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Removing polluted water from building sites has in the past been a messy business. But an SME has successfully trialled a new technology that looks set to change that. *Claire Dodd* reports

Green revolution for waste water

Client James Hall & Co
Contract length One year
Awards Brownfield Briefing Remediation Innovation Award for Most Innovative Remediation Method 2010

The best environmentally friendly building solutions save money too. It was with this in mind that contaminated soil and groundwater specialist Geo2 Remediation decided to trial a revolutionary new technology on a project to clear a former petrol station site in Barnoldswick in Lancashire.

Contaminated land had to be prepared for the construction of a new Spar shop for clients James Hall & Co. But with diesel having absorbed up to a metre into the ground in parts of the site, using traditional methods would have proved costly.

Granular Activated Carbon is usually used on such projects to absorb any effluent. Once contained, this then has to be disposed of. But GAC has a number of drawbacks according to Mike Swindells, director of Geo2 Remediation.

"It's dirty and it's messy – you get a lot of powder, which is like coal dust really. It often gets blocked up, so it needs changing out. It's not 100 per cent absorptive, so you don't get 100 per cent efficiency out of it and it's expensive to dispose of and buy," he says.

"If we treat a 1,000 m³ of water, we might spend £1,600 – £2,400 on carbon alone. With removal and disposal costs that works out at anywhere between £1.60 to £3 per m³."

When Geo2 heard of a new method that removed the need for carbon, thus reducing the cost to about 3pence per m³ of water treated they opted to trial it at the site.

The Arvia Process from Liverpool-based company Arvia Technology requires no added chemicals and produces no solid waste. It was developed to recycle water and in particular to remove toxic and non-biodegradable wastes.

Where it provides real cost savings is in energy consumption. It requires very low levels of energy as it uses an absorbent, reuseable, graphite-based substance called Nyex to capture pollutants. These are then destroyed when a low level of current is passed through it. The result is a process that costs around 3p per m³ of water treated.

"This is completely revolutionary," says Mr Swindells. "It is a whole new approach to groundwater treatment. There was a certain amount of fine tuning to begin with to get the absorption time right. We wanted to make sure we could put the minimum amount of electrical current through and get the maximum amount of destruction. That worked out at around 0.5kwh per m³."

Across the 4,500m² area treated, that's a cost saving of at least £7,000.

4,500 Number of properties being protected

Top: Arvia's patented adsorbent Nyex, with water contaminated with organics and water following treatment. Bottom: polluted groundwater at petrol station site

Dr Nigel Brown, technical director and founder of Arvia Technology, says: "The challenge on this project was the low temperatures experienced on site. The process had been developed at room temperatures and had been demonstrated to be slightly more effective at higher temperatures.

"Despite the cold we were extremely pleased with the results."