OPEN DAY SHOWCASING INNOVATION SOLVING SEWER MANHOLE BLOCKAGES AND SEWAGE SPILLAGES

The Manhole Protector Grid (MPG) Demonstration and Technology

Date: 12 August 2025

Time: 10:00 – 14:00

Venue: Khotsong – Nala Local Municipality, Bothaville, Free State

Background

Leaking and overflowing sewers are the bigger timebomb to haunt us in the future. Invisible to the Green Drop at present, yet in most municipalities, nearly half of the overflowing sewerage is going straight into the main rivers. Within Nala Municipality in Free State, the issues are multitude from user behaviour, but more of influx of informal settlements which use the sewers and stormwater to dump nightsoil and other detritus. This is perpetuated by historic engineering and construction flaws. In some sections, the sewers flow upwards, more especially in cases there are no joints between two pipes. Further the roads are not graded and higher in elevation to people's houses, which causes sewer flooding due to the overflows. Response breaking sewers and directing drainage and all the silt with it. Low-income communities are badly served. This is just one community amongst thousands with challenges and a big problem on the brew.

The WRC has partnered with Nala Local Municipality to host an open day for showcasing the pilot project to a wide range of water services organisations and municipalities. It will also be the formal launch of the pilot project, with the implementation phase completed where 50 Manhole Protector Grid (MPG) that have been installed in the settlement of Khotsong. This will be our first technology transfer and open day to view the technology and its operation.

Technology benefit

The Manhole Protector Grid (MPG) is a proactive, simple, and permanent solution that can help prevent destructive human behaviour as a first line of defence. By installing the MPG into existing and new manholes, a barrier is established that prevents solid objects from entering the underground pipelines through the manholes. This will reduce the incidence of sewer manhole blockages and the attendant operations and maintenance (O&M) costs by up to 70%, allowing our sewer networks to function as intended.

Additionally, the “Smart MPG” component, consisting of a flow measurement device linked to an IoT data monitoring platform, can provide early warning alerts to the O&M teams to attend to sewage blockage incidents before they result in sewage spillages.

The development of the MPG has involved a number of different designs and a “market ready” prototype is now available for testing in a real-world municipal environment where there are sewage spillage hotspots.

The widespread sewage spillages and the high pollution levels in water bodies across the country have brought attention to the ongoing issues with blocked sewer networks. This problem is compounded by the discharge of non-compliant effluent from dysfunctional WWTWs into water bodies (DWS Green Drop 2022), which has led to disease outbreaks such as cholera in areas like Hammanskraal, Parys, and other locations in 2023.

Critically, the Green Drop report's focus is on WWTWs, with no attention to the sewage that does not get to the WWTWs through sewage spillages out of blocked manholes in the sewer networks. We estimate that this "lost" sewage volumes may be as high as 50% of the total sewage flows, hence the importance of the MPG solution.

Up to 70% of the sewer manhole blockages and subsequent sewage spillages in South Africa are caused by negative human behaviour such as the dumping of solid objects into the sewer manholes, which is exacerbated by the theft of manhole cover lids for their scrap value, leaving the manholes exposed. Unfortunately, this behaviour also leads to a range of other negative consequences including environmental degradation, public nuisance, health hazards and safety risks (injuries and drownings).

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The research is necessary to establish the following:
1) Suitability of the proposed MPG Methodology for municipalities;
2) The projected 70% reduction in sewage spillages;
3) The projected 70% reduction in Operations and Maintenance (O&M) costs;
4) The appropriate percentage sewer network coverage in municipalities, the initial proposed coverage is 30%;
5) Pollution reduction in nearby water bodies;
6) Reduced incidences of water-borne illnesses like cholera, diarrhoea, dysentery, etc.

Upon completion of the research, the efficacy of the MPG will be verified and the way forward will be for the MPG to be adopted by the relevant authorities as an essential manhole accessory to be installed in all designated sewer manholes. Certification of the MPG by Agrement SA and SANS should proceed in parallel with the research project.

Objectives:

- Demonstrate the operational effectiveness of the MPG.
- Share insights and findings: Highlight the results of the MPG model and share key findings related to its operation, including high collection of detritus and scalability.
- Facilitate multi-stakeholder engagement and knowledge exchange.
- Promote awareness of MPGs

Figure 1: Image showing the MPG

Programme

Programme Director: Water Research Commission

Time	**Activity**	**Responsible**
SESSION 1		
09:20 - 10:00	Registration	Event Coordinators
10:00 –10:15	Welcome address	Mayor, Nala Local Municipality
10:15 –10:30	Opening Remarks	Municipal Manager, Nala Local Municipality
10:30 –10:50	Opening Remarks	WRC CEO – Dr Jennifer Molwantwa
10:50 –11:05	Introduction of keynote speaker	Water Research Commission
11:05 –11:20	Keynote Address	DWS (tbc)
11:20 –11:40	Vote of thanks	Local
11:40 –12:10	Tea Break	All

Time	Activity	Responsible
SESSION 2		
12:10 - 12:25	Project Overview	Jay Bhagwan and Christopher Kimaru
12:25 - 12:35	Q&A and Discussion	Project Manager & technical team
12:35 - 12:45	Walk around to the facilities	ISA Consulting
12:45 - 13:00	Handover of the Technology	WRC - DWS and District Municipality
13:00	Closing Remarks	WRC Technology Transfer Manager - Thabo Mthombeni, WRC
13:15	Networking and Refreshments	All Participants