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4

**News**

8

**Geodiary**

11

**Contracts**

15

**Designer bargain in Knightsbridge**

A new system for real time analysis of ground movement

16

**Orders from on high**

Aerial photography for slope assessment on Scotland's railways

19

**Achievement of a lifetime**

"Driller skills for life" campaign launched

26

**Where Beagles dare**

The search for water and life on Mars

24

**How to get the best results**

Common pitfalls in sampling for contaminated land

26

**A long time coming**

Revision of BS5930: Code of practice for site investigations

28

**Technical note**

Pre-installation acceptance testing of vibrating wire piezometers

31

**Design of CFA piles in chalk**

Position paper from the Federation of Piling Specialists

34

**Technical note**

New tests for sulfur compounds

36

**Some geotechnical properties of waste glass**

J Blewett and PK Woodward

41

**Gathering Speed**

Spotlight on computing

42

**Directory/appointments**

45

**My job**

**Cover**

Computer simulation of the Mars Express orbiter. © Beagle 2

Iqbal Manhas puts the case for landfill mining.

**N**ext summer the UK Government will implement an EC directive aimed at drastically reducing the amount of biodegradable municipal waste going to landfills. As more than 85% of municipal waste goes to landfill, this represents a sizeable challenge.

The Landfill Directive – 1999/31/EC on the landfill of waste – must be implemented through UK law no later than 16 July 2001. It requires that after five, eight and 15 years, biodegradable municipal waste going to landfills must be reduced to 75%, 50% and 35% respectively of the total amount by weight of the biodegradable waste produced in 1995.

In its consultation paper "Limiting Landfill" the Department of Environment, Transport and the Regions has set out the actions it proposes to take.

Not only is the use of landfill to be limited, but alternatives are being developed and initiatives encouraged which minimise the amounts of biodegradable municipal waste produced.

These are discussed in the draft strategy for England and Wales "A way with waste". They include recycling, composting and energy recovery. However, neither the consultation paper on landfilling nor the draft strategy make any reference to the relevance of landfill mining to waste management practices in the UK.

From humble beginnings as little more than a research topic as recently as 1990, today landfill mining in the USA has matured into an accepted waste management tool. So what is landfill mining and is the tool really appropriate to waste management in the UK?

Landfill mining is a process whereby solid wastes which had previously been landfilled are excavated and processed to recover potentially useful materials including energy through incineration.

It is said that we have a legacy of some 6500 landfills in this country, most of which were not engineered and are unlined. We have a

**We have 6500 landfills in the UK – a large resource sitting in the ground waiting to be tapped for recovery and recycling**

large resource sitting in the ground waiting to be tapped for recovery and recycling. There are other benefits as well.

We live on an island and space is limited.

There are continuing pressures to extend the life of existing landfills as more and more waste is produced by society experiencing technological change at an ever increasing pace.

Landfill mining has the potential to solve this problem. Indeed where a landfill has no liner, it can be lined cell by cell as mining progresses and leachate and gas management included as part of the design. There is thus a direct improvement of the

environment with reduction of risk to the ground water, any surrounding developments and the

public at large.

At present, landfill is at the bottom of the waste management hierarchy (reduce/recover/recycle/dispose). This is because it sentences potentially recyclable materials to a permanent grave. Landfill mining will change this. It will turn landfilling into an intermediate step rather than a final one. In this context it is possible to consider landfill mining as an integral part of a continuous landfill scheme akin to a massive engineered bio-reactor which is filled, decomposed, mined and recycled in an ongoing cycle extending over decades. However, such wider concepts require development through trials and full scale schemes and this cannot be done without government assistance and encouragement.

Landfill mining inherently implies that money will not have to be spent on closure, capping and monitoring of landfill sites when they come to the end of their useful life. Such operations form a sizeable proportion of the total costs of landfilling and makes the case for the landfill mining favourable.

Completely clearing landfills by mining will also give peace of mind by avoiding potential future liabilities. Even where the space thus released is not required for further landfilling, it can be used for housing. This is in line with government policy which is aiming for a target of 60% of new homes to be built on brownfield land by 2010.

There has been some interest in landfill mining in the past couple of years in the UK. Babbie Group carried out a desk study into landfill mining for Berkshire County Council in March 1998.

Subsequently, a generally successful pilot study into the landfill reclamation of buried waste at a site in Farnham was undertaken by the same firm in July 1998. A small trial has also been carried out at Peterborough by another.

Further interest can only be created by government policy and research and development programmes. Until this takes place it is unlikely we will ever see the first full scale facility in this country and a great opportunity will be lost.

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## talkingpoint

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