

TERAX™

Hydrothermal Deconstruction



TERAX™ Pilot Plant, Rotorua

February 2013

Proven at pilot scale, the TERAX™ hydrothermal deconstruction process offers a new approach to organic waste management. Developed by Crown Research Institute Scion, the TERAX™ technology breaks down biosolids and other organic waste into useful industrial chemicals, energy or fertiliser products.

Pilot plant trials completed

The pilot plant research programme on municipal biosolids has been successfully completed. Technical challenges overcome included working at high temperatures and managing large volumes of abrasive material. Results show that:

- 90% deconstruction of biosolids at pilot scale validated previous laboratory-based results
- organic acids were successfully converted to acetic acid
- high conversion levels of proteins to recoverable ammonia were achieved
- high phosphorus content residual solids were produced for downstream processing
- continuous pre-fermentation of biosolids was successfully operated for over a year
- the final TERAX™ liquor was able to be used as a beneficial carbon supplement in a wastewater treatment plant.

Data collected over the past 15 months has provided very encouraging results and given the project team confidence to proceed to the development of a commercial-scale operation.



Taking the technology to the next level

The success of the pilot plant has given Rotorua District Council (RDC) and the New Zealand Government confidence to invest in the construction of a commercial-scale (11,750 t/yr) demonstration model (see over page).

Next steps for TERAX™ are:

- extending application of the technology to general municipal organic landfill wastes
- refitting the existing pilot plant so it will have the ability to undertake commercial trials on other industrial organic wastes
- completing the detailed design by Transfield Worley for the full-scale demonstration plant
- commencing construction of this demonstration plant in early 2014.

TERAX™ attracts multi-million dollar Government investment

For territorial authorities or industries interested in implementing the TERAX™ technology in their own region, a \$4.7 million Government grant will go a long way towards answering the crucial question - will it work at commercial scale?

The grant is the largest to be awarded from the Waste Minimisation Fund, and was announced in February 2013 by Environment Minister Amy Adams.

The investment will go towards construction and research for a commercial scale TERAX™ demonstration plant. The plant will be built at Rotorua's wastewater treatment facility and will process all of the sewage waste for the city of Rotorua.

"This world first technology will have a major impact on how New Zealand cities and primary industries deal with organic waste in the future," says Mayor Kevin Winters. "It will reduce the amount of organic waste going to landfill and the toxins it creates, and reduce the costs associated with that.

Scion Chief Executive Warren Parker says that having the technology working at the scale of Rotorua city will give exactly the sort of data that other regional investors are looking for.

The TERAX™ technology has already attracted the attention of many New Zealand regional authorities, and will be made available to other councils on preferred terms. Scion and RDC are working with several interested parties on both national and international opportunities for this technology.



Rotorua's Mayor Kevin Winters (left) and Scion CEO Warren Parker show their delight at receiving the multi-million dollar grant

Previous investment

Government investment in this technology began in 2006 when the Foundation for Research, Science and Technology (FRST) funded a project to provide innovative solutions for forest industry waste.

Promising results led to FRST funding a 'Waste 2 Gold' research programme that began in 2007 and looked at a broader range of biosolid wastes, including municipal waste.

On the strength of laboratory scale results, Scion and RDC joined forces in 2008 to develop the TERAX™ technology. In 2010, the Ministry for the Environment awarded \$1 million towards construction of the pilot plant.

Welcome Steve Sopora



Steve Sopora has been appointed as Scion's new General Manager of Business Development and Commercialisation and will play a central role in the commercialisation of TERAX™.

Recruited from Canada and with a chemical and process engineering background,

Steve previously worked as the Manager of Business Development for Methanex Corporation, the world's largest methanol producer. During his time with Methanex, Steve was involved in establishing new methanol plants in Egypt and the United States.

Shortlisted for national awards

TERAX™ and Scion were finalists in two of New Zealand's major innovation and sustainability awards in:

- Innovation category in Clean Tech at the 2012 New Zealand Innovators Award, and
- the Environment section of the 2012 Sustainable 60 Awards.

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