



FROM RESEARCH & DEVELOPMENT TO COMMERCIALISATION: LESSONS FROM THE WRC LOW & POUR FLUSH SYSTEM

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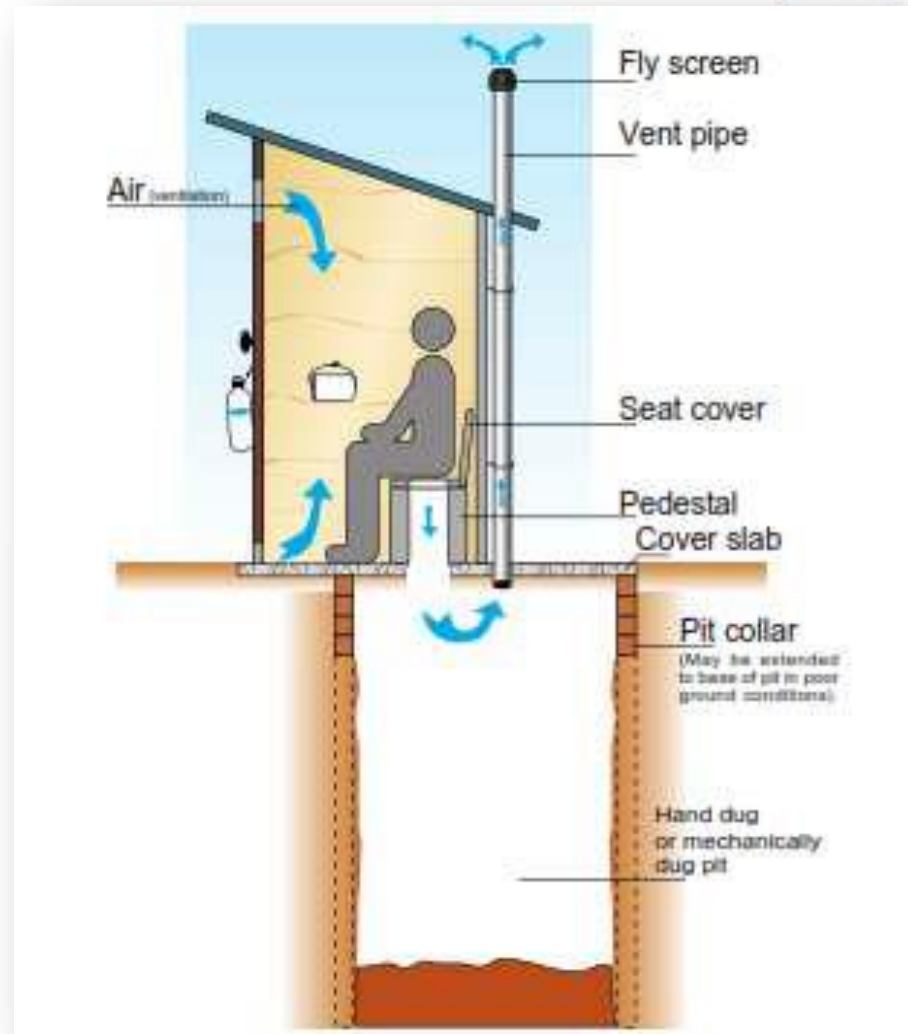
HISTORICAL OVERVIEW & CONTEXT

- ❑ First democratic election in 1994
- ❑ Sanitation services **mirrored apartheid spatial geography**
- ❑ Political objectives – **Reconstruction and Development Programme (RDP)** – political will and commitment (budget)
- ❑ The **National Sanitation Policy** - White Paper (1996) – Ventilated Improved Pit (VIP) Latrine defined as *basic level of sanitation*
- ❑ **Strategic Framework for Water Service** (2003) indicated that free basic sanitation service should be maintained at government expense
- ❑ Progress has been made – from **62% in 2002** coverage to **80% in 2015**



The VIP (Ventilated Improved Pit)

- ❑ Design to reduce disease transmission and smells
- ❑ Improve on stability of pit latrine structure
- ❑ Has concrete slab and vent pipe
- ❑ Nearly 10% of South African population serviced by VIP toilets





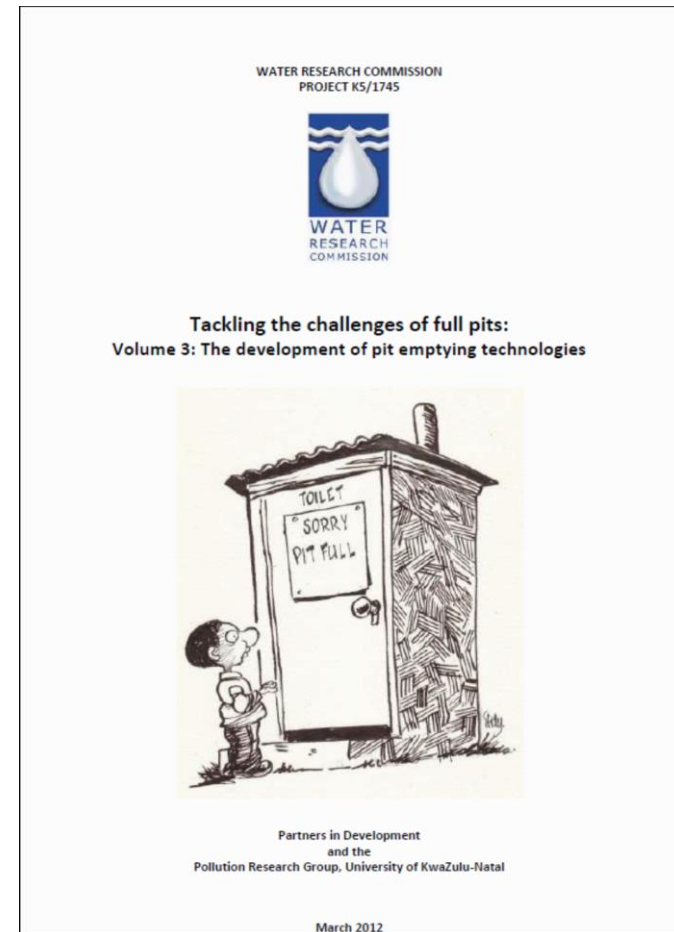




WRC Research

Research Report K5/1745 “Tackling the Challenges of Full Pit Latrines”

- ❑ Study area: Ethekewini Municipality
- ❑ Expansion of municipal boundaries
- ❑ Inheritance of many VIP toilets
- ❑ 30,000 VIPs nearly full
- ❑ Pits filling faster than design rate
- ❑ Research was required to better understand the nature of faecal sludge, pit filling rates, the efficiency of additives, pathogen survival rates, etc.
- ❑ Research partnership between municipality, donors, university & WRC
- ❑ Other studies: lightweight VIP structures, franchising O&M services, new pedestal designs



Unfortunate Incidents

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Breaking News. First

LAST UPDATED: 2017-02-11, 12:03



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A warning for extremely high fire dangers has been issued again over the interior of the Northern and Western Capes.

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Limpopo boy drowns in pit toilet

2015-02-05 18:03

Johannesburg - A 4-year-old boy drowned in a pit toilet in Limpopo on Thursday, police said.



He was one three boys who drowned in the province on Thursday, police spokesperson Moatshe Ngoepe said.

The boy, Samuel Matshusa, had been playing with his friends near the pit, in Mugwazeni village, Letsitele.

It was filled with rain water and he fell in and drowned.

In Mawa village, Bolobedu, Tebatso Simango and Tshepo Mkhabela, both aged 12, drowned in the Merikoma River while swimming.

All three bodies had been recovered.

Matshusa was at least the third boy to die in a pit toilet since January last year.

Three-year-old Hlumisa Makhasi drowned in a pit toilet, in France township on the outskirts of Pietermaritzburg, KwaZulu-Natal, in December last year.

In January last year, 6-year-old Michael Komape drowned in a pit toilet at the Mahlodumela Primary School in Chebeng village outside Polokwane, Limpopo.

Read more on: [polokwane](#) | [drownings](#)



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'Stop all the pit latrine deaths'

NEWS

Athanidwe Saba and S'thembele Cele
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He was found in a pool of human excrement in January last year, his body infested with maggots and froth coming out of his mouth.

This was the gruesome picture painted in court papers by public interest law centre Section 27 to describe the death of six-year-old Michael Komape, who drowned in a pit latrine at his primary school in Chebeng village, Limpopo.

Section 27 is now assisting his parents to sue the Limpopo education department for R3 million because of alleged rights violations that led to the drowning.

All the boy wanted to do was use the toilet at his school, Mahlodumela Lower Primary, in Limpopo, last year in January. But what passed for a toilet at the school was merely a dilapidated corrugated iron structure with a loose seat that could not sustain little Michael's body weight.

He drowned in human excrement and, according to papers filed late last month at the South Gauteng High Court by Section 27, Michael died as a result of inhaling excrement, urine and other putrid substances.

The papers read: "The body was infested with maggots ... bloody froth was coming from the mouth ... there was severe oedema [build-up of fluid] in the brain and the lungs were enlarged."

According to Michael's mother, Rosina Komape, the school principal called her, asking her where the little boy was because he had not come back after



James and Rosinah Komape during their son's funeral in January. PHOTO: ELIJAR MUSHIANA

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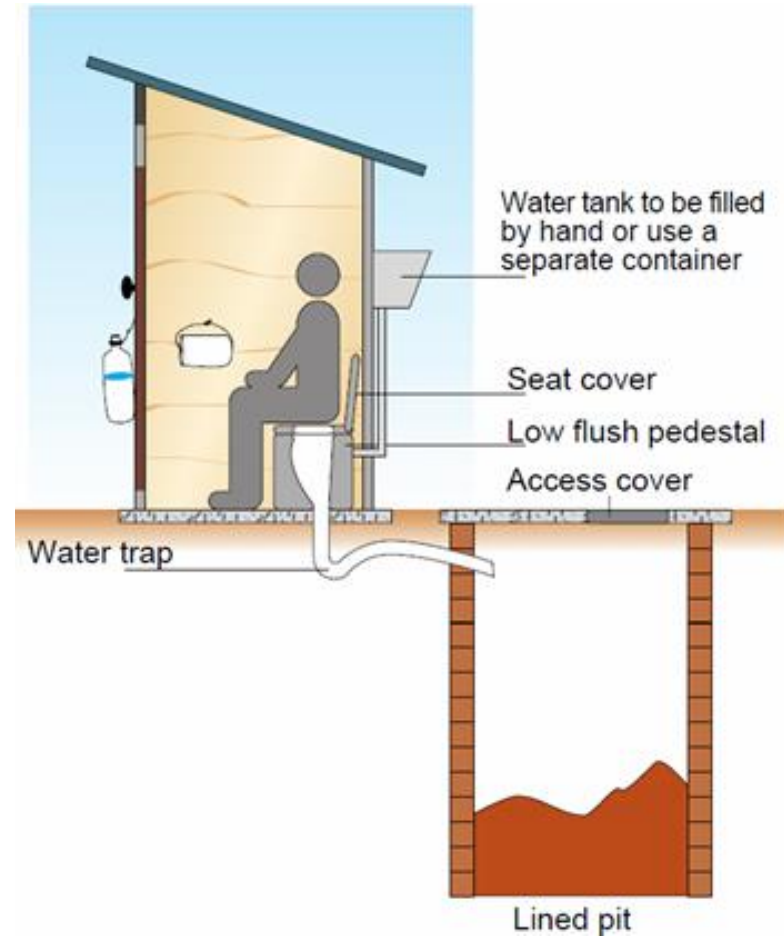
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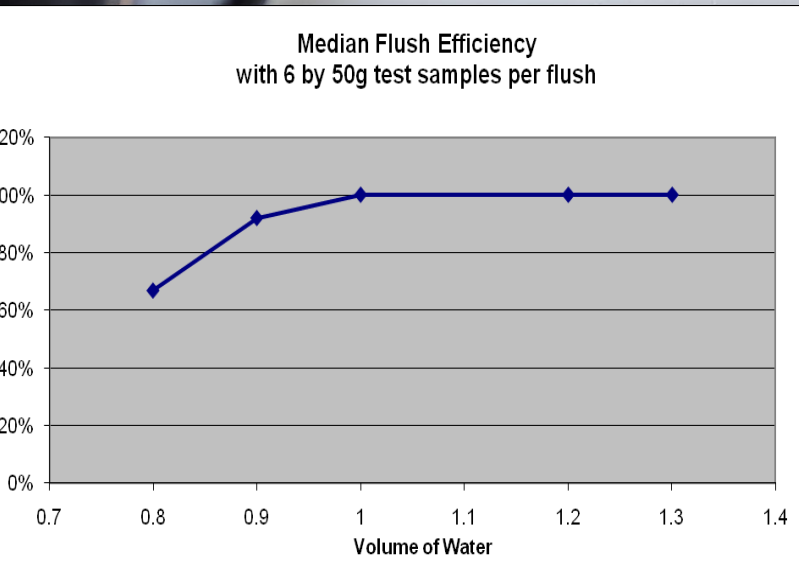
THE CHALLENGE

- ❑ Establish past / previous experiences of pour / low flush in South Africa
 - Why did similar tech fail?
 - Identify source of failures
- ❑ Adapt Pour Flush principle in South Africa
 - Sitters not squatters
 - Wipers not washers
- ❑ Monitor technical, operation and social viability



WORKING PEDESTAL DESIGN & TESTED






INTERNATIONAL FLUSHING PROTOCOLS

WRC POUR FLUSH SANITATION – *THE FUTURE OR A FLASH IN THE PAN?*

KWA ZULU NATAL PILOT



This pilot was commissioned on 1 Sept 2010. The sewer is over 17 metres long and the first section falls at only 1%. Only one blockage in that time, when kids flushed a plastic bag. This was removed at one of the inspection chambers

Completed installation – note no cistern, no water connection = no 24/7 leakage



Splitter box to enable usage of two leach pits



Leach pit – easy access for emptying



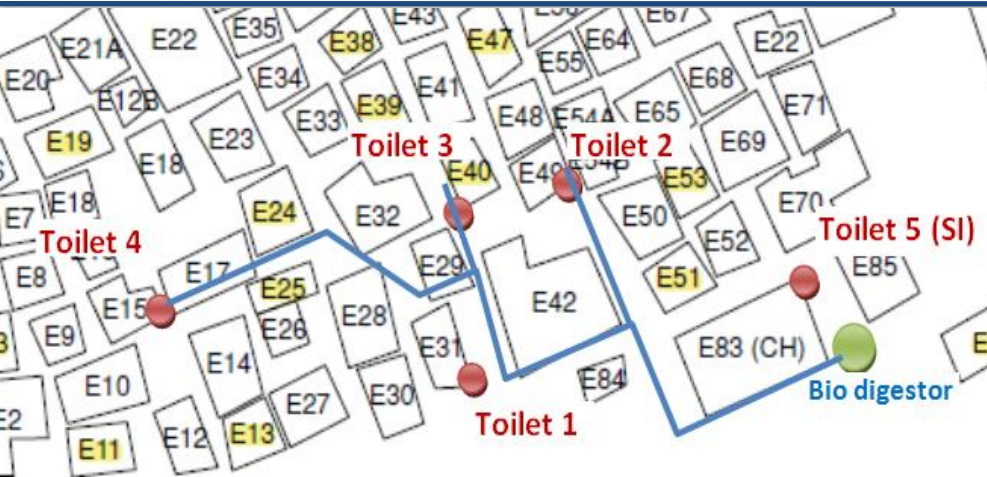


**Leach pits after
installation either
side of tree – no
visible sign on
surface**

This pilot pour flush has been in operation since January 2011. In that time the users have had no problems and are delighted with the toilet. Here the mother demonstrates its use.



WESTERN CAPE PILOT – retrofit in HIGH density settlements



Sludge Characterisation & Pollution Plumes

- ❖ Sludge characterisation by UKZN (PRG) and UKZN (PMB)
- ❖ Similar physico-chemical characteristics but significantly less trash
- ❖ Pollution plume largely localised

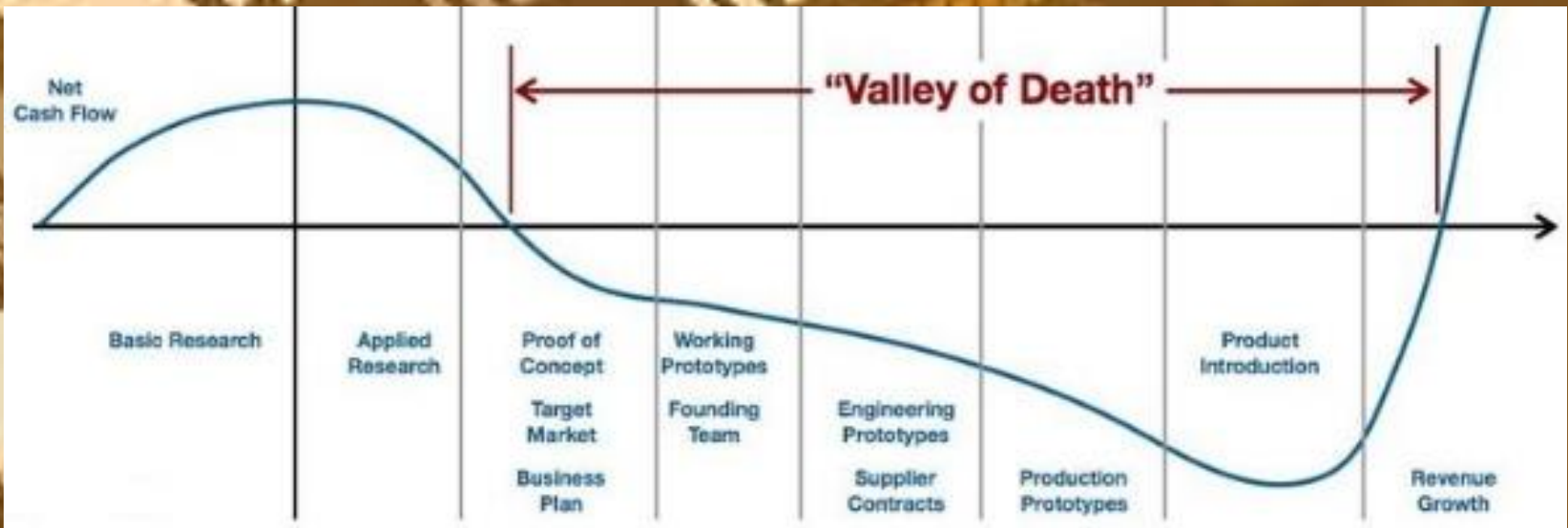


KEY FINDINGS

- No problems with flushing toilet paper but even newspaper ok (sometimes needs an extra flush)
- Sludge accumulation 20 litres/c/yr, about half of VIP rate
- Less trash in sludge
- Negligible leaching of contaminants – same as VIP
- Typical water use 1 – 2 litres per flush
- Sewers flow without blockage at gradients at ≥ 1 in 100
- Participants extremely enthusiastic about technology
- Increased interest to install inside the home.
- Reduced hydraulic load complements Biogas Systems



TRANSVERSING THE VALLEY OF DEATH



Strategic Partnerships

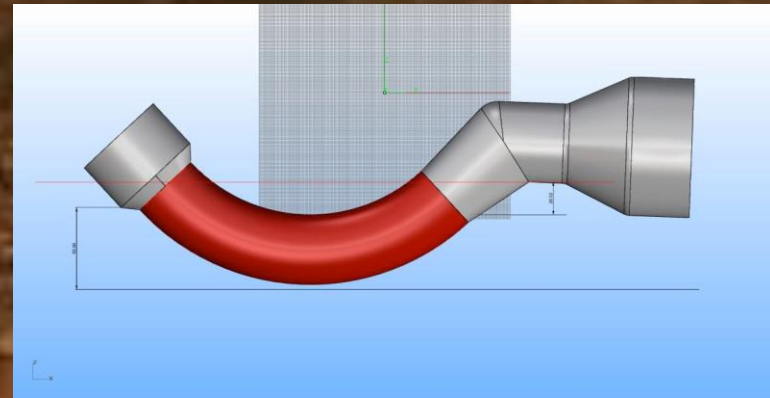


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Continuous Evolution & Diversification



New P-Trap Designs



CURRENT ACTIVITY

- Low flush adaptation tested successfully in two homes and 2 schools (8 units in total) in KZN.
- Durban almost complete for Low Flush for the Oakbrook Housing Project (600+ sites with greywater re-use flush)
- Further demonstration trials under way at schools in Limpopo and Eastern Cape
- Department of Science and Technology funding further demonstrations (800) units around R.S.A



Cistern Upgrade at Schools



Pour Flush and Low flush at schools





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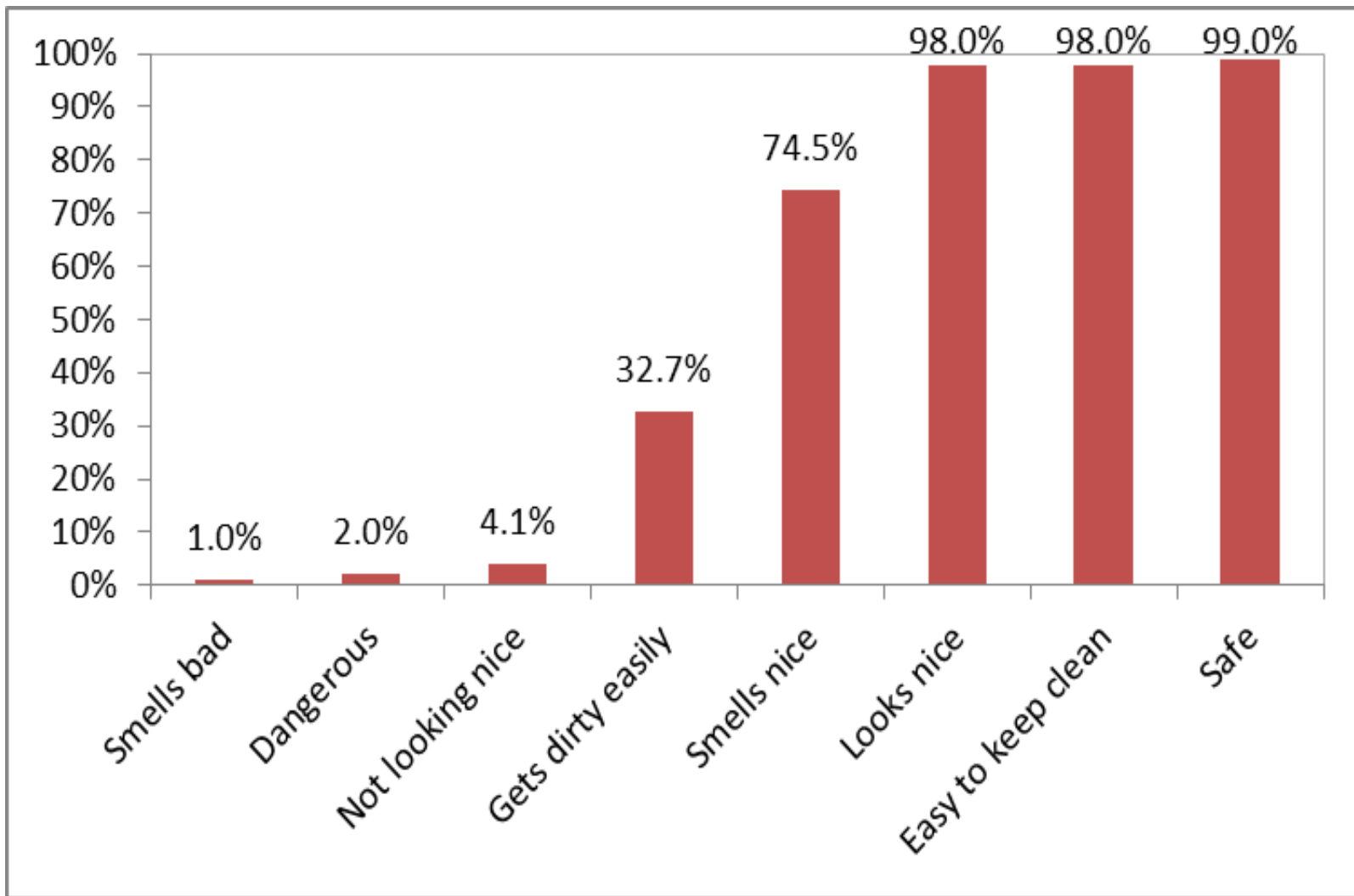


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Prefab and Block – Quick Installation





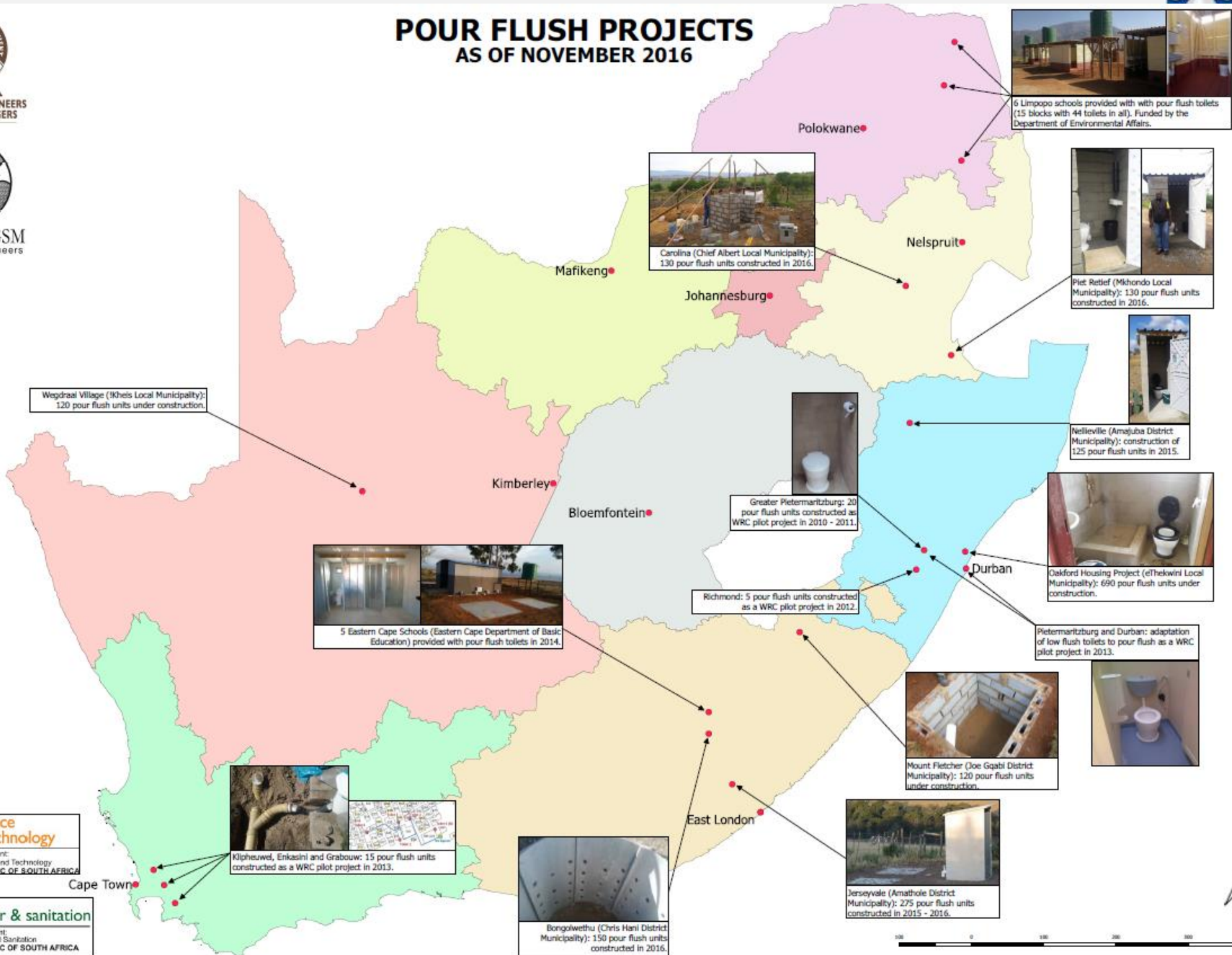


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POUR FLUSH PROJECTS AS OF NOVEMBER 2016



Key Outputs

- ❖ Research to large-scale demo in <7 years
- ❖ Social acceptability and municipal affordability
- ❖ Scaling achieved through inter-governmental partnerships and private sector buy-in
- ❖ Continuous evolution of product to be more efficient
- ❖ Adaptability to needs of customer



Acknowledgements

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