

- the use of experienced, specialist contractors who can advise on the merits of the different techniques. It is important that construction advice is sought at an early stage in the design process

The assessment of preferred method shall consider:

- availability of contractor expertise
- construction safety
- ground conditions
- area of land required for the permanent works and construction working areas
- environmental impact, including impact on the public and property owners/occupiers
- construction cost
- construction duration

## 4.10. Hazardous Areas

Although a storm water network provides an inherently less dangerous environment than a foul sewer system, it is still important to consider the hazards that can arise and to address these in the design.

Hazard	Possible Design Solution
The accumulation of explosive or poisonous gases in the pipe network, chambers and pumping stations. Methane for example could arise from the decomposition of organic matter contained in run-off or by diffusion from the natural ground. Explosive gases are normally lighter than air and thus accumulate at high spots.	<i>Vent stacks to be provided. Avoid specifying materials that could generate sparks from static electricity. Check the geological reports for the presence of natural gases or organic material in the ground and identify this risk in the residual hazards document.</i>
The displacement of oxygen by other gases such that the air in the pipe network, chambers and pumping stations becomes irrespirable for maintenance/repair workers.	<i>Ensure that there are no foul or contaminated area connections to the storm water network. Check the geological reports for the presence of natural gases or organic material in the ground and identify this risk in the residual hazards document.</i>
The release of gases through disturbing pipe sediment during maintenance or repair activities	<i>Ensure that the minimum pipe gradients are provided to minimise sediment accumulation.</i>
The accidental discharge of toxic or explosive chemicals in a part of the catchment which then finds its way into the storm water network.	<i>Ensure that there are no foul or contaminated area connections to the storm water network.</i>
Deep manholes	<i>Provide intermediate landings or staircases Provide space for lift of unconscious person from base of manhole to ground level</i>

**Table 4-6 - Potential Hazards in a Storm Water Network**