

PUBLIC HEALTH GUIDELINES FOR FAECAL SLUDGE
MANAGEMENT:
MINIMUM STANDARDS FOR SANITATION, AND OCCUPATIONAL
HEALTH AND SAFETY IN KAMPALA CITY, UGANDA



Schweizerische Eidgenossenschaft
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Forward

Many people in the world live without access to basic sanitation services. Many more people are exposed to harmful disease-causing organisms through the inadequate management of sanitation systems, causing them to be exposed to faeces and urine in their communities, in their drinking water, food and through their recreational water activities.

Unsafe management of faeces, urine and wastewater is widespread and creates significant health and environmental risks. The direct relationship between diseases and the unrestricted discharges of residential sewage is globally well documented. Several studies have confirmed the human health risks associated with exposure to enteric viruses, bacteria, protozoa, and helminths because of poor sanitation and hygiene practices. The potential exposure routes from contaminated clean safe water, wastewater, soils, and food sources include intentional and accidental eating, contact on the skin and breathing in. On the other hand, the public health risks from sanitation systems are often a result of the inadequate collection, storage, treatment, disposal or re-use of faeces and urine, wastewater and solid waste. These risks may be higher in urban slums because of the lack of adequate sanitation provision.

In these highly populated areas with people of low socioeconomic status, there is a lack of physical access to toilets in-home and institutions, filled-up toilets and containment facilities which are often either abandoned or are directly emptied into the environment through open drains. The faecal sludge ends up in groundwater and surface water bodies through run-off, which increases the concentration of disease-causing organisms, which affect the health of the immediate and downstream populations. This situation has contributed to high incidences of water and sanitation-related diseases, such as cholera and diarrhea, as well as degradation of the environment in and around Kampala due to the illicit dumping of faecal sludge in swamps, quarries, gardens and water bodies.

The process of Faecal Sludge Management has several steps including the generation and storage of faecal sludge, collection, and transportation to the treatment site, treatment of the sludge and re-use or disposal of the byproducts from the treatment process. Along this chain, several health and occupational risks are high. These include direct contact of workers with faecal sludge and spillage of faecal sludge at different stages in the whole process which pollutes the environment. These risks are worsened by the poor state of toilets; lack of proper and adequate physical access for cesspool/pit-emptying due to poor planning; and lack of proper personal protective wear for adequate protection of the workers.

To address these gaps, Kampala Capital City (KCCA) designed and approved standards for the siting and minimum requirements of toilets and containment facilities within the City (2017). Also, KCCA, passed The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019 as a legal tool for effective management of faecal sludge in Kampala.

These Guidelines for Faecal Sludge Management are timely to provide the minimum standards, operation, and maintenance guidelines, and health, occupational and environmental safety measures at every step of the faecal sludge management process. It is, therefore, our hope that these guidelines can be used by all stakeholders in ensuring that all workers involved in faecal sludge management, surrounding communities and environment are safe.

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List of acronyms and abbreviations

CBO:	Community Based Organization
CIDI:	Community Integrated Development Initiatives
CSO:	Civil Society Organizations
FS:	Faecal Sludge
FSM	Faecal Sludge Management
KCCA:	Kampala Capital City
KEA:	Kampala Emptier's Association
M&E:	Monitoring and evaluation
NEMA:	National Environmental Management Authority
NWSC:	National Water and Sewerage Corporation
OSS:	On-site sanitation Systems
PEAU:	Private Emptier's Association of Uganda
PPE:	Personal Protective Equipment
UBOS:	Uganda Bureau of Statistics
UGA:	Uganda Gulper's Association
VIPs:	Improved Pit-latrines

Executive summary

The population in Kampala Capital City is rapidly increasing, with proliferating urbanization and economic development. However, like many cities in developing regions, the provision of Sanitation services is not at the same rate as the population growth and urbanization. In the slums of Kampala about three out of ten (3/10) people practice open defecation with about two out of ten (2/10) people in the slums using polythene bags, so-called “flying toilets” discarded in rubbish bins, or drainage channels posing public and environmental health risks. A majority, 86% of the households in Kampala use traditional pit latrines, 7.6% use Ventilated Improved Pit-latrines (VIPs), 3.2% use flush toilets and 1.8% have no facilities. Poor faecal sludge management affects all toilet facility users; people who live and/or work nearby the sanitation system with the community; farmers, and lower-lying communities; end-users of faecal sludge treatment products; and all workers involved in faecal sludge management.

The purpose of these guidelines is to provide minimum Faecal Sludge Management (FSM) standards and guidelines for public health, environmental, and occupational health and safety in Kampala City. Implementation of these guidelines will be made with frequent and consistent reference to the minimum standards for the siting and minimum requirements of toilets and containment facilities within the City (2017); and The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019 Key stakeholders in faecal sludge management in Kampala City include KCCA (City Hall and Divisions), Private sector (CSO/CBOs), NEMA, NWSC, Community leaders and Community (households).

Standards and guidelines

The toilet should be used appropriately to ensure that no faecal matter is littered around it; be suitable, accessible and safe to use for all intended users, taking into consideration their gender, age and physical mobility; have a slab and pan or pedestal constructed using durable material; have superstructure; and include the provision of culturally- and context-appropriate facilities for anal cleansing, handwashing with soap, solid waste disposal, and menstrual hygiene management.

A containment facility should be leak-proof /watertight; be easily emptied/closed and sealed and meet the requirements stipulated in the minimum standards for OSS technological options for Kampala.

During collection and transportation of faecal sludge, all workers should be trained on the risks of working within the FSM system, including handling wastewater and/or faecal sludge, and be equipped to follow Standard Operating Procedure; consistently and correctly wear Personal Equipment (PPE), Have regular health checks, receive medical advice and treatment, be dewormed and vaccinated, Only dedicated tools and equipment should be used, which are fit for the purpose.

At the faecal sludge treatment plant, all workers should wear personal protective wear (PPE) all the time. “NO ACCESS” and “DO NOT TOUCH” signs should be highlighted at the treatment plant; the FS equipment operation manual should be availed highlighting the functions and operational procedures needed during off-loading from FS trucks and in FS treatment processes at the treatment plant. Regular spot check and inspection should be conducted

The direct use of untreated faecal matter in agriculture presents the most significant health risk, particularly for farmers directly engaged in the use of faeces and urine from dry pits and consumers of feces and urine-fertilized crops. Crop type and restriction, appropriate faecal sludge treatment, use of PPE, pathogen die-off period, appropriate washing of the hands and crops, hygiene education and promotion and farm and market inspection should be observed.

1. Background

The populations in Kampala Capital City is rapidly increasing with proliferating urbanization and economic development. However, like many cities in developing regions, the provision of sanitation services is not at the same rate as the population growth and urbanization. Access to safely managed sanitation in the city is less than 30%. The reasons for this situation are several including; a limited sewerage network connection (less than 10%) and an inadequate corresponding non-sewer sanitation system in the City. Whereas nine out of ten (9/10) people in the city rely on on-site sanitation solutions including Septic tanks and pit latrines, about four out of ten (4/10) were found to access unimproved sanitation characterized by sanitation facilities of varying quality which do not meet the minimum standards or that have potential to contaminate the environment.

In the slums of Kampala, about three out of ten (3/10) people practice open defecation with about two out of ten (2/10) people in the slums using polythene bags, so-called “flying toilets” discarded in rubbish bins, or drainage channels posing public and environmental health risks. Majority, 86% of the households in Kampala use traditional pit latrines, 7.6% use Ventilated Improved Pit-latrines (VIPs), 3.2% use flush toilets and 1.8% have no toilet (UBOS, 2013). Also, 45% of these sanitation facilities are abandoned after 5 years when they are either full or broken-down. However, most household pit-latrines in low-income areas of Kampala are unlined, filled with other solid wastes, and hard to access for emptying services.

With regards to school sanitation, only 8% of primary schools within Kampala have adequate latrines for the number of students attending. KCCA has a schedule for regularly emptying OSS facilities for public schools but most schools lack a proper operations and maintenance plan leading to poor hygienic conditions which predispose children to health risks. Diseases related to unsafe sanitation such as intestinal nematode infections, malnutrition, trachoma, schistosomiasis, and lymphatic filariasis, were estimated to have caused several thousand deaths and significant disease burden in Uganda.

Household latrine facilities in Kampala are emptied by both mechanical and semi-mechanized methods. There are several service providers engaged in faecal sludge management especially in the collection and transportation to treatment/disposal sites. Kampala has a total of 83 cesspool trucks (private and institutions) of which 7 trucks are owned by KCCA and 43 trucks by the Private Emptier’s Association Uganda (PEAU) and Kampala Emptier’s Association (KEA). PEAU and KEA are responsible for about 75% of all the current faecal sludge collection and transportation businesses within the City. Also, there are 2 schools in Kampala that own and operate their trucks, while NGOs such as Community Integrated Development Initiative (CIDI) have recently acquired 3 cesspool emptier’s (vacuum trucks) under the Kawempe Urban Poor Sanitation Improvement Project (KUPSIP Project) to serve Kawempe division. The remaining trucks belong to a hotel, the army, the police, and two private companies. Currently, KCCA is piloting a business model that promotes the use of sludge gulpers under the Uganda Gulpers Association (UGA) along with two new FS transfer tanks Kampala.

With all these stakeholders on board, clear guidelines and standards must be laid down to ensure that the faecal sludge management process is efficient and effective.

2. Who is most affected

The most affected people include the following: -

- All people who use the toilet;
- People who are not necessarily users but live and/or work nearby the sanitation system within the community;
- The wider population including: -
 - Farmers, and lower-lying communities;
 - end-users of faecal sludge¹ treatment products (compost, faecal sludge, wastewater²);
 - Consumers of products (e.g. fish, crops) that are produced using sanitation end-use products intentionally or unintentionally;
- All workers involved in faecal sludge management

3. Why the Guidelines

The purpose of these guidelines is to provide minimum Faecal Sludge Management (FSM) standards and guidelines for public health, environmental, and occupational health and safety in Kampala City. These are designed to provide a framework for FSM, which:-

- Promotes responsible management of faecal sludge;
- Protects public health, environmental, and occupational health and safety;
- Promotes consistent practices along the safe sanitation service chain;
- Informs and is acceptable to the community/public;
- Allows for local conditions and legal/policy requirements to be considered; and
- Can be supported by the existing institutional arrangements.

4. Enabling environment

4.1. Policy and legal environment

There are several legal and policy provisions at the national and city level that favor FSM as elaborated in the detailed guidelines and standard. However, during the implementation of these guidelines, frequent and consistent reference will be made to: -

- Minimum standards for the siting and minimum requirements of toilets and containment facilities within the City (2017), and
- The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019.

4.2. Licensing service providers

Construction of sanitation facilities, emptying and transport should only be done by individuals who are licensed by KCCA.

4.3. Capacity building and training

For these guidelines to be effectively implemented, all workers and key stakeholders need training that enhances their knowledge, understanding, and skills with regards to all processes along the faecal sludge management process.

¹ a mixture of human faeces, urine, water and solid wastes (e.g. toilet paper or other anal cleansing materials, menstrual hygiene materials)

² used water from domestic, industrial, commercial or agricultural activities, surface runoff or stormwater, and any sewer inflow or sewer infiltration

4.4. Sanitation Behavioral Change

Sanitation practices are mostly determined by the knowledge and attitude of individuals. To influence community sanitation behavioral practices, there is a need to avail knowledge, and skills to the community so that their attitudes change positively to realize good sanitation practices. Some of the key desired sanitation behaviors include:

- Abandoning open defecation and adopting use of safe sanitation facilities;
- Handwashing with soap at critical times;
- Building and using a permanent toilet with access for emptying;
- Following safe procedures during emptying and transportation of FS
- Where available and possible, connecting to a sewerage system; and
- Safe practices in handling wastewater and faecal sludge reuse in food production.

5. Who should do what

Key stakeholders in Faecal Sludge Management in Kampala City include KCCA (City Hall and Divisions), Private sector (CSO/CBOs), NEMA, NWSC, Community leaders and Community (households).

- KCCA is the legal entity established by an Act of Parliament in Uganda (KCCA Act, 2010), and is the body charged with administering Kampala Capital City. KCCA is mandated with the provision of services in the city that enable residents and businesses to function in an environment that supports development.
- National Environmental Management Authority (NEMA) has the mandate to oversee, coordinate and supervise environmental management in Uganda. NEMA's enforcement branch is the department of Monitoring and Compliance, which is responsible for ensuring that enterprises comply with various environmental regulations and standards, including Licensing of FS C&T operators.
- **National Water and Sewerage Corporation (NWSC)** is responsible for operating and providing water and sewerage services in areas entrusted to it. The NWSC is responsible for wastewater treatment – currently; there is a treatment plant at Bugolobi and Lubigi.
- Households have the legal responsibility to ensure they maintain a clean and safe environment. In urban areas, landlords are responsible for the provision of sanitary facilities to tenants within reasonable distances and with a proposed maximum loading of 5 people to one stance.
- The Kampala citizen as a user, beneficiary and affected person should practice personal and environmental hygiene always. The Kampala citizen should demand proper facilities and become change agents for fellow community members to practice personal and environmental hygiene as well as demand for safe sanitation systems.
- Associations involved in faecal sludge management include the Emptier's association and the Gulpers association. These are mainly engaged in mobilization, awareness creation, organizing and providing compliance assistance regarding the KCCA FS operational framework to their respective members
- Civil Society Organizations (NGOs and CBOs) have a key role in capacity building of communities as well as service provision of safe sanitation facilities.

- Several sanitation Development partners have played a fundamental pivotal role in sanitation service delivery, particularly funding implementation of Sanitation promotion.

6. Hazards along the sanitation service chain

Different types of hazards that exist during faecal sludge management are summarized below: -

a) Physical hazards

- Foul smell from the sludge;
- Risk of collapsing soils especially for semi-motorized emptying
- Slips, trips and falls;
- Exposure to sharp objects contained in the sludge (e.g. razor, glass, metals);
- Carrying heavy loads (e.g. containment structure cover or sludge-filled containers)

b) Biological hazards

- Direct and indirect oral, nasal and dermal exposure to different species of pathogens like bacteria, viruses, protozoa, and helminths

c) Chemical hazards

- Direct and indirect oral, nasal and dermal exposure to chemicals like methane, ammonia, Sulphur dioxide.
-

d) Psychosocial / Other hazards

- Alcohol and drug consumption during emptying
- Stigma from the community

7. The Standards and Guidelines

These minimum standards and guidelines are based on basic processes entailed in a safe sanitation service chain as highlighted in the figure below.



From: WHO, 2018

7.1. Toilet and Containment

A toilet refers to the structure which the user interacts with at the beginning of the sanitation system, where faeces and urine are captured and can incorporate any type of toilet seat or latrine slab, pedestal, pan or urinal.

a) Minimum requirements for a Toilet

The toilet should: -

- Be used appropriately to ensure that no faecal matter is littered around;
- Be suitable, accessible and safe to use for all intended users, taking into consideration their gender, age and physical mobility (e.g. disabled, sick, children, and older people);
- Have a slab and pan or pedestal constructed using durable material that can be easily cleaned for example concrete, fiberglass, porcelain, stainless steel, durable plastic or smooth wood;

- Have superstructure to prevent the intrusion of rainwater, stormwater runoff, animals and insects;
- Provide safety and privacy with lockable doors for shared or public toilets;
- Have adequate lighting always to enhance use;
- Be odor-free always;
- Include the provision of culturally- and context-appropriate facilities for: -
 - Anal cleansing,
 - Handwashing with soap,
 - Solid waste³ disposal, and
 - Menstrual hygiene management;
- Have a toilet lid in use always for safety and hygiene; and
- Be well maintained and regularly cleaned.

b) Minimum requirements for containment facilities

A containment facility is a container, usually located below ground level, to which the toilet is connected like septic tanks, dry- and wet-pit latrines, composting toilets, dehydration vaults, urine storage tanks, etc. It is only relevant to non-sewered sanitation systems.

A containment facility should: -

- Be leak-proof /watertight and certified to prevent leakage to reduce risks of faecal pathogens in the effluent;
- Be easily emptied/closed and sealed;
- Be designed in full consideration of how emptying and transport of the sludge will be done;
- Have effluent discharge pipes that should be kept clear of blockages.
- Conform to the building control regulations and meets the requirements stipulated in the Minimum Standards for on-site sanitation technological options for Kampala.
- All premises producing sewage shall connect to the sewer network in areas where sewer lines exist within thirty meters of the premises.

c) Legal requirement:

According to “The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019”, it is stipulated that:

“A person shall not throw, empty in, or suffer or permit to be thrown in or emptied in or to pass into, any sewer and latrine, any solid waste or other matter likely to interfere with the free flow of contents in sewers, or to affect prejudicially the treatment and disposal of contents of sewers, latrines and septic tanks”. Also, “A person shall not discharge the contents of a toilet, latrine, septic tank or sewer into a stormwater drain, waterbody, road surface or another body in which they are likely to cause or suffer to be caused a nuisance”.

7.2. Collection/emptying and Transportation

³ solid material that has been discarded because it has served its purpose or is no longer useful.

Collection and transportation refer to the deliberate movement of faecal sludge from a containment facility to off-site treatment, and/or end-use/ disposal. Transportation systems can be sewer-based or based on motorized or semi-motorized emptying and transportation.

a) Preventive measures for mitigating risks during FS collection and transportation

All workers should: -

- Be trained on the risks of working within the faecal sludge management system, including handling wastewater and/or faecal sludge, hygiene and sanitation practices, use and disposal of personal protective equipment and be equipped to follow Standard Operating Procedures.
- Consistently and correctly wear Personal Protective Equipment (PPE) (including gloves, masks, hats, full overalls, and enclosed waterproof footwear)
- Use appropriate tools and equipment during emptying
- Have regular health checks, receive medical advice and treatment (e.g. deworming), and be adequately vaccinated against potentially relevant infections (like Tetanus, and Hepatitis B)
- Never enter any confined space (like containment facility or sewers) alone
- Avoid touching face, mouth, eyes, nose, or open sores and cuts while emptying.
- Keep open sores, cuts, and wounds covered with clean, dry bandages.
- Gently flush eyes with safe water in case of any suspected contact with your eyes
- Remove PPEs before leaving the work site.
- Use only dedicated tools and equipment, which are fit for purpose and should be cleaned with water between uses.
- Ensure that all clothing (both PPE and under layers) are washed daily and all rubber boots and gloves cleaned with water.
- Have adequate ventilation should be ensured before entering any confined space (like a containment facility or sewers).
- Spillage and spills should be contained and cleaned up when they do occur.
- Remove soiled work clothes before eating and eat in designated areas away from human waste and sewage-handling activities.
- Wash hands with soap: -
 - immediately after coming into contact with faecal sludge
 - before and after using the toilet.
 - before eating or drinking.
- Not: -
 - smoke or chew tobacco or gum while emptying.
 - receive phone calls while emptying
 - work under the influence of alcohol and drugs
 - eat during emptying of faecal sludge

b) Minimum operational procedures- FS C & T operators` welfare

Workers at all levels of the faecal sludge management chain including collection and transport must be provided with the following: -

- Safety equipment including:

- Personal protective equipment (PPE) such as hardhat, face protection, eye protection, boots, and gloves;
- Disinfectants, barriers, sorbents, and bags for cleaning up and collecting spilled material.
- Designated washing areas with soap for workers during (if required) and after work before mingling with the public and the family.
- Continuous safe drinking water and sanitation facilities as basic rights
- Arrangements for comfortable and clean eating areas while on duty
- Mandatory annual medical check-up and immunization against the potential health risks related to direct handling of faecal sludge including for Tetanus and Hepatitis B, and deworming.
- Insurance for all workers to cater to occupational health and safety risks;
- Clear procedures for medical assistance in case of emergencies like injury and accidents.
 - First aid facilities and training;
 - A medical emergency plan and procedures with a list of designated health facilities near the workplaces where the workers can access/receive immediate medical help.
 - A clear process for immediate reporting of incidents as physical injuries, sudden back injuries because of lifting heavy waste, cuts from sharp objects or skin problems caused by hazardous substances.
- Routine safety briefings including monthly safety and health committee meetings by faecal sludge managers responsible for the workers.
- Organized work-schedule which allows all workers to have weekend breaks and national holidays, seasonal holidays, as appropriate. Also, 8 working hours maximum per day for workers with a lunch break and two short breaks.

c) Minimum operational procedures for the actual emptying of containment facilities

During emptying and collection workers need to avoid risks such as accidents from the inhalation of gas, slips, direct faecal sludge contact with skin or eyes, or ingestion.

In this respect, the following minimum operational and maintenance procedures should be adhered to: -

The following steps should be followed: -

1. Locate the septic tank or latrine and display warning signs since pumping cesspools and latrines is dangerous – older site-built systems may be more likely to collapse inwards when relieved of their contents.
2. Use a shovel to excavate the ground around the tank to find the lid;
Dig the ground to create at least 16 inches of clearance on all sides of the lid;
3. Use a pry bar to lift the lids out of their seating;
4. Do not lean over or crouch down at the tank opening due to the risks of direct exposure to gas that could lead suffocation, potential collapse depending on the design and condition of the pit/tank or soil; and health risks associated with direct contact with faecal sludge;

5. Do not enter a septic tank as the gases in the tank can be fatal and tanks can cave-in. If someone does fall into a septic tank, do not enter the tank to try to save them as this may lead to double fatalities - call emergency rescue/support;
6. Wear full Personal Protective Equipment (PPE) when handling anything that comes in contact with the mouth poses risks of possible ingestion of faecal sludge.
7. The PPE should be thoroughly washed (or discarded if soiled together with the sludge toweling in a disposable plastic bag).
8. Rinse sludge measuring sticks with bleach water to disinfect before storing using 3/4 cup bleach to 1-gallon water.
9. The parking and wash-bay should have an adequate and continuous supply of water for hosing down the trucks every day after completing the daily schedule of work.
10. The greywater/dirty water from washing should be directed to the sewer system and should not be disposed of directly into rivers, ponds or canals.

d) Minimum operation procedures for handling faecal sludge spillage during collection and transport

When transporting faecal sludge, it is important to remember that untreated faecal sludge can potentially harm people, animals, and the environment if not handled properly. The operational procedure for handling faecal sludge spillage must, therefore, address aspects related to the following:-

- Location the spillage takes place (i.e. whether at the collection point, street/road or disposal site);
- The amount of faecal sludge spilled as this determines the mode of cleaning and response mechanism; and
- The responsible parties to be involved to ensure public and environmental health are not compromised.

The following minimum measures regarding faecal sludge spillage must be included in the Faecal Sludge Management protocol/Code of Practice:

- Access to information for the public on health risks of coming into direct contact with the untreated faecal sludge.
- For small amounts of faecal sludge spillage, the workers should sprinkle lime or bleach over the spilled area, wait for 15 minutes, then wash with water.
- If the volume is less than 100 liters workers should take immediate action to contain the spillage to reduce the possibility of health hazards and minimize the environmental impact. Workers should start immediate clean-up using such tools as shovels while wearing full PPE to avoid personal health risks. The area must be disinfected with bleach and the community advised avoiding direct contact without footwear for a few days.
- If the spillage is over 100 liters KCCA should be informed immediately providing the relevant information on the location, time of spillage, amount of spillage, immediate actions that have been taken to contain the faecal sludge.
- If faecal sludge spillage is over 500 liters the KCCA and NEMA departments dealing with conservation must be notified immediately and they must disinfect the area and ensure further actions to make the area free from hazards and risks to the public and the environment.
- If spillage occurs in the street during transport, the faecal sludge should immediately be removed and covered by the side of the road or by hosing with water to reduce

health risks to the users. If there are drains it should be washed into the drains but not into water bodies such as ponds or rivers. The street must then be disinfected by bleach or quicklime sprinkled. The above specifications apply depending on the amount of spillage.

- At faecal sludge transfer stations, clean up any spillage in the area around the inlet after completing the discharge of FS into the transfer station.
- If there is a spill or sudden spray due to malfunction/poor workmanship of emptiers, the person affected should immediately take a proper shower/bath. If it affects an emptier, he should immediately be released from the duty to have a thorough wash.
- All tools used for handling spillage must be washed and disinfected before being kept away.

e) Minimum standards for faecal sludge transportation vehicles:

The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019 provides that:

“A vehicle used for the collection and transportation of faecal sludge shall –

- have a secure metal body or similar construction;
- be maintained in good mechanical condition and repair;
- display the company name in a conspicuous place on the vehicle;
- be labelled with the sign “CESSPOOL EMPTIER” or “GULPER”, whichever is applicable;
- state the nature of contents being transported;
- be kept clean at all times;
- state any other information the Authority may require.”

f) Include a section on requirements for connection to a sewer network (See clauses in the new KCCA SFSM ordinance)

6.3. Faecal Sludge Treatment

Treatment refers to the process(es) that changes the physical, chemical and biological characteristics or composition of faecal sludge or wastewater so that it is of a quality that is fit for purpose for the intended next use or disposal.

a)

- All workers should wear Personal Protective Equipment (PPE) all the time. Based on the body part that needs to be protected, different PPE should be prioritized e.g. the eyes, ears, head, hands, feet or respiratory system. PPE can be considered in three categories: i) protection against simple risks (e.g. aprons); ii) significant risks (e.g. safety shoes); iii) life-threatening risks (e.g. compressed air equipment). Generally, the PPE should include: -
 - Liquid-proof/water-proof elbow-length gloves;
 - Liquid-proof/water-proof long-sleeved overalls with high visibility colors;
 - Liquid-proof foot protection (boots);
 - Good quality fitting head protective gear/helmet;
 - Face shield;

- Respiratory protection with gas filter;
- Safety glasses; and
- reflection jackets always
- The PPE must be right fitting PPE and must be washed daily and kept in a designated place and must be replaced immediately in the event of damage (e.g. scratches, or wear and tear);
- There should be a device for measuring gas concentration in the air and alarms if certain contents are too high;
- All equipment must have hazard signs. The Warning signs should not obstruct the view of the cesspool trucks or come too close to the truck or touch any moving parts of the vehicles;
- FS vehicles should bare hazards signs;
- There should be visibly marked emergency stop switches for immediate operation by both FS operators (and staff at the dumping site workers in case it is necessary);
- Biohazard signs should be used to warn against direct contact with untreated FS or treated FS waste from the treatment plants.
- “NO ACCESS” and “DO NOT TOUCH” signs should be highlighted at the treatment plant.
- FS equipment operation manual should be availed highlighting the functions and operational procedures needed during off-loading from FS trucks and in FS treatment processes at the treatment plant.
- The effluent from the treatment processes should meet the National Standard for the treatment faecal Sludge for Safe End-Use and/or Disposal

6.4. Re-use and disposal of faecal sludge

End-use/disposal refers to the different ways by which treatment products are ultimately discharged into the environment, either as end-use products or reduced-risk materials.

a) Safety guidelines for untreated faecal sludge disposal

The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019 states that:

“faecal sludge treatment or disposal sites include: -

- (a) designated or certified transfer stations;
- (b) designated or certified co-composting solid waste treatment facility;
- (c) designated or certified faecal sludge treatment facilities;
- (d) designated or certified incineration sites”.

The following safety guidelines at the disposal point for untreated FS should be adhered to: Workers should: -

- Check-in with a facility guard or operator.
- Carefully following instructions regarding the sampling of faecal sludge.
- Position the truck in the designated location for sludge removal, park and take the truck out of gear, apply the parking brake, and chock the wheels.
- Should remove the hose and then make the connections.

- Engage the power take-off or another mechanism for unloading the tank and complete the offloading process.
- Obtain the necessary authorization and access to the transfer station before transporting faecal sludge, as some transfer stations have locked inlets.
- Ensure sufficient water is available for washing the solids as some transfer stations have screens to remove non-biodegradable solids.
- Store any screened non-biodegradable solids in a safe location to drain and dry before containment and/or proper disposal either through incineration or landfilling.
- Use proper lifting techniques when discharging drums into a transfer station such as standing on a stable surface, and ensure all protective equipment is worn.
- Clean up any spillage in the area around the inlet after completing the discharge of FS into the transfer station and re-seal the inlet.
- Replace hoses and equipment, following adequate hygiene practices (e.g. hand washing), and completing the required paperwork.

b) Minimizing health and occupational risks during faecal sludge Re-use in agriculture

The direct use of untreated urine and faeces in agriculture presents the most significant health risk, particularly for farmers directly engaged in the use of faeces and urine from dry pits and consumers of faeces and urine-fertilized crops. In the case of agricultural reuse, the main groups at risk of exposure are farmers applying the wastewater or faeces and urine-based products; consumers of crops to which wastewater or feces and urine-based products have been applied (particularly vegetables eaten raw); and populations living near the agricultural sites.

- The Waste Discharge Regulations define standards for water discharged into water or onto land - within quite strict limits (NH₄-N<10mg/l, COD<100mg/l).
- Total nitrogen and phosphorus concentrations in raw wastewater are usually in the ranges 10–100 mg/l and 5–15 mg/l respectively, and
- Potassium is in the range of 10–40 mg/l.

c) Guidelines for FS product application

All workers should: -

- use PPE;
- Adhere to handwashing procedures;
- Care against inhalation, contact with skin and eyes, etc.;
- Adhere to provided steps to take if such contact happened.

d) Guidelines to minimize occupational and public health risks at the site of treated sludge use

To minimize occupational and public health risks at the site of use and in post-harvest exposure the following minimum standards will be applicable.

Table 1: Guidelines to minimize occupational and public health risks at the site of use

Site of FS application exposure control measure	Control measure	Further Requirement
Crop restriction	Restriction to: non-food crops such as cotton;	Crop restriction requires that FS is

	bioenergy crops e.g. rapeseed; fast-growing woods such as Salix plantations used for biofuel; crops processed before consumption e.g. wheat or crops that have to be cooked	treated before use even where crop restriction is applicable.
Application techniques	Urine should be applied close to the ground and worked into the soil to minimize nitrogen losses;	
Fieldworkers	Use of personal protective gear e.g. gloves, shoes/boots	Appropriate FS treatment is required before application; Workers have undergone health hygiene training.
Withholding period?	1-2 weeks between FS or urine application and crop harvesting can be effective in a reduction in crop contamination with a further reduction in pathogens when for a cessation period of up to 30 days	
Die-off period of organisms before consumption	The interval between the final application of FS as fertilizer and produce consumption reduces the number of pathogens substantially.	Precise pathogen reduction values depend on climatic conditions with rapid pathogen die-off in hot dry weather and less in cool wet conditions (approximately 0.5 log unit per day); Helminth eggs can remain viable on crop surfaces for up to 2 months Other health protection measures should be combined.
Post-harvest exposure control	Vigorous washing in the tap water of rough-surfaced salad crops (e.g. lettuce, parsley) and vegetables are eaten uncooked reduces bacteria by at least 1 log unit; For smooth-surfaced salad crops (e.g. cucumber, tomatoes) the reduction is approximately 2 log units; Washing with disinfectant or detergent solutions (commonly hypochlorite solution) and rinsing in tap water reduces pathogens by 1-2 log units; Peeling fruits and root vegetables reduces pathogens by at least 2 log units; Cooking vegetables achieves a complete reduction of 5-6 log units of pathogens.	Effective hygiene education and promotion programmes for food handlers (in markets at home, restaurants and food kiosks) needed on the positive impacts of washing produce fertilized with FS.

e) Handling commercial products (other than fertilizer) produced from Sludge

The handling commercial products (other than fertilizer) produced with sludge and/or incinerator ash as raw material are used in the construction business such as bricks, cement, pumice, and artificial aggregate must be handled properly.

f) Disposal of FS which cannot be re-used (land-filling and incineration)

For the final or ultimate disposal of faecal sludge, which cannot be reused, land-filling and incineration should be utilized for disposal while observing the following minimum standard to ensure public and environmental health is not compromised:

- Lining of the landfill with clay or plastic liner to prevent contamination of groundwater since faecal sludge may contain heavy metals or toxic chemicals due to the different sources of faecal sludge received at the treatment plants;
- Incineration of faecal sludge is by a multiple hearth furnace or fluidized bed furnace.

Reading List:

Kampala Capital City Authority (2017). Minimum Standards for Onsite Sanitation Technology Options in Kampala. Kampala Capital City Authority

NEMA, (1999). The National Environment (Standards for Discharge of Effluent into Water or on Land) Regulations, S.I. No 5/1999].

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WHO (2018)? Guidelines on sanitation and health. Geneva: World Health Organization; 2018. License: CC BY-NC-SA 3.0 IGO

WHO, (2006): Protecting Groundwater for Health: Managing the Quality of Drinking-water Sources

WHO, (2015) Sanitation Safety Planning (SSP)- Manual for Safe Reuse and Disposal of Wastewater, Greywater and Excreta.

KCCA (2019), The Kampala Capital City (Sewage and Faecal Sludge Management) Ordinance, 2019

Annex : SPECIFICATIONS FOR PERSONAL PROTECTIVE GEAR

From: The Faecal Sludge Management Ordinance for Kampala (2019) (SCHEDULE 5)

1. Overalls

Blue overall, water repellent, chemical resistant, fully branded with attached hood and with reflector stripes [Color: Orange] on the arms, waist and legs;

2. Gumboots:

Rubber, water resistant, Colour: Orange

3. Hard Hat / Safety Helmet

- a) Color: Orange
- b) ABS/PP/HDPE material
- c) 4-point, double fabric tape suspension connection

4. Nose mask:

Reusable nose mask (preferably with plastic cartridge filters).

5. Heavy Duty Rubber Gloves:

Full hand covering up to elbow level, water proof with good mechanical and chemical Resistance