

## Hydrogen Sulphide – The Concrete Killer

In addition to excellent long-term structural performance and the tightest joints of any sewer pipe, there is another reason to allow only PVC pipe for sanitary sewers – hydrogen sulfide corrosion.

**B**acteria living on the submerged surfaces of sewer pipes convert the sulfate ( $\text{SO}_4$ ) present in most wastewaters into hydrogen sulfide ( $\text{H}_2\text{S}$ ).  $\text{H}_2\text{S}$  is much less soluble in water than the  $\text{SO}_4$  ion, and escapes into the atmosphere in areas of turbulence, much like carbon dioxide from soda pop.

The  $\text{H}_2\text{S}$  is then metabolized by bacteria on the unsubmerged surfaces of pipes and manholes, and secreted as sulfuric acid ( $\text{H}_2\text{SO}_4$ ). It is this sulfuric acid that causes so much damage to concrete pipes and manholes, as it turns the Portland cement matrix of the concrete into gypsum. The damage can be severe, as seen in these pictures. PVC pipe, on the other hand, is immune to attack by sulfuric acid.

It is simply not possible for even the most talented engineer to “design out” all sources of  $\text{H}_2\text{S}$  generation in a sanitary sewer piping system. High velocity sewers, forcemain discharges, wet well intakes – all are required at some point and all are significant points for  $\text{H}_2\text{S}$ . A hot climate is not required – the picture is from a small city in Canada, and this problem has been seen countless times across North America. PVC is simply the best sanitary sewer pipe available – specify it right up to 1200mm in diameter.



Sulfuric acid causes severe damages to concrete pipes and manholes over time.