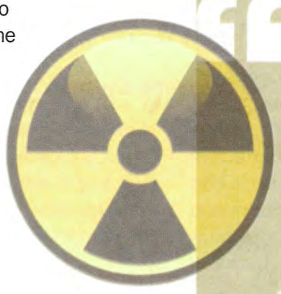
The Silent Polluter

DR RICHARD COULTON, MANAGING DIRECTOR OF SILTBUSTER LIMITED, BELIEVES IT IS ESSENTIAL TO ADDRESS THE LEVELS OF HIGH PH WATER FROM CONCRETING OPERATIONS – HERE HE EXPLAINS THE REPERCUSSIONS FOR COMPANIES THAT FAIL TO ACT.

FOR YEARS, the construction sector has advocated the adoption of environmental best practice and promoted this through 'green' initiatives such as the Considerate Constructors Scheme. In many respects, this approach has been widely adopted, something for which the construction sector should be applauded. As a result, most contractors are fully aware of the potential impact of their activities on the surrounding environment and, in particular, the need to prevent aquatic pollution from silt and oils. There is, however, one area where best practice is frequently overlooked – the treatment and the disposal of water associated with concreting activities.

Most contractors diligently settle out the solids from waste water generated by such activities. However, it is a common misconception that because the water 'looks clean', it can simply be released into the environment. Unfortunately, this is not the case. The pH of concrete washwater is incredibly high - typically 12 to 13.5 on a scale which runs from one (very acidic) to 14 (highly alkaline), making it extremely corrosive, highly toxic to fish and other aquatic wildlife and, with prolonged skin contact, capable of causing second degree burns. The only commonly-used commodity with a higher pH is domestic oven cleaner – and you just have to look at the warnings that come with that! Consequently, high pH water's potential to cause environmental harm is often overlooked or misunderstood. To put it bluntly, it is the silent polluter.



In a limp attempt to deal with truck mixer washout, many contractors resort to polyethylene-lined skips. As it is no longer legal to dispose of liquid waste to landfill, the high pH washwater generated from such activities should be transferred to a licensed waste management facility for further treatment and disposal. In practice though, how often does this happen? On a lot of sites, the high pH water is simply lost by storing it in a layer of gravel placed in the bottom of the skip, or inadvertently released into the environment as a result of leakage from the skip or water spillage when loading the skip and transporting it offsite.

A recent Environmental Audit on a large commercial building project revealed that washing truck mixer discharge chutes alone generates about 20 litres of high pH washwater and up to 5 litres of waste concrete per truck. Over the entire construction phase of the project this amounted to 75m3 of potentially environmentally-damaging washwater.

Yet dilution is definitely not the solution to pollution from concrete washwater. Unfortunately, pH is a logarithmic scale and so the release of even a small quantity of concrete washwater can significantly increase the pH of a receiving watercourse. For example, the release of 75m3 of pH 13 washwater would theoretically raise the pH of 750,000m3 of neutral river water to pH 9 – the limit commonly adopted for discharge to the environment. This is equivalent to polluting 300 Olympic-sized swimming pools. Consequently, the uncontrolled release of even a small quantity of high pH washwater can have a devastating effect on the environment. In one case, kills in excess of 3,500 fish were reported as a result of the release of relatively small volumes of cement and, in another, a fine of £35,000 was imposed on the release of high pH water from small scale grouting operations.

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Some 22.5 million m3 of concrete is produced in the UK every year on average, which equates to some 3.7 million truck loads and 3.7 million potential pollution events. However, the problem is not just limited to the washwater from cleaning equipment and bleed water from concrete pours. It also relates to hydro-demolition, concrete cutting/drilling, seepage through crushed concrete - plus other recycled fill materials such as steelmaking slag - and run-off from lime stabilisation operations.

Siltbuster recently treated over 2,000m3 of pH 13.5 water from a flooded basement back-filled with crushed concrete and an ever greater volume of seepage water from a car park built on steel slag. On both sites, the client was dismayed to discover that this could be a long-term problem requiring ongoing treatment for many years to come. Although these projects are relatively large, they are not untypical of the challenges faced by the construction industry.

This problem is not new – it has just been largely ignored. However, with the construction industry actively promoting environmental improvement and the re-use of reclaimed materials such as crushed concrete, surely it is an issue that can no longer be poorly-managed or ignored. After all, we wouldn't dream of pouring oven cleaner into our local rivers so surely we should have the same level of consideration when dealing with high pH water generated by our concreting activities? B&E