



## Case Study: Minerals processing solutions

### TankCell® -200 optimises zinc concentrate grade at Zinifex Century Mine

The open cut Zinifex Century Mine is the second largest zinc mine in the world, measured both on production and on

<b>Organisation:</b>	Zinifex Limited
<b>Site:</b>	Century, QLD, Australia
<b>Year:</b>	2002
<b>Application:</b>	Lead/zinc flotation
<b>Challenge:</b>	Optimization of zinc concentrate grade
<b>Solution:</b>	TankCell® -200r
<b>Key benefits:</b>	<ul style="list-style-type: none"><li>■ Zinc concentrate grade increased by 1%</li><li>■ Zinc recovery increased by 0.5%</li><li>■ Lower capital cost</li><li>■ Lower installation</li><li>■ Lower maintenance costs</li><li>■ Fitted into existing footprint</li><li>■ Lower power consumption</li><li>■ Lower air consumption</li></ul>

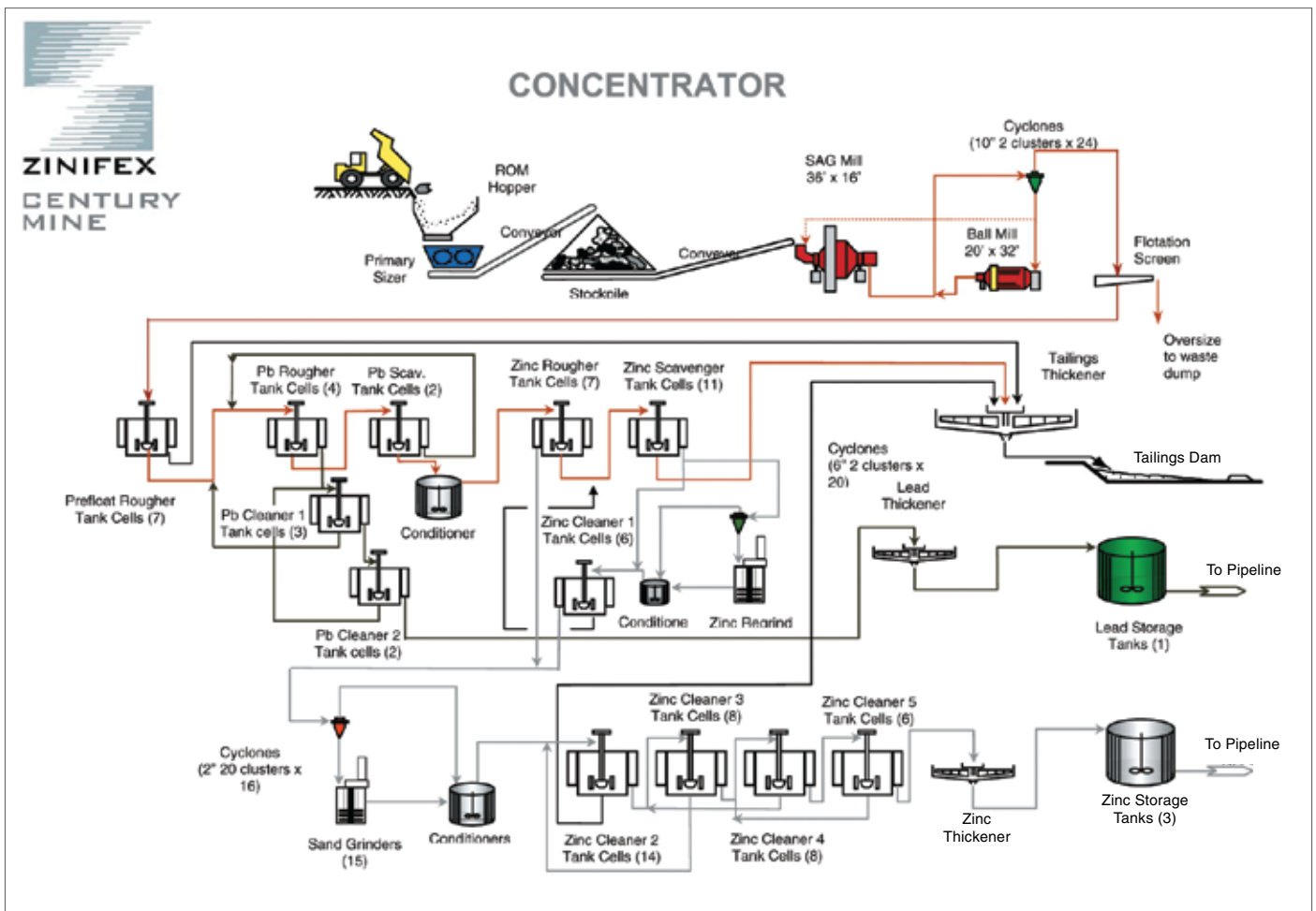
reserves. Mining zinc, lead and silver, the mine produces 880,000 tonnes of zinc concentrate and 70,000 tonnes of lead concentrate per year. The Century mine, employing over 800 people, is located approximately 250 kilometres from Mount Isa in northwest Queensland, Australia.

Zinifex Limited (ASX: ZFX), one of the world's largest integrated zinc and lead producers, is headquartered in Melbourne, Australia, with production facilities in Australia, the Netherlands, and the United States.

### Processing at Century

Century's processing plant is largely a conventional grinding and froth flotation circuit. Once ground to an ultra fine level to maximize recovery, the ore then passes to the flotation circuit where lead and zinc concentrates are produced.

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### The primary zinc flotation circuit

In the plant's primary zinc flotation circuit, zinc roughing occurs in seven Outotec 100m<sup>3</sup> TankCell®, six of which are equipped with froth washing. The first cell does not have froth washing as this was converted from a conditioning tank. Rougher tailings gravitate to the zinc scavenger conditioner where additional copper sulphate and lime is added. The slurry is then pumped to the zinc scavenger circuit, which consisted of ten Outotec 100m<sup>3</sup> cells. Zinc scavenger concentrate is reground and then floated in the zinc 1st cleaner circuit which consists of six Outotec 100m<sup>3</sup> TankCell®.

### Optimising concentrate grade

It was recognised through testwork and comprehensive analysis that the primary zinc recovery and concentrate grade could be even further optimised. Many options were explored and the solution chosen was dilution of the feed. Through dilution of the feed, residence time and recovery rate (if the original flotation capacity was maintained) are reduced. To maintain the desired residence time, additional flotation volume was required.

### A partnership approach

Outotec, in partnership with Century staff, carried out extensive studies on the various options for providing additional flotation volume. This partnership approach ensured all options were thoroughly examined within a very short timeframe. The solution chosen was an Outotec 200m<sup>3</sup> TankCell®, installed as a zinc scavenger cell into the circuit. This partnership method meant both parties had a real stake and interest in the success of the project - and all ensuing studies, design, engineering, associated testwork, installation and commissioning proceeded smoothly and within the allocated timeframe.

Laurie Reemeyer, Metallurgy manager, explains that previous experience with Outotec was also an important factor when choosing the technology provider. "We had worked with Outotec before and were impressed with their approach to doing business. They took a real interest in providing the best solution for us, not just in making a quick sale. As a matter of fact, it would have been more expensive to purchase two 100m<sup>3</sup> cells, but Outotec recommended the 200m<sup>3</sup> solution"

## The whole plant circuit benefits

The benefits of installing a 200m<sup>3</sup> cell in the zinc scavenger circuit were manifold. From a logistical and financial viewpoint, the new scavenger cell needed to fit into the existing plant footprint. Based on the old circuit layout, the new flotation circuit would have been remodeled, if two 100m<sup>3</sup> cells were chosen. There were also other financial benefits. Peter Bourke, Outotec's Global Technology Manager - Flotation Process, explains "The 200m<sup>3</sup> cell is not only more cost effective to buy and install, but over the long term maintenance costs are also far lower. It was a real win-win solution for Century".

## The optimum solution

Installation of the 200m<sup>3</sup> into the zinc scavenger circuit helped to achieve an increase of 1% in zinc concentrate grade and at least 0.5% in zinc recovery. This recovery was from the overall primary zinc circuit which consisted of roughers, scavengers and 1st cleaners. A parallel project, which increased the capacity of the zinc scavenger regrind, treated the additional concentrate recovered from the new 200m<sup>3</sup> cell.

"Despite a higher throughput, Outotec's 200m<sup>3</sup> TankCell® has comfortably met our demanding specifications" Laurie Reemeyer says. "The optimised primary circuit is easily handling our throughput, returning an average 0.5% increase in recovery at a greatly improved concentrate grade. The cell is giving us exactly what we want in terms of performance – and with a lot less maintenance than other solutions"

*Outotec is a worldwide technology leader providing innovative and environmentally sound solutions for a wide variety of customers in minerals and metals processing as well as related process industries. Outotec Oyj is listed on the NASDAQ OMX Helsinki.*

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