

## Case study briefing

# The crisis of poor water supply, inadequate sanitation and chronic groundwater pollution facing Lusaka

## Evidence from George Compound



### At a glance

The groundwater resource underlying Lusaka is of critical importance to the city and its residents, providing more than half of the city's current water needs. This all important resource is also highly vulnerable to contamination from inadequate sewerage provision, industrial pollution and poorly planned development. Together with unregulated exploitation, this threatens the sustainability of the resource and the well-being of Lusaka's residents and its economy.

Nowhere is this more apparent than in George Compound, where poor planning and inadequate water supply and sanitation services degrade and deplete groundwater resources, with a severe toll on the health and livelihoods of 161,200 residents.

Extensive legislation exists to enable responsible institutions to provide water supply and sanitation services and protect the resource, including the Water Resources Management Act 2011, the Water Supply and Sanitation Act 1997, the Environmental Management Act 2011, the Public Health Act and the Local Government Act. However, it is clear that those responsible for ensuring the protection and management of water resources in the interest of public health and safety are failing to deliver on their mandates.

The current situation in George Compound shows how important it is for our water governance institutions to be active and accountable. Reversing the water crisis in George requires a well-coordinated and immediate response from the Water Resources Management Authority (WARMA), the Zambia Environmental Management Agency (ZEMA), the National Water Supply and Sanitation Council (NWASCO), Lusaka Water and Sewerage Company (LWSC), the Lusaka City Council (LCC), the Ministry of Health (MoH) and ZESCO.

Planning, new-investment and action to improve the provision of water supply and sanitation services, as well as the protection and management of groundwater resources is desperately needed across Lusaka's peri-urban areas to safeguard the health and economic well-being of citizens and the sustainability of precious groundwater resources.

### The vulnerability of Lusaka's groundwater resources

Lusaka lies on a plateau of mainly dolomitic marbles and fractured karstic rocks. These rocks support a highly productive and extensively used aquifer system which is of great strategic importance to the region. While highly productive, the karst aquifer in Lusaka is also highly vulnerable to contamination because the water moves quickly through large fractures in the rock and is not subjected to a filtering process (BGR, 2011).

George Compound is a legalised, but unplanned settlement in Lusaka, which is located in an area of highly vulnerable and poor quality groundwater (BGR 2013).

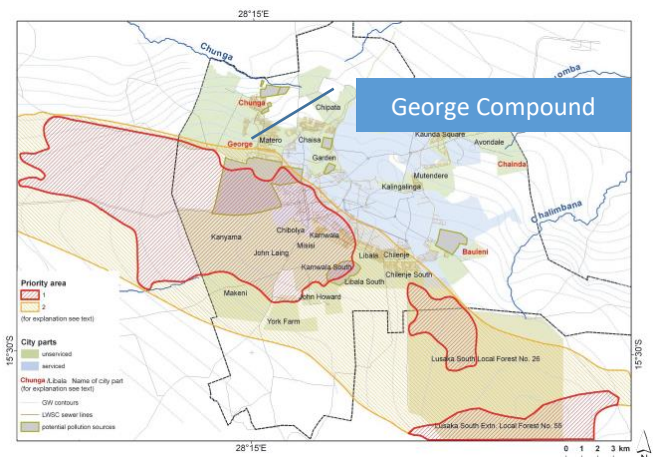


Figure 1: Priority intervention areas for groundwater protection (BGR, 2013)

Across most of Lusaka's peri-urban areas, sanitation takes the form of simple pit-latrines. Combined with leaking sewerage these discharge untreated human sewage directly into the aquifer upon which people rely for drinking water. Together with pollution from industrial and commercial activity this severely degrades groundwater quality, particularly where development is allowed to encroach into the protection zones normally in place to protect public supply boreholes.

As an example, according to LWSC, the construction and subsequent pollution discharges from a brewery in George

led to groundwater contamination and the closure of a high yielding borehole at George Machinery House No. 1.

Under the Local Government Act Cap 281, the Lusaka City Council has the duty to control developments and the use of land in the interest of public health and safety, and to take measures to prevent the pollution of water supplies in places like George Compound. However, the Council has yet to fulfil this duty to protect groundwater and the health of communities.

The Water Resources Management Authority (WARMA) has been handed a powerful legal mandate and duty to protect the nation's groundwater resources under Section 93(1) of the Water Resources Management Act 2011. However, despite the Act being in existence for 5 years, WARMA has yet to take any measures to protect and regulate the use of groundwater resources in Lusaka, or anywhere else in Zambia.

It is critical that these responsible institutions fulfil their key roles. For example, they need to step up monitoring of the resource and its use, and establish and enforce clear guidelines and by-laws to protect groundwater in George Compound, and Lusaka more widely to ensure that residents and the water utilities can use the resource safely and sustainably.

### The impact of inadequate water supply services

The Water Supply and Sanitation Act No. 28 of 1997 requires water supply and sanitation utilities to provide for the efficient and sustainable supply of water and sanitation services under the regulation of the National Water Supply and Sanitation Council (NWASCO). NWASCO requires service providers to guarantee a defined level of service in a Service Level Guarantee (SLG). When the SLG is breached, the utility must set targets for improvement in a Service Level Agreement (SLA).

Despite NWASCO identifying George as a "severely water stressed" area (2014:53), in 2014, LWSC failed to meet its targets in terms of number of water supply hours, and number of interruptions to water supply (NWASCO, 2014).

A survey conducted in 2015 by LWSC found that 70% of respondents in George Compound reported receiving only 1-4 hours of water supply a day, compared to the 12 hour target set by LWSC (NWASCO, 2015).



Closed taps in George Compound

A further issue is that communal taps operated on behalf of LWSC have no clear schedule for operation. They are open for a limited time, with little warning.

The problems of a highly erratic supply are exacerbated by the load-shedding crisis. According to LWSC, the reduced supply of power from ZESCO has affected their pumping hours, leading to a further reduced supply of water for residents of George Compound.

According to local residents, collecting water takes 3-4 hours each day because of the long queues, which are intensified by the erratic supply.

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*We spend a lot of time collecting water... it takes us from 16:00 hours to 19:00 hours, and even up to 20:00 hours. - George resident*

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It is women and girls who bear the brunt of this burden of queuing and waiting for water. The time wasted to collect water eats into income generating activities, and school attendance (Gauß Ingenieure, 2011).

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*If water was full time I could make 500 kwacha a day... If I have to spend my time fetching water, I can only make 100 kwacha. - George resident*

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Even when water is available, some residents of George Compound are unable to afford the tariff, meaning they have to seek out water of inferior quality from unprotected shallow wells.

### The impact of inadequate sanitation services

There is no sustainable sanitation system in George Compound. A gap analysis conducted by Village Water (2014) found that pit latrines are the most common sanitation facility, with over 4,000 pit latrines found in Lima ward alone. Due to inadequate and erratic supply, and problems of affordability, many residents of George use shallow wells as their main source of water. According to the findings of Village Water (2014), there are 146 shallow wells found in Lima ward, many of which are found within 10 meters of pit latrines.



Pit latrine in George Compound

Shallow wells in peri-urban areas surrounded by pit latrines face very severe and dangerous levels of water contamination by pathogenic – disease causing – material. Studies carried out in George Compound and elsewhere in Lusaka show high levels of contamination of groundwater by pit latrines. They conclude that shallow well water in George Compound is:

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*...a serious health hazard if it were to be used, especially for purposes of drinking and cooking without treatment. – Mucheleng'anga, 2007: 71*

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The water was shown to have total coliform counts 100 times the recommended maximum WHO limit for safe use as drinking water, as well as concentrations of lead, cadmium and nitrates in excess of acceptable levels (Mucheleng'anga, 2007).

In their assessment of LWSC supply systems, Gauff Ingeniure (2011: 61) also conclude that:

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*...shallow wells in Lusaka are not an option for water supply, especially in informal and peri-urban areas using pit latrines. – Gauff Ingeniure, 2011: 61*

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**Resident of George Compound using a shallow well**

The use of untreated water from shallow wells is a major contributory factor to high rates of waterborne disease in George Compound, including cholera, typhoid and diarrhoeal diseases (Village Water, 2014). Unfortunately, residents often have no option but to use shallow wells and place their health and their family's health at risk. As one shallow well user in George attested:

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*We use a shallow well, but the water is dirty. We get stomach pains. - George resident*

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## What needs to change?

The situation in George Compound highlights the importance of accountable institutions for the effective implementation of water management law and policy.

Addressing the interrelated issues of water supply and sanitation provision, and groundwater management and protection in George Compound and other vulnerable peri-urban areas in Lusaka requires a well-coordinated, immediate and time-bound response by the responsible institutions. In order to improve the situation, it is recommended that:

### Locally:

- NWASCO must ensure that LWSC finds a solution to meet the terms of its SLG and SLA in terms of water supply hours, and interruptions to service.
- The Lusaka City Council and NWASCO should mobilize funding through the Ministry of Local Government and Housing and the Devolution Trust Fund to invest in LWSC for the improvement of water supply services in George Compound. Additionally, the LCC and LWSC need to take responsibility for the provision of sanitation services, and procure and allocate the necessary resources to do so.
- ZESCO must provide consistent, uninterrupted power to LWSC treatment and pumping facilities in George Compound.
- The Ministry of Health (MoH) through the Lusaka District Health Management Team should increase water quality monitoring and step up community sensitization activities, and undertake comprehensive water safety planning in order to assess and manage risks to water supply. Additionally, the MoH should advocate, and collaborate with other institutions for the adequate provision of water supply and sanitation services.

### Nationally:

- WARMA needs to fulfil its mandate under the Water Resources Management Act 2011 Section 93(1) to sustainably manage and protect groundwater resources in coordination with the appropriate authorities. In order to fulfil this mandate, WARMA should establish a groundwater management unit and develop by-laws on groundwater usage and protection.
- ZEMA need to fulfil their duties under Section 48(1) of the Environmental Management Act 2011 to monitor effluents and groundwater quality and take measures to prevent pollution.