SFD Report

Dannhauser Local Municipality
Amajuba District Municipality
KwaZulu Natal, South Africa

This SFD Intermediate Report was prepared by
Emanti Management.

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1. The SFD Graphic

Dannhauser, KwaZulu Natal, South Africa
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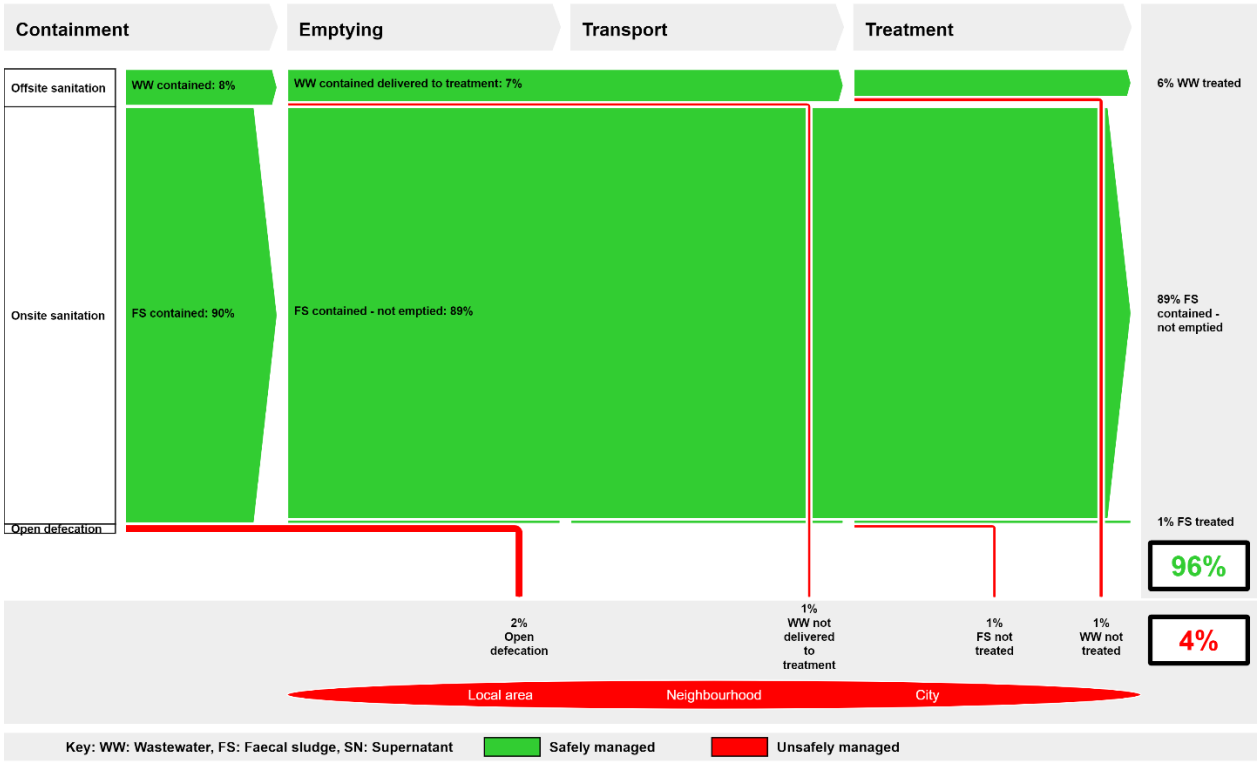

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The SFD Promotion Initiative recommends that this graphic is read in conjunction with the city's SFD Report which is available at: sfd.susana.org

2. Diagram information

SFD Level:

This is an Intermediate SFD.

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3. General municipal information

Dannhauser *Local Municipality* (LM) is a Category *B* municipality situated in the *Amajuba District Municipality* (ADM) in the KwaZulu Natal province of South Africa. The ADM is a *Water Services Authority* (WSA) for its area of jurisdiction in terms of the Water Services Act (Act 108 of 1997, Water Services Act). ADM therefore has statutory responsibilities and accountability in terms of legislation and policy with respect to the provision of water services. Water and sanitation services are provided through a contract between the ADM and its three (3) LMs.

Dannhauser LM covers an area of 1,707 *square kilometres* (km²) and consists of 13 wards. The main towns in Dannhauser LM are Dannhauser and Hattingspruit. The main economic activities in the LM include agriculture, mining, manufacturing and services. The temperature typically ranges from 4°C to 27°C and is rarely below 0°C or above 32°C. Dannhauser experiences extreme seasonal variation in monthly rainfall with the month of January usually associated with the most rain and the May to July noted for significantly less rainfall.

The geology of Dannhauser can be described as consisting mainly of Arenite with small portions of Dolerite and Shale. The major soil types in Dannhauser LM: Loam Soil, Sandy Clay Loam, Silt Loam and Silty Clay soils.

Dannhauser LM has an estimated population size of 105,341 people. There are 20,242 households (average household size is 5.2 people per house). Formal dwellings make up around 70% of all households. Dannhauser LM has been historically poorly provided with potable water and appropriate sanitation facilities. In Dannhauser LM, up to 80% of households have a piped water supply either to their dwelling or on-site (e.g. communal stand pipes). Nearly 13% of households are reliant on natural and other water supplies (boreholes, springs). The quality of the water obtained from these sources is unknown and cannot be guaranteed thus leading to potential health problems. Significant backlogs have been noted in *Statistics South Africa* (Stats SA) Census 2011. The Sanitation Project was implemented from 2014 and funded by the *Department of Water Affairs* (DWA - now Department of Water and Sanitation) to tackle backlogs. The majority of people in Dannhauser LM are supplied with on-site latrines and there is a low coverage of off-site sewerage infrastructure. Electricity for lighting is available for over 90% of the population. There is poor weekly refuse removal coverage (around 10%).

4. Service outcomes

The following sanitation technologies were noted:

- Toilet discharges directly to a centralised foul / separate sewer – these are flush toilets that are connected directly to the wastewater treatment works.
- Fully lined tanks (these are *Ventilated Improved Pit latrines* (VIPs) - sides and bottom are sealed). To-date, no VIP emptying has occurred and a VIP emptying strategy does not exist. Fully-lined VIPs are implemented to minimise potential pollution impact on groundwater. These are considered as fully lined tanks.
- Fully lined tanks – these are flush toilets connected to a conservancy tank (concrete or plastic) for an individual house/building.
- No toilet, open defecation – these are rural and informal households that have not been serviced, and do not have a toilet. Their status is unknown, and it is assumed that open defecation occurs.

The vast majority of the population of Dannhauser LM utilise on-site sanitation systems (90% on-site sanitation), only 8% of the population are connected to off-site sanitation and 2% practice open defecation.

Based on the available data, estimates and assumptions, the SFD graphic illustrates that nearly all excreta (96%) is safely managed. Over 90% of the safely managed sanitation is faecal sludge that is not emptied and remains contained in the VIPs. This excreta is safely managed but it is a short term solution as after a period of time all the VIPs will become full and, if space is limited for a cover and replace approach, will eventually require emptying or the pits upgrading so that they can be emptied.

There is concern that an emptying strategy has not yet been developed. With time, VIPs will fill and without subsequent emptying, the current status could therefore deteriorate if this is not considered in the near future. This has been noted by ADM in their latest IDP which indicated that surveys undertaken in the ward are indicating that pit latrines are becoming unhygienic and many of them are full, thereby exacerbating the problems associated with poor sanitation (Amajuba District Municipality, 2020). This SFD Intermediate Report includes a forecasting scenario should pits not be emptied – see below and section 2.5.

Water for both urban and rural areas of Dannhauser LM is supplied from various water treatment works via pipeline to households, with the majority of households either receiving water via household taps, yard connections or communal standpipes. Raw water is obtained from various surface water sources (i.e. dams).

A number of boreholes exist, and are used as a back-up resource in times of drought. As such, protection of these water sources is essential. VIPs constructed in the area are therefore fully lined. Although the groundwater is therefore not generally being used, climate change impacts and the increasing water scarcity facing many parts of South Africa and the province of KwaZulu-Natal.

5. Service delivery context

The Constitution of South Africa classifies municipalities into three (3) categories (A, B and C). Category *A* municipalities are metropolitan municipalities which consist of a major urbanised core. Category C municipalities are DMs that consist of 1 or more LMs (Category B municipalities). Dannhauser LM is a Category B municipality within the Category C ADM. ADM has the responsibility of planning and development, including the supply of water and sanitation services.

The sanitation sector in the country has been guided and regulated by the following policy documents:

- the White Paper on Water Supply and Sanitation (1994);
- the White Paper on a National Sanitation Policy (1997);
- the Water Services Act (1997)
- White Paper on Basic Household Sanitation (2001)
- Strategic Framework for Water Services (2003)
- Free Basic Sanitation Implementation Strategy (2009)
- National Sanitation Policy (2006 and 2016)

The policy documents make provision for procedures, rules and allocation mechanisms for sanitation which are implemented through the policy instrument of laws and regulations; economic measures; information and education programmes; and assignment of rights and responsibilities for providing services. Implementation of the South African sanitation policy is guided by The Strategic Framework for Water Services (DWAF, 2003). This document guides the sanitation policy with respect to the provision of water services from rural to urban and people and industry.

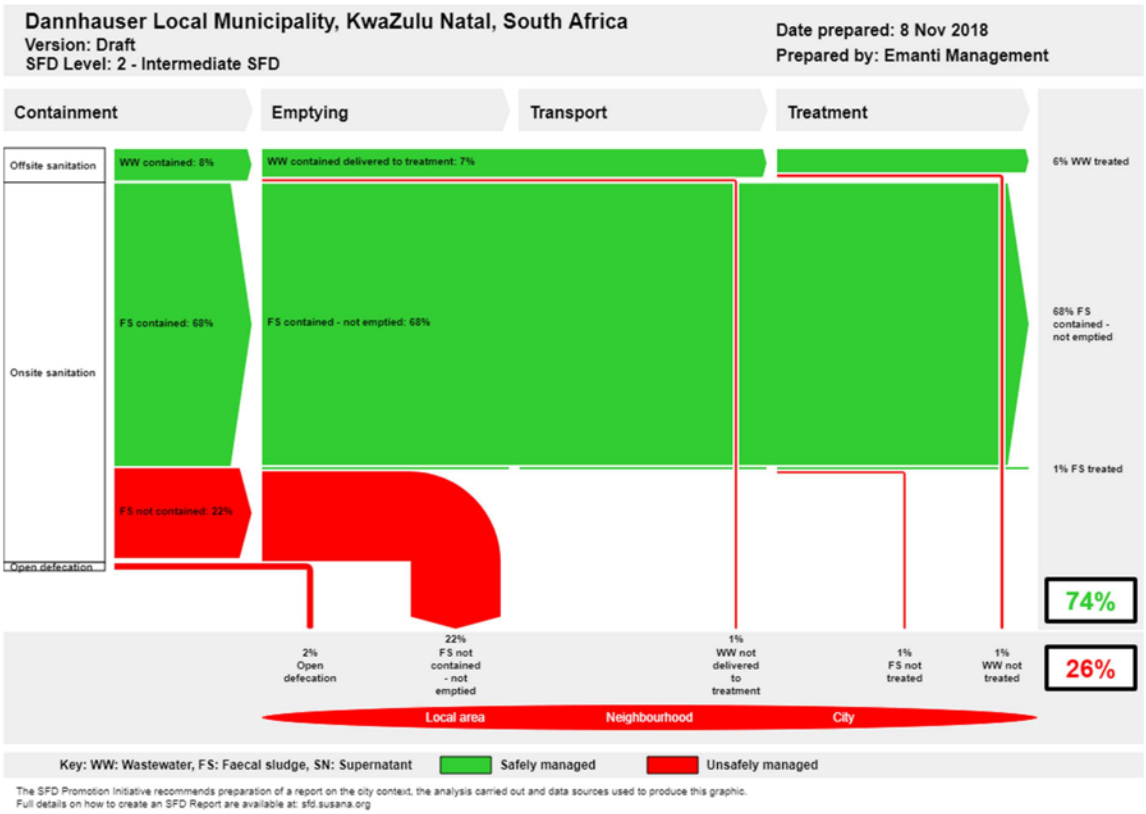
Due to the legacy of Apartheid planning, the targeted area has a history of significant water and service backlogs and lack of infrastructure. Backlogs have / are being addressed through various programmes. Significant development has occurred in the targeted area with formal housing increasing by around 15% from 2001 to 2011 (Dannhauser Local Municipality, 2014). Dannhauser LM is predominately rural with Dannhauser town better serviced with water and sanitation than rural areas. Hence, backlogs are mostly in rural areas. Details of approved water and sanitation projects can be viewed in the *Integrated Development Plan* (IDP) of the LM and DM. The IDP is a plan for an area that provides for an overall framework for development and has a budget approved by the municipal council.

6. Overview of stakeholders

An overview of stakeholders involved:

- ADM which is *Water Services Authority* (WSA) and *Water Services Provider* (WSP)
- Department of Water and Sanitation (DWS), local and national

7. Possible future scenario SFD



Possible future scenario if no action is undertaken with regards to pit emptying and treatment/disposal (Source: Emanti Management, 2018)

No pit emptying strategy is in place for the LM. Over time, pits should fill and without timeous emptying, the current status could deteriorate as shown in the future scenario in the figure above.

9. Process of SFD development

This SFD Intermediate Report was developed with the assistance of ADM. Various sources of information were used for the compilation of this report. This includes Stats SA data, IDPs, DM Rural Development Plan, *Water Services Development Plan* (WSDP) for ADM.

The Stats SA data is undertaken every 5 years. Any developments in between this time period is sometimes reported in the IDPs and WSDP especially if the municipality has undertaken its own survey. Therefore, data between the ADM and Stats SA can deviate.

This report has relied solely on data from the ADM.

10. Credibility of data

There is no reason to suggest that data from ADM is not credible. Water and sanitation project budgets are approved by council based on backlogs and are included in IDPs and WSDPs. The ADM reports on water and sanitation service levels every second month. ADM has an internal backlog monitoring database used to measure service delivery on ward level.

11. List of data sources

Include an abbreviated list of all data sources used for the production of the SFD report.

- Stats SA Census (2011)
- Stats SA Community Survey (2016)
- IDP for ADM (2018 – 2019) (and associated annexures)
- Draft District Rural Development Plan: Amajuba District Municipality (2016)
- WSDP for Amajuba District Municipality (2016)
- IWA Water Balance for Amajuba District Municipality (2017/2018)

- Feasibility Study for The Roll-Out Of Non-Revenue Water Interventions Over The Next Three Years According To The Approved Strategic Management Plan for Amajuba District Municipality (2018)
- Amajuba District Municipality Socio-Economic Profile (2014)

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Abbreviations

ADM	Amajuba District Municipality
DM	District Municipality
DPLG	Department of Provincial and Local Government
DWA	Department of Water Affairs (now DWS)
DWAF	Department of Water Affairs and Forestry (now DWS)
DWS	Department of Water and Sanitation
FS	Faecal sludge
IDP	Integrated Development Plan
LM	Local Municipality
NRW	Non-Revenue Water
PPE	Personal Protective Equipment
RDP	Reconstruction and Development Programme
SALGA	South African Local Government Association
SFD	Shit Flow Diagram
Stats SA	Statistics South Africa
VIP	Ventilated Improved Pit Latrine
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Service Provider
WW	Wastewater
WWTW	Wastewater Treatment Works

1 Municipal context

Dannhauser *Local Municipality* (LM) is a Category *B* municipality situated in the Amajuba District Municipality (ADM) in the KwaZulu Natal province of South Africa. Dannhauser LM covers an area of 1,707 square kilometres (km²) and consists of thirteen (13) wards with a combined total of 58 settlements. Dannhauser LM has an estimated 105,341 people and 20,242 households within the 13 wards (5.2 persons per household) (Stats SA 2011 and 2016 data cited in Municipalities of South Africa, 2021). The average annual population growth rate for Dannhauser LM is around 0.52% per annum. Of the 20,242 households, 14,020 are considered formal (69%), 261 are considered informal (1%), and 5,936 (29%) are considered traditional (Stats SA, 2016). The towns of Dannhauser and Hattingspruit are the main urban nodes in Dannhauser LM. Dannhauser town is located midway between Durban (KwaZulu-Natal Province) and Johannesburg (Gauteng Province). Dannhauser functions as a small rural service centre and is not a large employment generator. The main economic activities include agriculture, mining, manufacturing and services. The majority of its population speaks IsiZulu (Stats SA, 2011). The temperature typically ranges from 4°C to 27°C and is rarely below 0°C or above 32°C. Dannhauser experiences extreme seasonal variation in monthly rainfall with the month of January usually associated with the most rain and the May to July noted for significantly less rainfall (Weather Spark, 2021). The geology of Dannhauser can be described as consisting Arenite with smaller portions of Dolerite and Shale. The major soil types in Dannhauser are Loam Soil, Sandy Clay Loam, Silt Loam and Silty Clay soils.

The Constitution of South Africa classifies municipalities into three (3) categories (*A*, *B* and *C*). Category *A* municipalities are metropolitan municipalities which consist of a major urbanised core. Category C municipalities are DMs that consist of 1 or more LMs (Category B municipalities). Dannhauser LM is a Category B municipality within the ADM which is a Category C municipality (**Figure 1** and **Figure 2**). The responsibility of planning and development, including the supply of water and sanitation services, lies with ADM for Dannhauser LM. ADM is a *Water Services Authority* (WSA) for Dannhauser LM jin terms of the *Water Services Act* (Act 108 of 1997, Water Services Act) (Republic of South Africa, 1997). It therefore has statutory responsibilities and accountability with respect to the provision of water services. ADM is the appointed WSA and *Water Service Provider* (WSP) for Dannhauser LM. The ADM receives a yearly allocation from Treasury to address water & sanitation matters within Dannhauser LM.

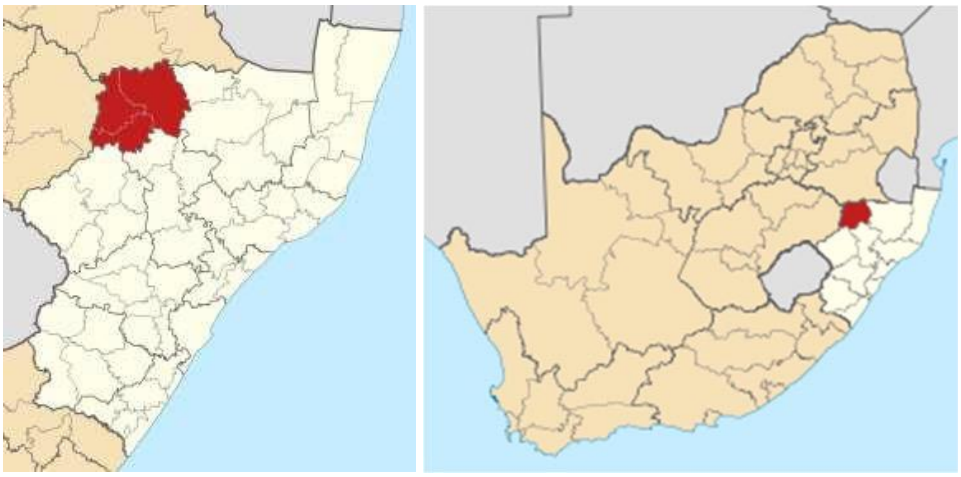

Figure 1: Location of Amajuba District Municipality within KwaZulu Natal Province of South Africa. Source: en.wikipedia.org

Figure 2: Location of Dannhauser Local Municipality within Amajuba District Municipality. Source: www.municipalities.co.za I

In Dannhauser LM, up to 80% of households have a piped water supply either to their dwelling or on-site (e.g. communal stand pipes). Unauthorised illegal connections have resulted in an increased number of households with yard connections. Almost 13% of households are reliant on natural and other water supplies (boreholes, springs) (KZN COGTA, 2016). A significant proportion of the population have unreliable water supply (around 19%) (Amajuba District Municipality, 2020). The quality of the water obtained from these sources is unknown and cannot be guaranteed, thus possibly leading to health problems.

The Dannhauser LM has been historically generally poorly provided with sanitation facilities. The *Integrated Development Plan* (IDP) for the municipality in 2014/2015 indicated that approximately 6.6% of its households did not have access to sanitation facilities (Dannhauser Local Municipality, 2014). Rural settlements (66% of households) make use of on-site pit latrines while most commercial farms have on-site septic tanks. The sewer network is concentrated mainly in town, is aging and requires upgrading and maintenance. It has been noted that the Dannhauser *Wastewater Treatment Works* (WWTW) will have sufficient capacity to service the anticipated future growth in the area for the next 10-15 years (Dannhauser Local Municipality, 2014).

On-site sanitation remains the most prevalent form of sanitation facilities. There has been steady increase in service as outlined in **Table 1** below.

Table 1. Sanitation provision from 2001 to 2016 (Amajuba District Municipality, 2020)

Type of facility	Year	Number
Waterborne / Chemical	2001	4,753
	2011	3,301
	2016	9,558
Pit latrine	2001	14,694
	2011	14,717
	2016	18,343
Bucket latrine / Ecological	2001	74
	2011	33
	2016	136
None	2001	1,251
	2011	620
	2016	186

Note: Data sourced from Stats SA

According to the most recent IDP of ADM, there are 2,066 households (11% of 19,648) that have do not have sanitation services according to *Reconstruction and Development Plan* (RDP) levels (*Ventilated Improved Pit latrines* - VIP - level or better). This data was sourced from the regulator, the *Department of Water and Sanitation* (DWS), in 2016. The report noted that the DWS data did not correspond to the data from Stats SA 2016 Community Survey and that the DWS data reflected a higher percentage of served population. Further, the number of households enumerated in the DWS 2016 survey was less (19,648 households) than that from the Stats SA 2016 Community Survey (Amajuba District Municipality, 2020).

2 Service Outcomes

Service outcome analysis is based on secondary sources. The following key sources of data are used:

- Stats SA Census (2011)
- Stats SA Community Survey (2016)
- IDP for ADM (2018 – 2019) (and associated annexures)
- Draft District Rural Development Plan: Amajuba District Municipality (2016)
- WSDP for Amajuba District Municipality (2016)
- IWA Water Balance for Amajuba District Municipality (2017/2018)
- Feasibility Study for The Roll-Out Of Non-Revenue Water Interventions Over The Next Three Years According To The Approved Strategic Management Plan for Amajuba District Municipality (2018)
- Amajuba District Municipality Socio-Economic Profile (2014)

This SFD Intermediate Report has relied on data obtained from ADM. Water and sanitation project budgets are approved by council based on backlogs and are included in IDPs and WSDPs. The ADM reports on water and sanitation service levels every second month. ADM has an internal backlog monitoring database used to measure service delivery on ward level (Amajuba District Municipality, 2020). Data on emptying and transport is not currently closely monitored and is mostly qualitative in nature, however, only 1% of population reportedly have their tanks emptied.

2.1 Overview

This section presents the range of sanitation technologies/infrastructure, methods and services designed to support the management of *faecal sludge* (FS) and/or *wastewater* (WW) through the sanitation services chain in Dannhauser LM. The details on the quantitative estimations are presented in the **Table 2** and sections that follow. These estimates were provided by the municipal officials at the meeting and site visits held on the 31st October – 1st November 2018. It may be noted that there are discrepancies with the data from various sources, maybe due to time intervals of data collection or sources used.

Table 2: Sanitation technologies and contribution of excreta in terms of percentage of population

No.	Sanitation technologies and systems as defined by:		SFD reference variable	Percentage of population
	Amajuba DM	**SFD promotion initiative**		
1	Toilet flushes directly to sewer	Toilet discharges directly to a centralised foul/separate sewer	T1A1C2	8%
2	Septic and conservancy tanks (plastic or concrete)	Fully lined tank (sealed), no outlet or overflow	T1A3C10	1%
3	VIPs – fully lined	Fully lined tank (sealed), no outlet or overflow	T1A3C10	89%
4	Not serviced	No toilet, open defecation	T1B11C7 to C9	2%

2.1.1 Containment

There is a limited sewerage network with only 1 out of 13 wards (Ward 2-8% of population) with off-site formal waterborne sewer system linked to the Dannhauser WWTW (Tweediedale Ponds) and Durnacol WWTW (activated sludge – oxidation ditch) with domestic effluent originating from Dannhauser (town) (T1A1C2 = 8% on Table 2).

The remaining areas are reliant on on-site sanitation systems. The following on-site containment systems are generally noted:

- Flush toilet connected to a conservancy tank (concrete or plastic) for an individual house/building (T1A3C10 = 1% on Table 2)., and
- VIPs (fully lined) (T1A3C10 = 89% on Table 2).

There is a mixture of septic tanks (mostly on farms, and self-treating) and conservancy tanks (mostly small business and in town and a rate is paid per load disposed by the municipality), but little clarity on the actual number of each type of structure. At this stage there are no specific municipal design standards for septic tanks or conservancy tanks and therefore the size, material of construction, configuration of installed infrastructure, etc. is variable.

The conservancy tanks have no formal outlets; they are defined as fully lined tanks within the SFD nomenclature. The ADM does not seem to currently have an asset register/database of all these septic/conservancy tanks. Most of the conservancy tanks either serve small businesses/industry in Dannhauser (there is also one public toilet related conservancy tank at the taxi rank, or are located in the nearby town of Hattingspruit. It is noted that these conservancy tanks sometimes overflow thereby spilling wastewater into the environment.

There are parts of Dannhauser urban and rural areas where communities use VIP toilets. All VIPs installed within Dannhauser LM are thought to be fully lined (i.e. both on sides and bottom, due to high groundwater table/risk of groundwater pollution). To-date, these toilets have never been emptied and indications are that some of these VIPs are filling rapidly. The reason for the rapid filling could not be confirmed. It is possible that the pits were built shallow or the communities are dumping detritus within latrines. In rural areas, communities are used to covering up and abandoning a full VIP and relocating the VIP to a new location. In the urban context, limited space could prohibit this practice.

2.1.2 Emptying and Transport

Dannhauser LM have access to only 1 honeysucker (vacuum truck), mostly functioning in Hattingspruit, and also supporting conservancy tank emptying in Dannhauser. Due to the limited number of tanks that need to be emptied (mostly servicing businesses), the truck currently only operates approximately 3 times per week.

There is one public toilet in Dannhauser that is connected to a conservancy tank. This tank is emptied on a monthly basis via honeysucker.

Wastewater/sludge emptied from all conservancy tanks is transported via honeysucker to the Dannhauser #7 Pump Station for disposal. The municipality have had incidents in the past where the driver could not access the pump station and therefore disposed of the truck contents outside the pump station creating nuisance conditions. An arrangement has now been made

that if there is no access to the pump station, the driver can dispose of the waste at the Tweediedale Ponds. The pump station is, however, preferred as this is a more controlled environment.
The ADM have 1 vacuum truck to service Dannhauser LM. The truck has a capacity of 6,000 L. The truck is operated by 1 driver and 1 or possibly 2 assistants. Personnel are issued with appropriate *Personal Protective Equipment* (PPE) including boots and gloves, but they don't always use provided equipment. If the vacuum truck breaks down, ADM have an existing emergency appointment with a service provider, who is then able to service and empty the conservancy tanks.

Businesses/industries have accounts with the municipality and therefore the emptying of conservancy tanks forms part of their monthly bill. When a tank is emptied, it is recorded in a logbook, and the customer is asked to sign off. For businesses/industries without accounts, upfront payment is required prior to the tank emptying service being provided.

Any wastewater/sludge discharges to the ADM sewer network/ponds needs to be paid for (i.e. even if the user has paid for the honeysucker of a private service provider to empty their tank). As the tanks vary in size, it is difficult to estimate the average number of tanks emptied per day. A lack of adequate record checking and verification, and associated data analysis/interpretation also makes this a challenge.

VIPs are currently not emptied. There is currently no strategy or plan within ADM to deal with VIP emptying and disposal/treatment. There have been limited cases of pits being full after a short-period (e.g. 6 months) and it is assumed that these pits were not dug deep enough by contractors (i.e. need for improved supervision of contractors). To-date, the contents of VIPs have not yet been analysed or categorised. User education of VIP operation, maintenance and management is performed by ADM when such structures are handed over.

The ADM is not aware of manual emptying from on-site sanitation systems (e.g. VIPs, conservancy tanks) occurring within Dannhauser LM.

ADM have an existing appointment with a honeysucker service provider who is able to assist with providing a service in an emergency (i.e. should the municipal honeysucker break down and require maintenance, supply chain management can mobilise quickly). There is currently very little monitoring and management of vacuum truck emptying (i.e. don't have a system in place to record and track trucks at pump station/WWTWs), and monitoring at point of discharge to the WWTWs does not appear to be occurring (i.e. do emptiers actually deliver collected sludge to the designated discharge points?). Despite this, it is noted that from a municipal perspective, as municipal officials operate the honeysucker, they assume they do deliver at the specific discharge points (e.g. pump station, pond system), as these officials will not be turned away and therefore have no reason to illegally discharge. Furthermore, the distance to travel from the conservancy tanks to the discharge point is relatively short (<15 km). However, as emptiers are salaried staff, there does not seem to be an incentive to manage time efficiently.

The sewer system is aging with some pipes constructed from earthenware material (clay), with the balance of pipe materials either being AC or uPVC. The actual length of sewers is not known.

When power failures occur, some overflows of sewage pump stations are noted, and not all wastewater would end up at the 2 WWTWs.

A key aspect to note is that in 2013, water and wastewater related assets were transferred from Uthukela Water to ADM. At this stage, it was noted that the current infrastructure asset registers were incomplete (e.g. no as-built drawings) and ADM embarked on addressing these gaps. However, as funding for this aspect is currently limited, ADM continue to complete the asset register in a piecemeal fashion. This will account for some of the noted knowledge gaps.

2.1.3 Treatment and Disposal

Dannhauser LM is serviced by 2 WWTWs, namely the Dannhauser WWTW (Tweediedale Ponds) and the Durnacol WWTW, with 8 associated pump stations. The limited sewerage network is confined to Ward 2 and conveys wastewater to the 2 WWTWs.

The Dannhauser WWTW (Tweediedale Ponds) (design capacity: 2 ML/d) consists of 14 ponds and also accepts tankered effluent (if there is no access to Dannhauser #7 Pump Station) (**Figure 3**). The works are properly fenced with controllable access via a security guard. At the time of the site inspection, there was however evidence that animals had recently entered the site (visible droppings – likely goats). Sludge appears to be accumulating in the ponds, and access to some of the ponds is challenging.

Figure 3: Aerial view of Dannhauser WWTW (Tweediedale Ponds)

The Durnacol WWTW (design capacity: 2 ML/d) is an oxidation ditch system based on activated sludge treatment technology (**Figure 4**). Final effluent is disinfected before it is released to the nearby wetland. The works are properly fenced with controllable access via a security guard. Only 3 of the on-site drying beds are in use and the sludge digester is no longer in use.

Figure 4: Aerial view of Durnacol WWTW

To-date, the wastewater sludge from both WWTWs has not been categorised (only drinking water treatment-related sludge for Dannhauser LM has been categorised). Currently, there is no beneficial use of sludge, and sludge is stockpiled on-site at the WWTWs (i.e. not disposed of at a landfill).

An overview of the two WWTWs is presented in Table 3.

Table 3: Overview of Dannhauser LM WWTWs

Name	Treatment type	Design Capacity (ML/day)	Winter Flow (ML/day)	Summer Flow (ML/day)	Sludge treatment	Sludge disposal/use
Dannhauser WWTW (Tweediedale Ponds)	Ponds	2	0.4 – 0.6	0.8 – 0.9	None	None, stockpiled
Durnacol WWTW	Oxidation ditch (activated sludge)	2	1.0 – 1.5	1.8 – 2.0	None	None, stockpiled

2.1.4 Human resources

It is noted that within Engineering Services in ADM for 2018/2019, of a total number of posts of 11; 8 posts are filled (70%), while 33 posts are vacant (30%) (Amajuba District Municipality, 2018). This could indicate potential gaps with fulfilling all required sanitation services functions/tasks.

2.2 SFD Matrix

presents the SFD Matrix for the Dannhauser LM using data collected from ADM in 2018. A description of the assumption used in the SFD Matrix are presented in the following sections.

2.2.1 Off-site sanitation

According to municipal records, 8% of the population are serviced via off-site sanitation (T1A1C2 = 8% on Table 4). Wastewater collected is delivered to the 2 WWTWs, namely the Dannhauser WWTW (Tweediedale Ponds) and the Durnacol WWTW.

In order to determine the proportion of wastewater in the sewer system that is actually delivered to centralised WWTWs, the status of the sewer network needs to be known. Although the average life remaining of the sewer network is unknown (asset register is incomplete), it is assumed that the existing sewer systems in some areas of Dannhauser LM are beyond their design lives and in poor condition. It is therefore anticipated that leakage will occur.

Table 4: SFD Matrix for Dannhauser Local Municipality (2018).

Dannhauser, KwaZulu Natal, South Africa, 8 Nov 2018. SFD Level: 2 - Intermediate SFD Population: 105341 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	8.0	90.0	84.0			
T1A3C10 Fully lined tank (sealed), no outlet or overflow	90.0			1.0	100.0	84.0
T1B11 C7 TO C9 Open defecation	2.0					

Considering a current water supply of approximately 3.6 ML/day for Dannhauser LM, and if we assume that 70% of the water supply will enter the sewerage system (i.e. ~2.5 ML/day), and if there was no leakage, we would expect the same quantity at the WWTWs (i.e., ~2.5 ML/day). Currently, the two WWTWs are receiving and treating (on average) ~2.25

ML/day. The calculated leakage within the sewer network is therefore approximately 10% ((2.5 – 2.25) / 2.5 = 10%), and this proportion of wastewater is therefore not delivered to the WWTWs. It is therefore estimated that 90% is delivered to the centralised WWTWs for treatment (W4a = 90% on Table 4).

Once the wastewater reaches the WWTWs, it is treated to meet specified requirements. Table 5 shows the various flows per WWTW and associated overall effluent compliance per WWTW, an overall flow weighted compliance of 84% is noted (W5a = 84% on Table 4).

Table 5: Compliance for Dannhauser LM WWTWs

No.	Wastewater Treatment Works (WWTW)	Average Flow (Ml/day)	Overall Effluent compliance (%)
1	Dannhasuer WWTW (Tweedledale Ponds)	1.57	82%
2	Durnacol WWTW	0.68	91%
	Total	**2.25**	**84%**

To-date, wastewater sludge has not yet been analysed or categorised, and therefore sludge compliance still needs to be determined. Wastewater sludge is currently stockpiled at the respective WWTWs.

2.2.2 On-site sanitation

Containment

Of the 630 conservancy tanks (concrete or plastic, sealed, fully lined), 80% (504) are considered to be in good condition (i.e. sealed, not leaking) while 20% (126) are considered to be in poor condition (i.e. possibly leaking to environment but unable to determine where).

Of the total 93,684 VIPs, all (i.e. 100%) are fully lined with brick/cement blocks (sides and bottom) so as to prevent potential groundwater pollution. The first VIPs in the area started functioning around 2006 and they are considered to be in a good condition. The ADM have not yet emptied any VIPs and a VIP emptying strategy has not yet been developed. A limited number of cases of “full VIPs after 6 months” have been reported, and in these cases it is suspected that contractors did not dig deep enough pits (as per required specifications).

Therefore, a total of 93,684 + 504 = 94,188 (89.4% of total households) are considered to be served by fully lined (sealed) tanks in good condition while 126 (0.1% of total households) are considered to be in poor condition (Total = 94,314 or 89.5%). Both good and poor condition on-site sanitation make up 90% (89.5% rounded) of the population served by this type of sanitation system (T1A3C10 = 90% on Table 4).

Emptying and transport

As explained earlier, faecal sludge is emptied from conservancy tanks by the municipal honeysucker (vacuum truck) but the VIPs are never emptied, instead when full, they are covered, closed and a new facility constructed. Therefore only 1% of fully lined tanks (sealed) – the conservancy tanks - are emptied (F3 = 1% on Table 4).

As it is noted that alternative points of discharge do not appear to be feasible, it is assumed that the small proportion of faecal sludge emptied from the tanks is delivered to the WWTWs with no illegal dumping (F4 = 100% on Table 4)).

Treatment
Once it reaches the WWTWs, faecal sludge is treated to meet specified requirements. As previously noted in Table 5, and considering the various flows per WWTW and associated overall effluent compliance per WWTW, an overall flow weighted compliance of 84% is noted (F5 = 84% on Table 4).

2.2.3 Open defecation

There were 2,404 households that were not serviced (i.e. ~2%). This is considered the sanitation backlog and needs to be addressed. As Dannhauser LM do not know the sanitation practices for these households, it is assumed that current sanitation practices are unsafe and that 2% of population is practicing open defecation, as shown on Table 4 .

2.2.4 Risk of groundwater contamination

With respect to groundwater contamination, water for both urban and rural areas of Dannhauser LM is supplied from various water treatment works via pipeline to households, with the majority of households either receiving water via household taps, yard connections or communal standpipes.

A number of boreholes exist and are used as a back-up resource in times of drought. As such, protection of these water sources is essential. VIPs constructed in the area are therefore fully lined. Although the groundwater is therefore not generally being used, climate change impacts and the increasing water scarcity facing many parts of South Africa and the KwaZulu-Natal province.

Of concern, is that in Dannhauser LM, an appropriate asset register of conservancy tanks does not exist, and therefore there is a risk that such systems could be damaged/broken and polluting the environment, and possible impacting on groundwater quality. On-going groundwater quality monitoring by ADM appears to indicate no impact on groundwater quality.

There is a need to create awareness among the rural people about the need to ensure that VIPs are adequately sealed when closed/moved/new pit dug and of the effects of using polluted water.

2.2.5 Data assumptions

The SFD graphic was developed in 2018 for Dannhauser LM. Data for the SFD Matrix and subsequent SFD Graphic was obtained from ADM. The more recent IDP of ADM indicated that there were around 1,768 housesholds without sanitation (Amajuba District Municipality, 2020). The figure is similar to figures reported in the development of this SFD Intermediate Report in 2018 (2,404 households). The ADM has an internal backlog monitoring database used to measure service delivery on ward level and would this represent the most-to-date record (Amajuba District Municipality, 2020).

2.3 SFD Graphic

Based on the above data, estimates and assumptions, the SFD graphic illustrates that nearly all excreta (96%) is safely managed in Dannhauser LM (Figure 5).

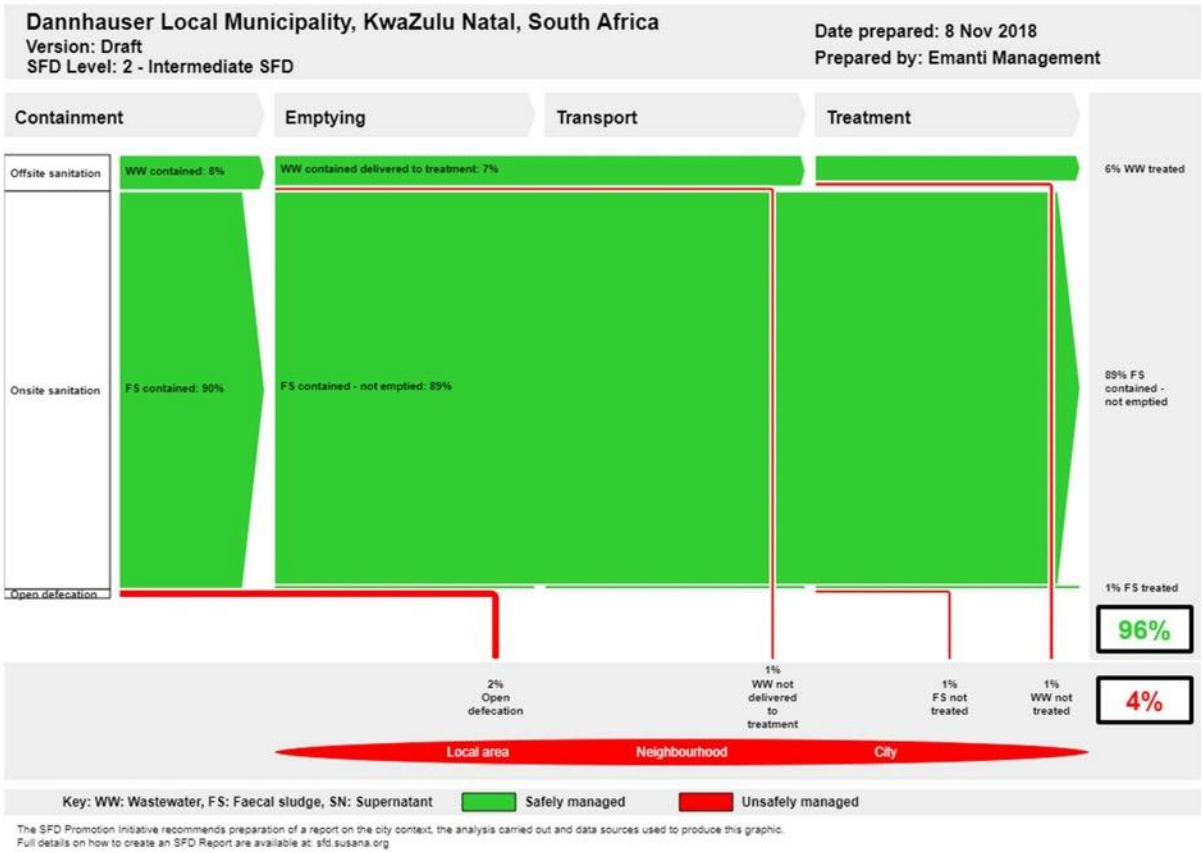

Figure 5. SFD Graphic for Dannhauser Local Municipality (2018).

The vast majority of the population of Dannhauser LM utilise on-site sanitation systems (90% on-site sanitation on Figure 5), only 8% of the population are connected to off-site sanitation and 2% practice open defecation.

Over 90% of the safely managed sanitation is faecal sludge that is not emptied and remains contained in the VIPs (89% FS contained - not emptied on Figure 5). This excreta is safely managed but it is a short term solution as after a period of time all the VIPs will become full and, if space is limited for a cover and replace approach, will eventually require emptying or the pits upgrading so that they can be emptied.

There is concern that an emptying strategy has not yet been developed. With time, VIPs will fill and without subsequent emptying, the current status could therefore deteriorate if this is not considered in the near future. This has been noted by ADM in their latest IDP which indicated that surveys undertaken in the ward are indicating that pit latrines are becoming unhygienic and many of them are full, thereby exacerbating the problems associated with poor sanitation (Amajuba District Municipality, 2020). This SFD Intermediate Report includes a forecasting scenario should pits not be emptied and is discussed in the following section 2.5.

2.4 Need for a VIP emptying strategy

It is expected that VIPs will eventually fill. Without subsequent emptying, the current SFD status could therefore be expected to deteriorate in the future scenario SFD Graphic presented in Figure 6.

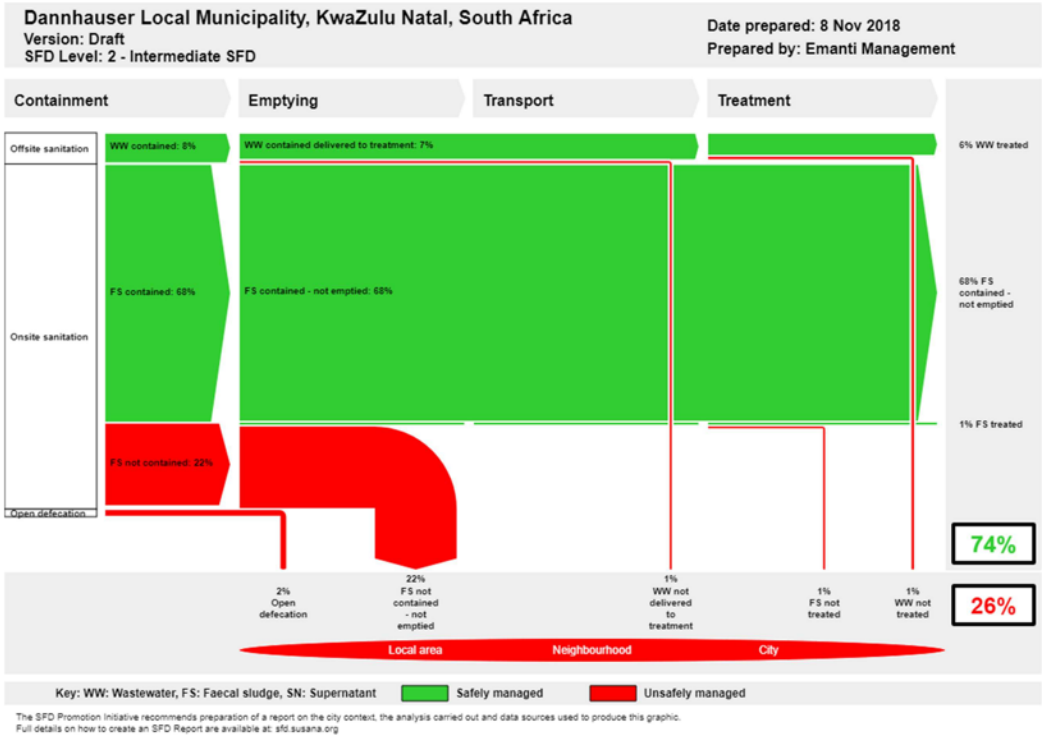

Figure 6: SFD graphic – Possible Future Scenario

The assumptions used in the future scenario are:

- 25% of current VIP users, will remain as is.
- 25% of VIPs will never be emptied, but abandoned when full and adequately covered with soil, no outlet or overflow.
- 25% of VIPs will never be emptied but abandoned when full, but NOT adequately covered with soil, no outlet or overflow.
- 25% of households will move to unlined pits.

In this future scenario, current VIPs are re-categorised on the SFD matrix (Table 7).

Considering this possible future scenario, it can be concluded that excreta of 74% of the population in Dannhauser LM would be safely managed, while 26% of excreta would be discharged into the environment untreated. This highlights the importance of developing and implementing an appropriate VIP emptying strategy. The latest IDP reports for the ADM indicate that pits are becoming unhygienic and some are full.

Table 6: Possible Future scenario – re-categorisation of VIPs

	SFD Categorisation	Current Status		Possible Future Scenario	
		%	Number	%	Number
1	Full lined (sealed) tank	100%	93 684	25%	23 421
2	Pit (all types) never emptied, but abandoned when full and covered with soil, no outlet or overflow	0%	0	25%	23 421
3	Pit (all types) never emptied but abandoned when full but NOT adequately covered with soil, no outlet or overflow	0%	0	25%	23 421
4	Unlined pits	0%	0	25%	23 421
	Totals	**100%**	**93 684**	**100%**	**93 684**

3 Service delivery context

This section provides the service delivery context.

3.1 Policy, legislation and regulation

This section provides an overview of policy, legislation and regulation related to sanitation services.

Constitution of the Republic of South Africa (1996)

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 has often been interpreted as implying a right to basic sanitation for all. Water and sanitation are intrinsically linked. All spheres of government are tasked with the responsibility to ensure that these basic water supply and sanitation services are provided.

Water Supply and Sanitation Policy (1994)

With democracy in 1994, the newly formed *Department of Water Affairs and Forestry* (DWAF) - subsequently renamed the *Department of Water Affairs* (DWA) and then more recently

Department of Water and Sanitation (DWS) – developed the White Paper on Water Supply and Sanitation Policy (1994). The White Paper provided the institutional framework for water and sanitation services which was subsequently legislated in the Water Services Act (1997) (Tissington, 2011).

The White Paper noted that full waterborne sewerage was not technically feasible and that VIPs, if constructed to agreed standards and maintained properly, would provide an appropriate and adequate basic level of sanitation service. Thus, a well-constructed VIPs would be classified as an adequate basic provision (Department of Water Affairs and Forestry, 1994). Policy principles from this documented were mirrored in the later White Paper on Basic Household Sanitation (2001) (Tissington, 2011).

National Sanitation Policy (1996)

The National Sanitation Policy of 1996 defines sanitation as "the principles and practices relating to the collection, removal or disposal of human excreta, refuse and waste water, as they impact upon users, operators and the environment." This White Paper was developed by the National Sanitation Task Team as a policy document that is complemented by an implementation strategy (National Sanitation Task Team, 1996). The 1996 National Sanitation Policy followed the 1994 White Paper on Water Supply and Sanitation Policy. The document noted that sanitation is more than building toilets and includes behavioural aspects including hygiene and community involvement. The document noted that the provision of household sanitation is the responsibility of the householders. Local government plays a role to help make this possible with support from provincial and national government spheres. The document listed the main types of sanitation systems used in South Africa and provided criteria for implementation. Bucket toilets and traditional pit toilets (without ventilation and fly screen) were not considered appropriate sanitation. The minimum acceptable level of basic sanitation stated by the then DWA (now DWS) is the VIP latrine (National Sanitation Task Team, 1996).

Water Services Act (1997)

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

<u>The National Water Act (1998)</u>

The National Water Act (Act 36 of 1998) (NWA) defines how water resources are protected, used and managed. Amendments to the Act have been undertaken in 1999 (Act 45) and 2014 (Act 27). The Act governs how wastewater may be returned to the environment and the requirement of a Water Use Authorisation (Section 40) for the disposal of sewage sludge and thus faecal matter. Furthermore, the Act might require a General Authorisation for the application of sludge if this is not part of the WWTW Water Use License (National Water Act 36, 1998).

Municipal Systems Act (2000)

The Municipal Systems Act 32 (2000) provides the framework to enable municipalities to: achieve development targets and ensure universal access to essential services that are affordable to all. The Act defines what is a municipality and defines it role. It further indicates how services may be undertaken through a local municipality or district municipality and the procedures required to do so (Act 33 of 2000).

Municipalities are obliged to develop and adopt an IDP. Th IDP forms the policy framework and basis by which budgets are developed. Municipal planning has to be developmentally oriented.

Section 26 of the Municipal Systems Act (2000) states:.
“An integrated development plan must reflect—

(a) the municipal council’s vision for the long term development of the municipality with special emphasis on the municipality’s most critical development and internal transformation needs;
(b) an assessment of the existing level of development in the municipality, which must include an identification of communities which do not have access to basic municipal services;
(c) the council’s development priorities and objectives for its elected term, including its local economic development aims and its internal transformation needs;
(d) the council’s development strategies which must be aligned with any national or provincial sectoral plans and planning requirements binding on the municipality in terms of legislation;
(e) a spatial development framework which must include the provision of basic guidelines for a land use management system for the municipality;
(f) the council’s operational strategies;
(g) applicable disaster management plans;
(h) a financial plan, which must include a budget projection for at least the next three years; and
(i) the key performance indicators and performance targets determined in terms of section 41”.

Each district municipality, within a prescribed period after the start of its elected term and after following a consultative process with the local municipalities within its area, must adopt the IDP. The IDP will remain in effect until a new IDP is adopted by the next elected council (Republic of South Africa, 2000).

White Paper on Basic Household Sanitation (2001)

The White Paper on Basic Household Sanitation aimed to improve on National Sanitation Policy of 1996 and incorporated the knowledge gained in actual implementation of the sanitation programmes since then. The White Paper articulated the Government policies on sanitation,

highlighted the impact sanitation of the public and provide a framework for the implementation and monitoring of sanitation programmes with greater coherence and co-ordination amounts different spheres of government (Department of Water Affairs and Forestry, 2001). The focus of the policy was on the provision of basic sanitation facilities to mostly rural and informal settlements.

The principles to guide the policy and intervention strategies as stated in the White Paper:
“

1. **Sanitation improvement must be responsive to the demands of the people and supported by an intensive Health and Hygiene Programme.**
   Household sanitation is first and foremost a household responsibility. For users to benefit maximally, they must also understand the link between their own health, good hygiene and toilet facilities.
2. **Community participation**
   Communities must be fully involved in projects that relate to their health and wellbeing, and also in decisions relating to community facilities such as schools and clinics. Communities must participate in decision making about what should be done and how; must contribute to the implementation of the decisions and must share in the benefits of the project or programme.
3. **Integrated planning and development**
   The health, social, and environmental benefits of improved sanitation are maximised when sanitation is planned for and provided in an integrated manner along with water supply and other municipal services.
4. **Sanitation is about environment and health**
   Sanitation improvement must be accompanied by activities promoting health, hygiene and the environment.
5. **Basic sanitation is a human right**
   Government has an obligation to create an enabling environment through which all South Africans can gain access to basic sanitation services.
6. **To provide access to sanitation services.**
   Local government has the constitutional responsibility to provide sanitation services.
7. **Access to sanitation for all**
   Those with the greatest health risk due to poor sanitation must be assisted first.
8. **Equitable regional allocation of development resources**
   The limited national resources available to support the incremental improvement of sanitation services should be equitably distributed throughout the country according to population, level of development, and the risk-to-health of not supporting sanitation improvement.
9. **Water has an economic value**
   The way in which sanitation services are provided must take cognisance of the growing scarcity of good quality water in South Africa.
10. **Polluter pays principle**
    Polluters must pay for the cost of remediation of the effects on the environment of the pollution they create.
11. **Sanitation services must be financially sustainable.**
    Sanitation services must be sustainable both in terms of capital (input) costs and recurrent (ongoing service) costs.
12. **Environmental integrity**

> The environment must be protected from the potentially negative impacts of badly designed sanitation systems" (Department of Water Affairs and Forestry, 2001).

The strategic interventions include many aspects including community participation, health and hygiene awareness education, adopting environmental management in approach, upgrading of facilities, utilising common approaches including technical options for implementation and undertaking specific programmes for eliminating backlogs (Department of Water Affairs and Forestry, 2001). The IDPs as seen as the mechanism for prioritisation and co-ordination of service delivery. The White Paper stated that the IDPs must contain at least the following:
the existing service levels available to households;

- proposed new service levels per household;
- health and hygiene education to be provided;
- the estimated capital and recurring costs of providing these services;
- the cost to households for service payments;
- the availability of grant funding;
- the implications for the overall municipal budget; and
- how the service impact of the investment will be measured and monitored.

In 2001, the DWAF produced a summary of the 2001 White Paper on Basic Household Sanitation (Department of Water Affairs and Forestry, Sanitation for a Healthy Nation: Summary of the White Paper on Basic Household Sanitation). The document showed the linkage between the IDP, WSP and the Sanitation Plan for a municipality. The WSDP is a component of the IDP and the universal sanitation coverage of at least a minimum basic level of sanitation by the target date is a requirement of the policy and must be committed to in the IDP.

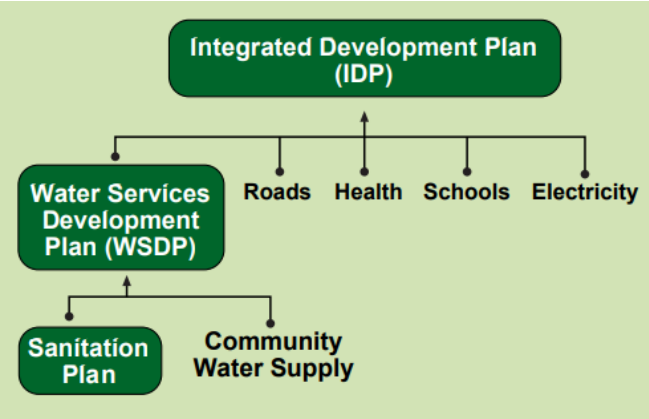

Figure 7. Interlinking of the IDP, WSDP and Sanitation Plan (Department of Water Affairs and Forestry, Sanitation for a Healthy Nation: Summary of the White Paper on Basic Household Sanitation)

Strategic Framework for Water Services (2003)

The 2003 Strategic Framework for Water Services was approved by Cabinet in September 2003 to address the challenges in water and sanitation sector since democracy in 1994 and the adoption of new legislation since. The framework was developed through a consultative process involving the *Department of Provincial and Local Government* (DPLG), the *South African Local Government Association* (SALGA) and the *South Africa Association of Water Utilities* (SAWU). The framework was devised to guide the water sector with policies, legislation and strategies aligned and the framing of 7 sector goals, including that all citizens in South

Africa must have access to appropriate, acceptable, safe and affordable basic water and sanitation supply. Eliminating the backlog was a key theme and the target at the time of the framework was to exceed to Millennium Development Goals (Department of Water Affairs and Forestry, 2001).

National Sanitation Strategy (2005)

The National Sanitation Strategy of 2005 was prepared through the DWAF and the National Sanitation Task team. The strategy incorporates the strategies of other stakeholders including SALGA and the Provincial Sanitation Task Teams. The vision of the strategy was to co-ordinate resources at all government spheres to achieve universal sanitation by 2010. The strategy builds upon the 2003 Strategic Framework for Water Services and sought to increase priority and resources in sanitation implementation programmes by local authorities. The strategy examines various aspects of the delivery of sanitation including current bottlenecks and makes proposals for accelerating the delivery in order to meet the 2010 national target. The sanitation strategy states that no sanitation systems lower than a VIP latrine should be implemented and that bucket toilets should be eradicated with the WSA having the key responsibility of sanitation delivery. The WSA is required to develop a Free Basic Sanitation programme (Department of Water Affairs and Forestry, 2005).

Free Basic Sanitation Implementation Strategy (2008)

The 2003 Free Basic Sanitation Implementation Strategy was developed to guide WSAs in the implementation of the National Free Basic Sanitation Policy. The DWAF acknowledged that the 2010 target of universal sanitation access would not be achieved given the challenges faced by WSAs in sanitation service delivery. A revised target of 2014 was set and in line with the Department of Housing target of all citizens having access in 2014. The definition of Basic Sanitation remained unchanged from the 2003 Strategic Framework for Water Services. The strategy adopts the principles that national guidelines should be implemented by local conditions and choice allowing flexibility in the implementation approach. Community participation is as seen as key aspect for long-term success. The primary intended beneficiaries of the strategy are poor households with the most practical indicator of poverty being household expenditure. The document provides guidance of the term *free basic sanitation* and noted that whole national policy is to provide free basic sanitation to the poor, many WSAs are financially constrained and in such cases, they may pace cap on the free basic sanitation grant and require beneficiaries to contribute in cash or kind. However, citizens should no receive sanitation facilities below the basic minimum level and should be included the WSAs Free Basic Sanitation Policy (Department of Water Affairs and Forestry, 2008).

National Sanitation Policy (2016)

The DWS (renamed in 2014) developed the 2016 National Sanitation Policy through a consultative process. The document provides policy positions to address the policy gaps and challenges as indicated through the stakeholder consultation process. It also includes country's new national and international development imperatives. The document adopts many of the strategic policy positions outlined by the 2003 Strategic Framework for Water Services.

3.2 Planning

In the latest IDP of ADM, it was noted that over 19,160 households were served with VIP latrines within Dannhauser LM in the past 6 years. It has been estimated that a further 1,200 to 1,429 households still require basic sanitation services based on the Stats SA Community Survey 2016 and 2016 DWS data. ADM was the WSA estimated that around ZAR 10 million is required to eradicate backlogs with a further ZAR 278 million required to convert from VIP to septic/waterborne sanitation in certain wards were housing projects and upgrade are required (Amajuba District Municipality, 2020).

There are also further plans for water and sewer reticulation asset replacement for ZAR 250 million, starting in 2022 and including Dannhauser and Emadlangeni LMs. A further ZAR50 million has been budgeted for bulk water and sewer reticulation for housing in Dannhauser LM.

3.3 Equity

3.3.1 Current choice of services for the urban poor

Most rural settlements use pit latrines for sanitation purposes while most commercial farms have on-site septic tanks. The sewer system is concentrated mainly in town but is aging and requires upgrading and maintenance. The current sewer system is able to handle the population growth for up to 5 years. The infrastructure of the municipality plans is maintained through their operation and maintenance plan and the WSDP (Amajuba District Municipality, 2020).

3.3.2 Plans and measures to reduce inequity

This is achieved through WSDP which forms an integral component of the IDP as previously discussed. The ADM WSDP has been reviewed and approved by Council on the 30 May 2017 (Amajuba District Municipality, 2020). The ADM has noted that WSDP needs to be updated.

3.4 Outputs

3.4.1 Capacity to meet service needs, demands and targets

The vacancy rate within the ADM is 27.5%. At the time of this updated SFD report, 6 managerial posts have been filled and there is a recruitment process for Director of Technical services (Amajuba District Municipality, 2020).

The Amajuba DM has indicated in its latest IDP that its WSDP needs to be updated for 2020/21 and is in the process of developing a web based WSDP application (Amajuba District Municipality, 2020)

3.4.2 Monitoring and reporting access to services

This has been previously discussed in this SFD Intermediate Report and it includes data from Stats SA and DWS.

4 Stakeholder Engagement

The relevant ADM staff were contacted through e-mail, letter and telephone call prior to the visit to Dannhauser LM. The purpose of the SFD study and depth of data required was conveyed through an introductory letter to respective staff. Although a number of stakeholders of government departments were noted, this SFD study aimed to focus on interviews with staff from ADM, and their associated service providers.

Interviews were held with appropriate WSA superintendents and technicians who report directly to the Municipal Manager (currently no Technical Director – vacancy), who also accompanied the team to the site inspection. During the site inspection, interviews were held with the process controllers at the Dannhauser WWTW (Tweediedale Ponds) and Durnacol WWTW.

As the municipal vacuum truck was being serviced (only have 1 truck), interviews with the driver and assistants could not be conducted.

5 Acknowledgements (Optional)

This report was compiled for a *Water Research Commission* (WRC) project *Country-wide Shit-Flow Diagram: Establishing National Excreta Flows in South Africa* and as part of the SFD Promotion Initiative. We would like to thank Luyanda Simelane (Process Technician), Siphamandla Buthelezi (Superintendent), Sabelo Dube (Technician), Nokwazi Shabalala (Technician), and all participating ADM staff for giving time and necessary information for the assessment.

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7 Appendix

7.1 Appendix 1: Stakeholder identification

Table 7: Stakeholder identification

No.	Stakeholder group	In Amajuba DM context
1	City council / Municipal authority / Utility	Water Services Authority (WSA): Amajuba District Municipality Water Services Provider (WSP): Amajuba District Municipality
2	Ministry in charge of urban sanitation and sewerage	National: Department of Water and Sanitation Provincial: Department of Water and Sanitation (KwaZulu-Natal)
3	Ministry in charge of urban solid waste	National: Department of Environmental Affairs Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
4	Ministry in charge of urban planning, finances and economic development	National: Department of Human Settlements Provincial: KwaZulu-Natal Department of Human Settlements National: National Treasury Provincial: KwaZulu-Natal Provincial Treasury Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
5	Ministry in charge of environmental protection	National: Department of Environmental Affairs Provincial: Department of Economic Development, Tourism and Environmental Affairs of KwaZulu-Natal (EDTEA)
6	Ministry in charge of health	National: Department of Health Provincial: KwaZulu-Natal Department of Health
7	Service provider for construction of on-site sanitation technologies	Various, by tender appointment
8	Service provider for emptying and transport of faecal sludge	Various, by tender appointment
9	Service provider for operation and maintenance of treatment infrastructure	N/A Performed by Amajuba District Municipality
10	Market participants practicing end-use of faecal sludge end products	N/A
11	Service provider for disposal of faecal sludge (sanitary landfill management)	N/A
12	External agencies associated with faecal sludge management services (e.g. NGOs, academic institutions, donors)	N/A

7.2 Appendix 2: Tracking of Engagement

Table 8: Tracking of stakeholder engagement

Name of organization	Name of contact person	Designation	Date of engagement	Purpose of engagement
Amajuba District Municipality	Luyanda Simelane	Process Technician	24th October 2018	Introducing SFD, securing support for project
Amajuba District Municipality	Luyanda Simelane	Process Technician	31st October – 1st November 2018	Data collection, collation, verification and site visits including key informant interviews
Amajuba District Municipality	Siphamandla Buthelezi	Superintendent		
Amajuba District Municipality	Sabelo Dube	Technician		
Amajuba District Municipality	Nokwazi Shabalala	Technician		
Amajuba District Municipality	Luyanda Simelane	Process Technician	2nd – 6th November 2018	Data gaps, follow-ups
Amajuba District Municipality	Luyanda Simelane	Process Technician	23rd – 30th November 2018	Draft report review and finalisation

7.3 Appendix 3: Selected Site Visit Photos

Figure 8: Newly constructed VIP and indicating ability to be connected to water supply (in future, if required)

Figure 9: Dannhauser WWTW (Tweediedale Ponds)

Figure 10: Pond showing accumulated sludge at Dannhauser WWTW (Tweediedale Ponds)

Figure 11: Evidence of wastewater leaking from taxi rank public toilet conservancy tank (Dannhauser)

Figure 12: Durnacol WWTW with indication of required maintenance

Figure 13: Data gathering, verification, analysis and interpretation with Amajuba DM team

SFD Dannhauser Local Municipality, South Africa, Updated 2021

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