SFD Report

George Local Municipality, Western Cape, South Africa

Final Report

This SFD Report - Initial - was prepared by George Local Municipality

Date of production: 29/07/2025

Last update: 27/11/2025

SFD Report George Local Municipality, South Africa, 2025

Produced by:

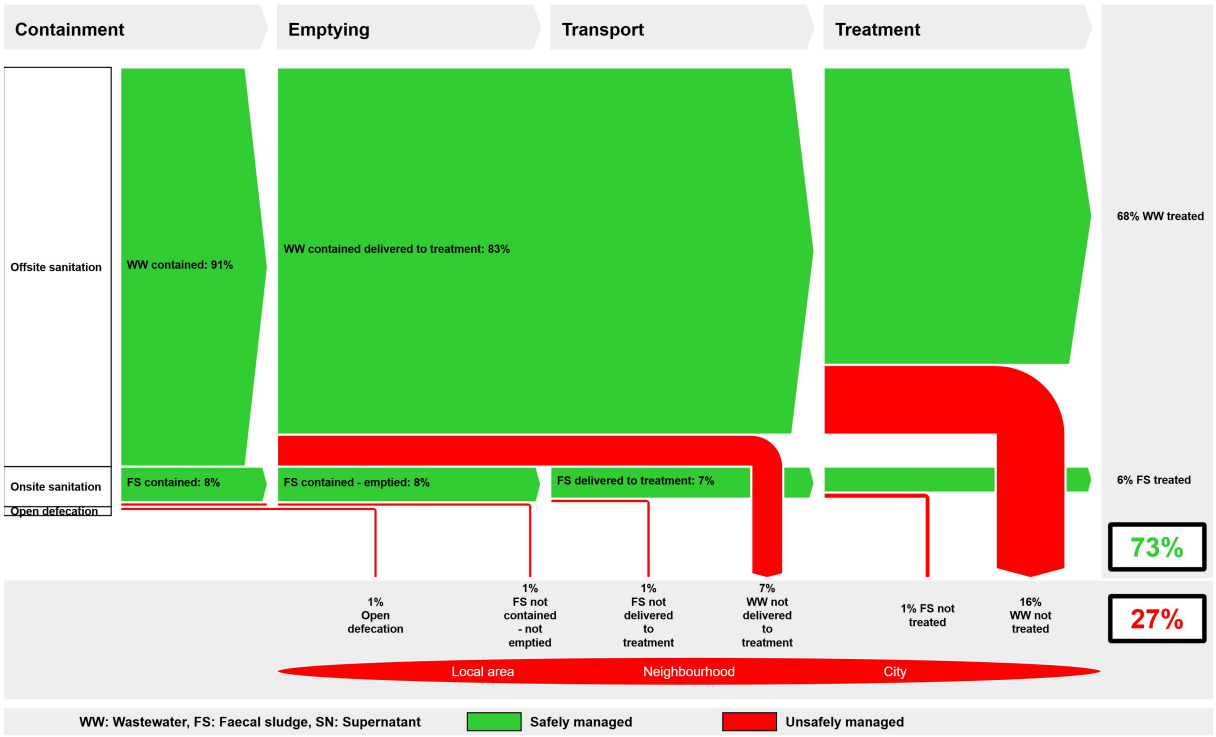
George Local Municipality

This Executive Summary and SFD Report are available from: www.sfd.susana.org

1. The SFD Graphic

George Local Municipality, Western Cape, South Africa
Version: Reviewed
SFD Level: 1 - Initial SFD

Date prepared: 29 Aug 2025
Prepared by: George Local Municipality



The SFD Promotion Initiative recommends preparation of a report on the city context the analysis carried out and data sources used to produce this graphic.
Full details on how to create an SFD Report are available at sfd.susana.org

2. Diagram information

SFD Level: Initial

Produced by:

George Local Municipality (GLM)

Collaborating partners:

- Partners in Development (PID)
- Water Group
- GIZ

Status: Final

Date of production: 29/07/2025

3. General city information

George Local Municipality (LM) is situated in the Garden Route District Municipality in the Western Cape Province of South Africa. It has a land area of 5,191 km2 that covers the Southern Cape and Little Karoo Regions of the Western Cape (George Municipality, 2025b).

The municipality has a population of 294,929 people in 85,931 households (Stats SA, 2022). George LM has 28 municipal wards. The average household size is 3.5 persons, which is the third highest in the district. The town of George has the highest population in the local municipality and the Garden Route District Municipality due to its economic activities and social amenities.

It is the most densely populated municipal area in the region due to its administrative role and economic activity within the Garden Route District Municipality. The municipality's population density was approximated at 46.3 persons/km^2, and this is expected to grow to 47 persons/km^2 in 2025, and 47.7 persons/km^2 in 2026. Thembalethu is the most densely populated area due to growth of informal settlements. The 2024 mid-year population estimate projected average annual population growth rate of 1.2% between 2023 and 2029 (George Municipality, 2025b).

4. Service outcomes

99% of households in George LM have access to some sort of sanitation technology. 0.5% of George LM households have damaged, failed, collapsed or flooded toilets. These are plain pit toilets, assumed to be damaged, and include "other toilet provision, below min. service level". 0.5% of household within the municipality practise open defecation.

90.6% of households utilise off-site sanitation facilities. These are all recorded as toilets discharging directly to a centralised foul / separate sewer.

8.6% of households utilise on-site sanitation facilities as presented below:

- 1.4% utilise septic tanks connected to soak pits
- 6.7% utilise impermeable / permeable tanks. These are fully lined tanks which are sealed and have no outlet or they overflow. 1% of households report using bucket toilets which they empty themselves, and these are assumed to be discharged/emptied to a water body/open ground. 5.7% of households use tanks with no outlet/overflow. These tanks include chemical toilets, "other non-waterborne toilets above min. service level", and 1/2 of septic tanks/conservancy, also includes “bucket toilets” serviced by the municipality.
- 0.4% utilise any type of pit toilets that are never emptied or are abandoned when full but not adequately covered with soil.

The SFD graphic shows that excreta from 73% of households is safely managed, and 27% is unsafely managed. Approximately 91% of wastewater is safely transported to treatment, and of that, approximately 81% is fully treated. It is assumed that 100% of faecal sludge from on-site systems is emptied, with 90% reaching the WWTW and 81% fully treated. 1% is not contained and not emptied.

5. Service delivery context

The service delivery context in George Local Municipality is governed by a comprehensive national and local framework that recognises sanitation as a basic right, anchored in the Constitution and the Water Services Act (1997), which requires Water Services Authorities to prepare Water Services Development Plans integrated into municipal Integrated Development Plans (IDPs).

George Municipality enforces updated Water Supply and Sanitation Services By-laws (2023) and an Indigent Policy that supports low-income households, while institutional responsibilities across national, provincial, district, and local levels—ranging from policy formation, funding, regulation, and technical oversight to infrastructure development and community engagement—collectively shape sanitation service delivery.

Monitoring and reporting mechanisms such as the IDP, annual performance reports, water quality and effluent monitoring, customer care platforms, external audits, and tracking of indigent households ensure accountability, transparency, and continuous improvement in sanitation services across the municipality.

6. Overview of stakeholders

Table 1 shows an overview of stakeholders in George Local Municipality.

Table 1: Overview of stakeholders.

Key Stakeholders	Institutions / Organizations /
Public Institutions	DWS, SALGA, COGTA, SALGA, WRC, GRDM, GLM municipal officials (Planning, Human Settlements and Civil Engineering Departments), Western Cape Provincial Government, Eskom & other institutions
Political	Councillors and Ward Committees
Non-governmental Organizations	NGOs, Labour Unions, Community, Farmers, Informal Settlement Support Program (ISSP) Forum
Private Sector	Private emptiers, Industry & Business, Farmers
Others	Academia (Universities), Researchers

7. Process of SFD development

The SFD Initial Report was developed following the standard development process stipulated in the SA-SFD Draft Manual, Version 1.0. George LM utilised data from sources that has been referenced in this report to classify household access to sanitation technologies and estimate operational information along the service chain. Data sources and approaches were agreed to during a workshop that included representatives from Civil Engineering and Human Settlements Directorates. There are some data gaps where assumptions were made during development of this SFD report.

8. Credibility of data

Credible and reliable data sources were used in the development of this report.

This report was developed using data from the 2022 Census (Stats SA), George Water Services Audit 2024-2025 (Revision 23 Oct 2025), George's IWA Water Balance (updated under the GIZ LCCR project), and the 2023 Green Drop Progress Report (DWS). George LM also supplied data on wastewater flows for analysis.

Key informant interviews and focus group discussions were conducted to gather data on on-site sanitation systems in informal settlements. Some assumptions were used to fill in data gaps relating to the emptying, transport, and treatment of wastewater and faecal sludge, as this data is currently not available. There are data gaps relating to transport of faecal sludge and potential hazards to groundwater. The soil and groundwater level data were also not available.

9. List of data sources

The list of data sources to produce this executive summary are:

- George Municipality 5th Generation Integrated Development Plan 2022-2027, 2025/2026 Final Reviewed IDP
- George Municipality: Annual Water Services Development Plan Performance- and Water Services Audit Report for 2024-2025
- George Municipality. (2025b). Integrated Development Plan 2025-2027: 2025/2026 Final Reviewed IDP.
- Operational data on WWT provided by the municipality
- Municipalities of South Africa Website
- Stats SA. (2022). Census.
- SuSanA Website.

SFD George LM, South Africa, 2025

Produced by:

George Local Municipality

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Table of Content

List of tables

List of figures

Abbreviations

ADWF	Average Dry Weather Flow
CRR	Cumulative Risk Rating
DM	District Municipality
DHS	Department of Human Settlements
DWS	Department of Water and Sanitation
FS	Faecal Sludge
GDPAT	Green Drop Progress Assessment Tool
GRDM	Garden Route District Municipality
GLM	George Local Municipality
IDP	Integrated Development Plan
KL/D	Kilo Litres Per Day
LM	Local Municipality
Mℓ/D	Mega Litres Per Day
SFD	Excreta Flow Diagram
SIV	System Input Volume
SN	Supernatant
WSA	Water Services Authority
WSDP	Water Services Development Plan
WW	Wastewater
WWTWs	Wastewater Treatment Works

1 City context

The Constitution of South Africa classifies municipalities into three categories: A, B, and C. Category A municipalities are metropolitan areas with a major urban core. Category C municipalities are District Municipalities (DMs) that include one or more Local Municipalities (LMs which are Category B). George Local Municipality (GLM) is a Category B Municipality within the Garden Route District Municipality (GRDM) in the Western Cape Province. It is also a Water Services Authority (WSA) with the authority and responsibility to provide water services within its area of jurisdiction in line with the Constitution of South Africa. As a WSA, GLM also manages and maintains its water and sanitation infrastructure.

Figure 1: George Local Municipality and surrounding local municipalities (Source: Municipalities of South Africa, n.d.)

GLM is bordered by the Oudtshoorn and Mossel Bay Municipal areas in the west and north-west of the Western Cape province within the Garden Route District. It also shares borders with the Dr Beyers Naude and Kou-Kamma Municipal areas to the north, north-east and eastern parts of the Eastern Cape province (Figure 1). GLM is bordered by the Knysna and Bitou Municipalities to the south and southeastern parts of the Western Cape province within the Garden Route District (Integrated Development Plan 2022-2027, 2025/2026 Final Reviewed IDP). The land area of GLM is 5,191 km^2, and it covers the Southern Cape and Little Karoo Regions of the Western Cape.

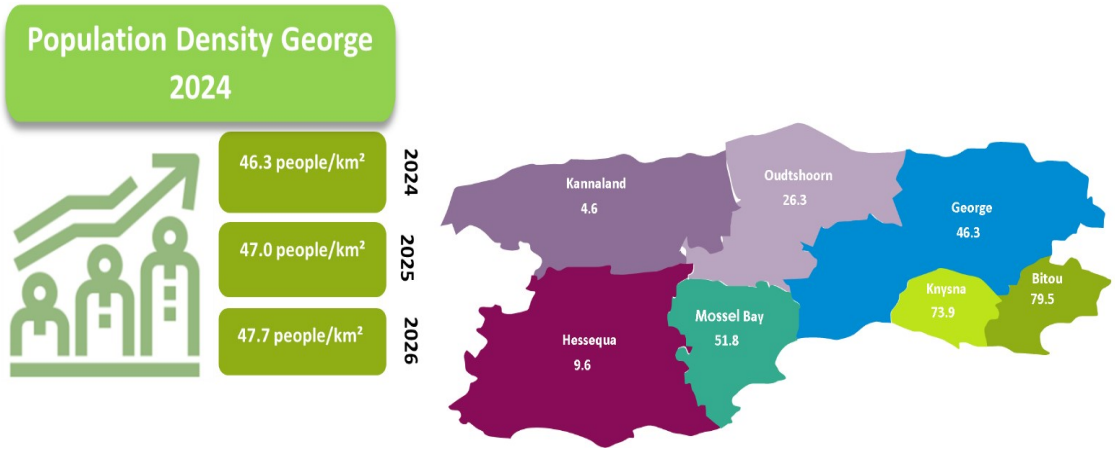

Figure 2: George LM's Level of Urbanisation and Population Density (Source: George Municipality 5th Generation Integrated Development Plan 2022-2027, 2025/2026 Final Reviewed IDP).

George LM is the most densely populated municipal area in the region due to its administrative role and economic activity within the Garden Route District Municipality. The municipality's population density was approximated at 46.3 persons/km^2, and this is expected to grow to 47.0 persons/km^2 in 2025, and 47.7 persons/km^2 in 2026. Thembalethu is the most densely populated area due to growth of informal settlements (Figure 2).

The municipality has a population of approximately 294,929 people in 85,931 households (Stats SA, 2022). It has a total of 28 municipal wards. The average household size in GLM is 3.5 persons. The town of George has the highest population in the local municipality and the GRDM due to its economic activities and social amenities. The average annual population growth rate is estimated to be 1.2% between 2023 and 2029 (George Municipality 5th Generation Integrated Development Plan 2022-2027, 2025/2026 Final Reviewed IDP).

The George city is the main urban centre of the municipality with 84% of the municipal population residing there. The remaining 16% of the municipal population resides in Wilderness, Uniondale and Haarlem. There is a huge in-migration to the city with the rural population reducing. 9% of the municipal population is rural.

The most common sanitation service type in George LM is flush toilets connected to sewerage, with 90.6% of households having access to this service as of the 2022 Census. In terms of climate, the southern region of the Outeniqua Mountain range in George LM experiences year-round rainfall while the northern regions experience higher temperatures and lower rainfall. Temperature varies between 8^0 C and 24^0 C. The warm season lasts for 3.1 months, from December to March, with an average daily high temperature above 23^{0}C. The hottest month of the year is February with an average high of 24^{0}C and low of 16^{0}C. The cool season lasts for 4 months from June to October with an average daily high temperature of 19^{0}C. The coldest month of the year is July with an average low of 8^{0}C and a high of 18^{0}C. George experiences some seasonal variation in monthly rainfall. The month with the most rainfall is April with an average rainfall of 36 millimetres and the month with the least rain is January with an average rainfall of 23 millimetres (Weather Spark, 2025)

The GLM average groundwater level is yet to be confirmed. A groundwater testing pilot project was implemented by the municipality. As an interim assessment, the Department of Water and Sanitation's National Groundwater Archive provides water table levels of registered boreholes in the municipal area. Many parts of the municipality have groundwater between 2-5 metres below ground level, while it is deeper in some areas. Some of the population relies on groundwater for their drinking water, but that is assumed to only be used by 1-25% of the population. Thus, the groundwater risk is assumed to be "low".

2 Service Outcomes

2.1 Overview

The sanitation service outcomes for containment in GLM were analysed primarily based on 2022 Census from Statistics SA. The service chain for each containment system was analysed using available operational data and some assumptions. The data sources used for each aspect of the service chain are described below, followed by the SFD Selection Grid and SFD Matrix generated using this data.

2.1.1 Containment systems

Two data sets were considered George Water Services Audit for 2024-2025 and the 2022 Census from Stats SA. There were some discrepancies between the two data sets, as the Water Services Audit information is still modelled from the 2011 Census. Thus, the Census 2022 data was selected as the more accurate data source. The George Municipality officials also indicated that the Census data appeared to better represent the split between on-and off-site sanitation systems (Table 1).

Table 1: Number of households using different containment types in George Municipality and the correponding system according to the SFD PI (Stats SA, 2022).

Census Category	Census 2022	SFD PI methodology
Flush toilet (connected to sewerage system)	77,868	T1A1C2
Flush toilet (with septic tank)	2,350	T1A2C5
Chemical Toilet	1,625	T1A3C10
Pit toilet with ventilation (VIP)	371	T1B8C10
Other (inc. ecological toilet)	251	T1A3C10
Pit latrine without ventilation	311	T1B8C10
Bucket toilet	1,872	T1A3C10
Other toilet provision (below min. service level)	872	T1A3C10
No toilet provisions	410	T1B11 C7 TO C9
Total Households	**85,931**	**--**

The figures below show various containment systems in use in George LM.

Figure 3: Example flush toilets connected to sewer, installed at the household level (left) and in a shared setting (right).

Figure 4: Typical chemical toilets often provided in George LM's informal settlements.

Figure 5: Example of a flush toilet with septic system being installed in one of George LM's informal settlements.

2.1.2 Operational data

Operational information is required for the rest of the sanitation service chain, including emptying, transport, and treatment. The steps and the data/estimations used for each are described below for off- and on-site systems.

Off-site sanitation

Off-site sanitation accounts for all households connected to sewers which discharge at one of George's 6 Wastewater Treatment Works (WWTWs). The data and approach utilized for each step of the service chain are described below.

Emptying

Emptying is not relevant for off-site sanitation systems, as no excreta is contained on site.

Transport

This refers to transport of wastewater to the WWTW in a sewer network. To determine the percentage of wastewater reaching the WWTW, a wastewater flow balance must be done. The following data was utilized for this Wastewater (WW) flow balance:

- Average Dry Weather Flow (ADWF) for each of the 6 WWTWs was supplied by the municipality and was used in the calculation.
- Population served by each WWTW and network.
- System input volume per capita from the George LM water balance (varies from one network to the next) (George Municipality, n.d.).
- Water losses from the water balance for each area.
- Assumption of conversion rate from water consumption to wastewater production (based on guidance from the South African Redbook, varies from one network to another based on approximate density) (Department of Human Settlements, 2019).

The calculations are summarised in Table 2 below. The overall percentage of wastewater reaching the WWTWs is based on a weighted average of the percentage for each WWTW. Those with a percentage over 100 are assumed to have 100% of wastewater reaching the WWTW.

Table 2: Calculation for percentage wastewater reaching the WWTW for input to the George SFD.

Parameter	Gwaing	Haarlem	Herold's Bay	Kleinkranz	Outeniqua	Uniondale
ADWF (kℓ/day)	9,908	92	164	766	14,000	504
Population	41,143	2,368[1]	943	9,153	184,692	6,574
System Input Volume (SIV) (ℓ/capita/day)	150	174	150	150	150	140
% water losses	21.4%	36.7%	21.4%	21.4%	21.4%	36.3%
Water consumption (kℓ/day)	4,851	261	111	1,079	21,775	586
General density (plot types)	High	Low	High	Medium	High	Medium
Estimated conversion to WW (%, based on Red Book Section K, Table K.4)	75%	55%	75%	65%	75%	65%
Estimated WW produced	3,638	143	83	701	16,331	381
%WW reaching WWTW	272%	64%	197%	109%	86%	132%
Overall reaching WWTW[2]	**92%**					

[1] Haarlem has 84 households served by septic tanks. These are emptied and discharged at Uniondale WWTW. Thus, the population from these households has been excluded from Haarlem and included in Uniondale.
[2] Note that percentages over 100% are excluded from the weighted average, as they are assumed to receive 100% of the generated wastewater. More detailed analysis would be required to understand the reasons for high wastewater generation in these areas, particularly Gwaing and Herold's Bay. The high inflow suggests that water consumption (and therefore wastewater generation) is higher in these areas.

Treatment

Percentage wastewater treated in George's SFD is based on the level of treatment in relation to the relevant standards. The calculation was done based on available data for the 2024/2025 financial year in the 2024-2025 Water Services Audit. The percentage compliance for microbiological, physical, and chemical determinands was averaged for each WWTW. A weighted average was then done based on ADWF for the WWTW, and it was concluded that 81% of wastewater is fully treated. This calculation may be updated in the future if further work is done on the SA-SFD process to improve and standardise these calculations. The calculation is presented in Table 3.

Table 3: Weighted average calculation for percentage wastewater treated (2024/2025 Water Services Audit (George Municipality, 2025a)).

WWTW name	Gwaing	Haarlem	Herold's Bay	Kleinkranz	Outeniqua	Uniondale	Overall
ADWF (Mℓ/d)	8.9	0.1	0.2	0.7	13.0	0.4	23.3
% Microbiological	82%	100%	100%	92%	53%	96%	
% Physical	95%	100%	100%	91%	80%	100%	
% Chemical	99%	100%	100%	99%	84%	100%	
% Compliance (combined)	92%	100%	100%	94%	72%	99%	
Weighted Contribution (%)	35%	0%	1%	3%	40%	2%	**81%**

Figure 6: Outeniqua WWTW, George's largest WWTW.

Figure 7: WW sludge belt press at Gwaing WWTW.

On-site sanitation

Operational data for on-site systems is based primarily on assumptions at this stage. To develop more accurate estimates, detailed quantities of faecal sludge emptied, transported, and treated would be required.

Emptying

Percentage of faecal sludge emptied from on-site sanitation systems was based on assumptions for individual technologies. This would need to be verified based on actual data. The following assumptions were made:

- Chemical toilets: 100% FS emptied.
- Septic/conservancy tanks: 100% FS emptied.
- VIP toilets: 0% emptied.

Transportation

Like off-site sanitation, determining the percentage of faecal sludge transported requires a faecal sludge balance between what is emptied and what eventually reaches the WWTW. Records were provided for the faecal sludge discharged at the WWTWs, but this cannot be checked against records of faecal sludge emptied. Therefore, it was assumed that 10% of faecal sludge is lost during transport (i.e., 90% reaches the WWTW). Faecal sludge may be lost during transport due to spills or illegal dumping. Verification is required to update and refine this assumption.

Treatment

Faecal sludge is currently discharged in the WWTW at the head of works. Therefore, the same percentage treated is used (i.e., 81%).

Figure 8: Faecal sludge is discharged into screens and then solid waste is removed before joining the head of works.

2.2 SFD Selection Grid

The types of sanitation systems in use in George are depicted in the SFD selection grid in Figure 9.

List A: Where does the toilet discharge to? (i.e. what type of containment technology, if any?)	List B: What is the containment technology connected to? (i.e. where does the outlet or overflow discharge to, if anything?)									
	to centralised combined sewer	to centralised foul/separate sewer	to decentralised combined sewer	to decentralised foul/separate sewer	to soakpit	to open drain or storm sewer	to water body	to open ground	to 'don't know where'	no outlet or overflow
No onsite container. Toilet discharges directly to destination given in List B		T1A1C2			Significant risk of GW pollution Low risk of GW pollution					Not Applicable
Septic tank					Significant risk of GW pollution T1A2C5					
Fully lined tank (sealed)					Significant risk of GW pollution Low risk of GW pollution					T1A3C10
Lined tank with impermeable walls and open bottom	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution	Significant risk of GW pollution Low risk of GW pollution					Significant risk of GW pollution Low risk of GW pollution
Lined pit with semi-permeable walls and open bottom	Not Applicable									Significant risk of GW pollution Low risk of GW pollution
Unlined pit										Significant risk of GW pollution Low risk of GW pollution
Pit (all types), never emptied but abandoned when full and covered with soil										Significant risk of GW pollution Low risk of GW pollution
Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil										T1B8C10
Toilet failed, damaged, collapsed or flooded										T1B9 C1 TO C10
Containment (septic tank or tank or pit latrine) failed, damaged, collapsed or flooded										
No toilet. Open defecation	Not Applicable							T1B11 C7 TO C9		Not Applicable

Figure 9: George LM sanitation selection grid.

2.3 SFD Matrix

The SFD matrix depicts the fate of human excreta across the service chain (Figure 10). Based on the data described above, it is assumed that 92% of wastewater in the sewer network is delivered to centralised treatment plants. Of the WW in the sewer system that is delivered to a centralised treatment plant, 81% is assumed to be fully treated. This was estimated based on a weighted average of the compliance percentages at each of George's 6 WWTWs.

It is assumed that 100% FS is emptied from chemical toilets and septic tanks. Ninety percent of emptied FS is assumed to be delivered to a treatment plant, and of that, 81% is assumed to be fully co-treated with the WW.

George Local Municipality, Western Cape, South Africa, 29 Aug 2025. SFD Level: 1 - Initial SFD
Population: 294929
Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 100%

Containment						
System type	Population	WW transport	WW treatment	FS emptying	FS transport	FS treatment
	Pop	W4a	W5a	F3	F4	F5
System label and description	Proportion of population using this type of system (p)	Proportion of wastewater in sewer system, which is delivered to centralised treatment plants	Proportion of wastewater delivered to centralised treatment plants, which is treated	Proportion of this type of system from which faecal sludge is emptied	Proportion of faecal sludge emptied, which is delivered to treatment plants	Proportion of faecal sludge delivered to treatment plants, which is treated
T1A1C2 Toilet discharges directly to a centralised foul/separate sewer	90.6	92.0	81.0			
T1A2C5 Septic tank connected to soak pit	1.4			100.0	90.0	81.0
T1A3C10 Fully lined tank (sealed), no outlet or overflow	6.7			100.0	90.0	81.0
T1B11 C7 TO C9 Open defecation	0.5					
T1B8C10 Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil, no outlet or overflow	0.4					
T1B9 C1 TO C10 Toilet failed, damaged, collapsed or flooded, connected to sewer, soak pit, open drain or storm sewer, water body, open ground or 'don't know where'	0.4					

Figure 10: George LM SFD Matrix.

2.3.1 Technologies and methods used for different sanitation systems through the sanitation service chain

Households in George LM utilise a variety of both off- and on-site sanitation technologies as explained below. Some households do not have access to a sanitation technology and are therefore considered to be practising open defecation.

a. Off-site sanitation technologies

Flush toilets discharging directly into centralised foul / separate sewers are the off-site sanitation technology utilised by households in GLM.

b. On-site sanitation technologies

Multiple on-site sanitation technologies are utilised by households in George LM. These include:

- Septic tanks connected to soak pits.

- Impermeable / permeable tanks that are fully lined and sealed. All these tanks have no outlet or they overflow. These are mainly chemical toilets and "other non-waterborne toilets above min. service level", including bucket toilets.
- Other households utilise VIP toilets that are never emptied but abandoned when full. They are assumed to be inadequately covered with soil, as there is no primary data to confirm the fate of these toilets when full. All these have no outlet or overflow.
- Other households only have access to a toilet that has failed, is damaged, has collapsed, or is flooded. All these have no outlet or overflow.

c. Excreta not contained

- 0.4% utilise plain pit toilets that are assumed to be damaged, collapsed, or flooded.
- 0.4% of households do not have access to a toilet and practise open defecation. This is to open ground.

2.3.2 Percentages of the population using those systems and services along the sanitation service chain

Off-site sanitation

90.6% of households in George LM utilise off-site sanitation technologies. These are toilets that discharge directly into a centralised foul / separate sewer (system T1A1C2). 92% of WW in the sewer system is assumed to be delivered in separate sewers to centralised treatment plants (variable W4a set to 92%). The remaining 8% is assumed to be lost through leakages in the sewer network. Of the WW delivered to the treatment plants, 81% is assumed to be fully treated (variable W5a set to 81%). This is calculated based on weighted average of compliance for 2024/2025 from the Water Services Audit (George Municipality, 2025a).

GLM has six (6) WWTWs, which are owned and operated by the municipality. Five (5) of these are activated sludge works and one (1) is an oxidation pond system. These have a combined capacity of 39,926 Mℓ/D.

Outlined below is performance of GLM WWTWs as per the 2023 Green Drop Progress Assessment Tool (GDPAT) Report (Including the Cumulative Risk Rating (CRR) scores):

- Outeniqua which is a Class B (Activated sludge): total design capacity of 25 Mℓ/D, operational capacity (% inflow/design) of 56%, technical skills compliance 91.7% and an overall CRR score of 66.7% which is medium risk.
- Uniondale which is a Class C (Activated sludge): total design capacity of 800 Kℓ/D, operational capacity (% inflow/design) of 63%, technical skills compliance 83.3% and an overall CRR score of 64.7% which is medium risk.
- Gwaing which is a Class A (Activated sludge): total design capacity of 11 Mℓ/D or 11,000 Kℓ/D (To be upgraded to 22 Mℓ/D, operational capacity (% inflow/design) of 90%, technical skills compliance 83.3% and an overall CRR score of 52.4% which is medium risk.

- Haarlem which is a Class D (Activated sludge): total design capacity of 156 Kℓ/D, operational capacity (% inflow/design) of 59%, technical skills compliance 66.7% and an overall CRR score of 38.5% which is low risk.
- Kleinkranz which is a Class C (Activated sludge): total design capacity of 2,500 Kℓ/D, operational capacity (% inflow/design) of 31%, technical skills compliance 83.3% and an overall CRR score of 37.5% which is low risk.
- Herold's Bay which is a Class E (Oxidation ponds): total design capacity of 300 Kℓ/D, operational capacity (% inflow/design) of 55%, technical skills compliance 66.7% and an overall CRR score of 38.5% which is low risk.

The overall %CRR score reflects the total risk rating of each supply system expressed as a % of the maximum risk that a plant can potentially reach. A higher value indicates a high-risk state that requires urgent intervention to improve the overall risk rating of the collector system. A lower value indicates a low-risk rating.

The whole George LM sewer system has a total of 113 pump stations, 71 kilometres of rising mains (Pressure pipelines) and 857 kilometres of gravity pipelines.

The WW Department of George LM has some challenges including:

- Disastrous floods that happened in 2023/24 financial year had a severe impact on the sewer infrastructure.
- Understaffing and staff turnover.
- Budget constraints.
- Delays in mechanical and electrical repairs.
- Increased demand. Expansion of George results in additional effluent generation. This is exacerbated by peak season usage of facilities which adds more stress on the infrastructure capacity.

Both Uniondale and Outeniqua WWTWs were upgraded after 2023, which led to improvements in effluent quality.

On-site sanitation

8.6% of households use on-site sanitation technologies as described below:

1.4% utilise septic tanks / conservancy tanks connected to soak pits (system T1A3C10). 100% FS from the septic tanks is emptied (variable F3 set to 100%). Of the emptied FS, 90% is assumed to be delivered to treatment plants (variable F4 set to 90%). Treatment of faecal sludge (FS) depends on the performance of the wastewater treatment works (WWTW). For consistency, the treatment efficiency is assumed to be the same as that applied to wastewater from off-site systems; therefore, variable F5 is set at 81%. The responsibility for operation and maintenance of septic tanks / conservancy tanks including all the associative costs lies with the property owners. The owners also have responsibilities to ensure access to the tanks for emptying and check tank levels regularly and book services in advance to avoid spillages or overflows. For emergency overflows, immediate response by the municipality depends on truck availability and scheduling. Emergency call-outs are charged at the emergency tariff based on the size of the required vacuum truck. Services for such are

only dispatched when the client accepts the emergency fee and tanker size. (George Local Municipality, 2025)

6.7% of households utilise impermeable / permeable tanks. All these have no outlet (system T1A3C10). Out of 6.7%, 1% are bucket toilets that are emptied by households, and they are assumed to be emptied to open ground. The remaining 5.7% have no outlet and are emptied by vacuum tankers. These types of tanks include chemical toilets, "other non-waterborne toilets above min. service level", and 1/2 of septic tanks/conservancy. 100% FS from the chemical toilets is emptied (variable F3 set to 90%). 90% of emptied FS is assumed to be delivered to treatment plants (variable F4 set to 90%). Treatment of FS is dependent on the WWTW; therefore, 81% is assumed to be fully treated (variable F5 set to 90%).

Chemical toilets are primarily located in informal settlements, and emptying happens through the appointed service providers who frequently empty facilities in line with their contracts with George LM (2-4x per week). However, the focus group discussions and semi-structured interviews conducted at selected informal settlements within George, pointed out some dissatisfaction with the emptying services. The service providers (vacuum truck operators) do not consistently empty chemical toilets in some areas, resulting in an increased health risk and contamination of the environment. Faecal sludge emptied from chemical toilets is transported to WWTW where records on the volumes discharged are kept. No data is available on the number of chemical toilets or volume of faecal sludge emptied. To increase credibility of this report, records or information on FS emptying will have to be made available.

Due to the rapid growth of informal settlements in George LM, planning for provision of services is on an ad-hoc basis. This is also due to the municipal long-term plan to provide formalised serviced stands, and the Provincial Government’s Breaking New Grounds Programme plans to provide housing packages to households. As an interim sanitation provision measure, the municipality conducts surveys with support from local ward councillors to confirm the number of households needing services. The municipality then allocates communal toilets at a ratio of 1 toilet to 5 households.

In terms of environmental health, people who are most vulnerable are the ones living in informal areas with shared services. Challenges municipalities experience with regards to informal settlements include the difficulty to supply toilets due to the density of the settlements; grey water pollution, and grey water run-off from standpipes. These challenges pose a health risk to the populations residing in the informal settlements.

GLM’s Human Settlements inspection team is responsible for monitoring and inspection of services in informal settlements. They visit informal settlements to do their monitoring every Friday, although it is not a comprehensive exercise. They go out to check on the status of services and to engage the community. The inspectors use a monitoring sheet to capture services issues. Complaints are then sent to relevant sections of the municipality. Any identified maintenance issues are escalated to the maintenance team within Human Settlements Directorate of the municipality.

Septic tanks with soakaways (Buffalo Tanks) have also been installed to replace chemical toilets at various informal settlements. The technology was approved and adopted to replace chemical toilets at the informal settlements within the municipal area of George LM after implementation of a pilot project by various service providers. Pilot units were installed in

various settlements, and a larger number have now been installed in Wilderness Heights and Syferfontein.

0.4% utilise pit toilets that are never emptied or are abandoned when full but not adequately covered with soil (system T1B8C10). All unimproved pit toilets are assumed to not discharge anywhere.

The remaining 0.4% of households in George LM practise open defecation (system T1B9 C1 TO C10). This is to open ground where there is no FS containment, emptying, transport, or treatment occurs.

2.3.3 Risk of groundwater contamination

The only technologies in use in George with any potential risk of groundwater contamination are septic tanks with soak pits and pit toilets. These are used by a very small portion of the population, but it is still important to assess the risk of groundwater pollution based on, inter alia, soil type, groundwater table depth, and utilisation of groundwater. Detailed data was not available, but a very small percentage of the population relies on groundwater for its water supply. Therefore, low risk was selected (system T1A2C5).

George LM monitors borehole and groundwater quality to protect them from pollution, as some households in the region rely on boreholes. The level of the water table varies across the municipality. The groundwater level at George LM is yet to be confirmed from the George LM groundwater testing pilot project. A credible source and accompanying report(s) should be used to substantiate the data on groundwater levels. Reports on contamination should also be provided and must include results for the conducted sampling.

The main sources of pollution in the municipality are: failure to capture pollutants (human and animal faeces, solid waste, etc), in the upper parts of the catchment; inadequate infrastructure to manage waste in the sewer system between upper catchment and sewage treatment works; inadequate and outdated sewage works; ingress of stormwater into sewers; and also ingress of other materials that cause blockages. As confirmed during the June-July 2025 fieldwork conducted to collect primary data on non-sewered sanitation, a lot of pollution also happens at informal settlements where chemical toilets are said to fill up quickly due to over-usage and inconsistent emptying practices by the appointed service providers. The risk of environmental contamination (including groundwater contamination) is higher in areas that have a high ground water table.

2.3.4 Discussion of certainty/uncertainty levels of associated data used for the SFD Matrix

George LM expressed some uncertainty around the accuracy of the Census data. The accuracy could be verified through some primary data collection in a representative sample of the municipality, but this is a time and budget-intensive exercise. In addition, some assumptions were made in the assessment of the operational parameters. This includes, for example, the conversion of water consumption to wastewater generation (taken from the Red Book guidelines). In addition, no data was available on emptying of on-site sanitation systems, and therefore, this could not be analysed in detail and then connected to records of faecal sludge reaching the WWTW.

2.4 SFD Graphic

Figure 11 below shows the SFD Graphic for George LM based on the information presented above. The SFD shows that most George LM households (91%) rely on offsite sanitation. The remaining 9% is made up of 8% utilising contained on-site sanitation and 1% either using uncontained on-site sanitation or practising open defecation.

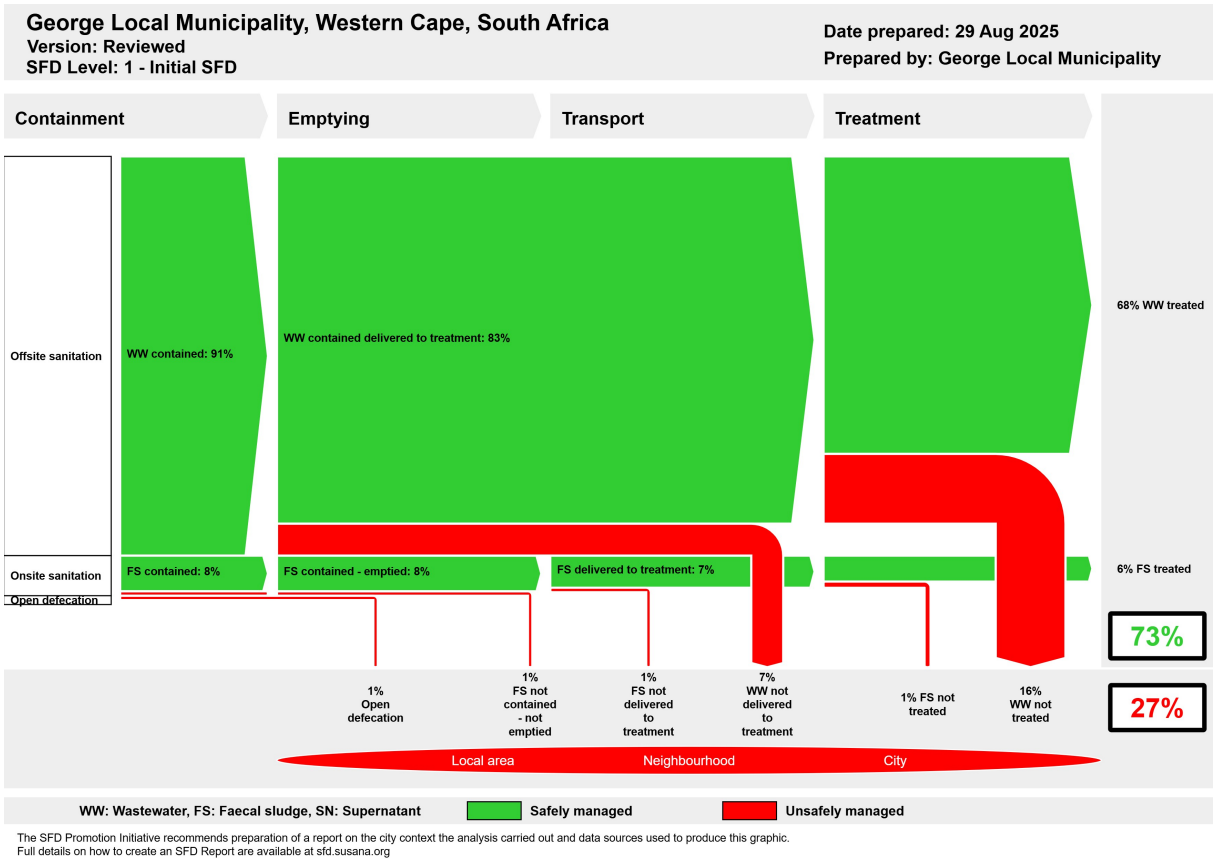

Figure 11: George LM SFD Graphic (Source: SuSanA Website, 2025).

Overall, 27% of excreta is unsafely managed. At the local level, this is made up of open defecation (0.5%) and uncontained faecal sludge from on-site sanitation (0.5%). This can cause issues such as soil and groundwater contamination. A further 1% of households are estimated to be using on-site sanitation from which emptied faecal sludge does not reach the treatment plant. This suggests spillages during transport or illegal dumping.

The largest share of unsafely managed sanitation comes from off-site systems. Seven (7) percent of households use off-site sanitation from which wastewater does not reach the WWTW. This could be due to leaky sewers, blockages, and/or pumpstation failure. Of the WW reaching the WWTW, 81% is fully treated, which translates to 16% of households served by off-site sanitation whose sewage is not fully treated.

Overall, 73% of excreta is safely managed. Sixty-eight (68) percent of households are served by off-site sanitation from which wastewater reaches the WWTW and is fully treated. The other portion of safely managed sanitation is made up of households relying on on-site sanitation from which faecal sludge is effectively emptied, transported, and treated in the WWTWs.

Table 4 shows a summary of the safely and unsafely managed sanitation throughout the service chain. The totals in Table 2 above add to 100%. As a check, percentages from the SFD Matrix and Selection Sheet were summed up and compared to the percentages presented in the SFD Graphic.

Table 4: George LM SFD Graphic results (Source: Generated using data presented in the SFD Graphic).

	Safely Managed		Unsafely Managed		Notes	Area of consequence
	WW [%]	FS [%]	WW [%]	FS [%]		
Containment	91	8	--	0.5	Open Defecation	Local Area
Emptying	83	8	--	0.5	Failed containment	
Transport	83	7	7	1	Leaks/ spillages	Neighbourhood
Treatment	68	6	16	1	WWT effectiveness	City
Total	**73**		**27**			

3 Service delivery context

3.1 Policy, legislation and regulation

This section offers an overview of the policies, legislation, and regulations on sanitation services in George Local Municipality.

3.1.1 Policy

The sanitation sector in the country is guided and regulated by various policy documents:

Constitution of the Republic of South Africa (1996): Section 27(1)(b); Section 27(2).

Section 24(a), Bill of Rights in the Constitution states that "everyone has a right to an environment that is not harmful to their health or well-being" and 24(b) "to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (Constitution of the Republic of South Africa, 1996).

Section 27(1)(b) of the Bill of Rights in the Constitution states that "everyone has the right to have access to sufficient food and water".

Section 27(2) tasks the state to "take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation" to ensure access to basic water supply (Constitution of the Republic of South Africa, 1996).

These clauses have often been interpreted as implying a right to basic sanitation for all. Water and sanitation are intrinsically linked. All spheres of government are responsible for ensuring that these basic water supply and sanitation services are provided.

Water Supply and Sanitation Policy (1994)

The Water Services Act (Act 108 of 1997) is the primary law relating to the provision of water services, including sanitation supply, to households and other municipal users.

Section 3 of the Water Services Act of 1997 states that:

"(1) Everyone has a right of access to basic water supply and basic sanitation.

(2) Every water services institution must take reasonable measures to realise these rights.

(3) Every water services authority must, in its Water Services Development Plan (WSDP), provide for measures to realise these rights.

(4) The rights mentioned in this section are subject to the limitations contained in this Act".

Basic sanitation is defined in the Water Services Act of 1997 as:

"The prescribed minimum standard of services necessary for the safe, hygienic and adequate collection, removal, disposal or purification of human excreta, domestic wastewater and sewage from households, including informal households."

The 1997 Water Services Act defined the role of WSAs and other water institutions such as WSPs and water boards. According to section 12, WSAs are obliged to prepare and adopt a

WSDP for its areas of jurisdiction. The WSDP shall also prioritise and include how the WSA intends to improve access to basic water and sanitation services should it not be able to deliver on these obligations:

“Every draft water services development plan must contain details:

(a) of the physical attributes of the area to which it applies;

(b) of the size and distribution of the population within that area;

(c) of a time frame for the plan. including the implementation programme for the following five years;

(d) of existing water services;

(e) of existing industrial water use within the area of jurisdiction of the relevant water services authority:

(f) of existing industrial effluent disposed of within the area of jurisdiction of the relevant water services authority;

(g) of the number and location of persons within the area who are not being provided with a basic water supply and basic sanitation;

(h) regarding the future provision of water services and water for industrial use and the future disposal of industrial effluent. including—

i. the water services providers which will provide those water services;

ii. the contracts and proposed contracts with those water services providers;

iii. the proposed infrastructure necessary;

iv. the water sources to be used and the quantity of water to be obtained from and discharged into each source;

v. the estimated capital and operating costs of those water services and the financial arrangements for funding those water services, including the tariff structures;

vi. any water services institution that will assist the water services authority;

vii. the operation, maintenance, repair and replacement of existing and future infrastructure;

(i) of the number and location of persons to whom water services cannot be provided within the next five years setting out –

i. the reasons therefore: and

ii. the time frame within which it may reasonably be expected that a basic water supply and basic sanitation will be provided to those persons; and

(j) of existing and proposed water conservation, recycling and environmental protection measures.”

Notice is expected to be given to municipal users of the drafting of the WSDP, with the draft expected to undergo stakeholder consultation and, therefore, sent to the Minister, the Province and neighbouring WSAs.

Municipalities also must develop an Integrated Development Plan (IDP) to organise and budget for development plans for their area of jurisdiction. The IDP is done in conjunction with various stakeholders, including the municipality, councillors, communities and national and provincial sector departments, which are affected at any stage of the plan. The WSDP must form part of the municipality's IDP, and it is expected that WSAs will report on its implementation during each financial year (Republic of South Africa, 1997).

DWS has developed model bylaws and standard water services policy to assist WSAs to develop local policy and bylaws. Additional to that DWS provide support to WSAs on the actual development of these policies and Bylaws (Table 5).

Table 5: Local Policies, legislations and By-laws.

Local Policies/ Legislation/ By-laws	Status of current implementation	Comment
George Municipality Water Supply and Sanitation Services By-law 2023	The Water and Sanitation Services By-law promulgated in the Provincial Gazette 6687 dated 15 January 2010 was repealed. The George Municipality Water Supply and Sanitation Services By-law was approved by Council in 2023 and published in the Provincial Gazette (Province of the Western Cape: Provincial Gazette Extraordinary 8795, 2023) Implementation of the George Municipality Water Supply and Sanitation Services By-law 2023 commenced on the date of publication in the Provincial Gazette.	Few sanitation personnel
Indigent Policy	Policy is in place. It provides procedures and guidelines for the subsidisation of free basic services charges to the indigent households, using the equitable share allocation received from national government and other budgetary provisions.	GLM provides free basic services to households earning less than R4,000 (USD 233) per month. The trend is that the number of registered indigent households has been on the decline across all the free basic services. This is despite the efforts by the municipality to register additional households.

The George Local Municipality Water and Sanitation by-laws

The George Local Municipality, as the WSA, has established by-laws governing water and sanitation services to regulate the provision of water and sanitation services within its area of jurisdiction. Chapter 3 of the water services by-laws focuses on water and sanitation service levels as described in the Water and Sanitation Service Level Policy or as determined by Council. Chapter 5 of the by-laws deals with the conditions for sanitation services with focus on connection to sewer, interconnection between premises, disconnections from sewer, standards for sanitation services, determination of charges (Domestic and industrial effluent), charges for onsite sanitation services, drainage installations, maintenance and disconnections, technical requirements for drainage installations, drains, sewer blockages, onsite sanitation services and associated services (Installation as well as the operation and maintenance of onsite sanitation services; septic tanks and treatment plants; French drains; conservancy tanks; disused conservancy and septic tanks), other sanitation services, etc.

3.1.2 Institutional roles

George Local Municipality is a Water Service Authority (WSA) responsible for providing water and sanitation services. The municipality plays a vital role in the provision of these services, as 76.1% of the population has access to flush toilets. Table 6 below provides a summary of other institutional roles on a national, regional and local level.

Table 6: Summary of institutional roles played by public and private institutions engaged in the sanitation service chain.

Level	Institution	Role(s)	Responsibility
National (Public)	DWS	Policy formation & Regulation	Overseer of water and sanitation policy and regulation
	National Treasury	Funding & financial management	Allocates funding for sanitation services through the Municipal Infrastructure Grant (MIG)
	COGTA	Governance & oversight	Supports municipalities in service delivery, coordinates between national and local levels, and ensures policy implementation.
	SABS	Regulation & quality control	Develops technical standards for sanitation infrastructure and ensures compliance with safety and quality regulations.
	WRC	Research and Innovation	Conducts research on innovative sanitation technologies, evaluates service delivery models, and provides recommendations for sustainable sanitation solutions.
	DHS	Integration of sanitation in housing	Ensures that sanitation infrastructure is included in housing and urban planning, especially in low-income settlements.
	Department of Health	Public health & hygiene promotion	Monitors sanitation-related diseases, ensures hygiene compliance in public areas, and conducts health awareness campaigns on sanitation.
	NBI	Public-private partnerships	Facilitates collaboration between businesses and government for improved sanitation service delivery.
	Financial Institutions (Development Banks, Private Banks)	Financing	Provide loans and grants for large-scale sanitation infrastructure and support municipal service providers.
	Consulting & Engineering Firms	Infrastructure development	Design, construct, and manage sanitation facilities and wastewater treatment plants, ensuring compliance with industry standards.
Regional	Provincial Departments of Water and Sanitation	Oversight & technical support	Ensure sanitation policies are implemented at the provincial level, provide technical guidance to municipalities, and monitor compliance.
	Water Boards	Bulk water supply & wastewater management	Supply bulk water for sanitation purposes, maintain regional wastewater treatment plants, and ensure wastewater quality meets national standards.

Level	Institution	Role(s)	Responsibility
	District Municipalities	Support & shared services	Assist local municipalities with technical and financial resources for sanitation projects, especially where local capacity is weak.
	NGOs	Advocacy & community engagement	Support sanitation awareness campaigns, implement community-based sanitation projects, and advocate for improved access.
	Sanitation Technology Providers	Innovation & service delivery	Develop and distribute sustainable sanitation technologies such as water-saving toilets and decentralized treatment systems.
Local	Local Municipalities	Service provision & infrastructure management	Plan, implement, and maintain sanitation infrastructure, ensure household and community sanitation service delivery, and enforce local sanitation by-laws.
	Municipal Water Services Authorities (WSAs)	Wastewater treatment & infrastructure operation	Manage sewer systems, operate wastewater treatment facilities, and monitor sanitation service compliance.
	Environmental Health Departments	Hygiene monitoring & awareness	Conduct sanitation awareness campaigns, enforce hygiene regulations, and monitor health risks associated with poor sanitation.
	Private Water and Sanitation Service Providers	Infrastructure management	Contracted by municipalities to operate and maintain sanitation infrastructure, including public toilets and decentralized wastewater treatment systems.
	Construction & Waste Management Companies	Infrastructure development & waste disposal	Build and maintain sewerage systems, provide waste collection services, and manage faecal sludge treatment.
	Community-Based Organizations (CBOs)	Local service delivery & community engagement	Operate small-scale sanitation projects in informal settlements, manage communal toilets, and promote community-led sanitation solutions.

3.1.3 Monitoring and reporting access to services

Monitoring and reporting on access to services within George Local Municipality are conducted through several structured mechanisms to ensure transparency, accountability, and continuous improvement in service delivery.

1. Integrated Development Plan (IDP): The IDP serves as the municipality's principal strategic planning document, outlining development priorities and objectives. It ensures coordination between projects and programs, both internally and with other government spheres. The IDP informs all financial planning and budgeting, with its implementation monitored and evaluated through Service Delivery and Budget Implementation Plans (SDBIPs). This process facilitates ongoing assessment of service delivery against set targets.

2. Service Delivery and Budget Implementation Plans (SDBIPs): An SDBIP is a management, implementation and monitoring tool that assists the Mayor, Councillors,

Municipal Manager, senior managers and the community. SDBIPs provide detailed plans for implementing municipal services and capital projects, aligning with the IDP and budget. They include performance indicators and quarterly targets, enabling systematic monitoring and reporting on service delivery progress. Regular performance reports derived from SDBIPs are submitted to the Executive Mayor and Council, promoting accountability and transparency.

3. Annual Performance Reports: In compliance with Section 46 of the Municipal Systems Act, the municipality prepares annual performance reports reflecting:

- The performance of the municipality and each external service provider during the financial year.
- A comparison of actual performance with targets set for the previous financial year.
- Measures to be taken to improve performance. These reports are made public as part of the annual report, allowing community members to assess municipal performance.

4. Water Services Monitoring: The municipality implements a comprehensive operational and compliance water quality and final effluent monitoring programmes. That includes monitoring of monitoring of industrial effluent.

5. Community Engagement and Customer Care: The municipality emphasizes community involvement in monitoring service delivery. A dedicated Customer Care platform enables residents to voice their views and report service delivery issues, facilitating real-time monitoring and responsiveness. Ward Committees are the interface between the municipality and communities. They facilitate public participation on local government matters. Ward Committees identify community needs and also fine-tune municipal programmes to accommodate local circumstances.

6. External Audits and Oversight: The Auditor-General annually audits the municipality's financial statements and performance information. Findings and recommendations from these audits are incorporated into oversight reports, which the Council considers addressing identified issues and enhance service delivery.

7. Indigent Policy Monitoring: The Municipal Manager reports to the Mayor monthly and per ward, on the number of households registered as indigents. The Mayor submits the indigent reports to the council and also to the municipality’s ward committees on a quarterly basis, or monthly. For indigent customers, the Chief Financial Officer and Credit Control Unit monitor and report on the implementation of the Indigent Policy. This includes maintaining a register of indigent customers and ensuring compliance with policy provisions. The municipality conducts regular audits of the indigent register.

4 Stakeholder Engagement

The data was collected through secondary sources, and to some extent primary sources. The relevant municipality stakeholders in the sanitation department were contacted by email and telephone to arrange meetings. Upon confirmation of the meeting dates, a data validation visit was conducted in the municipality. The relevant managers in the municipality provided the required secondary data, which was helpful in compiling this report.

5 Acknowledgements

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- Department of Water and Sanitation (DWS National).
- GIZ.
- Partners in Development (PID).

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