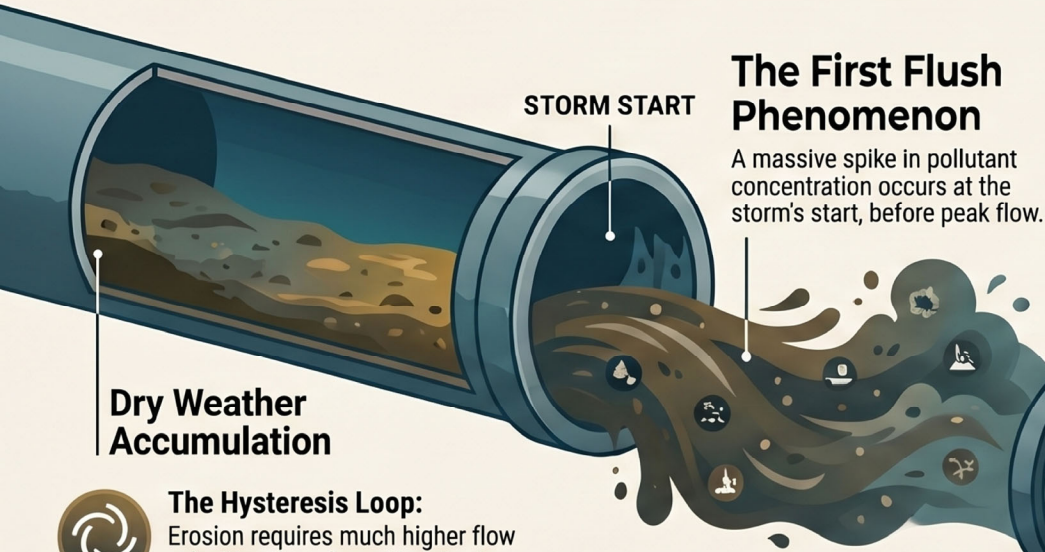


The Hidden Cycle: Sewer Sediment Transport & The First Flush

THE PROBLEM: ACCUMULATION & "FIRST FLUSH"



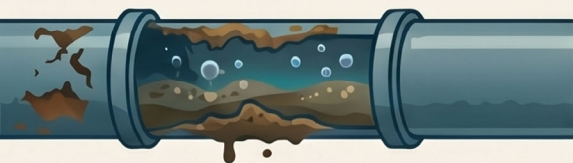
The First Flush Phenomenon

A massive spike in pollutant concentration occurs at the storm's start, before peak flow.

Dry Weather Accumulation

The Hysteresis Loop:

Erosion requires much higher flow velocities than deposition due to cohesive sediment properties.



Infrastructure Corrosion

Anaerobic sediment produces Hydrogen Sulfide (H_2S), which converts to sulfuric acid and eats pipes.

Sediment Transport Modes

Bed Load		Rolling/Saltation Grit and coarse urban particles
Suspended Load		Turbulent Diffusion Major transport mode in storm events
Wash Load		Always in Suspension Fine cohesive particles and organic flocs

THE SOLUTION: ENGINEERING & CONTROL

Integrated Source Control

Combining hydraulic design with Best Management Practices (BMPs) to manage urban runoff externally.



0.6 m/s

Self-Cleansing Velocity

The minimum flow speed needed to prevent fine particles from settling and consolidating.

Engineered Flushing Waves

Releasing stored stormwater in controlled waves to restore capacity and reduce pollution spikes.