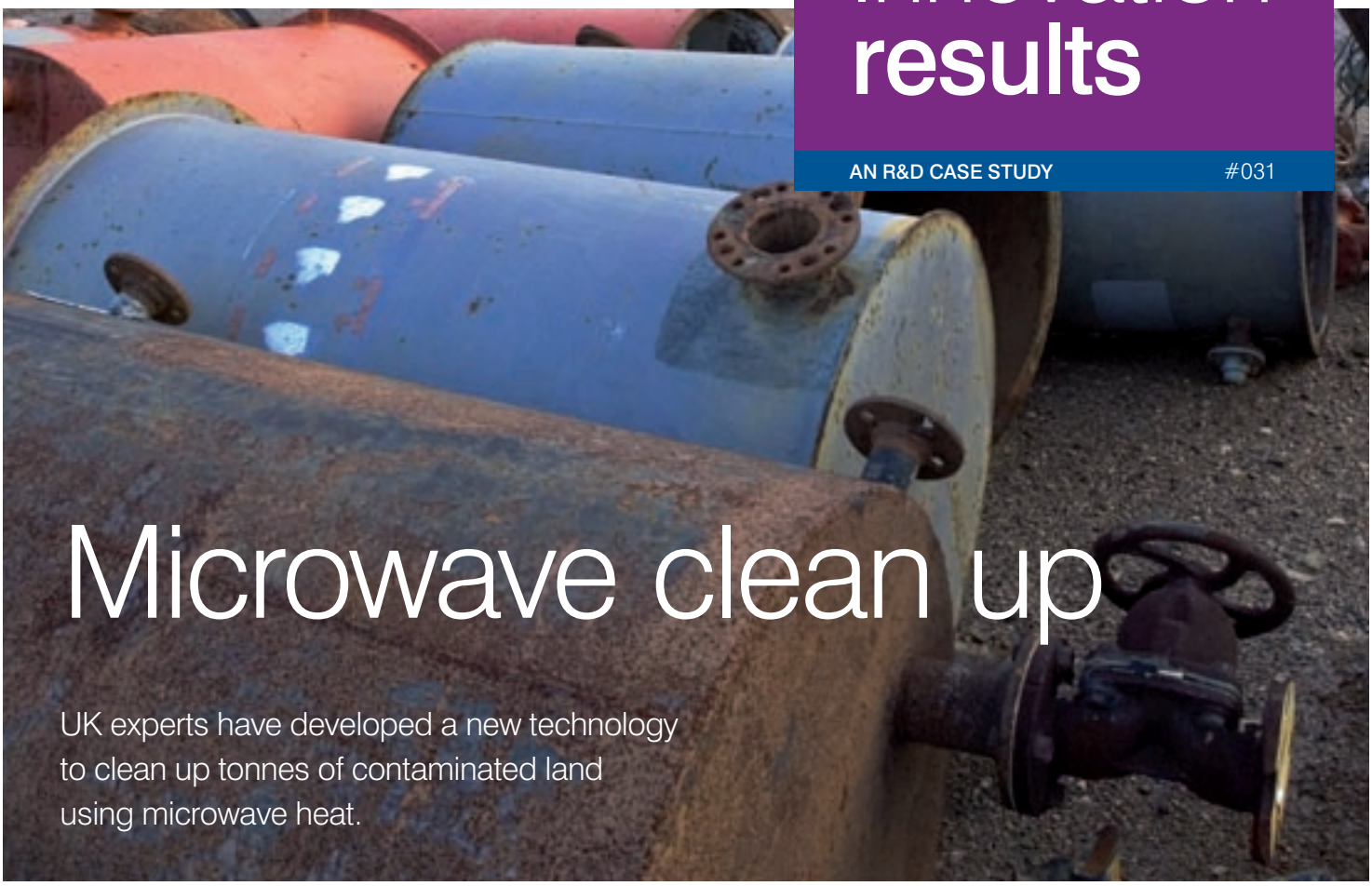
Technology Strategy Board
Driving Innovation

Innovation **results**

AN R&D CASE STUDY #031



Microwave clean up

UK experts have developed a new technology to clean up tonnes of contaminated land using microwave heat.

The need

Industrial land or brownfield sites can contain dangerous contaminants that need to be removed before sites can be reclaimed for residential or leisure purposes. European legislation, including the EU Landfill Directive, as well as the phasing out of Landfill Tax exemptions for contaminated land introduced in 2008, have increased the need for new and more efficient technologies to clean up contaminants. These include potentially carcinogenic pollutants that not only put human health at risk, but the soil and water supply too.

The results

Residues of hydrocarbons such as diesel and petrol as well as other potentially dangerous pollutants are often left behind on land used by filling stations and industry. These contaminants need to be removed before housing can be built safely on the site, but the process is complex and time-consuming.

Heat has long been used to separate and remove pollutants in a process known as thermal desorption, but a UK-based project has now found a way of using microwave-based heat which is faster, more efficient and more environmentally friendly than traditional heat sources such as gas.

The Waveland team includes six UK-based small and medium-sized businesses with combined expertise. The team spent three years working with business strategists Pera Innovation, the University of Nottingham and experts in industrial microwave processing, to develop a new microwave-based thermal technology which uses half the energy of traditional methods.

As the heating time for microwaves is extremely short compared to conventional heat sources, the process of removing contaminants from soil or water is much faster, resulting in significant labour and energy savings.

The Waveland project has also shown in test results that the microwave heat source is safer and more effective, there are fewer transportation costs and it results in less waste going to landfill.

The machines which will carry out the cleansing will also be able to work on sites that are difficult to access using traditional energy sources due to their small size.

The technology is unique to the UK and has been patented.

Next steps

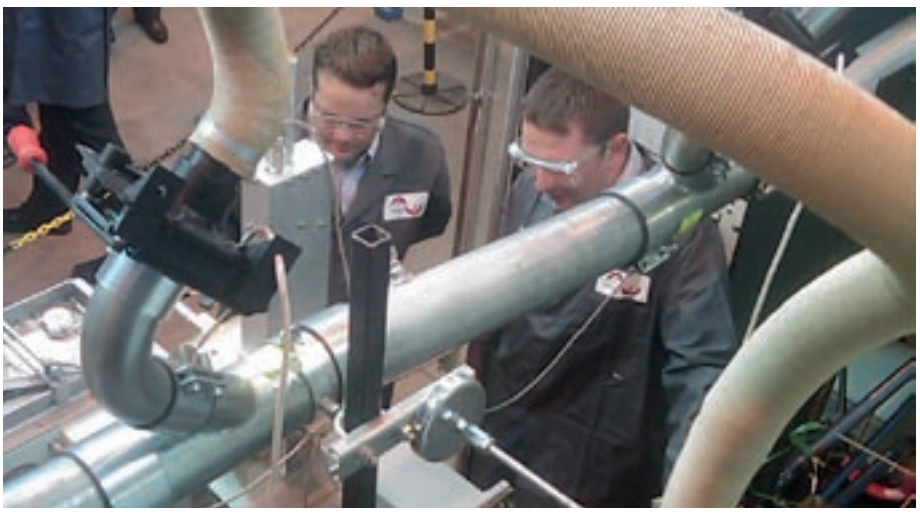
After success in the laboratory, the search is now underway to find an equipment manufacturer to build the machines so that the technology can be tested in harsh operating environments. Developments have been hampered by the downturn in the economy when the crash in the housing market meant that there was less demand for land remediation. However the future market potential is huge. In the UK alone there are up to 5 million tonnes of land that could benefit from the faster and more efficient process of cleansing land of pollutants. Across Europe there is up to 25m tonnes of potential land per year, and growing.

'This funding has enabled the Waveland Team to work with world-class researchers who would ordinarily be out of the reach of small companies.'

SIAN MITCHELL, ENVIRONMENTAL TECHNOLOGIES PROJECT MANAGER, PERA INNOVATION LTD.

New contracts

As a result of its early success Stingray Geophysical has been awarded a contract by BP, which is recognised as an industry leader, to conduct two feasibility studies into the requirements of installing permanent systems on the Clair and Schiehallion fields in the UK's North Sea.



Project no.
TP/5/CON/6/I/H0587K

Funding

Total project cost
£800,000

Funding from Technology Strategy Board £400,000

Partners
Pera
University of Nottingham
Shanks Waste Solutions
Global Energy Associates
Davis Decade Ltd
TMD Technologies Ltd
Nelson (Heat Transfer) Ltd
International Moisture Analysers Ltd

Project Duration
Started: 1st November 2006
Ended: 30th April 2009

Contact
Sian Mitchell
Environmental Technologies Project Manager
PERA Innovation Ltd
Nottingham Road
Melton Mowbray
Leicestershire
LE13 OPB

T **Sian.mitchell@pera.com**
E **01664 501501**
W **http://waveland.pera.com**

Technology Strategy Board
Driving Innovation

Collaborative research and development projects are one of the tools that the Technology Strategy Board uses to drive innovation in the UK. The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life. It is sponsored by the Department for Business, Innovation and Skills (BIS).

Tel: **01793 442700 www.innovateuk.org**

T10/019 March 2010