



BRINGING FORWARD THE DAY  
WHEN EVERY PERSON HAS  
ACCESS TO SUSTAINABLE  
SANITATION FACILITIES.

A SAFE, SUSTAINABLE  
AND MODERN  
SOLUTION TO SOUTH  
AFRICA'S SANITATION  
CRISIS.

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## 1. Introduction

South Africa has a sanitation problem and there is a readymade solution. The solution is not second-rate, but rather one that is already being adopted by forward thinking countries such as Sweden, Australia, France, USA, Kenya and by select municipalities and government departments in South Africa. It is a solution that is earmarked as a highly sustainable, extremely cost effective and technologically advanced response to the sanitation crisis that besets the world. The solution is an aerated, waterless toilet system.

In March 2012, the Department of Water Affairs, Republic of South Africa published a report on the “Status of Sanitation Services in South Africa”. The department of performance of monitoring and evaluation in the office of the Presidency of South Africa and the Department of Human Settlements are also closely associated with the report. In fact it was a collaborative effort across these three departments that laid bare the state of sanitation in South Africa.

The report is optimistically titled “Sanitation services - the quality of sanitation in South Africa”. In the case of some areas of South Africa, using the word quality and sanitation services in the same sentence is optimistic and highly misleading. Even before the investigation was commissioned, it was apparent to anyone who reads newspapers, listens to the radio or watches television, that the state of sanitation facilities in South Africa was dire at best and hellish at worst. Unsurprisingly, the report confirms this. The state of sanitation in the country varies from province to province and municipality to municipality, but there is, without a doubt, a widespread problem that must be tackled as a priority.

Some may say that to describe the true state of sanitation as nothing short of dire, diabolical, lamentable, and hellish is both unhelpful and a case of over dramatising the situation. A third of our nation can understand being faced with having to defecate in the open, or in a hole in the ground, or in a sanitation facility that is dirty, infested with flies and obnoxiously smelly. Many of our nation’s children are faced with attending schools without toilets that are safe and clean. Can you imagine having to relieve yourself with no toilet door and suffering from diarrheal or intestinal disease as a result of coming into contact with human waste? Not many people can but it is a sad reality for so many.

The government report acknowledges there is a problem. The future crime is if nothing is done, immediately, to address the problem, especially as there is a South African grown solution available.

As daunting as it may seem, given the scale of the sanitation problem in both numbers and geographic spread, it is entirely possible to reverse the current situation through systematic long-term planning, effective execution, visionary leadership, and a commitment from national, provincial and municipal government to public-private partnerships.

Such an approach can and will allow for the sanitation crisis to be tackled aggressively and proactively and deliver long-lasting tangible benefits to communities, provinces and the country.

The social and economic benefits of safe and sustainable sanitation solutions are widely documented. And we all know that achieving the Millennium Development Goal (MDG) targets South Africa signed up to can be brought a step closer by addressing the sanitation crisis. The time for action is now. Not tomorrow, next week or at the next election.

It is important to acknowledge that factors such as infrastructure, sustainability and cost must be taken into account when deciding the most appropriate strategy in addressing the sanitation crisis in South Africa. The fact is that a new approach, an alternative technology and an alternative system must be considered and adopted if any significant progress can be made in the short term that will have longevity, as the traditional flush toilet is not a viable option in many cases.

For many people the flush toilet is perceived as the only acceptable sanitation solution and one that the majority of people have their sights set on. The flush toilet was designed and developed hundreds of years ago. The world has changed considerably since then, as has the availability and reserves of precious resources such as water. The idea of flushing good water that can be used for hygiene, drinking, agriculture, manufacturing and industry down a toilet is as ludicrous as it is irrational.

Dry sanitation is the way forward in the new world. It is a system that will eventually be the norm throughout the world. It is a safe, sustainable, cost effective and environmentally friendly solution that is climate, geographic and topographic, and culture immune. It is a solution that is already being implemented in both the developed and developing worlds, in urban and rural areas, and in Christian, Muslim and Jewish communities.

Enviro Loo is a commercial organisation that offers sustainable sanitation solutions that are waterless and therefore take account of infrastructure restrictions, cost constraints and longevity. Of course we have a vested interest in the government of South Africa tackling this crisis head on and with vigour and commitment. But our interest goes beyond the commercial and extends directly to the human.

Every single employee at Enviro Loo is committed to bringing forward the day when every person has access to sustainable sanitation facilities. We believe that we can make a huge difference to the social and economic development of South Africa, to the country meeting its MDG targets and in providing dignity to millions of South Africans. The sanitation solutions that can address the crisis in South Africa are available now. And now is the time to act. All South Africans deserve to live a life of dignity.



Lance Joel  
Managing Director  
Enviro Loo South Africa



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## 2. “We get a picture of service delivery failure on a massive scale”

So says the government in “Report on the status of sanitation services in South Africa”, published in March 2012.

Both startling and sad is the inadequacy, or complete lack, of sanitation facilities that is resulting in millions of lives being negatively impacted and as a result additional strain placed on health resources, the economy, and the environment.

South African Sanitation Crisis	Households	Lives Impacted*	Issues
	3,2 million	16 million	Service failure
	1,4 million (formal settlements)	7 million	No services
	545,000 (informal settlements)	2,7 million	Interim services only
	3,2 million	16 million	Below standard

\*5 people per household

Tackling the current state of affairs requires a planned and systematic rollout of a sanitation solution that is locally relevant, is a long-term solution (permanent) but can be implemented in the short and medium terms, and contributes to, rather than detracts from the local area and community. The answer is an aerated, waterless sanitation system that is maintained and serviced, with the offset products used to benefit the community. Other systems such as anaerobic and chemical are possible alternatives but on a like for like basis in terms of cost, infrastructure requirements, longevity and environmental preservation an aerated, waterless system wins every time.

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### **3. Massive benefits across health, education, economy, environment**

Access to sanitation is a universal human right. An estimated 23 million South Africans do not have access to adequate sanitation facilities. Those who have inadequate sanitation may be using the bucket system, unimproved pit toilets or sadly, open defecation. When these fail, the impact on health, education, the pollution of our environment and the economy, is extremely serious.

#### **Health impact and benefits**

“One gram of faeces can contain 10 million viruses, one million bacteria, one thousand parasite cysts and 100 worm eggs”. The impact of inadequate sanitation on the health of the poor is significant in terms of the quality of life, and the education and development potential of communities.

1 000 deaths per day in South Africa are caused by waterborne disease; at an annual cost burden to the Department of Health of R8 billion per annum, as well as an estimated number of diarrhoeal cases reported in children under 5 years of 1.5 million, resulting in more than 100 deaths per day.

Improved sanitation facilities help lower mortality and morbidity rates, improve learning and retention and reduce stunting. Utilising a sanitation solution that is non-polluting, safe and has a zero discharge system; that will not cause either ground water contamination or the breeding of water-borne diseases, which are killing and causing illness to South African’s daily, should become the norm. Sanitation improvement must be demand-responsive and supported by an intensive health and hygiene programme.

#### **Environmental impact and benefit**

South Africa’s usable water yield is 98%, with water demand growing by 1-2% in the next decade and the urban growth forecast of 2.5% per annum; water scarcity in South Africa is impending according to Acting Water Affairs Director-General, Trevor Balzer.

The world is changing. Our planet is getting more and more stressed due to urbanisation and an increasing population. Urbanisation is contributing to a major sanitary crisis in urban areas

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and the need to feed an increasing population is putting stress on agriculture. Both these trends demand use of the most precious of the planets resources – water.

Agriculture accounts for 70% of human usage of fresh water, the majority of which is used for livestock production. And with water flushing toilets being considered the norm in urban areas, there is an increased and unsustainable demand for water to be used in sanitation. We have to conserve water – there is no alternative.

Inadequate sanitation leads to dispersed pollution of water sources. This in turn increases the cost of downstream water treatment, as well as the risk of disease for communities who use untreated water. The South African environment should be addressed in a holistic manner and all natural resources, of which water is most important, should be carefully considered. Although water systems are able to tolerate a certain degree of pollution there is a limit to the amount that can be handled without causing the water quality to deteriorate to such an extent that the water cannot be used.

Let's understand how sanitation is impacting the South African environment:

- I. 8% of South Africa's population are living with NO access to sanitation – resulting in defecation and urination in our local rivers
- II. Some of KwaZulu Natal's beaches have lost their blue flag beach status due to the high eColi count in the water
- III. Europe has threatened to stop importing fruit and vegetables from South Africa, due to eColi in the water used to irrigate the crops

If a sustainable sanitation solution is utilised to solve the 23 million people sanitation crisis in South Africa – approximately 350 billion litres of water per annum will be saved. So let's be clear here, utilising sanitation systems that require water is no longer an option. Utilising sanitation systems that impact the environment and lead to ground water contamination is no longer an option. Only solutions with fixed installations, limited treatment onsite before disposal, and zero water requirements and environmental impact should be considered.

### **Impact and benefit for education:**

“Education is a fundamental human right and essential for the exercise of all other human rights. It promotes individual freedom and empowerment and yields important development

benefits. Yet millions of children and adults remain deprived of educational opportunities.”  
(UNESCO)

Educational institutions have many pressures and financial resources are scarce. But we all know, as Nelson Mandela famously said “Education is the greatest weapon you can use to change the world”. Every person deserves and has a right to an education. That education has to be foregone because of a lack of or inadequate sanitation facilities cannot and must not continue. It would be a travesty.

Inadequate sanitation greatly affects learners’ school attendance, with girls being the most affected and resulting in many early dropouts.

**The challenge in South African schools is catastrophic (equaleducation.org.za)**

<b>Sanitation Facilities in South African Schools</b>	913 schools with no sanitation facilities	11 450 schools still using pit latrine toilets
<b>Water Supply in South African Schools</b>	2402 schools have no water supply	2611 schools have unreliable water supply

**Case Study: The impact of the sanitation crisis in a Gauteng school, South Africa (equaleducation.org.za)**

	<b>Examples of Impact</b>	<b>Student Testimony</b>
<b>Education</b>	Globally, children miss over 270 million school days due to poor sanitation and lack of water supply in schools and their surrounding communities[1]	<p>“I get there, there is a long queue of learners who also wants to use the toilet. I will have to choose between waiting at the queue for minutes and missing the class lesson or going back to class where else I will be holding my urine which will cause distraction.” (Masiqhakaze)</p> <p>“There are toilets near my class and there’s a smell when those toilets are not clean.” (Phomolong)</p>
<b>Health</b>	Improved sanitation reduces cases of diarrhoea by 37.5%; Washing hands can reduce diarrhoeal cases by 35%[2]	“We catch diseases so fast because the toilets are very dirty and you don’t have basins to wash your hands after.” (Tembisa West)

<b>Dignity</b>	Students can feel that being forced to use unsanitary conditions is degrading	“My dignity is not there anymore because of the dirty toilet I have to go to every day.” (Inggayizivele)
<b>Safety &amp; Security</b>	Globally, about one in ten female students do not attend school during menstruation or drop out because they do not have access to sanitation facilities they feel are private, clean and safe[3]	“The doors in our toilets have no locks...which violates our dignity and [the] security [of] girls” (Masiqhakaze)

[1] United Nations Water. [http://esa.un.org/iys/docs/IYS\\_flagship\\_web\\_small.pdf](http://esa.un.org/iys/docs/IYS_flagship_web_small.pdf)

[2] World Health Organisation.

[http://www.who.int/water\\_sanitation\\_health/publications/factsfigures04/en/](http://www.who.int/water_sanitation_health/publications/factsfigures04/en/)

[3] <http://www.irc.nl/page/16710>. P. 40

### Case Study: The impact of the sanitation crisis in Mahlodinela Primary School, Sengatane Village, Limpopo, South Africa

	Impact	Testimony
<b>Education</b>	A 6-year-old boy (Michael Komape) fell into a pit toilet and died at a school in Limpopo. The child had gone to relieve himself during break time and did not return to class.	“We are battling on matters of school sanitation. We can’t run away from the truth. There are only pit toilets at the school. The young boy’s death was a “very unfortunate situation.” [Phuti Seloba, Spokesperson Limpopo Department of Education][1]
<b>Health</b>	Death due to drowning in pit latrine. Ventilated improved pit latrine solutions have been deemed acceptable solutions for the sanitation crisis.	Data shows that pit and ventilated improved pit latrines are ineffective and pose potential health implications, and even death as in the case of 6-year-old boy Michael Komape.
<b>Dignity</b>	Many of the pit toilets don’t even have doors.	The poor conditions of this school’s toilets goes far beyond a child’s dignity and human rights.
<b>Safety &amp; Security</b>	“To get to the toilets where little Michael met his fate, pupils have to walk past nine other uncovered toilet holes.”	“If my child had not used that toilet, he would not have died,” said the child’s mother.[2]

[1] <http://www.enca.com/south-africa/grade-0-learner-dies-after-plunging-school-pit-toilet>

[2] <http://www.news24.com/SouthAfrica/News/Limpopo-pupils-put-off-by-horrific-conditions-20140116>.

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This tragic incident demonstrates the health and safety dangers of pit and ventilated improved pit latrines and emphasises the urgent need to address school infrastructure, particularly in rural areas where the poorest and most under-resourced schools are in the majority. Pit latrines and those alike should be eradicated as a matter of urgency; it is a matter of life and death.

### **Economic impact and benefit**

Poor sanitation cripples national development: workers produce less, live shorter lives, save and invest less, and are less able to send their children to school. The economic case for sanitation is no longer in doubt; each US \$1 investment in sanitation delivers a US \$9 return (World Health Organisation).

The World Bank's Economics of Sanitation report shows that the cost of not addressing sanitation is indefensible. The lack of safe sanitation results in increased health expenditure, untimely mortality, contributes to malnutrition, causes land and water table contamination and greatly affects work productivity. Investing in sanitation makes investments in education more effective; girls are more likely to attend school when adequate sanitation is available. Investments in sanitation also protect water resources, make investments in water supply more effective, and increase tourism revenues.

The economic impact of poor or zero safe sanitation is catastrophic but preventable.

The math is simple and the impact huge. Currently, 23 million South Africans do not have access to adequate sanitation facilities. Assuming each toilet installed will service 5 people, we would require 4.6 million toilets to provide adequate sustainable sanitation to 23 million South Africans. The impact on our economy would be:

- i. **23 million South African lives** will be improved,
- ii. The cost of an aerated, waterless sustainable sanitation solution over 20 years is estimated to be between R60 billion and R139 billion
- iii. The economic benefit created for South Africa will be between **R380 billion and R1.2 trillion**
- iv. The water savings achieved from an aerated, waterless solution will equate to **350 billion litres** of water per year

We will bring forth the day that every South African has access to sustainable sanitation facilities.

#### 4. Technologies available

In July 2010 the United Nations declared access to water and sanitation a universal human right. Human rights are conceived as universal (applicable everywhere) and egalitarian (the same for everyone). These principles must be upheld with regards sanitation facilities. All people should be afforded permanent, clean, safe sanitation facilities. Access to safe sanitation facilities has quantifiable health, economic, social and education benefits, which cannot be ignored.

The issue of cost is always top of mind. But it is important to calculate the true cost of any sanitation solution. The total cost of ownership over a lifetime must be taken into account; capital investment, maintenance and servicing, replacement costs, contamination or clean-up costs, health costs etc.

	<b>Aerated and Waterless</b>	<b>Chemical</b>	<b>Anaerobic / VIP</b>
<b>Description</b>	Odourless	Some odour	Strong odour
	Minimum maintenance and servicing costs	Expensive maintenance and servicing costs	Costly mechanical pit-emptying equipment required
	Non-polluting zero discharge	Environmental pollution occurs	Local groundwater (used for drinking) contamination occurs
	Conserves water resources	Conserves water resources	Contaminates water resources
	No chemicals used	Hazardous chemicals	Occasional chemical use
	Inside installation possible	No inside installation possible	No inside installation possible
	Relatively easy installation	Easy installation	Fairly complex installation
<b>Life span</b>	50 years	10-15 years	3-5 years
<b>Capital costs</b>	ZAR 9,500 – 11,135	ZAR 0 – 400	ZAR 5,000 – 11,000
<b>Annual service and maintenance</b>	ZAR 500 – 960	ZAR 6,600 – 11,520	ZAR 400 – 1,800
<b>20 year total costs of ownership</b>	ZAR 19,500 – 30,335	ZAR 132,000 – 230,400	ZAR 33,000 – 60,000
<b>Cost per user/per day for 5 users</b>	ZAR 0,53 – 0,83	ZAR 3,62 – 6,32	ZAR 0,9 – 1,64

## 5. Financial argument to eradicate current sanitation backlog

According to the government report “Sanitation services - the quality of sanitation in South Africa”, there are 1.4 million South African households, in both formal and informal settlements that do not have access to sanitation facilities. As well as 3.2 million households with below adequate access to sanitation facilities.

Addressing the current sanitation crisis, the results will speak for themselves:

### Addressing the backlog – No sanitation services

Requirements	Aerated and Waterless sanitation solution capital	Capital budget required	Services budget required for 20 years	Economic return	Lives improved
1.4 million households	ZAR 11,135 Household of 5 users	ZAR 15,5 billion	ZAR 26,8 billion	ZAR 380 billion	7 million

### Addressing the backlog – Inadequate Sanitation Facilities

Requirements	Aerated and Waterless sanitation solution capital	Capital budget required	Services budget required for 20 years	Economic return	Lives improved
3.2 million households	ZAR 11, 135 Household of 5 users	ZAR 35,6 billion	ZAR 61,4 billion	ZAR 873 billion	16 million

### Technologies cost comparison

	Aerated and Waterless	Chemical	Anaerobic
20 year cost of ownership (based on 4.6 million toilets to eradicate backlog)	ZAR 139 billion	ZAR 1 trillion	ZAR 276 billion

As per the Intergovernmental Fiscal Review of Local Government Budgets and Expenditure published by treasury on 14 September 2011, there was an estimated capital budget for FY 2012/2013 of ZAR 5.4 billion. Based on these figures, it would take 9 to 10 years to eradicate the sanitation backlog and replace inadequate sanitation facilities using an aerated, waterless sanitation system. By focusing on the right solution to tackle the current problem, we can and will bring forward the day that every South African has access to sustainable sanitation facilities.

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## 6. Sanitation as a contributor not a detractor

Progressive countries are actively looking at ways to reuse products and waste from all areas of modern life and waste from toilet facilities is no exception. As part of this philosophy, progressive countries and governments are also ensuring that projects and initiatives that have environmental implications are designed and executed to deliver on the current needs of communities but are also long term in their application and do not drain or diminish valuable resources unnecessarily. In the case of sanitation the most precious resource, which is currently wasted in the billions per year, is litres of water.

Waste products and water consumption are two areas that progressive countries, governments and communities can address and use to their benefit if a new, progressive approach to sanitation is taken. A waterless solution to address the sanitation crisis delivers the possibilities for communities and countries to benefit.

### Waste re-use

Human waste is roughly 95% water. Through natural process it can be collected and reused. But the collection process is critical and the correct toilet facility is required.

Aerated sanitation systems are dry, i.e. waterless toilet systems that provide for effective waste collection and reuse. Human waste is collected on completely sealed drying trays and through exposure to both ventilation and heat is converted into a dry and stable waste. The dried waste is roughly 5 to 10% of its original mass and its transformation is a result of naturally occurring aerated bacterial and biological activity. It can be collected and after further composting treatment; it can be reused for a number of activities, including:

- A. Fertiliser for local community gardens
- B. Sold to local garden centres for re-sale as a fertiliser
- C. Sold to local fertiliser plant
- D. Sold or donated to local institutions (hospitals, schools, prisons) for fertiliser for gardens

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### **Water management**

Water is the most precious resource and its scarcity necessitates prioritisation of use. All governments and communities across the world are actively seeking ways to reduce water wastage and conserve water for priority use and for the future.

Water priority must be for drinking, bathing and agriculture and industry. These priorities make both humane and economic and social sense. To be wasting water by flushing it down a toilet seems ludicrous and that is a key reason dry i.e. waterless toilet systems are the future but really need to be the present. We are already seeing manufacturers making alterations to the flushing systems, reducing water usage with half flushes. Eventually there will be no flush, as dry toilet systems become the norm and it will become a global standard and possibly even legislation in order to conserve water.

Implementing dry toilet systems now delivers on a necessary and critical need today but importantly plans for a future not too far away.

### **Local involvement through employment opportunities**

Like all toilet facilities maintenance and servicing is required. This must be carried out periodically to ensure maximum effectiveness of the system. Maintenance is simple and quick to carry out and can be developed as a local industry with training provided. The dried material is simply raked from the drying plate into the drying bag. The matter can be removed safely; it is harmless, easy to handle and simple to dispose of. As discussed previously it can be reused locally or sold for reuse.

This approach not only creates employment opportunities locally but also has the potential to build a cottage industry in the resale and/or reuse of the waste to the benefit of the community.

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## **7. Accelerating the delivery of sanitation services to South Africa's citizens with a waterless alternative**

### **a. Visionary leadership**

The installation of sanitation solutions that are safe, effective, sustainable, cost-effective, technologically advanced, easily installed and maintained, environmentally friendly and provide local employment opportunities is possible today. In short, it is possible dignity could be afforded the millions of South Africans who are currently denied it, if leaders adopt a visionary and committed approach to the issues.

Critical to addressing and reversing the increasing sanitation crisis is ensuring that all sanitation solutions implemented are sustainable. This requires the government to advance its definitions of what constitutes safe, reliable, private and ventilated sanitation facilities.

Historically, both pit and ventilated improved pit latrine solutions have been deemed acceptable solutions for the sanitation crisis. Whilst these solutions may have appeared to be an acceptable solution to the crisis, the data shows that this solution is ineffective, detrimental to the environment, temporary, excessively costly over its short lifetime and poses potential health implications, and even death.

To halt the installation of pit or anaerobic toilets is visionary because it is addressing today's sanitation crisis that will halt and reverse the crisis for the long-term, and not be looking for a short-term, quick, temporary fix that is statistics driven and not humanity and issues driven.

We challenge the government to make far reaching decisions that actually address the sanitation problem and don't merely try to fix a cancer with a plaster.

Such far-reaching and visionary approaches could include legislative resolve that all sanitation solutions in South Africa should:

- Be scientifically certified as an aerated system
- Hold environmental credentials relating to:
  - Water resource conservation (i.e. should be waterless)

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- Power resource conservation
  - Waste containment – i.e. fully sealed units with no possibility of leakage into or out of the system
  - Weather resistant and safe i.e. immune to flooding, extremes of temperature etc.
  - Have maintenance and service contractual capabilities that create local employment and training
  - Financially stable with all necessary tax and compliance affairs up to date
  - Contributing to and supporting the communities in which they operate

**b. Public-private partnership**

The number of citizens who do not have access to safe sanitation is widespread and the “State of sanitation services in South Africa” report clearly outlines the scope of the problem. So from a numbers perspective we are talking millions of citizens not afforded the basic human right of dignity. If we add to this the knock-on negative economic and social effects that no or inadequate sanitation breed, the situation is heading towards ‘state of emergency’ status. And this is not being dramatic but rather an attempt to force pragmatic action to be taken.

Whilst the scale of the issues may appear to be insurmountable in reality they are not. But a change in mind set, approach and commitment is required. Political agendas must be put aside before the country reaches epidemic status. The private sector must be actively involved and should be driving the delivery of sanitation services.

This is the only way to proceed if any tangible headway is to be made in addressing both the backlog and the increasing number of citizens requiring sanitation solutions as the population grows. A public-private partnership must be established, and strict governance controls put in place to eliminate the contracting of organisations that do not meet the proposed new criteria for providers of sanitation solutions.

The partnership approach will ensure that sanitation experts with a commitment to bringing forward the day when every person has access to safe, sustainable sanitation facilities are contracted.

Service providers with this vision will drive and facilitate the implementation of sanitation solutions for the long-term. At front of mind for all service provider contracting organisations must be the economic and social benefits that can be realised with correct sanitation solutions. This will then ensure that all decisions made are society and community centric.

**c. Effective execution**

On pages 26 and 27 of the “Status of sanitation services in South Africa” report, the authors list six typical issues affecting the efficient provision of sanitation services at the project level.

All six issues are avoidable if the correct public-private partnerships are established, and that correctly qualified, certified and committed service providers work together based on a common vision to bringing forward the day when everyone has access to sanitation facilities and not a vision to make a quick buck and an approach of dump and depart in terms of implementation.

**The six issues listed in the report are:**

1. Contractors not following designs and implementation plans (e.g. building unimproved pit toilets or building toilets with unlined or shallow pits).
2. Municipalities providing flush toilets where there are inadequate water supplies for flushing.
3. Waterborne sanitation schemes where pump stations and the WWTW are not properly maintained resulting in severe pollution of the environment.
4. Bulk infrastructure under capacity and unable to cope with the effluent load.
5. Lack of water demand management resulting in very high effluent flows far beyond design criteria for particular settlements (and hence hydraulic overloading of bulk infrastructure).
6. Pit toilets that have filled up but are not emptied or the top structure is/or cannot be moved to a new pit.

All six issues are easily avoidable and can be eliminated by a system that adopts the following mitigation measures:

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**Issue 1:** Contractors not following designs and implementation plans (e.g. building unimproved pit toilets or building anaerobic toilets with unlined or shallow pits).

- **Mitigation measure:** Installing pit toilets or anaerobic / VIP toilets should be stopped immediately. The reasons for this are obvious. This solution is not sustainable, it is environmentally inefficient and unfriendly, and excessively costly over its lifetime. The fact that it is a temporary solution should rule this out as being a solution at all. South Africa's citizens deserve and are entitled to sanitation solutions that are safe, sustainable and offer dignity.

**Issue 2:** Municipalities providing flush toilets where there are inadequate water supplies for flushing.

- **Mitigation measure:** Water is the most precious resource on the planet. Water reserves are limited and to be flushing it down the toilet is both irresponsible and will create far greater long-term problems for the country. Governments around the world recognise the need to conserve water and prioritise usage for activities such as agriculture and livestock, drinking, and cleanliness. Waterless, aerated sanitation systems are available in South Africa today, and should not only be the first choice but the only choice.

It is important to note that waterless aerated sanitation systems are not the preserve of the developing world. Advanced and visionary countries are looking to waterless aerated sanitation solutions which are already being used across the developed world in countries such as France, Switzerland, USA, Australia, Germany, United Arab Emirates to name a few, in addition to South Africa, Kenya, Ghana and a host of other countries.

Modern sanitation solutions do not require flushing; the water must and should be preserved and conserved for hand washing. Developed countries have realised this, South Africa should be leading the way on the African continent.

**Issue 3:** Waterborne sanitation schemes where pump stations and the WWTW are not properly maintained resulting in severe pollution of the environment.

- **Mitigation measure:** Modern sanitation solutions that are waterless and aerated in nature do not require pump stations. More importantly they

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are environmentally friendly and 100% environment safe in that they are guaranteed non-polluting units. It is extremely important that all aerated systems are designed as a fully sealed self-contained unit with zero leakage and zero water seepage.

**Issue 4:** Bulk infrastructure under capacity and unable to cope with the effluent load.

- **Mitigation measure:** All aerated, waterless systems must be designed as a fully contained unit, which will negate the need for bulk infrastructure, as the system will cope with its own effluent load. This means that the installation of the system will have zero impact on current sewage systems. Maintenance and servicing of the unit is required but is far less in frequency, much more hygienic and as per the newly proposed service provider criteria would be integrated into the 50 year unit lifecycle providing job opportunities and skills development within the communities in which they are installed.

**Issue 5:** Lack of water demand management resulting in very high effluent flows far beyond design criteria for particular settlements (and hence hydraulic overloading of bulk infrastructure).

- **Mitigation measure:** This issue is completely eliminated by implementing fully self-contained aerated and waterless sanitation solutions that are also permanent, environmentally friendly.

**Issue 6:** Pit toilets that have filled up but are not emptied or the top structure is/or cannot be moved to a new pit.

- **Mitigation measure:** Outlaw pit toilets in all its variations. This is not a solution for civilised society. Sanitation solutions must be permanent, environmentally friendly, safe, and hygienic and must not require human beings to be in physical contact with effluent. Implementing a solution such as the fully self-contained aerated, waterless systems would eliminate this issue.

**d. Systematic long-term planning**

The sanitation crisis has come about over a long period of time. The approach taken to address the issue must take into consideration the long-term with relation to

social and economic impacts. The solutions implemented must be holistic in nature and be solutions that are fully inclusive in terms of product, people and place. What this means is the product chosen must be a long-term appropriate solution. The implementation of the solution must include local community outreach in terms of employment opportunities and user education and awareness, and the quantity of the provision of sanitation solutions must be relevant to the demographics of the location.

Aerated, waterless systems that are fully self-contained address sanitation issues with the long-term in mind, whilst delivering effective, efficient, sustainable and cost effective solutions for the short and medium term.

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## 8. Addressing the challenges and building a sustainable sanitation infrastructure

The challenges and issues affecting sustainability cited in the report include:

- **Governance**
  - The need for consolidated norms and standards.
  - Need for sanitation strategies to give better guidance on implementation of higher levels of service.
- **Institutional**
  - Inadequate technical capacity at municipal level.
  - Inadequate O&M (operations & maintenance) capacity at local level.
  - Lack of M&E (monitoring & evaluations) systems.
  - Lack of O&M guidelines for on-site sanitation.
- **Social**
  - Low community acceptance of toilet quality.
  - Inadequate involvement of communities in the planning and implementation.
  - Low affordability of households to pay for maintenance.
  - Inadequate health awareness and user education.
- **Health**
  - Health and hygiene education not provided in many cases.
- **Technical**
  - Quality of facilities is not standardised.
  - Quality of some facilities does not comply with the definition of an acceptable basic sanitation facility.
  - Inadequate and un-coordinated M&E and regulation functions with sector departments.
  - Effective service level choice and affordability is lacking.
- **O&M**
  - Inadequate maintenance of infrastructure (need of proper O&M plan).
  - Few municipalities have a maintenance programme for on-site dry sanitation systems.
  - Small municipalities do not effectively operate and maintain their waterborne sanitation schemes.

The above challenges can be addressed in a systematic and planned way through public private partnerships based on an honest commitment to bringing forward the day when everyone has access to safe, clean and sustainable sanitation solutions. Also required is a practical approach that demands long-term vision supported by short and medium term execution. At all times the driving force for decision making around the provision of sanitation solutions as well as their implementation must be the communities and individuals that will use the facilities.

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All government departments – health, education, housing, and water; must work together to bring about the required change in the state of sanitation in South Africa. The result will be tangible; social and economic benefits that will have a far-reaching impact throughout the country.

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## 9. Summary and next steps

This response document to the “Status of Sanitation Services in South Africa”, was compiled to earnestly highlight and provide a true reflection of the state of our nation. There are South African people living without access to sanitation; a sad and shocking reality for 31% of our country. The time to act is now.

With the nation’s population steadily increasing and the lack of sanitation facilities, water, and adequate infrastructure in place to cater for the current population; one can only imagine the devastating effects a larger population will have on our health and education system, the environment and thereafter our economy.

The South African government have an obligation to provide adequate sanitation to every South African. Furthermore, our government has an obligation to afford every South African the basic human right of dignity. This obligation cannot be seen in isolation in a civilised society. This obligation extends to being environmentally responsible to our water reserves, our nations’ rivers and oceans, as well as to South Africa’s agricultural industry. This obligation includes considering the alternative sanitation technologies available and eradicating the sanitation backlog by choosing a toilet system that has zero potential health risks, zero impact on the environment, a positive impact on education and significantly lower cost implications.

When a like for like comparison is made in terms of cost, infrastructure requirements, longevity and environmental preservation; an aerated, waterless system wins every time. Dry sanitation is the only way forward. It is a safe, effective, sustainable and environmentally sound alternate to solving the country’s sanitation backlog. With the considerable population growth being experienced in South Africa; government need to be forward thinking in their approach to solving the sanitation crisis. For the sake of the country and the wellbeing of our fellow South Africans; ignoring the crisis and making irresponsible choices when attempting to solve the sanitation crisis; is no longer an option – it is a devastation.

It is time to think about our nation and create a new reflection of South Africa. We have the technology available and together with new partnerships, visionary leadership, effective execution and long-term planning; we can create a reflection that we are truly proud of.