spilled.
- Employ a contractor to make the necessary repairs or cleaning operations if they are beyond your capabilities.

After an overflow event

- Determine cause, duration of incident, amount spilled and remedial actions for reporting purposes.
- Restore the affected area to its original condition. Collect and remove debris. Disinfect by spreading lime or similar disinfectant.
- Severe winter storms, icing, freezing weather – Ice storms and freezing weather can create both mechanical and biological problems at a plant. Refer to the response plan for power failures as winter storms are likely to cause power outages.
- Monitor the weather continuously.
- In severe storms, travel to the plant can be difficult or impossible. If necessary, arrange for travel in and out of the plant.
- Have two-way radios or cell phones on hand in the event telephone lines are compromised.
- Make sure all trucks and heavy equipment are fuelled beforehand.
- Within the plant, ensure that power lines are free from overhanging tree branches.
- Keep roadways within the plant clear as much as possible.
- Monitor rooftops for heavy snow accumulation and remove after the storm to prevent structural damage.
- Watch for ice build-up on plant equipment or process tankage. Remove scum skimmer blades on clarifier surfaces prone to freezing.
- Adjust biological processes to prepare for the onset of cold weather. Adjust MLSS levels in activated sludge tanks or place additional tanks on-line.
- Properly heat and winterize chemical storage areas, vulnerable process piping, and portable pumps and equipment.

Hurricanes, tornadoes, high winds – Hurricanes, while not common, have caused extensive damage in the state. High winds, heavy rain, coastal storm surges and tornadoes typically accompany hurricane events. Fortunately, hurricanes can be predicted with some degree of certainty as to their approximate path, strength and timeline. This often affords some opportunity to prepare for this natural disaster. Tornadoes, on the other hand, are usually isolated events capable of causing severe damage, mostly by wind, but often with little warning.

Roll-up doors are particularly vulnerable to failure, as are roofs, roof top ventilation units, windows, and even digester covers. Flying debris is especially dangerous. Anything not anchored down becomes a lethal weapon. Hurricane and tornado-force winds can fill process tanks with debris as large as vehicles.

Catwalks can be ripped from their anchors and blown into clarifiers. The skin of aluminium domes can easily be peeled off.

Preparing for a storm

- Monitor the weather through local weather channels.
- Make plans for communicating with employees and their families before and after a hurricane. Offer them shelter if possible. Homes of employees may be destroyed, causing severe personal disruption, making it difficult for them to come into work. Plans should be made to bring in temporary workers or volunteers such as electricians, mechanics and possibly operators from less damaged plants if needed. Options for temporary housing should be explored and identified.
- Give consideration to whether the plant needs to be staffed. It may be safest to abandon the plant and return after the storm has passed.
- Have on hand cell phones and two-way radios. Be prepared for long term communications problems.
- Bring in or secure all loose equipment.
- In the event of a hurricane, do not seek shelter in basement or tunnels. Inundating rains may make these areas flood and electric shock hazards. A basement or tunnel may be the safest place for a tornado as these storm events are fast moving with smaller amounts of rain; otherwise, consider small interior rooms on the lowest floor and without windows, hallways on the lowest floor away from doors and windows, or rooms constructed with reinforced concrete or block with no windows.
- Make sure there is adequate fuel for all emergency generating and pumping equipment. Be prepared for long term power outages.
- Maintain detailed records and take photographs to obtain insurance company and FEMA reimbursement. Previous disasters show that this process can take as many as five to six years to complete.
- Travel to and from the plant after the storm can be difficult due to downed power lines. Scattered debris on the roadways can be very problematic causing numerous flat tires. Heavy equipment may be required to clear the road.
- Be prepared to have on hand vactor trucks and tanker/septage trucks to handle major storms.

After the storm

- Account for all personnel.
- Thoroughly inspect the plant, pump stations and collection system. Sometimes force mains or gravity sewers can be dislodged due to the uprooting of trees growing in the vicinity of these transmission lines. Be aware of downed power lines.

Earthquakes – Earthquakes can cause significant structural damage from shaking. Landslides are a possibility. Damage from fire caused by the disruption of gas and fuel lines poses a definite hazard. Lagoon systems contained by earthen berms can fail due to wave action and overtopping of the berm, leading to further instability and washout of the berm itself. Water surges within concrete tanks can also cause damage to interior components. All underground piping is susceptible to damage, including collection

system piping. Piping galleries and tunnels have been known to flood as a result of damage to process piping. Chemical spills due to containment failure can occur. Gasoline can leak into sewer lines from damaged gas stations in town. The initial earthquake may only last for 10 seconds, but lesser aftershocks can still occur for days or weeks later.

Preparing for an earthquake

- Consult building codes or conduct an engineering evaluation to ensure that your buildings meet current structural safety standards.
- Designate safe areas to seek refuge throughout the plant. Most injuries occur by falling objects when people move more than 5-10 meters from where they were standing when the earthquake first struck.
- Bolt bookcases, cabinets and shelving to walls.
- Move large or heavy objects to lower shelves.
- Make sure overhead light fixtures are adequately secured.
- Store chemicals and flammable liquids in properly secured storage cabinets.
- Secure water heaters and gas or propane-fueled appliances or equipment. Provide flexible connectors for all gas fired appliances and equipment. Secure computers and lab equipment.

During an earthquake

- Immediately take shelter at the nearest safe location. Seek protection underneath a heavy table or desk. Stay indoors if possible.
- If outdoors, find a safe spot away from buildings, trees, streetlights and power lines.
- If in a vehicle, pull over to a clear location and stop with your seatbelt fastened until the shaking stops. Watch for tsunamis if in a coastal area.
- Expect fire alarms and sprinkler systems to go off.

After an earthquake

- Account for all people. Check for injuries.
- Expect aftershocks and possibly more damage.
- Look for and extinguish small fires.
- Monitor the situation using radio or television.
- Open cabinets carefully and watch for falling objects.
- Inspect entire plant, pump stations and collection system for damage.
- Check for gas leaks and inspect electrical system.
- Be aware of flooding due to broken pipes.
- TV sewer lines for hidden damage.
- Monitor for methane leakage from anaerobic digesters.
- Do not use elevators until inspected.

Fires – Fires can occur as a result of an electrical problem, the improper use of equipment, the ignition of flammable materials, an overheated motor or a natural disaster such as an earthquake. Fires must have three components to ignite and maintain combustion: fuel, heat, and oxygen. The goals of any fire safety and prevention program should be, in this order: to prevent combustion by controlling sources of fuel and heat; to protect people from injury and loss of life; Fire prevention strategies

- Practice good housekeeping. Keep work areas, walkways and stairwells clear of loose materials and trash. Clean up spills such as grease, oil or chemicals immediately. Avoid the buildup of combustible trash such as paper, wood and oily rags.
- Store all chemicals and combustible liquids in approved containers and away from sources of ignition.
- Keep incompatible chemicals away from each other.
- Place oily rags in metal containers with lids.
- Always ensure adequate clearances around electrical panels.
- Use only approved extension cords and in good condition.
- Don't overload electrical circuits.
- Always keep fire doors closed.
- Smoke only in designated areas.
- Practice fire drills regularly.
- Place fire extinguishers in appropriate locations, inspect regularly, and train everyone in their use and location.
- Test smoke detectors and fire alarms regularly.
- Implement a hot work permit program. A hot work permit program establishes written procedures to be used to assist in preventing fires resulting from temporary operations involving an open flame, produce heat, or those that generate sparks and/or hot slag. This includes, but is not limited to brazing, cutting, grinding, soldering, thawing pipes, torch applied roofing, and welding.

In the event of a fire

- Use the appropriate fire extinguisher for the situation. Class A extinguishers are for ordinary combustibles such as paper, wood, cardboard, and most plastics. Class B extinguishers are for combustibles and flammables such as gasoline, kerosene, grease and oil. Class C extinguishers are for fires involving electrical equipment, circuit breakers and outlets. Class D extinguishers are for fires involving laboratory chemicals such as magnesium, titanium and potassium. Some extinguishers are multipurpose and can fight several types of fires.
- Only fight a fire if it is small and not spreading. Only fight a fire if you know how to use the extinguisher.
- When using an extinguisher, always stand with an exit at your back. Use a sweeping motion and aim at the base of the fire.
- If possible, use a buddy system.
- Watch for re-ignition.

- Never fight a fire if it is spreading rapidly or you don't know what is burning. Never fight a fire if there is too much smoke. Instead, immediately call the emergency services line.

Explosions – We often think about explosions as a result of the ignition of sewer gases, but in reality, an explosion can happen as a result of many things. The ignition of flammable liquids (gasoline, methanol), rupturing of compressed gas cylinders, boiler explosions, maintenance and laboratory activities, dust, and terrorist activities are a few examples. The risks to health and life from an explosion are: smoke inhalation, lung and hearing damage, trauma and burns due to the force and heat of the blast, flying debris, and worsening of pre-existing medical conditions as a result of acute physiological or psychological stress. Structural damage to the facilities, equipment damage and loss of process are other hazards of an explosion.

Preventing explosions

- Properly store all hazardous materials. Routinely inspect storage areas.
- Secure cylinders of compressed gases and do not expose to excessive heat.
- Continuously monitor headworks, pump stations, sludge handling areas and digesters for explosive and flammable gases.
- Restrict smoking to designated areas of the plant well away from potentially explosive areas.
- Do not smoke in or around pump stations or manholes.
- Test the atmosphere and ventilate prior to doing any welding, cutting, or using an open flame in any area where wastewater or sludge has leaked, stored or been treated.
- Follow confined space entry procedures and use non-sparking tools.
- Enforce sewer use ordinances.
- Conduct proper preventative maintenance on boilers and compressed gas systems.
- Oversee and document all vendor-performed work.
- Implement a hot work permit program.

In the event of an explosion

- Immediately take cover under tables, desks or other objects that can offer protection from flying glass or debris.
- Seek out, assist and evacuate injured persons. Do not move seriously injured persons unless they are obviously in immediate danger.
- Evacuate and do not use elevators.
- Activate the building fire alarm system or call 911.
- Do not attempt to go back into the building.
- Once outside, move to an area at least 300 meters from the affected building. Keep roadways and walkways clear for emergency responders.
- Be wary of further possible explosions.

- After the area has been deemed safe immediately assess the damage and restore service.
- Notify NHDES of the situation as soon as practicable.

Chemical spills within the plant - Chemical spills can occur at any place or at any time. The severity of a spill can range from a ruptured storage tank of several thousand liters in volume to the spilling of a few millilitres of lab chemicals. A spill can occur within the plant or it can happen on the roadways during transit. A spill can occur at an industry that discharges to your facility. Vandals or disgruntled employees at any location can spitefully or wilfully dump chemicals. This section will deal with spills within the confines of the plant.

Spill prevention & preparedness

- Maintain MSDS sheets on all chemical substances used in the plant.
- Inventory all chemicals used in the plant. Document the chemical name, exact location, storage volume and chemical supplier.
- Provide the fire department with a copy of your chemical inventory list. Invite them for periodic tours and spill response training.
- Make sure all storage containers are in good condition, properly labeled and have proper spill containment.
- Make sure all bulk storage containers have appropriate secondary containment. Perform regular inspections of secondary containment structures.
- Make sure outdoor secondary containment areas are not filled with rain water which would take up spill volume. Pump out as required.
- Keep volumes of chemicals stored to a minimum. Keep on hand only those amounts that you would normally use in a given time period.
- All hazardous substances should be stored inside buildings or under cover, preferably in areas not subject to excess heat. Keep sources of ignition away from the storage areas.
- Small volumes of hazardous chemicals should be stored in specially designated and labeled storage cabinets.
- Keep incompatible chemicals stored separately.
- Immediately clean up drips or leakage. Practice good housekeeping by keeping all storage areas clean and in good general condition.
- For bulk chemical deliveries, ensure that an operator is present at all times during the off-loading of chemical.
- Make sure that all chemical fill pipes are properly labeled.
- Make sure bulk storage tanks are equipped with high level alarms to prevent overflows.
- Alarm chemical containment areas to detect the presence of spilled material.
- Maintain spill response kits appropriate to the chemicals in storage. Typically they would be sized based on the anticipated spill volume according to the largest storage container. Spill kits should be

located where spills are likely to occur. A spill kit would typically contain absorbents, booms, neutralizing agents, tools such as shovels, brooms squeegees, and personal protective equipment such as gloves, goggles, aprons, boots, respirators, etc.

- Have an evacuation plan in place and a method for alerting personnel of a major spill.
- Keep chemical storage areas away from high volume traffic areas.

  Determine which chemicals and what amounts of chemicals can be safely handled by plant staff in the event of a spill. Consult with the fire department or your chemical supplier on this.

Spill response procedures

- Refer to appropriate MSDS sheets for specific cleanup procedures.
- Determine which chemical has leaked or spilled. Estimate the volume or severity of the spill and its impact to health, property and the environment.
- Spills may be cleaned up by on-site personnel if: they are properly trained, the spilled chemical and its hazardous properties have been identified, the spill is small and easily contained, and the responder is aware of the chemical's hazardous properties.
- If a spill or release cannot be controlled or injuries have occurred, immediately call emergency services.
- Evacuate the area if necessary. Turn off ventilation units to avoid fumes being carried throughout the building.
- Eliminate sources of ignition if it is safe to do so.
- If the spill is small and can be contained, first obtain the proper personal safety equipment, then try to stop the leak. Contain the leaked material by applying booms or improvised dikes such as sand or soak up as much material as you can by using absorbent pads or absorbent material such as kitty litter. Isolate floor drains by plugging them or installing drain covers.

Reporting petroleum spills

Petroleum spills may involve but are not limited to crude oil, gasoline, heating oil, various fuel oils, lubricating oil, hydraulic oil or asphaltic residuals. The following guidelines as determined by NHDES should be used when determining when to report a petroleum spill. **WHEN IN DOUBT, REPORT THE SPILL.**

The responsible person in charge must report the spill immediately unless it meets **all** of the following conditions: a. The discharge is less than 100 litres;

b. The discharge is immediately contained;
c. The discharge and/or contamination is completely removed within 24 hours;
d. There is no impact or potential impact to groundwater or surface water; and
e. There is no potential for vapors which pose an imminent threat to human health.

To report a spill: First contact the local emergency services responder or fire department.

When reporting a spill, be prepared to give the following

information: a. The caller's name and phone number;

b. The name, address and phone number of the responsible party;
c. Location of the spill site;
d. Date and time of the spill;
e. Cause of the spill;
f. Substance spilled; and
g. Amount spilled.
h. What actions have been taken prior to the call.

Response to a sodium hypochlorite (liquid bleach) spill

- Spills of 100 pounds (≈ 300 liters) or more of sodium hypochlorite must be reported to the emergency services
- Sodium hypochlorite is not combustible, but is an oxidizer and can ignite combustible materials such as wood, paper, oil, clothing, etc.
- Eliminate all ignition sources in the immediate area.
- Sodium hypochlorite is a corrosive product and may cause burns to skin, eyes, respiratory tract and mucous membranes.
- In no instance allow hypo to come into contact with acids, ammonia, metals, alum, ferric, and organic chemicals such as fuel oils, organic polymers or hydrogen peroxide as violent reactions can occur releasing toxic chlorine gas.
- Assess volume and source of leak. If the leak is manageable, attempt to stop it or begin clean-up only if you have been properly trained and have donned the appropriate protective clothing (Butyl, Nitrile, Neoprene, Natural Rubber, PVC or Viton gloves and suits, footware, respirator suited for sodium hypochlorite and splash resistant goggles.)
- It is not recommended to try and neutralize material with sodium bisulfite or other dechlorinating agents as this chemical reaction may give off heat, potentially causing boiling or splashing.
- Restrict access to the area and provide maximum ventilation.
- Dike area to contain spill and absorb spilled material with dry earth, sand, kitty litter, vermiculite or absorbent pads. Do not use combustible absorbents such as sawdust.
- Do not flush down drains to sewer. Prevent the passage of material to any drains or surface waters.
- Sodium hypochlorite will cause surfaces to become slippery and slimy.
- Place absorbed material in covered containers. Material may be treated as hazardous waste. Dispose of properly.
- Small fires involving this chemical can be fought with dry chemical, CO2 or water sprays.

Chemical spills originating from outside the plant - Chemical spills occurring off of plant grounds can affect the treatment plant in a number of ways. Transportation accidents involving the trucking of chemicals through town can result in spillage on the roadways, potentially entering manholes or storm drains. Industrial accidents can result in spills or overflows that can be discharged to the sewer system. Fuel oil spills or overflows may enter the sewer line via a homeowner's basement sump pump or illegal floor drain. Homeowners can also dump gasoline, paint thinners or solvents down the sink without realizing the consequences. All of these scenarios have the potential to cause significant damage, either by creating an explosive or flammable situation, thereby threatening human health and safety or by inhibiting or killing the biological process and possibly causing permit violations. Some of these situations you may hear about through established notification procedures, but others may happen without your knowledge.

Prevention and preparedness

- Establish an industrial pretreatment program.
- Identify and inspect all industrial users.
- Establish notification procedures.
- Determine chemical inventories.
- Collect MSDS sheets.
- Enforce sewer use ordinance.
- Conduct public information and outreach activities through mailings, local public access channels, etc.

If you have advanced notification of a spill, petroleum or otherwise

- Any spill involving a transportation related accident would automatically involve the local fire department and other emergency responders. Follow their direction. Fire department's clean-up personnel must be instructed not to flush roadway spills to storm drains and collection system.
- If the spill comes from an industry, notify the fire department.
- Try to contain and isolate the spill if possible. If it has already entered the sewer system, isolate in a pump station or divert to an empty tank.
- Use containment booms if necessary. Call an environmental cleanup firm to dispose of the residuals. For petroleum or gas spills make sure NHDES has been notified, as you may be eligible for cleanup money.
- Thoroughly ventilate the areas impacted by a spill and monitor for explosive gases.
- Gasoline and fuel oils are biodegradable by typical bacteria. In small quantities they will not be toxic, however, it is best to act fast and remove it. Maximize aeration to ensure there is enough to decompose this material and also to aid in stripping out as much as possible.
- If there is no empty tankage, sacrifice one biological train over the others.

- Call your NHDES compliance inspector and the EPA within 24 hours of event awareness and send a detailed letter within 5 days of event awareness.

Response to an unknown spill

- Continuously monitor influent pH to provide you with an early warning system
- Signs of toxicity to the biological process include an increase in turbidity, low oxygen uptake rate, increase in dissolved oxygen, dispersed floc and dead or inactive microorganisms as observed under the microscope, and an increase in effluent ammonia or nitrite.
- For activated sludge processes; switch operating modes from plug flow to contact stabilization or complete mix, reduce RAS to keep the healthy bugs in the clarifier, decrease wasting if protozoa are present but slow, increase wasting if protozoa are absent or dead, seed from another plant if wiped out.
- Maintaining higher solids inventories helps to deal with chemical spills.

Equipment failure - Wastewater treatment plant environments are subject to moisture, corrosion, dust, gases, heat and chemicals. Equipment can and will break down. Developing and practicing a sound maintenance program will ensure the reliability of critical equipment. A reactive or corrective maintenance program, on the other hand, is basically a "run it until it breaks" philosophy. This approach can lead to serious equipment failure at the worst possible time, often resulting in process failure, permit violations or environmental disaster such as sewer overflows.

Ensuring equipment reliability

- Practice a sound maintenance program incorporating regular oil changes and lubrication frequencies, in addition to thermal imaging, oil and vibration analyses for the most critical equipment.
- Maintaining a spare parts inventory so that when a critical component fails, disruption can be kept to a minimum.
- Ensuring that all critical pieces of equipment have an operable backup.
- Developing a practice to exercise seldom run equipment such as generators on a regular basis.
- For equipment that utilizes special tools, make sure those tools are on hand.
- Periodically check electrical connections and switchgear to look for potential problems.

Response to equipment failure

- Isolate the failed piece of equipment and activate the backup unit.
- If necessary, employ portable pumps or generators if a backup is not available.
- Be prepared to call in electricians or qualified repair people if necessary.
- In the event of an extended dewatering equipment failure, be prepared and budget for the hauling of sludge in liquid form or bring in portable dewatering equipment.

Process upsets - Most treatment plants are biological in nature and thus depend upon the activity of bacteria to treat the wastewater. Since they are living organisms, their survival and health are subject to environmental conditions. Toxic chemicals, extreme pH swings, high strength wastes, inadequate aeration and equipment malfunction can all have a detrimental effect on these organisms. All of these situations can lead to a process upset and adversely affect effluent quality.

Process upset avoidance

- Maintain adequate process control and keep good records.
- Enforce an industrial pretreatment program. Inspect industries regularly.
- Maintain a reliable preventative maintenance program.
- Regularly monitor the health of your system by performing routine microscopic exams.
- Use in-situ process monitoring such as pH, D.O., turbidity or TSS meters to be used as early warning systems.

Response to a process upset

- Any noncompliance due to an upset or any violation of a daily maximum NPDES permit limitation must be reported as outlined in the NPDES/Provincial REPORTING OF NON-COMPLIANCE procedures found at the end of this chapter.
- Increase process monitoring until the upset condition has passed.
- Contact NHDES Wastewater Operations for assistance.

Loss of Supervisory Control and Data Acquisition (SCADA) system or alarm functions – Wastewater treatment facilities increasingly rely on automation to run the process, monitor treatment efficiency and monitor collection system pump stations. The simplest of systems consist of basic alarms such as floats in a wet well to alert us if the wet well level is too high or low. Many plants are now implementing more sophisticated control systems such as SCADA which monitors the process and runs equipment in addition to sounding alarms. Either type of system is subject to failure. Proper precautions must be taken to ensure that failure does not occur. System failure can be the result of human error, weather conditions, water damage or individual component failure. SCADA systems are particularly vulnerable to computer hackers or terrorists if the system can be accessed from the internet.

Precautions for basic alarm only systems

- Make sure all critical components are alarmed.
- Periodically test the alarms to make sure they are all in working order.
- Periodically test the transmission and communications system to make sure that if an alarm occurs during periods when the plant is not staffed the person on call will be notified.
- Keep all wet wells free of grease buildup which could interfere with alarm functions.

Precautions for SCADA systems

- The most vulnerable components are the CPU, power supply and communications. A CPU failure results in the complete loss of the SCADA system. A power supply failure results in a complete loss of the SCADA system. A communication system failure can result in the loss of data integrity and transfer, resulting in a partial loss of the SCADA system.
- Assure all processes and systems can be operated manually should the SCADA system fail.
- Make sure computer access is password protected and there is adequate virus protection installed.
- Make sure employees are thoroughly trained in the use of SCADA.
- If the system is internet connected, make sure there is industry standard firewall software installed and that it is updated regularly.
- Make sure you back up data regularly.
- Make sure system computers are located where they will be least likely to be affected by adverse conditions and natural disasters.
- Make sure SCADA computers are dedicated to SCADA only. Do not allow email or other programs to be used on SCADA computers.
- Ensure redundancy by having backup hardware components. If the main CPU goes down, the backup will automatically take over.
- Provide a backup power source capable of lasting for a minimum of four hours.
- Ensure that all SCADA and control wiring is protected within conduit.

Response to an alarm or SCADA system failure

- If the alarm system is armed, any loss of functioning should send an alarm condition. Any type of communications system error should send an alarm. A failure of the SCADA system should send an alarm.
- After receipt of a system failure, verify plant conditions and alarm status by physically going to the plant if it occurs outside of work hours.
- If necessary, call in an appropriate SCADA technician or qualified electrician if it is a simple alarm malfunction. If it is a communications problem, notify the telephone company or your communications carrier and alert them of the problem.
- Visit the plant or pump stations as often as required to verify operational status until the alarm or SCADA system failure is resolved.

Personnel injury – All injuries at wastewater treatment facilities require medical attention in the form of first aid, regardless of severity. Many cases have been reported where a small injury quickly leads to an infection, threatening the health and limb of an employee. Serious injuries require the assistance of medical professionals and transportation to a hospital. First aid refers to medical attention that is usually administered immediately after the injury occurs and at the location where it occurred. It often consists

of a one-time, short-term treatment and requires little technology or training to administer. First aid can include cleaning minor cuts, scrapes, or scratches; treating a minor burn; applying bandages and dressings; the use of non-prescription medicine; draining blisters; removing debris from the eyes; massage; and drinking fluids to relieve heat stress. Employee allergies to specific drugs and medications should be documented and kept up to date and in-house.

Every plant should develop a first aid program. Contact OSHA or the Department of Labor for requirements that may apply to your facility. Conduct a first aid risk assessment that identifies potential causes of workplace injury and illness, assesses the risk of workplace injury and illness, and determines what type of first aid facilities are required to meet the assessed needs. First aid kits should be made available throughout the plant and everyone should know how to use them and where they are located.

These emergency warning signs can be used as a guide to determine when to call 911. If one or more of these signs are present, immediately call 911:

- Prolonged chest pain or pressure;
- Uncontrolled bleeding;
- Difficulty breathing or shortness of breath;
- Choking or vomiting blood;
- Severe pain;
- A weak or non-existent heartbeat when checking for a pulse on the neck (along side the Adam's apple);
- Sudden weakness, change in vision, or dizziness;
- Persistent vomiting or diarrhea;
- Confusion or difficulty arousing;
- Unconsciousness; and
- Injuries to the head, neck or back.

If you need to call emergency services

- Remain calm, be aware of your surroundings, and closely evaluate the scene to protect yourself and others from further injury.
- Do not move critically injured persons unless instructed by emergency medical professionals.
- Do not try to drive someone who is critically ill or injured to a hospital unless there is no way to summon help.
- Listen carefully to the 911 dispatcher's questions. Answer them calmly and quickly.
- Remain on the line until the dispatcher tells you to hang up.
- Relay any known allergies to aid personnel.

Security threats / vandalism / terrorism – Security threats can come in many forms: disgruntled employees, domestic violence in the workplace, upset neighbors, abutters and/orcustomers, domestic & international terrorists, extremist environmental groups, trespassers, and vandals. The damage can range from simple mischief to outright theft, armed or hostile confrontations, bombs, or chemical, biological and even radiological agents. The threat can be limited to a local area of the plant or widespread throughout the city. Notification of a threat may come through several avenues: via law enforcement, the perpetrators themselves, internal security breaches, eyewitness accounts, news media or unusual sewage characteristics.

General security measures

- Make sure the treatment plant and all related equipment are secured with fencing that is resistant to climbing and the gate and all buildings are kept locked when unoccupied.
- Make sure all doors and windows are locked when buildings are unoccupied.
- Install outdoor lighting or motion-activated lights.
- Post No Trespassing signs and state the penalty if convicted of trespassing.
- Ensure that all incoming utilities (electric, natural gas, communication lines, etc.) are protected from accidental or deliberate damage.
- Install intrusion detectors at the perimeter of the facility and building doors.
- Consider closed circuit television monitoring.
- Install security grills for accessible windows, louver openings, roof hatches, culverts, etc.
- Provide locking devices for manhole covers.
- Ensure chemical storage tanks are fully protected from unauthorized access.
- Ensure all exterior doors are made of heavy duty sheet metal with security door hardware.
- Establish a neighborhood watch system for vandal prone areas.
- Have only one access entryway to the plant.
- Keep all vegetation around the perimeter areas trimmed.
- Keep trees and shrubs trimmed back from windows, doors and walkways.
- Ask the police to step up patrols in vandal prone areas.
- Check references prior to hiring anyone. This includes education, previous employers, character references and criminal background checks.
- Use two employees to escort terminated personnel out the gate.
- Track visitors by requiring them to check in first and issue them visitor badges and check out upon exit.
- All employees should wear ID badges.

- Ensure on-site supervision for all outside contractors.
- Apply these security items to all pump stations and collection system facilities.

Response to vandalism

- Notify the police immediately upon detection.
- Before entering, assess the area to make sure the vandals are still not there. You may have no idea who did the damage or what the motive could have been. They could be armed and may resist if confronted. If the situation looks like it could be more than just broken windows or graffiti painted walls, wait for the police to arrive before entering the area.
- After the site is deemed safe, assess the damages and restore service if it has been disrupted.
- Document any damage with photos for insurance purposes.

Response to a telephone threat from the perpetrator

- Take all threats seriously.
- Remain calm and get as much information from the caller as you can.
- Listen carefully, be polite and show interest.
- Pay attention to the caller's voice, accent, demeanour, background noises, anything that can help the police.
- Find out where and when the threat will be carried out.
- Call 10111 immediately.

Response to workplace violence – Workplace violence can result from domestic or family problems, termination of employment, disciplinary actions, on-going conflicts between employees, or financial problems at home. It can result in threats, physical altercations, or any conduct that creates an intimidating, offensive or hostile environment. Potential warning signs may be: verbal, nonverbal or written threats; new or increased stress at home or at work; expressions of hopelessness or anxiety; fascination with weapons or violence; insubordinate behaviour; dramatic change in work performance; drug or alcohol abuse; and externalization of blame

- Be aware of what is going on around you.
- Contact your supervisor or your Human Resources Department if you notice any unusual, troubling, or suspicious behaviour.

Response to face-to-face escalated behaviour and threats from an outsider

- As far as possible, meet any demands – DO NOT ARGUE!
- DO NOT MAKE PROMISES, just say: "I hear what you are saying".
- Immediately write down a description of the individual. Include clothing, scars, glasses, speech, the way they walked, license plate of vehicle, etc.
- Notify the police if a threat or an assault occurred.

- Contact your supervisor and Human Resources department.

Response to an armed intruder

- Never take any action that will put your safety or life or of that of your coworkers in jeopardy!
- Never restrain or forcibly evict an angry or armed person from the premises.
- Evacuate occupants away from the danger area, but do not draw attention to the evacuation.
- DO NOT sound the fire alarm. This may send people directly into the possible line of fire.

Response to bomb threats or suspicious packages

- Work with police to determine whether the building must be evacuated.
- Be on the lookout for unusual objects which could be a bomb.
- Leave file cabinets unlocked and doors open so authorities can quickly and easily search the premises.
- When evacuating, take personal belongings such as handbags, objects or parcels which may appear suspect to searchers.
- Turn off personal computers, fans and other devices under your control which emit noise, so authorities can listen for unusual sounds.
- DO NOT ever touch or move a suspicious object.
- DO NOT turn light switches on or off as this may detonate a bomb.
- DO NOT use two way radios, cell phones, or other radio signal emitting devices within 150 meters of a threatened building, as this may detonate a bomb.
- If time permits, open windows as this may help to vent any explosion.

Response to the threat of a deliberate dumping of contaminants into the sewer

- Immediately call 911 for any threat involving the deliberate dumping of chemicals or contaminants and provide as much information as possible. If the contaminant has been identified, and if the emergency responders agree, ventilate the headworks building and any pump stations that may be affected by the chemical to avoid
- the buildup of hazardous fumes. Do not do this if the threat is known to be biological or radiological in origin. Emergency responders should make this decision so as not to spread the agent more than need be.
- Trap and remove the chemical contaminant in the collection system if possible or divert to empty tanks upon reaching the plant. Isolate pump station if possible to prevent further flow of contaminants.

Labor strikes – Most of New Hampshire's wastewater treatment facilities are publicly owned and operated. Labor strikes by public employees in New Hampshire are illegal by statute, making a labor strike unlikely in a publicly operated plant. However, municipal plants operated by contract operations firms may experience labor unrest. This possibility should be covered in the contract between the

contract operations firm and the municipality. A contract operator may be able to bring in substitute workers from other facilities that they operate in the event of a localized strike. Union contractors (electricians, plumbers) working on upgrade projects for the treatment facility may go on strike, temporarily disrupting the project's work schedule, but otherwise having little effect on plant operations. In the event of a strike involving plant operators or maintenance people, a community can request help from another treatment plant, or a contract operator can be hired to provide needed manpower on a short-term basis.

AFTER THE EMERGENCY / RECOVERY PHASE

- Designate a recovery manager and provide this person with adequate time to do this job.
- Complete a detailed evaluation of all affected components and determine priorities for repair, reconstruction or replacement.
- Coordinate all vendor and contractor activities.
- Coordinate the completion of emergency repairs and schedule permanent repairs.
- Notify key regulatory agencies of emergency repair status and the scheduled completion of system repairs.
- Document all recovery activities including labor, equipment and materials expenses for potential disaster assistance from the state or federal government.
- Take measures to protect employees, contract workers and the public from hazardous exposures.
- Restore all telecommunications, data processing and similar services to full operation.

EMERGENCY PLAN APPROVAL, UPDATE AND TRAINING

The emergency response plan should be reviewed, updated and critiqued under any of the following conditions:

- Annually, with contact list updated every three months;
- Following an emergency response training exercise or an actual activation of the emergency response plan;
- Within two months of any significant plant modification, pump station upgrade or wastewater system change; Whenever there is a change in the roles, the responsibilities, or the individuals involved in response activities;
- Whenever internal or external contact information changes;
- Training, exercises and drills should be conducted at least annually or whenever new employees are hired, new equipment or materials are introduced, or procedures are updated or revised;

- Training can take place in the form of orientation sessions for new employees, written tests, tabletop workshops using a fabricated event, functional exercises designed to simulate a real major event, and full-scale drills utilizing actual emergency response personnel and equipment; and
- Each plan update should be reviewed and approved by management with input from the appropriate local emergency responders.

ANNEXURE J: TITLE DEEDS

A. VIR AKTEBESORGER SE GEBRUIK / FOR CONVEYANCER'S USE

Notas / Notes:

B. VIR AKTEKANTOOR / FOR DEEDS OFFICE USE

Interdikte nagesien deur Interdicts checked by ..... Datum Date.....	(1) Dorp goedgekeur (geproklameer) Township approved (proclaimed) (2) Begiftiging Endownment erven..... (3) Begiftiging Endownment..... (4) Voorwaardes Conditions..... (5) Mikro Micro..... (6) Algemene plan General plan..... (7) Titelakte Title deed..... (8) Verbande teen dorpstitel Bonds against township title..... (9) Datum nagesien Date checked.....	Opmerkings Remarks	Paraaf Initials
Interdikte nagesien deur Interdicts checked by ..... Datum Date.....			

Kantoor instruksies / Office instructions:

Seksie / Section ,

(Brief description of property (only para. 1 in Deed) / (Kort beskrywing van eiendom (slegs para. 1 in Akte)

Ptn 32 (Ptn of R/E Ptn 1) Farm Boekenhoutkraal 529 R/E Ptn 1 Farm Boekenhoutkraal 529

REGISTRASIE / REGISTRATION

LIEBENBERG MALAN LIEZEL HORN INC

LMLH
Prokureurs / Attorneys
2026
M MARAIS
Tel: 012 460 4149

A. VIR AKTEKANTOOR / FOR DEEDS OFFICE USE

(a) Datum van indiening Date of lodgement	(b) Gelyktydiges nie ingedien nie Simuls not lodged	(c) Regstellings Rectifications
LODGED 2022 -09- 12 PRETORIA DEEDS	MUST BE REGISTERED BY 2022 -09- 27 DEEDS OFFICE PRETORIA	

Ondersoekers Examiners	Kamer Room	Skakeling Linking	Verwerp Reject	Passeer Passed
1 M.L THOBEJANE				
2		FINAL BL... DATA 2022 -12- 23 DEEDS PRETORIA		
3 MOKALAPA MB				

B. (a) VIR AKTEBESORGER SE GEBRUIK / FOR CONVEYANCER'S USE

Verwysings No. / Reference No.	Skakeling / Linking
YG|E118	T000024551\2022

GELYKTYDIGES / SIMULS

	Kode Code	Name van Partye Names of Parties	Firma Firm No.	No. in Stel Batch	Titelaktes ens. binne Titles etc. within
1	VA	Reg 68(1)	2026	1	
2	VA	Reg 68(1)	2026	2	
3	BC	Reg 68(11)	2026	3	
4	BC	Reg 68(11)	2026	4	
5	T	Emjul Properties / Graafhpoort	2026	5	
6					
7					
8					
9					
10					

DOCUMENTS:
NOTES:

(b) GELYKTYDIGES MET ANDER REGISTRASIEKANTORE / DEELTITELS: SIMULS WITH OTHER REGISTRIES / SECTIONAL TITLES:

	Kode Code	Firma Firm	Eiendom Property	Kantoor Office
1				
2				
3				
4				

Registrasie Versoek deur / Registration Requested by:

Datum / Date:

010015722636

2026

Liebenberg Malan Liezel Horn Incorporated
407 Atterbury Road
Menlopark
Pretoria
Tel: (012) 460 4149

Prepared by me

CONVEYANCER
MORNE MARAIS
(M27466)

T 000074551/2022

DEED OF TRANSFER

BE IT HEREBY MADE KNOWN THAT

RONELL ERASMUS (M23159)

appeared before me, the Registrar of Deeds at Pretoria, the said appearer, being duly authorised thereto by a power of attorney granted to her by

EMJUL PROPERTIES CC
Registration Number 1996/000845/23

signed at LANSERIA on 8 AUGUST 2022

And the appearer declared that:

Whereas the Transferor had truly and legally sold the undermentioned properties on **8 December 2021** by Private Treaty

Now therefore the Appearer on behalf of the Transferor, did by these presents, cede and transfer to and on behalf of

GROWTHPOINT PROPERTIES LIMITED
Registration Number 1987/004988/06

its successors in title or assigns, in full and free property

1. **PORTION 32 (A PORTION OF PORTION 1) OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG**

   MEASURING 4,2337 (FOUR COMMA TWO THREE THREE SEVEN) HECTARES

   FIRST REGISTERED AND STILL HELD BY CERTIFICATE OF REGISTERED TITLE NUMBER T35361/2009 WITH DIAGRAM SG NUMBER 469/2008 RELATING THERETO

SUBJECT TO THE FOLLOWING CONDITIONS:

A. "GEREGTIG tot 'n reg van weg van en na Gedeelte D van die plaas gehou onder Akte van Verdelings-transport No. 922/1936 oor gedeelte B en die resterende gedeelte van die plaas groot as sulke 82,6305 Hektaar gehou onder Aktes van Verdelingstransport No. 9224/1936 en 9226/1963 respektiewelik soos aangetoon op die kaart van voormelde gedeelte B en die resterende gedeelte."

B. Onderhewig aan 'n Ewigdurende Serwituut gehou kragtens Akte van Serwituut vir Paddoeleindes 630 m² groot soos voorgestel deur die figuur a B c a volgens Kaart LG No. 469/2008 hierby aangeheg.

C. The portion is subject to servitudes for municipal purposes in favour of the local authority, 2m wide along any one boundary and 5 m wide along any other boundary. The position of these servitudes will be on boundaries other than road boundaries, as determined by the local authority, provided that the local authority may dispense with any servitude.

D. No building or other structures shall be erected within the aforesaid servitude area and no large rooted trees shall be planted within the area of such servitude or within 2 m thereof.

E. The local authority shall be entitled to deposit temporarily on the land adjoining the aforesaid servitude such material as may be excavated by them during the course of the construction, maintenance or removal of such sewerage mains and other works as it, in its discretion may deem necessary and shall further be entitled to reasonable access to the said land for the aforesaid purpose subject to any damage being done during the process of the construction, maintenance or removal of such sewerage mains and other works being made good by the local authority.

AND FURTHER SUBJECT to all such conditions as are mentioned or referred to in the aforesaid deed/s.

2. **REMAINING EXTENT OF PORTION 1 OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG**

MEASURING 4,2469 (FOUR COMMA TWO FOUR SIX NINE) HECTARES

FIRST TRANSFERRED BY DEED OF TRANSFER NUMBER T9225/1936 WITH DIAGRAM ANNEXED THERETO AND HELD BY DEED OF TRANSFER NUMBER T34954/1979

SUBJECT to the following special condition:

A. GEREGTIG tot 'n reg van weg van en na Gedeelte D van die plaas gehou onder Akte van Verdelingstransport No. 9225/1936 oor gedeeltes B en die resterende gedeelte van die plaas groot as sulke 82, 6305 Hektaar gehou onder Aktes van Verdelingstransport No. 9224/1936 en 9226/1936 respektiewelik, soos aangetoon op die kaarte van voormelde gedeelte B en die resterende gedeelte."

B. Onderhewig aan 'n ewigdurende serwituut vir paddoeleindes, 630 m² groot, onteien en gesedeer aan Stadsraad van Krugersdorp, soos meer volledig sal blyk uit Notariele Akte Nommer K3726/1991 gedateer 9 Augustus 1991.

AND FURTHER SUBJECT to all such conditions as are mentioned or referred to in the aforesaid deed/s.

WHEREFORE the appearer, renouncing all the right and title the said

EMJUL PROPERTIES CC

heretofore had to the premises, did, in consequence also acknowledge them to be entirely dispossessed of, and disentitled to, the same; and that, by virtue of these presents, the said

GROWTHPOINT PROPERTIES LIMITED

its successors in title or assigns, now is and henceforth shall be entitled thereto, conformably to local customs; the State, however, reserving its rights, and finally acknowledging that the purchase price is the amount of **R40 000 000,00 (Forty Million Rand).**

IN WITNESS WHEREOF I, the said Registrar, together with the appearer, have subscribed to these presents, and have caused the seal of office to be affixed thereto.

THUS DONE AND EXECUTED at the Office of the Registrar of Deeds at Pretoria on

26 SEP 2022

Signature of appearer *q.q.*

In my presence

Registrar of Deeds

2026

Liebenberg Malan Liezel Horn Incorporated
407 Atterbury Road
Menlopark
Pretoria
Tel: (012) 460 4149

Prepared by me

CONVEYANCER
MORNE MARAIS
(M27466)

POWER OF ATTORNEY TO PASS TRANSFER

I, the undersigned

LOUISE ANNE DE LUCA
duly authorised hereto by a resolution of the Members of
EMJUL PROPERTIES CC
Registration Number 1996/000845/23

Do hereby nominate, constitute and appoint

MORNE MARAIS (M27466) or RONELL ERASMUS (M23159) or LENSKA CECILIA KOEKEMOER (M27967) or YVETTE ERASMUS (M23674) or ELNE GERBER (M38465) or MICHEAL JOHNSON (M26696)

with the power of substitution to be my true and lawful attorney and agent in my name, place and stead to appear before the Registrar of Deeds at Pretoria, or any other competent official in the Republic of South Africa

And then and there to declare that the Transferor did on **8 December 2021** sell by Private Treaty the undermentioned properties to

GROWTHPOINT PROPERTIES LIMITED
Registration Number 1987/004988/06

the following properties:

1. **PORTION 32 (A PORTION OF PORTION 1) OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG**

   MEASURING 4,2337 (FOUR COMMA TWO THREE THREE SEVEN) HECTARES

   HELD BY CERTIFICATE OF REGISTERED TITLE NUMBER T35361/2009

2. **REMAINING EXTENT OF PORTION 1 OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG**

   MEASURING 4,2469 (FOUR COMMA TWO FOUR SIX NINE) HECTARES

   HELD BY DEED OF TRANSFER NUMBER T34954/1979

for the sum of **R40 000 000,00 (Forty Million Rand)**

And further cede and transfer the said properties to the said transferee; to renounce all right, title and interest which the Transferor heretofore had in and to the said properties, and generally, for effecting the purposes aforesaid, to do or cause to be done whatsoever shall be requisite, as fully and effectually, to all intents and purposes, as Transferor might or could do if personally present and acting therein, hereby ratifying, allowing and confirming all and whatsoever the said agent shall lawfully do or cause to be done in the premises by virtue of these presents.

Signed at LANSERIA on 8 AUGUST 2021 in the presence of the undersigned witnesses.

WITNESSES:

1. _____

2. _____

_____
LOUISE ANNE DE LUCA

L M M
Prokureurs / Attorneys
2026
M MARAIS
Tel:012 460 4149

SARS

Transfer Duty Declaration

TDREP

Reference Details

Transfer Duty Reference Number: TDE04F43C4

Details

Details of Seller / Transferor / Time Share Company

Surname / Registered Name	EMJUL PROPERTIES CC	Full Name	
Company / CC / Trust Reg No.	199600084523	Marital Status	

Details of Purchaser / Transferee

Full Name		Surname / Registered Name	GROWTHPOINT PROPERTIES LIMITED
Company / CC / Trust Reg No.	198700498806	Marital Notes if applicable	

Details of the Property

Date of Transaction/Acquisition (CCYYMMDD)	2021-12-08				
Total Fair Value	R	40000000.00	Total Consideration	R	40000000.00

Calculation of Duty and Penalty / Interest

Transfer Duty Payable on Natural Person	R	40000000.00

Property Description

1	PORTION 32 (A PORTION OF PORTION 1) OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG MEASURING 4,2337 (FOUR COMMA TWO THREE THREE SEVEN) HECTARES
2	REMAINING EXTENT OF PORTION 1 OF THE FARM BOTESDAL 529, REGISTRATION DIVISION JQ, PROVINCE OF GAUTENG MEASURING 4,2469 (FOUR COMMA TWO FOUR SIX NINE) HECTARES

Receipt

Receipt Details

Transfer Duty Reference Number	TDE04F43C4	Receipt No.	1200977977
Receipt Amount	R 4875933.34		

Declaration by Conveyancer / Attorney

I certify that this is a true copy of the transfer duty ~~declaration~~ / receipt / ~~exemption certificate~~ drawn from the SARS eFiling site, which will be retained by me for 5 years from the date of registration of transfer.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Please ensure you sign over the 2 lines of "X"s above

Morné Marais

Date (CCYYMMDD) 20220823

For enquiries go to www.sars.gov.za or call 0800 00 SARS (7277)

L M M
Prokureurs / Attorneys
Joburg 2026
M MARAIS
Tel:012 460 4149

Certificate Number : **5100528219**

SCHEDULE

CERTIFICATE IN TERMS OF SECTION 118 OF THE LOCAL GOVERNMENT MUNICIPAL SYSTEM ACT, 2000 (ACT No. 32 OF 2000) (AS PRESCRIBED IN TERMS OF SECTION 120 OF ACT No. 32 OF 2000)

ISSUED BY CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY

In terms of section 118 of the Local Government: Municipal Systems Act, 2000 (Act 32 of 2000), it is hereby certified that all amounts that became due to the City of Johannesburg Metropolitan Municipality in connection with the below-mentioned property situated within that municipality for municipal service fees, surcharge on fees, property rates and other municipal taxes, levies and duties during the two years preceding the application for this certificate have been fully paid.

21 Digit Code (or Municipal Reference Number)	:	**T0JQ00005290000052900001RE**
Erf Number	:	**00000529**
Portion	:	**00001**
Extension	:	**RE**
Zoning	:	**UNDETERMINED**
Registration division / Administrative District	:	
Suburb	:	**BOTESDAL 529-JQ**
Town	:	
Sectional Title Unit number	:	
Exclusive use area and number as referred to on the registered plan	:	
Real Right	:	
Scheme registration number	:	
Sectional Title Scheme Name	:	
Registered Owner	:	**EMJUL PROP (PTY) LTD**
Name and ID/ Registration No. of all purchaser/s	:	**1987/004988/06 ,**

This certificate is valid until : **30.11.2022**

MUNICIPAL MANAGER
CITY OF JOHANNESBURG MUNICIPALITY

Date Issued : **06.09.2022**

Signed by:Solofela Elizabeth Motomele
Signed at:2022-09-06 11:50:05 +02:00
Reason:I approve this document
Authorised Official : .....

Certificate By Conveyancer:

I, **Morné Marais** (full name and surname)
hereby certify that this is a printout of a data message in respect of the original clearance certificate electronically issued by the City of Johannesburg Municipality.

Conveyancer

2022-09-07
Date

CONVEYANCING CERTIFICATE

I, the undersigned

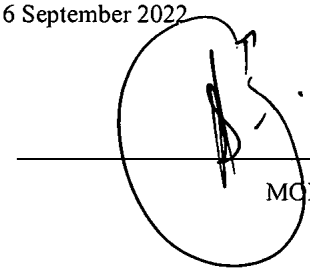
MORNE MARAIS (M27466)

being an admitted attorney and conveyancer do hereby declare and confirm that the full name and ID/Registration Number of the Purchaser on the attached clearance certificate issued by City of Johannesburg Metropolitan Municipality on 6 September 2022 should read as:

GROWTHPOINT PROPERTIES LIMITED
Registration Number 1987/004988/06

The incorrect description occurred due to a space limitation, and can I further confirm that it is covers the one and the same entities.

DONE AND SIGNED AT PRETORIA ON THIS 6 September 2022



MORNE MARAIS

Joburg

LMM
Prokureurs / Attorneys
2026
M MARAIS
Tel:012 460 4149

Certificate Number : **5100526472**

SCHEDULE

CERTIFICATE IN TERMS OF SECTION 118 OF THE LOCAL GOVERNMENT MUNICIPAL SYSTEM ACT, 2000 (ACT No. 32 OF 2000) (AS PRESCRIBED IN TERMS OF SECTION 120 OF ACT No. 32 OF 2000)

ISSUED BY CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY

In terms of section 118 of the Local Government: Municipal Systems Act, 2000 (Act 32 of 2000), it is hereby certified that all amounts that became due to the City of Johannesburg Metropolitan Municipality in connection with the below-mentioned property situated within that municipality for municipal service fees, surcharge on fees, property rates and other municipal taxes, levies and duties during the two years preceding the application for this certificate have been fully paid.

21 Digit Code (or Municipal Reference Number)	:	**T0JQ00005290000052900003200**
Erf Number	:	**00000529**
Portion	:	**00032**
Extension	:	**00**
Zoning	:	**UNDETERMINED**
Registration division / Administrative District	:	
Suburb	:	**BOTESDAL 529-JQ**
Town	:	
Sectional Title Unit number	:	
Exclusive use area and number as referred to on the registered plan	:	
Real Right	:	
Scheme registration number	:	
Sectional Title Scheme Name	:	
Registered Owner	:	**EMJUL PROP CC**
Name and ID/ Registration No. of all purchaser/s	:	**1987/004988/06 ,**

This certificate is valid until : **30.11.2022**

MUNICIPAL MANAGER
CITY OF JOHANNESBURG MUNICIPALITY

Date Issued : **25.08.2022**

Authorised Official: Signed by:Sololela Elizabeth Matomela
Signed at:2022-08-25 11:22:36 +02:00
Reason:I approve this document

Certificate By Conveyancer:

I.....**Morné Marais**.....(full name and surname) hereby certify that this is a printout of a data message in respect of the original clearance certificate electronically issued by the City of Johannesburg Municipality.

Conveyancer

29-08-2022
Date

CONVEYANCING CERTIFICATE

I, the undersigned

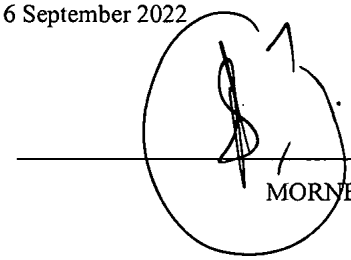
MORNE MARAIS (M27466)

being an admitted attorney and conveyancer do hereby declare and confirm that the full name and ID/Registration Number of the Purchaser on the attached clearance certificate issued by City of Johannesburg Metropolitan Municipality on 25 August 2022 should read as:

GROWTHPOINT PROPERTIES LIMITED
Registration Number 1987/004988/06

The incorrect description occurred due to a space limitation, and can I further confirm that it is covers the one and the same entities.

DONE AND SIGNED AT PRETORIA ON THIS 6 September 2022



MORNE MARAIS