



# GALVANISED FOR SUCCESS

Intec's Burnie demonstration plant manager Adam Randall; with a bar of pure zinc (inset).

**A new technology for heavy metals recycling offers the promise of a zero waste alternative to landfill disposal for the Australian galvanising industry. By Dave Sammut.**

The little town of Burnie, Tasmania may seem like an unlikely launch pad for the next breakthrough in clean technology, but Intec is this month flicking the switch on commercial trials for an innovative zero waste metals recycling process for the galvanising industry.

'Spent pickle liquor' is becoming an increasingly expensive waste problem for steel galvanising operations around Australia. With landfill levies rising sharply, the cost of conventional chemical fixation and stabilisation technologies is increasing the burden for operations that already face a challenging environment.

Prior to galvanising steel by dipping it in molten zinc, the steel surface is first prepared by dipping it in acid to dissolve any rust and zinc. Over time, the hydrochloric acid pickle liquor used for surface preparation becomes contaminated with excessive levels of dissolved iron and zinc, and the acid strength decreases to the point where it is no longer useful.

Conventional treatment for spent pickle liquor is similar to that of many heavy metal bearing wastewater streams. The spent acid is typically transported to an offsite treatment facility, where alkali

reagents are added to precipitate the metals as sludge. These sludges are notoriously difficult to filter and dewater, and the resulting waste needs to be further treated, such as with portland cement, to render it acceptable for landfill disposal. Every tonne of spent pickle liquor conventionally treated can generate 2.3 tonnes of solid and liquid waste.

Given the limited prescribed waste landfill space remaining in Victoria and the levies this attracts, landfill disposal is rapidly becoming an unattractive economic option, even before the long-term environmental risks of dumping heavy metals is considered.

## **Iron, zinc and acid flashback**

Intec's solution instead recovers the iron, zinc and acid as useful products, closing the loop to offer a zero-waste alternative to disposal-based technologies.

The products from the recycling process can, for the most part, be reused on site. Zinc is recovered electrolytically as



high-grade metal, which can be returned directly to the galvanising bath as a replacement for the equivalent amount of externally purchased feedstock. Acid is recovered at high strength so it can be reused directly in the pickle bath as a replacement to fresh reagent. Iron and calcium by-products can potentially be sold off-site.

Following the successful operation of continuous pilot trials of the technology earlier this year in Sydney, Intec has now progressed to Stage 2 full-scale commercial trials. For the next couple of months, the Burnie demonstration plant will be used to

recycle 50,000 litres of spent pickle liquor, proving the technology and generating engineering data for the final phase of the technology development program: the implementation of a commercial recycling facility in Dandenong, Victoria.

This is where Intec's Victorian project partner comes in. GB Galvanising Service (GBG) is Victoria's largest galvanising operator, with two sites in southeast Melbourne. Collectively, GBG's operations produce about one million litres per annum of spent pickle liquor, all of which will be recycled at a dedicated facility to be built on-site in 2011 as the third and final phase of the technology development program – provided, of course, the technology is confirmed to be technically and economically feasible.

Intec and GBG first met in November 2008 at EPA Victoria's HazWaste Expo, established specifically to bring together Victorian waste 'problems' and potential solution providers. Finding ample common ground, the two companies signed a memorandum of understanding in May 2009 and GBG then won a \$780,000 grant from EPA Victoria's HazWaste Fund, with support from Intec as a sub-contractor providing technology services.

Victoria applies an innovative approach to improving environmental outcomes. Unlike states such as NSW, money that is collected from landfill levies stays within the sustainability portfolio instead of being lost to general revenue. EPA Victoria supports industry to accelerate reductions in the volume and hazard of prescribed industrial waste generated in the state.

The support from EPA Victoria has proved pivotal in the implementation of the three-stage technology commercialisation program, the total cost of which is \$2.85 million. Intec and GBG believe other states could learn from Victoria's model. Fostering innovation and best practice takes more than blunt actions like levies. Governments can work constructively with industry to provide or develop clean alternatives to the old ways, particularly given the economic challenges of the small scale of Australian waste markets.

#### Developing the future

An ASX-listed Australian technology company, Intec has developed and proven a range of technologies during the past 20 years, primarily for the minerals processing industry.

It specialises in hydrometallurgy, the science of liquid inorganic chemistry, and

**Every tonne of spent pickle liquor conventionally treated can generate 2.3 tonnes of solid and liquid waste**

over the past few years has recognised the opportunities to extract and recover metals from materials that would previously have been regarded just as wastes.

During 2009, the company successfully implemented commercial recycling of heavy metals from other plating industry wastes, most particularly a high-level hazardous waste that was too contami-

nated to allow for any form of landfill disposal and had therefore been accumulated for 15 years.

This operation has been a finalist and/or a winner of several environmental awards during its two years of clean operation.

Intec is looking forward to the anticipated success of the current Stage 2 trials for the galvanising industry technology, both for the immediate benefits the technology can bring in Victoria and the wider national and international opportunities offered by the full suite of Intec's waste recycling technologies.

Dave Sammut is corporate development manager for Intec ([www.intec.com.au](http://www.intec.com.au)).

WME

## Do you have Environmental Responsibilities for your Site?

**Ensure improved compliance, performance and policies with correct Environmental Management training, practical skills, and state relevant legislative knowledge.**

### Certificate IV in On-Site Environmental Management

30657QLD Nationally Recognised

### Advanced Diploma of Environmental Management

Absorb Environmental Solutions has provided nationwide Environmental and Spill Response Training to Australian Industry since 2000. We recognise the value of having knowledgeable and qualified trainers, who enhance your learning experience with over 100 years of combined expertise and practical skills in the field.

**Absorb**  
Environmental Solutions

**1300 554 180**

[aes@absorbenviro.com.au](mailto:aes@absorbenviro.com.au)

[www.absorbenviro.com.au](http://www.absorbenviro.com.au)

\* conditions apply

**Places ARE Limited!**  
Register today for any of the courses above and quote AES7 to receive 20% off your next on-site spill response course\*