SFD Promotion Initiative

Dalton/Coolair

uMshwati Local Municipality, uMgungundlovu District Municipality

Kwazulu-Natal, South Africa

SFD Lite Final Report

This SFD Lite Report was created through field-based research by Emanti Management and Centre for Science and Environment for a Water Research Commission project and as part of the SFD Promotion Initiative.

Date of production: 22 October 2018

Last update: 22 October 2018

SFD Lite Report

The SFD Promotion Initiative (SFD PI) has developed recommended methods and tools for preparing SFD Graphics and Reports. A full SFD Report consists of the SFD Graphic, the analysis of the service delivery context and enabling environment for service provision in the city for which you are preparing your SFD, and the complete record of data sources used. This analysis allows a systemic understanding of excreta management in the city, with evidence to support it. As a starting point (first step stone) to this (explained in detail in the SFD Manual), the SFD Lite is a simplified reporting template that summarises the key information about the excreta management situation in the city.

SFD Lite Report Dalton/Coolair, South Africa, 2018

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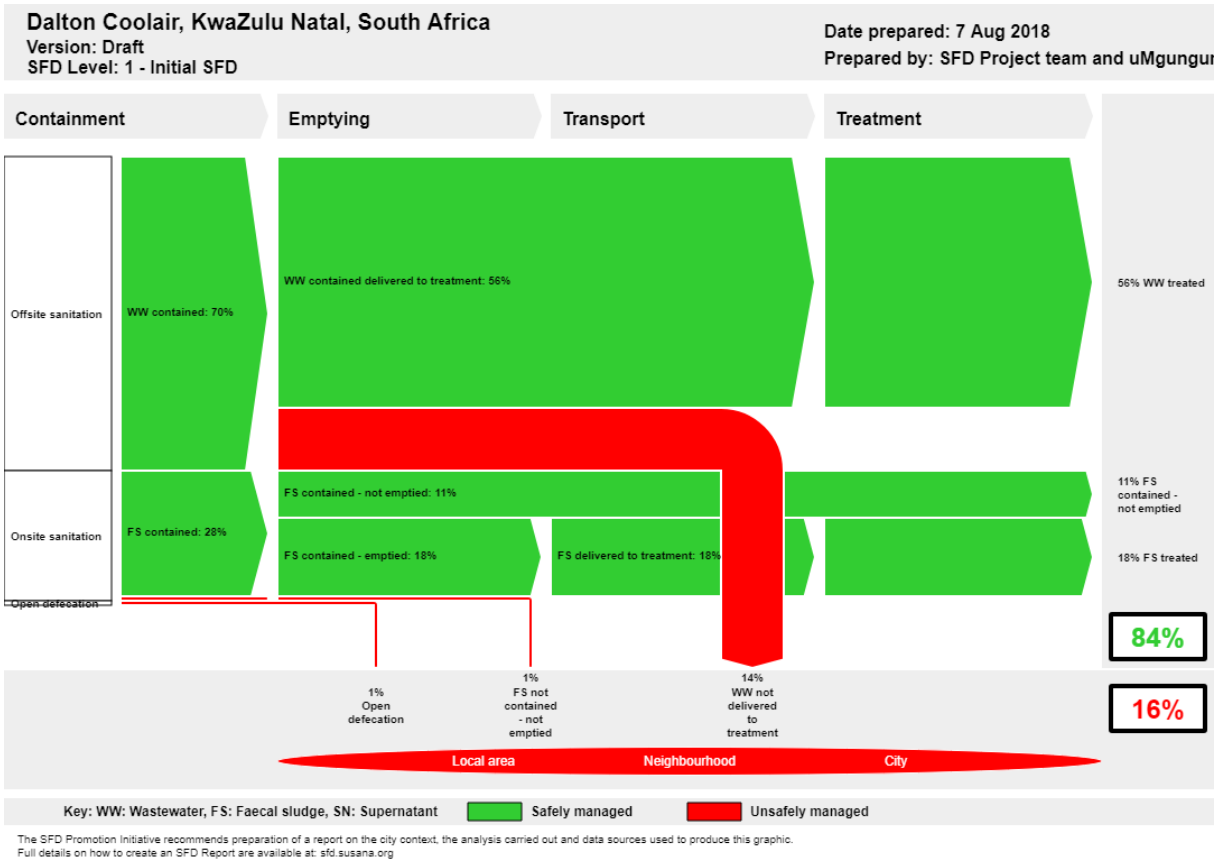
Executive Summary

1. The SFD Graphic



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

2. Diagram information

Desk or field based:

This is a field based SFD.

Produced by:

Emanti Management (Pty) Ltd, Stellenbosch, South Africa.

Centre for Science and Environment (CSE), New Delhi, India.

Status:

This is a final SFD.

Date of production:

22 October 2018

3. General City Information

uMgungundlovu District Municipality is a Category C Municipality located in Pietermaritzburg. Its area of jurisdiction covers seven local municipalities. The District covers about 8500 square kilometres with population of approximately 1,017,763 (one million, 17 thousand, seven hundred and sixty three) according to Census 2011.

The District constitutes about 10% of the Province of KwaZulu-Natal and it is number two in size after eThekwini Metro. uMgungundlovu is surrounded by these municipalities: eThekwini to the southeast (Durban), iLembe to the east (DC29), Sisonke to the southwest (DC43), Ugu to the south (DC21),

Umzinyathi to the north (DC24) and Uthukela to the northwest (DC23). Languages spoken: isiZulu, English, Afrikaans and other.

This SFD was developed for an area called Dalton in uMshwathi municipality which is the largest of the six smaller local municipalities in the district. Forty percent of the sugar cane in the district is produced in the uMshwathi area. Albert Falls Dam is found in uMshwathi, which is known as one of the bass fishing areas in the world.

4. Service outcomes

The following sanitation technologies were noted:

- Toilet discharges directly to a decentralised foul/separate sewer – toilets are connected directly to the wastewater treatment plant.
- Fully lined tank – sealed, no outlet or overflow – proportion of sludge emptied and delivered to treatment plant.
- Septic tank connected to soak pit – proportion of sludge emptied and delivered to treatment plant.
- Open defecation.
- Pit (all types) never emptied, but abandoned when full and covered with soil, no outlet or overflow.
- Pit (all types) never emptied but abandoned when full but NOT adequately covered with soil, no outlet or overflow.

5. SFD development process

Data was collected largely through secondary sources (IDP plans). However, a process of completing the SFD Graphic Generator to calculate the excreta flow in terms of percentage of the population was conducted with uMgungundlovu municipal officials.

6. List of data sources

Below is the list of data sources used for the development of the SFD.

- Published reports: Census 2011, Community Survey 2016
- Published documents: IDP, WSDP
- Key informant interviews: uMgungundlovu Municipal Officials

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Abbreviations

DM	District Municipality
DWS	Department of Water and Sanitation
FS	Faecal sludge
GDS	Green Drop System
IAM	Infrastructure Asset Management
ICT	Information and Communications Technology
IDP	Integrated Development Plan
IT	Information Technology
UMG	Umgungundlovu District Municipality
LG	Local Government
LM	Local Municipality
MuSSA	Municipal Strategic Self-Assessment
NRW	Non-Revenue Water
O&M	Operations and Maintenance
RDP	Reconstruction and Development Programme
SALGA	South African Local Government Association
SDBIP	Service Delivery and Budget Implementation Plan
SFD	Shit Flow Diagram
StatsSA	Statistics South Africa
VIP	Ventilated Improved Pit Latrine
W_2RAP	Wastewater Risk Abatement Plan
WCDM	Water Conservation and Demand Management
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Service Provider
WTW	Water Treatment Works
WW	Wastewater
WWTW	Wastewater Treatment Works

1. City context

uMgungundlovu District Municipality is a Category C Municipality located in Pietermaritzburg. Its area of jurisdiction covers seven local municipalities. The District covers about 8500 square kilometres with population of approximately 1,017,763 (one million, 17 thousand, seven hundred and sixty three) according to Census 2011.

The District constitutes about 10% of the Province of KwaZulu-Natal and it is number two in size after eThekwini Metro. uMgungundlovu is surrounded by these municipalities: eThekwini to the southeast (Durban), iLembe to the east (DC29), Sisonke to the southwest (DC43), Ugu to the south (DC21), Umzinyathi to the north (DC24) and Uthukela to the northwest (DC23). Languages spoken: isiZulu, English, Afrikaans and other.

This SFD was developed for an area called Dalton in uMshwathi municipality which is the largest of the six smaller local municipalities in the district. Forty percent of the sugar cane in the district is produced in the uMshwathi area. Albert Falls Dam is found in uMshwathi, which is known as one of the bass fishing areas in the world.

uMshwathi Local Municipality is ideally situated within the uMgungundlovu District Municipality immediately adjacent to Pietermaritzburg. The municipality is located in an area that was largely under the control of tribal authorities until very recently. However, in the remaining portion there are towns built by German immigrants some 150 years ago. In the 1850s, 13 cotton planter families from Osnabruck unter Bergthell left Germany and settled in the area. They were followed by missionaries and other colonists, mostly from Hanover, who also settled in the region, founded New Hanover and Wartburg, and brought with them not only the Lutheran faith but the German language and culture. Wartburg itself is named after the castle in Eisenach, where Dr Martin Luther translated the bible into German. The village crest also depicts the immigrants' arrival by sailing ship, the Luther Rose, and the call to 'pray and work'.

The land is mostly agricultural, although urban development is to be found in the main towns. The communities living in the underdeveloped areas have extremely limited access to basic physical and social requirements and very few economic opportunities. The present authority structures are, as yet, unable to provide for the improvement of basic living conditions urgently required by the rural inhabitants.

Figure 1: Location of Dalton within uMshwati Municipality in Umgungundlovu District Municipality

2. Service outcomes

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

- StatsSA Census (2011)

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 Dalton. The details on the quantitative estimations are presented in the table below and sections that follow.

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
	Umgungundlovu DM	SFD promotion initiative		
1	Toilet discharges directly to sewer	Toilet discharges directly to a decentralised foul/separate sewer	T1A1C4	70%
2	Septic tank (plastic or concrete)	Connected to soak pit	T1A2C5	19%
3	Septic tank (plastic or concrete)	Containment (fully lined tanks, partially lined tanks and pits, and unlined pits) failed, damaged, collapsed or flooded – with no outlet or overflow	T1A3C10	8%
4	VIPs (urban)	Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	T1B7C10	1%
5	VIPs (urban)	Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil, no outlet or overflow	T1B8C10	1%
6	Open	Defecation	T1B11 C7 to C9	1%

2.1.1 Containment

There is a limited sewerage network, with the only off-site formal waterborne sewer system being linked to the Dalton Wastewater Treatment Works (WWTW) with domestic effluent originating from the Dalton/Coolair and associated truck-stop.

There are parts of Dalton/Coolair urban and rural areas where communities use VIP toilets. To-date, these toilets have never been emptied. In rural areas, communities are used to covering up and abandoning a full VIP and relocating the VIP to a new location.

2.1.2 Emptying and Transport

Vacuum tankers are used to empty and transport sewage from the concrete and plastic tanks (individual and communal) to either the Dalton/Coolair.

2.1.3 Treatment and disposal

Dalton /Coolair town and surrounding areas are serviced by Dalton/Coolair Wastewater Treatment Works. On site sanitation are appropriately implemented, where the geotechnical condition are suitable, that is ,there is no danger of ground water contamination can be in the form of VIP toilet, septic tanks and soak-way system. These are acceptable levels of service. The overall Municipality has a high sanitation backlog, measured at 68, 21%.

2.1.4 Water Conservation and Demand Management

There is no information obtained from the municipality pertaining the non-revenue water

2.1.5. Access to Water and Sanitation

Access to water and sanitation is imperative to reaffirm people's dignity and the enjoyment of basic human rights. The backlog in water and sanitation provision is still a point of concern. 2001 Census data confirms that about 46% of the total households either source their water some 200 meters away or from boreholes, springs, rainwater tanks, dams/pool/stagnant water, rivers/streams, water vendor and other sources. The situation is worse especially in rural areas. In terms of sanitation, it was also estimated that about 52% of the total households used pit latrines with no ventilation, whilst 13, 8% had no toilet facilities at all.

2.1.6. Access to Energy

Energy is considered one of the vital components of human development. In the South African context, it is said that rural women spend up to eight hours per day gathering firewood. Inadequate lighting also impacts negatively on educational attainment. In the uMshwathi Municipal area, approximately 53% of households were said to be using electricity as main source of fuel for lighting, 21, 6% for heating and 24, 7% for cooking.

2.1.7. Refuse

Only 12,4 % of the total households had their refuse removed once a week by the municipality. For the rest, about two thirds used their own refuse dumps a staggering number of 16, 1% had no rubbish disposal. This has implications for health and environmental conditions of the people.

2.1.8 Social Facilities

Notwithstanding the fact that no data is available about number and state of social facilities such as clinics, parks, sport facilities, and so on, it can be concluded that these are also inadequate and uneven distributed in various wards. It is therefore not surprising that the provision of social services is still ranked highly as one of the most important community development priorities.

2.1.9. Current Backlog

It is estimated that 10 749 households within uMshwathi Municipality still do not have access to piped water and water within a distance of 200 meters respectively. Furthermore, approximately 19 045 households have no access to decent sanitation and 11 734 households do not have access to legal electricity connection. This backlog indicates that the ability of uMshwathi Municipality to implement Free Basic Services to all qualifying households will be hamstrung by the magnitude of the backlog it still faces. This level of backlog is even more critical when looked at against the national goals of universal access to portable water and sanitation by 2009 and universal access to electricity by 2012. (46%) and 7 875 (33%) of to legal electricity connection.

2.2 SFD matrix

The final SFD for Dalton is presented in **Appendix 6.1**.

2.2.1 SFD matrix explanation

All the plastic, concrete and cement block tanks are referred to as “septic tanks” by the municipality. These tanks, however, do not have an outlet/discharge point, and therefore are not defined as a septic tank as per SFD definitions. In this report these are categorised according to their design and functioning as per SFD terms. Below is a description of each of the sanitation technologies in Dalton.

- Toilet discharges directly to a decentralised foul/separate sewer – toilets are connected directly to the wastewater treatment plant.
- Fully lined tank – sealed, no outlet or overflow – proportion of sludge emptied and delivered to treatment plant.
- Septic tank connected to soak pit – proportion of sludge emptied and delivered to treatment plant.
- Open Defecation.
- Pit (all types) never emptied, but abandoned when full and covered with soil, no outlet or overflow.
- Pit (all types) never emptied but abandoned when full but NOT adequately covered with soil, no outlet or overflow.

Considering the above, the following is noted:

Off-site
According to municipal records, 70% of the sewage is contained but only 56% of that is transported to the treatment works. All of this wastewater is transported to the Dalton WWTWs where it is treated to meet specified requirements (no evidence of treatment efficiency, but assume compliance to treated effluent requirements). 14% is emptied but not transported to the treatment works.

On-site
28% of the facial sludge is contained, with 11% not emptied and 18% treated. Therefore 18% that reaches the wastewater treatment plants, it is assumed that it is treated to meet specified requirements (no evidence of treatment efficiency, but assume compliance to treated effluent requirements).

Open defecation
It was noted that 1% of the open defection of the facial sludge is contained

Table 2: Description of variables used in SFD

Variable	Description
W4a	WW delivered to centralized treatment plant
W5a	WW treated at centralized treatment plant
F3	FS emptied
F4	FS delivered to treatment plant
F5	FS treated

Dalton Coolair, KwaZulu Natal, South Africa, 7 Aug 2018. SFD Level: 1 - Initial SFD
Population: 7420
Proportion of tanks: septic tanks: 50%, fully lined tanks: 50%, lined, open bottom tanks: 50%

System label	Pop	W4b	W5b	F3	F4	F5
System description	Proportion of population using this type of system	Proportion of wastewater in sewer system, which is delivered to decentralised treatment plants	Proportion of wastewater delivered to decentralised 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
T1A1C4 Toilet discharges directly to a decentralised foul/separate sewer	70.0	80.0	100.0			
T1A2C5 Septic tank connected to soak pit	19.0			100.0	100.0	100.0
T1A3C10 Fully lined tank (sealed), no outlet or overflow	8.0			100.0	100.0	100.0
T1B11 C7 TO C9 Open defecation	1.0					
T1B7C10 Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow	1.0					
T1B8C10 Pit (all types), never emptied, abandoned when full but NOT adequately covered with soil, no outlet or overflow	1.0					

Figure 2: SFD Matrix for Dalton/Coolair (2018)

2.2.2 Risk of groundwater contamination

No information was provided in relation to the groundwater contamination.

3. Stakeholder engagement: key interviews

The relevant uMgungundlovu District Municipality staff were contacted through e-mail, letter and telephone. 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 uMgungundlovu District Municipality and their associated service providers.

4. Acknowledgements

This report was compiled for a Water Research Commission project and as part of the SFD Promotion Initiative. We would like to thank all participating uMgungundlovu District Municipality officials for giving time and necessary information for the assessment. A special thanks to Shantanu Kumar Padhi and Amrita Bhatnagar of CSE for their supervision and guidance during the assessment and report writing.

5. References

1. Statistics South Africa (2011). Census 2011.
2. Water service development plan (2017).

6. Appendix

6.1 SFD Matrix

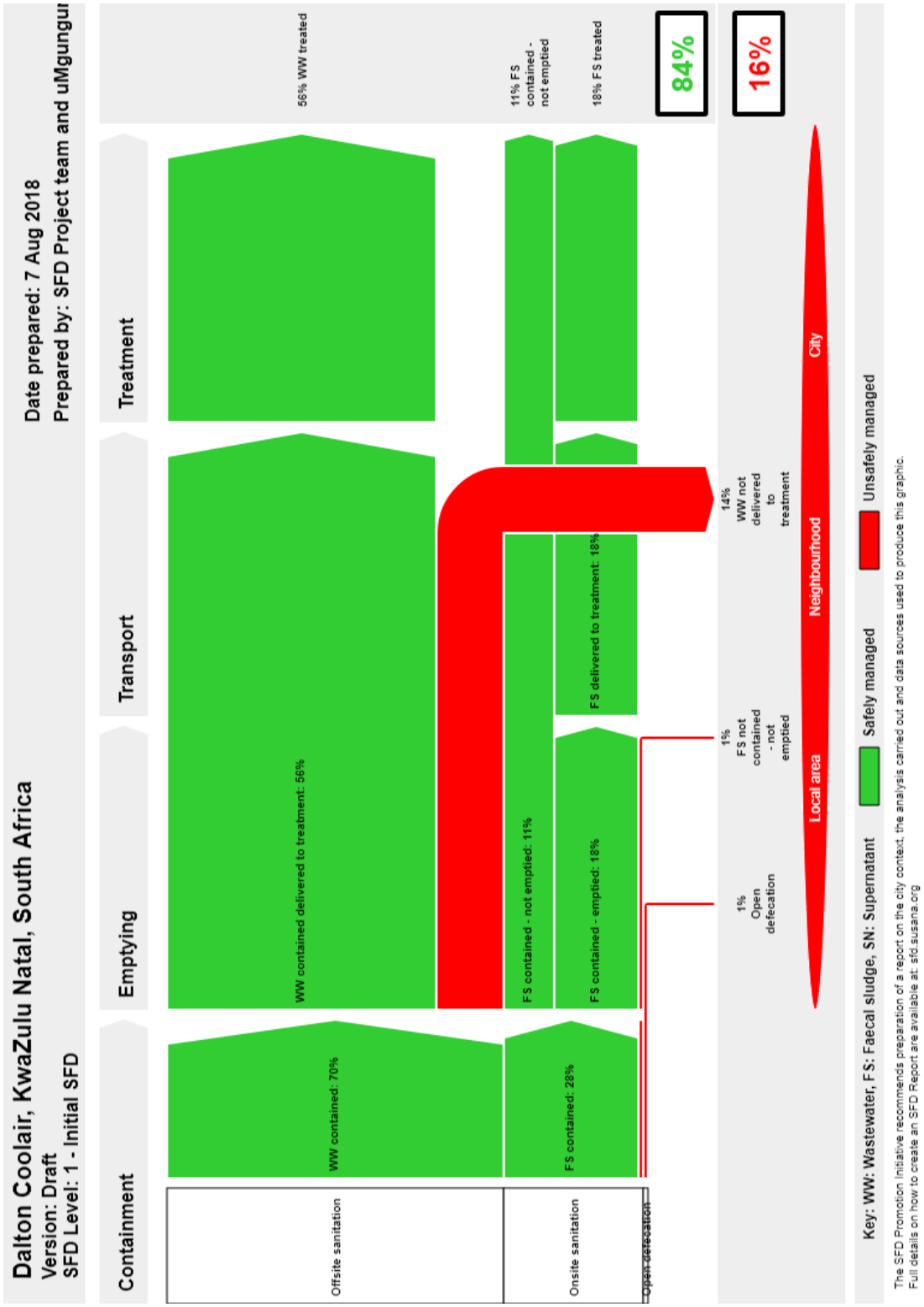

Figure 3: SFD matrix

6.2 Tracking of engagement

Table 3: Tracking of stakeholder engagement

Name of organization	Name of contact person	Designation	Date of engagement	Purpose of engagement
Umgungundlovu District Municipality	Mr. Buhle Msomi	Manager: WSA	5, 11 and 23 July 2018	Introducing SFD, securing support for project
Umgungundlovu District Municipality	Ms. Siphindile Shange	Manager: Sanitation	5, 11 and 23 July 2018	Introducing SFD, securing support for project