SFD Lite Report

Amathole District Municipality
Eastern Cape, South Africa

This SFD Lite Report was prepared by Emanti Management

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1 The SFD Graphic

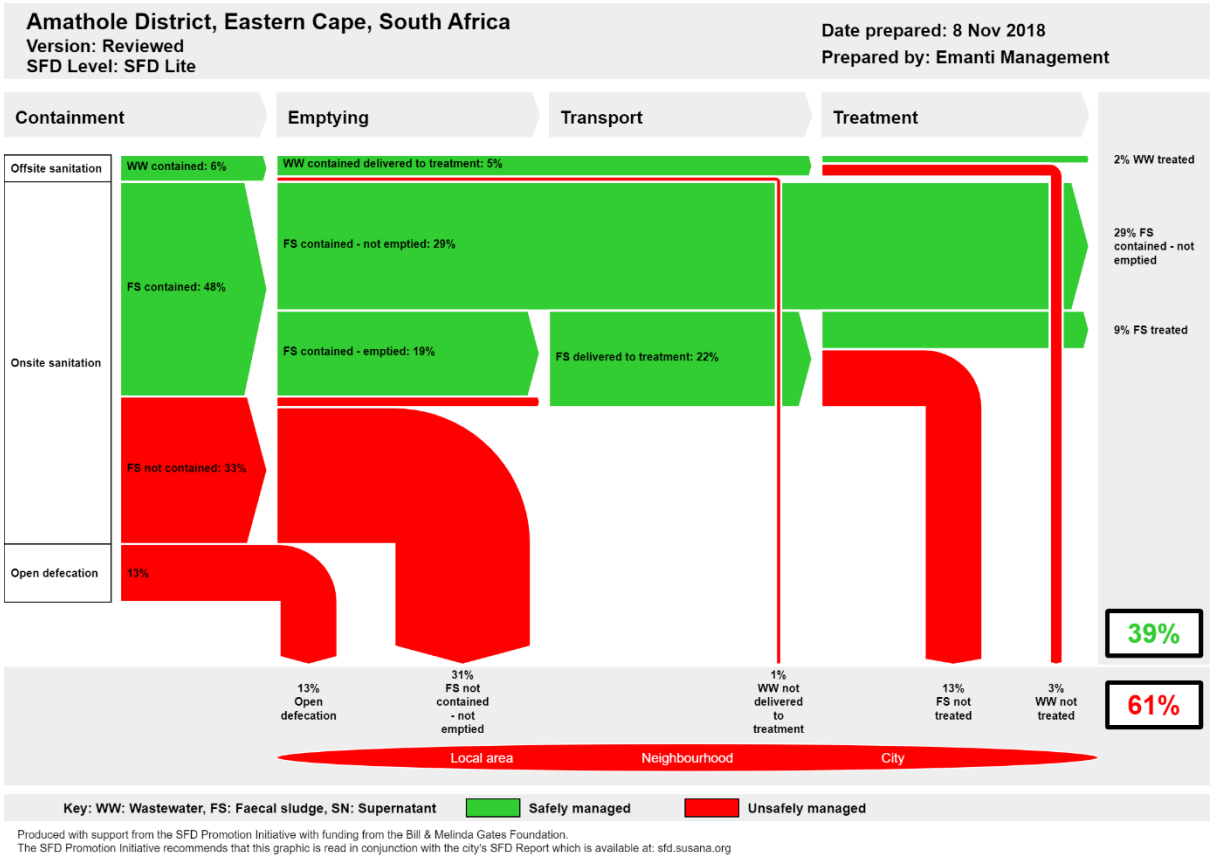

Figure 1. SFD graphic of Amathole District Municipality, Eastern Cape province, South Africa

2 SFD Lite information

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3 General municipal information

This *Shit Flow Diagram* (SFD) Lite Report was developed for the Amathole *District Municipality* (DM) in the Eastern Cape province, South Africa. The Constitution of South Africa classifies municipalities into three 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 one or more Local Municipalities (LMs) (Category *B* municipalities). The Category C DMs usually consist of more than one LM. The DM administers some of the functions of local government for a district which includes more than one LM.

The Amathole District Municipality (ADM) is in the central part of the Eastern Cape Province, South Africa. The Amathole DM covers 200 km of coastline of the Indian Ocean in the south to the Amathole Mountains in the north. The DM jurisdiction includes large parts of the previously disadvantaged Ciskei and Transkei homelands. The land of the DM is 21,229 square kilometres (km^2) (Amathole District Municipality, 2018). The topography of Amathole DM has been largely influenced by the underlying geography of the region specifically the formation of the Great Escarpment, that has resulted in the southern portion defined by a series of rivers and wetlands and the northern areas of the district associated with the altitudinous plains of the Escarpment and the drier conditions of the Great Karoo. The climate of the DM is moderate with moderate to warm temperatures (rarely below 10^{o}C and above 30^{o}C) throughout the year associated with sub-tropical climate conditions. January and February have been historically the warmest months of the year. The annual rainfall varies from 400 mm to more than 1,000 mm, with an annual average of around 700 mm per annum. Most of the rainfall period is in summer except in coastal area west of the city of East London. Climate change models indicate that the area will undergo temperature increases of around 1.5-2.5^{o}C and drier conditions (ICLEI – Local Governments for Sustainability – Africa Secretariat, 2017).

Figure 2: Map of the Amathole District Municipality with Local Municipalities in its area. Source: Integrated Development Plan (IDP) for Amathole District Municipality 2018/2019

Amathole DM area of jurisdiction is made up of six LMs. As a *Water Service Authority* (WSA), Amathole is responsible for the supply of water and sanitation services to all communities within its area (Republic of South Africa, 1997). The six LMs within the Amathole DM are listed below:

- Amahlathi LM comprising the towns of Stutterheim, Cathcart, Keiskammahoek and Kei Road, numerous peri-urban and rural settlements.
- Raymond Mhlaba LM comprising the towns of Alice, Fort Beaufort and Middledrift, the smaller towns of Hogsback and Seymour, numerous peri-urban and rural settlements.

- Ngqushwa LM, comprising the town of Peddie, the coastal town of Hamburg, numerous peri-urban and rural settlements.
- Great Kei LM comprising the town of Komga, the small coastal towns of Kei Mouth, Haga Haga, Morgan Bay and Cintsa, and a number of rural settlements.
- Mnquma LM comprising the main town of Butterworth, the small towns of Ngqamakwe and Centani, numerous peri-urban and rural settlements; and
- Mbhashe LM comprising the towns of Idutywa, Elliotdale and Willowvale, and numerous peri-urban and rural settlements (Amathole District Municipality, 2018).

Amathole DM offices are situated in the city of East London (Buffalo City Metropolitan Municipality of the Eastern Cape province) with 6 satellite offices in all its LMs (Dutywa, Butterworth, Komga, Stutterhiem, Peddie, Fort Beautiful and Adelaide) (Amathole District Municipality, 2018).

There are conflicting sources of the population size in Amathole DM. The population size has been reported to range between 862,077 and 914 842. The Municipalities of South Africa website cites a population size of 880,790 based on 2016 Stats SA Community Survey (Municipalities of South Africa, 2021). The *Integrated Development Plan* (IDP) from the Amathole DM has conflicting population size numbers within the same document with the population size indicated as 862,077 and 914,842 (Amathole District Municipality, 2018). Other sources show that the population in 2016 was 862,077 in line with the Municipalities of South Africa website (Eastern Cape Socio Economic Consultative Council, 2017). Key statistics related to services can be viewed in Figure 3.

Household Services	2011		2016	
	Number	Percent	Number	Percent
Access to housing				
Formal	120 148	52.7	119 571	55.9
Traditional	94 491	41.5	82 012	38.4
Informal	11 612	5.1	11 332	5.3
Other	1 569	0.7	818	0.4
Access to water				
Access to piped water	163 085	70.3	151 395	70.8
No Access to piped water	68 781	29.7	62 368	29.2
Access to sanitation				
Flush toilet	42 147	21.4	41 394	19.4
Chemical	6 774	3.4	11 029	5.2
Pit toilet	105 137	53.5	128 047	59.9
Bucket	2 798	1.4	1 255	0.6
None	39 840	20.3	27 016	12.6
Energy for lighting				
Electricity	161 644	69.9	176 207	82.7
Other	69 597	30.1	36 773	17.3
Energy for cooking				
Electricity	128 517	55.6	163 263	76.9
Other	102 792	44.4	49 144	23.1
Access to refuse removal				
Removed by local authority at least once a week	38 475	16.6	37 145	17.4
Removed by local authority less often	1 971	0.9	1 657	0.8
Communal refuse dump	3 232	1.4	10 323	4.8
Own refuse dump	145 456	62.7	146 032	68.3
No rubbish disposal	36 579	15.8	15 077	7.1

Figure 3. Key household services statistics (Eastern Cape Socio Economic Consultative Council, 2017).

The Amathole DM has developed a 5-year *Water and Sanitation Development Plan* (WSDP) during the 2017- 2022 IDP cycle. The WSDP forms part of an annexure of IDP (Amathole District Municipality, 2018). The WSDP indicates that the population is 914,823 with a total of

222,415 households (average household size is 4). There are 1,822 rural settlements (746,701 people) compared to 96 urban settlements (166,122 people) in the district. By 2018, Amathole DM has managed to provide water services to 223,224 households (93%) of households and sanitation services to 154,270 households (64%). The Amathole DM aims to conduct a [1]backlog verification exercise that will confirm the existing backlogs, the new extensions and quantifying the actual progress to date (Amathole District Municipality, 2018).

One of the challenges the DM faces is the simultaneous provision of a basic sanitation service while being expected to upgrade the bulk infrastructure under the conditions of unequal human settlement development. Further, communities are currently requesting a higher level of service (than a VIP). The Amathole DM has requested that National Government to re-access the conditional grant that is granted to the ADM due to the high number of indigents in the district. The district was also one of the most affected with drought from 2015/16 to date with Mbhashe and Mnquma LM the most affected. Funds had to be reshuffled to manage the drought in the above-mentioned areas and it was reported that there had been limited support that has been received from the national and provincial government during this period (Amathole District Municipality, 2018).

4 Service outcomes

This section presents the range of sanitation technologies/infrastructure, methods and services designed to support the management of *faecal sludge* (FS) and/or *wastewate*r (WW) through the sanitation services chain in Amathole DM (see also section 5 for further details of the quality of the services provided).

4.1 Sanitation technologies used

Table 1 shows the different sanitation technologies used in Amathole and how these are defined by the SFD Promotion Initiative, alongside the estimated percentage of population using each system. The estimates were made by municipal officials during the engagements of the 8th November for Amathole DM and are discussed in the sections that follow.

Below is a description of each of the sanitation technologies in Amathole DM:

[1] Sanitation backlogs refers to the population that has not been provided with acceptable sanitation services/infrastructure that does not meet the minimum standards.

Table 1: 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
	Amathole DM definition	SFD promotion initiative		
1	Toilet flushes directly to sewer	Toilet discharges directly to a centralised foul/separate sewer	T1A1C2	6%
2	Septic tank (plastic or concrete)	Septic tank connected to a soakpit	T1A2C5	1%
3	Conservancy tank (plastic or concrete)	Fully lined tank (sealed), no outlet, or overflow	T1A3C10	21%
4	Conservancy tank (concrete)	Lined tank with impermeable walls and open bottom, connected to open ground	T1A4C8	3%
5	VIPs – lined with cement blocks and open bottom	Lined pit with semi-permeable walls and open bottom	T1A5C10	2%
6	VIP toilets	Pit (all types) never emptied but abandoned when full and covered with soil, no outlet or overflow	T1B7C10	24%
7	VIPs – unlined	Unlined pit, no outlet or overflow, where there is a significant risk of groundwater pollution	T1A6C10	30%
8	Not serviced (rural and informal)	No toilet, open defecation	T1B11C7 to C9	13%

4.2 Off-site sanitation

There is a limited sewerage network that covers about 6% of Amathole DM population (T1A1C2 = 6% on Figure 4). The off- site formal waterborne sewer systems are linked to various oxidation ponds and *Wastewater Treatment Works* (WWTW) with domestic effluent originating from the residential network and various businesses. This figure is significantly lower than that reported in the WSDP (32,297 household connected to sewerage system = 14% of the population). It should be noted that the Amathole DM is currently undertaking a demographic and service level backlog verification survey. It was decided that once the survey is completed, the population, households and service level figures will be updated accordingly in the WSDP and in the DWS Geodatabase to reflect the updated figures (Amathole District Municipality, 2018).

Amathole District, Eastern Cape, South Africa, 8 Nov 2018. SFD Level: SFD Lite Population: 914823 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	6.0	80.0	40.0			
T1A2C5 Septic tank connected to soak pit	1.0			80.0	100.0	40.0
T1A3C10 Fully lined tank (sealed), no outlet or overflow	21.0			80.0	100.0	40.0
T1A4C8 Lined tank with impermeable walls and open bottom, connected to open ground	3.0			80.0	100.0	40.0
T1A5C10 Lined pit with semi-permeable walls and open bottom, no outlet or overflow	2.0			80.0	100.0	40.0
T1B11 C7 TO C9 Open defecation	13.0					
T1B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	24.0					
T2A6C10 Unlined pit, no outlet or overflow, where there is a 'significant risk' of groundwater pollution	30.0			0.0	0.0	0.0

Figure 4: SFD Matrix for Amathole District Municipality (2018)

Transport

The reticulated wastewater is transported to the various WWTWs within the respective municipalities. Much of the existing sewer system is aging and well beyond its design life. It is therefore anticipated that leakage is prevalent. However, there is no data to confirm this. Water supply losses are estimated to be 45% (Amathole District Municipality, 2018). However, this includes not just leakages from the system but also losses from illegal water connections in the rural areas and connected consumers that are not on the billing database (Amathole District Municipality, 2018). For the purposes of this SFD Lite report, leakage from the wastewater system is therefore estimated to be at around 20% i.e., approximately half the estimate of the water supply loss (W4a = 80% on Figure 4).

Treatment

Once the wastewater reaches the WWTWs, it is treated to meet specified requirements with effluent samples taken on a monthly basis. The 2017/2018 WSDP indicates that the 17 sampling points on the programme are compared to the DWS General Authorisation Standards for effluent discharge. In 2017/18, a total of 195 wastewater samples were taken

for analysis of which 95 samples complied with the General Authorisation Standards (Amathole District Municipality, 2018), indicating 48.7% compliance. However, these only report on microbiological compliance, other wastewater compliance figures are not noted in the WSDP. And taking onto consideration of other factors, such as high population growth resulting in possible overload conditions (Amathole District Municipality, 2018), an overall flow weighted compliance of 40% was estimated as a precautionary measure (W5a = 40% on Figure 4) .

4.3 On-site sanitation

Containment

The Amathole DM consists of a large rural population. On-site sanitation makes up the majority of sanitation facilities used by the total population.

VIP latrines are used by 56% of the total population. Two-fifths of these are unlined pits which are covered and replaced when full in areas where there is a low risk of groundwater pollution (T1B7C10 = 24% on Figure 4). A small percentage are lined VIPs with an open bottom which can be emptied and are also in areas where there is a low risk of groundwater pollution (T1A5C10 = 2% on Figure 4). The balance are unlined VIP latrines in locations where the use may result in a significant risk of groundwater pollution (T2A6C10 = 30% on Figure 4). The VIP latrine is considered as the basic minimum and therefore latrines that do not meet this specification are not considered as appropriate and therefore pose a risk to public health and environment.

Tank type onsite systems are used by 24% of the total population. The majority of these are fully lined tanks (buried concrete tanks, buried plastic tanks or plastic tanks covered with concrete slabs) with no outlet or overflow (T1A3C10 = 21% on Figure 4). A small percentage (3% of the total population) use concrete tanks that discharge to open ground, these have a sealed wall lining but an open bottom (T1A4C8 = 3% on Figure 4). And the remainder use septic tanks (plastic or concrete) with soak pits (T1A1C5 = 1% on Figure 4).

There is a mixture of septic tanks and conservancy tanks (mostly servicing the businesses and the towns). The users pay a fixed rate per load collected from the septic or conservancy tank. There is uncertainty in the design (whether lined/unlined and whether have one or two compartments) of these structures, however estimates were made based on the period of construction. ADM has a centre station for testing/evaluating different types of onsite sanitation technologies before they can be provided to the communities.

Emptying and transport

The fully lined tanks in the urban area are serviced by both municipal and private service providers (see full description in section 5). However, since there are no records of emptying coverage, the ADM estimate that 80% of all tanks and the lined VIPs are emptied (F3 = 80% on Figure 4) and that virtually all the emptied faecal sludge is transported and delivered to treatment (F4 = 100% on Figure 4), with no reports of illegal dumping. 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 entering the WWTWs) and monitoring at point of discharge to the WWTWs does not appear to be occurring (i.e., do emptiers 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, as these officials will not be turned away and therefore have no reason to illegally discharge. Likewise, as the private service provider is always accompanied by a municipal representative, as they are appointed by the municipality for this specific purpose, they will also not be turned away, and they too have no reason to illegally discharge. It is therefore assumed that all wastewater is delivered to the plant. The only small portion (1%) left is due to the remains in the truck and the containment.

As mentioned above, the unlined VIPs are never emptied but covered and replaced when full, therefore the accumulated FS is not transported to any treatment facility.

Treatment

Faecal sludge is delivered to and co-treated with wastewater at the WWTW. The proportion of faecal sludge treated is therefore based on the same estimation that only 40% of incoming waste is treated to effluent discharge standards at the WWTW – see details in section 4.2 (F5 = 40% on Figure 4).

4.4 Open defecation

The municipality noted that open defecation is estimated to be around 13%. This figure closely matches the data in the 2017/2018 WSDP (31,652 households with no toilet facilities at all = 15%). As Amathole DM do not know the sanitation practices for these households, it is assumed that current sanitation practices are unsafe, and that open defecation is occurring.

4.5 Risk of groundwater pollution

Groundwater contamination is challenging to determine for the targeted area. Dam levels (surface water) are monitored weekly while borehole levels are monitored on an ad-hoc basis. The Amathole DM is aware that monitoring of the groundwater is essential and indicated a need to put a groundwater monitoring plan in place (Amathole District Municipality, 2018).

Some of the unlined pits are located where the groundwater table is high, whilst some are located in sandy soil type and ground water monitoring results have indicated non - compliance. We have been conservative that there might be groundwater contamination because it is a rural environment.

4.6 SFD Graphic

Based on the above data, estimates and assumptions, the SFD graphic illustrates that 45% of excreta is safely managed in Amathole DM (Figure 5).

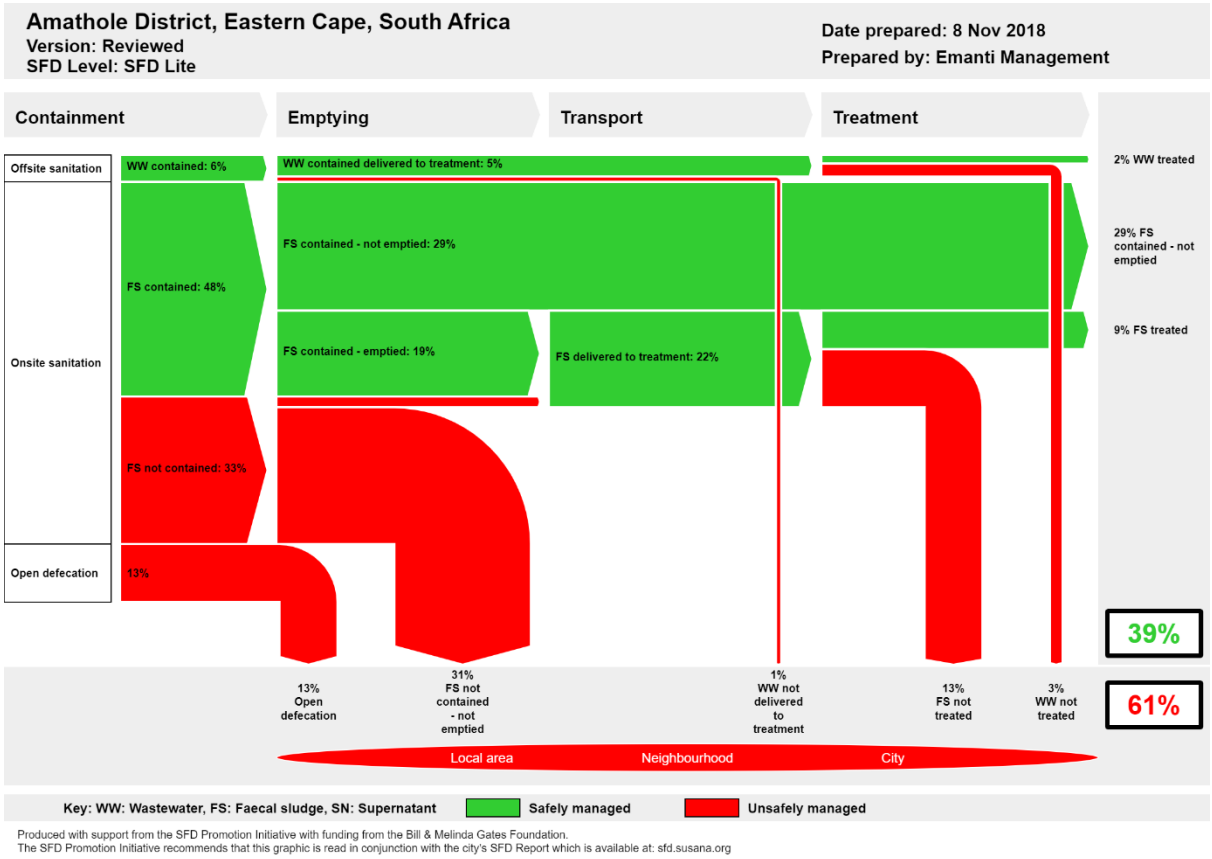

Figure 5: SFD Graphic of Amathole District Municipality

The majority of the population utilise on-site sanitation systems (81% on-site sanitation on Figure 5), only 6% of the population are connected to off-site sanitation and 13% practice open defecation.

Two-thirds of the of the safely managed sanitation is faecal sludge that is not emptied and remains contained in the VIPs and tanks (29% 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.

Nearly a third of the safely managed sanitation is from onsite systems which are emptied, and the faecal sludge taken to the WWTW where it is co-treated with wastewater (13% FS treated on Figure 5). The balance is the relatively small fraction of safely managed wastewater which is delivered to treatment and treated (3% WW treated on Figure 5).

An estimated 55% of the sanitation waste is not safely managed. Over half of this is from unlined VIP latrines which are not emptied but covered and replaced when full (31% FS not contained - not emptied on Figure 5). These facilities are in areas where there is a significant risk of groundwater pollution, according to the interviews held with the municipal officials.

5 Data and assumptions

This section provides the background to data and assumption used in developing the SFD Lite Report for Amathole DM. In developing the SFD Lite Report, a number of information sources were used and have been noted in section 6. Data has been sourced from Amathole DM. Assumptions made were confirmed through interviews with Amathole District Municipality

officials. There is a lack of correlation of figures reported in numerous sources and this has been discussed previously. It is assumed that the data supplied by Amathole DM data is most the recent and takes into account the latest backlog eradications and upgrades. The assumptions used in this SFD Lite Report have been classified according to the different sanitation supply chain components.

5.1 Containment

There is limited sewerage network that covers about 6% of Amathole DM. This SFD Lite Report has made use of data provided by Amathole DM through stakeholder engagement.

Latrine technologies make up the largest percentage of toilet facilities used by the district population.

5.2 Emptying and Transport

The septic and conservancy tanks are emptied by municipal tankers; however the tankers are in poor condition and limited in numbers. Therefore, the municipality is outsourcing honey suckers from privately owned companies which are expected to be in a good condition. Septic and conservancy tanks are emptied by vacuum trucks when they are full. The frequency of emptying conservancy tanks is higher than that of septic tanks.

As the tanks vary in size, it is difficult to estimate the average number of tanks emptied per day. Lack of adequate record keeping, monitoring, and associated data analysis/interpretation also makes this a challenge. Based on the fact that it is known that there are challenges associated with emptying due to the limited number of trucks and distance, the population faced with such challenges was estimated to be about 20%. Hence the assumption that 80% of these systems are emptied.

5.3 Treatment and Disposal

There are six LM which form part of the Amathole DM. Each local municipality has associated town/areas/villages with treatment facilities. Treatment occurs at formal WWTWs of the DM (formal wastewater treatment varies from oxidation ponds to conventional treatment works). Some of the ADM wastewater treatment facilities are categorised as high risk facilities and require upgrades. This SFD Lite Report used an estimate of 40% of the incoming wastewater is treated to compliance. The proportion ‘wastewater treated’ calculated as follows:

- 5% wastewater delivered to WWTW x 40% compliance = 3% wastewater treated.
- This also means that 2% of the wastewater is not adequately treated (see SFD graphic) (5% - 3% = 2%).

Faecal sludge is co-treated with wastewater. It was assumed that the average efficiency of all Amathole WWTW is 40%. There is no evidence of treatment efficiency, but assumption is based on understanding that the efficiency of the plants differs individually, therefore, a cautious estimate of 40% average compliance for all them combined is assumed.

5.4 Availability and Accessibility of Data and Data Gaps

Data is easily accessible from Stats SA for Amathole DM. Data collection and compilation is undertaken every 5-years. SFDs that are developed in between this 5-year period may not have data that take into account recent developments in service provision.

The IDP is a plan for an area that provides for an overall framework for development. This can be done at District or Local Municipality level and has a lifespan of 5-years. Plans within the IDP have a budget approved by the municipal council. IDPs are available on municipal websites for the LM and DM for the targeted area. The latest IDP contains the WSDP for the

municipality. A discrepancy has been noted in the population size and serviced figures in the IDP and WSDP. It has been noted that the Amathole DM will undertake a demographic and service level backlog verification survey. Once the survey is completed, the population, households and service level figures will be updated accordingly in the WSDP and in the DWS Geodatabase to reflect the updated figures (Amathole District Municipality, 2018).

6 List of data sources

The relevant Amathole DM staff were contacted through e-mail, letter and telephone call prior to the visit to the local municipality. 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 Amathole DM and their associated service providers.

Interactions were held with the managers: Water Services and Sanitation, who also accompanied the team to the site inspection. During the site inspection, interviews were held with the process controllers at the Kei Mouth Ponds, honey suckers driver and pump station controller. Interactions with some tanker drivers and assistants were held.

In addition to stakeholder interviews, below is the list of data sources used for the development of this SFD Lite Report.

- Published reports: Stats SA Census 2011 and Community Survey 2016.
- Published documents: 2017/2018 IDP and WSDP.
- Key informant interviews (10): Amathole DM, November 2018 (list in Appendix).

7 References

Amathole District Municipality. (2018). *Intregrated Development Plan for Amathole District Municipality 2018/2019.*

Eastern Cape Socio Economic Consultative Council. (2017). *Amathole District Municipality Socio Economic Review and Outlook 2017.* East London: ECSECC.

ICLEI – Local Governments for Sustainability – Africa Secretariat. (2017). *Amathole District Municipality Wetland Report.* Local Action for Biodiversity (LAB): Wetlands South Africa, ICLEI, Department of Environmental Affairs, SANBI, Working for Wetlands and USAID.

Municipalities of South Africa. (2021). *https://municipalities.co.za*. Retrieved Feb 18, 2021, from Enoch Mgijima Local Municipality (EC139): https://municipalities.co.za/overview/1234/enoch-mgijima-local-municipality

Republic of South Africa. (1997, Dec 19). *Water Services Act.* Office of the President. Cape Town: Republic of South Africa.

8 Acknowledgements

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Appendix

Table 2. Tracking of stakeholder engagement

Name of organization	Name of contact person	Designation	Date of engagement	Purpose of engagement
Amathole District Municipality	Stephen Nash	GM: WSP	08 November 2018	Introducing SFD, securing support for project Data collection, collation, verification and site visits including key informant interviews. Data gaps, follow-ups Draft report review and finalisation
Amathole District Municipality	Sakhiwo Balfor	Ops Manager	08 November 2018	
Amathole District Municipality	Mkangeli Maseti	SR- Coordinator		
Amathole District Municipality	Mpho	Assistant Manager		
Amathole District Municipality	Vusi Novukela	ISD		
Amathole District Municipality	Nosikhumbuzo Loliwe	Ops Manager	08 November 2018	
Amathole District Municipality	Mongezi Mabele	Ops Manager	08 November 2018	
Amathole District Municipality	Khumbelo Funyufunyu	Sanitation Officer	08 November 2018	
Amathole District Municipality	Peter Songezo	Sanitation P. Officer	08 November 2018	
Amathole District Municipality	Wendy Sithole	Control Technician	08 November 2018	

Selected pictures taken during visit

Figure *6*: Honey sucker discharging

Figure *7*: Pit toilet

Figure *8*: Kei Mouth Oxidations ponds

Figure 4: Public toilet connected to septic tank

Figure 5: Well-maintained ponds at Kei Mouth

Figure 6: Well-maintained communal toilets

SFD Amathole District Municipality, South Africa

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