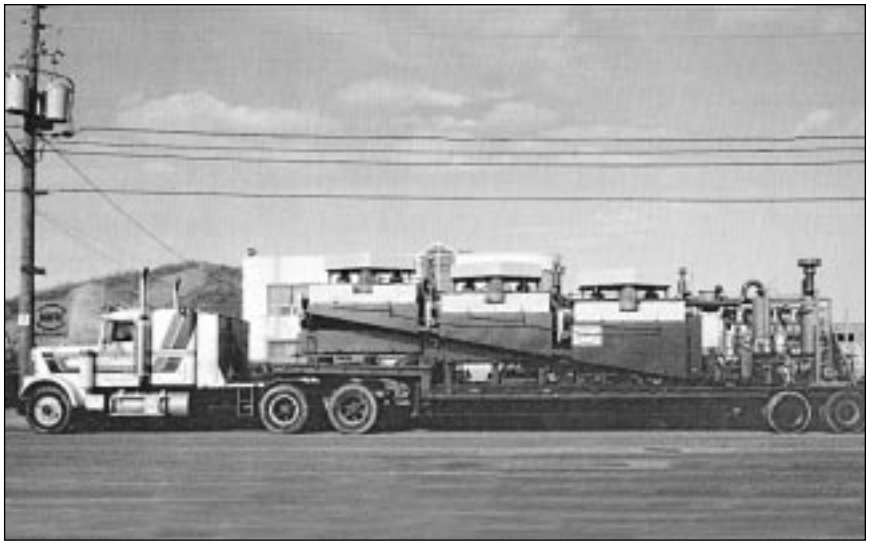
Remediation of contaminated soils

"The Tallon process offers a performance and cost-effective means to remedy historic and recent site contamination. The company is pleased to offer this service now on an international basis."

Bruce Holbein
President, Tallon Metal Technologies Inc.
Guelph, Ontario



Flotation module of 50 ton per day soil wash pilot plant

THE COMPANY

Tallon was established in 1987 to develop commercial applications for a series of patented heavy metal recovery and extraction processes which the company markets as Vitrokele™. Research and development plays an important role in the company as it is convinced that removing and recovering contaminants from soil is the only sustainable way to eliminate them.

THE CHALLENGE

By 1997, the world-wide market for site remediation services is estimated to top $35 billion. Further, the market is expected to grow by six to 15 per cent annually. Tallon and its international affiliates offer a full range of expertise, technology and materials handling services.

TECHNOLOGY DESCRIPTION

The Tallon process for cleaning up contaminated soil is multi-stepped.

1 The contaminated soil is screened to remove large debris such as stone and bricks.

2 The screened soil goes to a wet scrubber, which washes and separates the coarse components in the soil.

3 The resulting soil slurry is cleansed again using screens, magnets and gravity to remove coarse metal contaminants.

4 This soil slurry goes through a chemical treatment during which special reagents and physical organic separators recover organic contamination products.

5 The soil slurry is treated in a hydrometallurgical circuit which selectively extracts and recovers contaminated fine metal using Vitrokele™ metal-selective reagents and adsorbents.

6 Finally, the soil slurry is washed. The water is removed and the resulting soil is combined with the other decontaminated soil products to be used on site.

Tallon sends the recovered metals to off-site metal recycling facilities to be used as feedstock.

RESULTS

Tallon conducted a pilot-scale treatment demonstration of its process using four bulk samples — or a total of 35 tonnes — of contaminated soils from the Ataratiri site in Toronto.

The Ataratiri site is located to the east of Toronto's downtown. The city and the province had planned to redevelop the site as a commercial and residential area. But the site had been used for industry and as result much of the soil was contaminated with heavy metals, including lead, copper, zinc and cadmium and organics, primarily polyaromatic hydrocarbons (PAHs). Testing of excavated soils showed that an estimated 500,000 tonnes of soil on the site did not meet the province's guidelines for commercial/industrial use.

The pilot demonstration showed that each sample as well as a composite of all soil samples were treated effectively using Tallon's fully integrated steps.

In two of the more broadly based contaminated samples, results of tests showed that:

- about 60 per cent of lead, 90 per cent of the cadium and 95 per cent of the PAHs were recovered;
- the by-products of the treatment were high in recovered contaminants and suitable for off-site recycling.

Results of the pilot study showed that:

- 70 per cent of the soil on the Ataratiri site is contaminated with PAHs and requires organic treatment;
- 100 per cent of the soil requires partial treatment for metal contamination;
- 35 per cent of the soil requires a complete metal treatment;
- to clean the soil on the site would cost about $100 a tonne of contaminated soil.

TECHNOLOGY OPPORTUNITIES

Tallon has recently completed North America's largest heavy metal soil decontamination project at the Longue Pointe site in Montreal. Here, 150,000 tonnes of lead contaminated soil were treated. This soil also contained 50 per cent clay thereby rendering conventional soil treatments (soil washing) ineffective. The Vitrokele extraction of lead provided approximately 95 per cent of the soil mass for reuse on the site while recovered metal products and wastes were sent off-site for recycling or secure disposal.

Tallon has licensed its technology to Australian Defence Industries Ltd. for site remediation in Australia and Germany. Tallon has also set up a branch in the U.S.A., Tallon Inc., which, with the financial and technical help of Australian Defence Industries, will develop U.S. projects. Tallon Inc. has completed feasibility test work on projects in the U.S.A. Now the company is looking to team up with major American environmental engineering firms to introduce its soil recycling technology.

PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

The pilot phase of the development of this technology was partially supported by the Ontario Ministry of the Environment. Subsequent field scale demonstrations of the technology were supported by the Ontario Ministry of the Environment in association with Environment Canada.

Industrial companies located in Ontario may seek ministry / industry services that will help them to:

- reduce, reuse and recycle solid waste;
- remediate historic pollution effectively and destroy hazardous contaminants;
- reduce or eliminate liquid effluent and gaseous emissions;
- use energy and water more efficiently.

Equipment and service supply companies can benefit from the information provided on technologies identified for business development.

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MINISTRY OF THE ENVIRONMENT SERVICES

For information on Ministry of the Environment assistance to industry, please contact the Industry Conservation Branch at (416) 327-1492, Fax (416) 327-1261.

For more project profiles and other publications, visit the ministry's website at http://www.ene.gov.on.ca

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