

# The “smartest guys on the block” in Tungsten

☒ The Sangdong Tungsten/Molybdenum project in South Korea is one that those with longer memories will recall we have covered in the past, with fluctuating sentiments towards management, but never wavering in our interest in the asset itself. I have always found it very attractive and very prospective. After passing through the hands of several controlling groups in recent years, it is in the throes of bedding down with a serious new ownership group. However as they say “there is many a slip twixt cup and lip” and Almonty Industries (TSXV: AII), the new suitor of Sangdong or more correctly, Sangdong’s controlling company Woulfe Mining (CSE: WOF), is actually making its second run at the company in the space of six months.

## **Tungsten**

This metal has been relatively strong in recent years with demand for drill bits in the oil & gas industry and from the machine tool industry keeping the price healthy. Not many mines have come on stream and a number have gone off-stream. It is also not a metal with mega-mines but rather small to medium sized operations. Therefore a constant flow of new mines is required. Most of the mines that have been contemplated in recent years have been reopening of old mines and camps in diverse locations around the world. The space is also typified by “one-mine” miners rather than operators with multiple operations. This has meant most operators have lacked critical mass and also lacked a “pipeline” of future production.

## **The Revolving Door**

In late January it was announced that Almonty had entered into

an agreement with Woulfe Mining to merge the businesses of the two companies and create what Almonty claimed to be the leading tungsten company outside of China.

Under the terms of the LOI, Almonty was going to acquire all of the outstanding common shares of Woulfe at a price of CAD\$0.08 per share to be satisfied with a fraction of an Almonty common share. The deal shortly afterwards came to grief with many wondering if it was the predator or the prey that had called it off.

Six months went by and in recent weeks the deal resurfaced. This didn't surprise us as it made eminent sense in the first iteration and should have happened. Logic eventually prevailed and the wedding bells started ringing again and the new deal was cut at the equivalent of 7 cents per share for Woulfe holders. Shows the time value of money is not always positive.

### **The Asset in Question**

Woulfe's principal asset is the 100%-owned Sangdong Tungsten/Molybdenum project located in South Korea, located 187km southeast of Seoul. However this is subject to a third party – the very fickle Israeli group IMC – which may purchase a 25%-ownership interest in Sangdong for US\$35 million. The property is comprised of 12 Mining Rights with an aggregate area of 3,173 hectares.



The Sangdong project was, before its closure in 1992, the world's leading producer of tungsten for 40 years. Low metal prices, not the exhaustion of resources, led to the mine's premature closure. The historical production rate averaged 600,000 tpa mainly from the six-meter thick Main Vein.

The scoping study indicates that the property has over 40 years' of mine life remaining. Substantial underground infrastructure is in place and Woulfe has reopened the mine to

a distance of 1.4 km. The above-ground infrastructure includes access to roads, water and power.

Drilling conducted by KORES in 1980-1987 discovered a deep molybdenum deposit below the remaining tungsten skarn resources. The molybdenum content in the Sangdong mineralized zones ranges from 0.04% to 0.06% MoS<sub>2</sub> and an additional zone of molybdenum mineralization, as outlined by historical drilling, lies below the Sangdong mineralized zones.

In 2014 Woulfe completed a de-risking review of its final Feasibility Study report based on the Tetrattech 2012 feasibility report on the Sandong project.

## **The Resource**

After the Dundee interests ousted the Wesson management group it went through the usual “blame the outgoing management” routine and determined: “after a detailed review during the calendar year 2013 that it was urgent and necessary to reassess and de-risk the 2012 TetraTech Feasibility Study of the Sangdong Project”. While we are no great fans of mining consulting firms, we found little to fault in the original FS as the Wesson’s has applied a requirement that capex come in as low as possible with copious use of cheaper labour (imported from Fiji) and second-hand equipment.

Now while the Wesson group is never renowned for being as solicitous of GS&A as of capex, we felt this rewriting of history was just as excuse to mothball the project pending better financing markets and IMC getting their act together on whether they were supporting the project or not.

Woulfe commissioned AMC Consultants Pty Ltd. of Melbourne in August 2014 to undertake a Mineral Resource Update using cut-off grade of 0.4% W03.



## The Road to Production

The scoping study on the Sangdong project was completed by Wardrop in March 2010. This signalled an NPV of US\$462 million at an APT price of US\$250 per mtu.

After the scoping study Woulfe's then management started moving forward aggressively with project construction plans. The crushing and grinding sections of the process plant were well advanced at the time we wrote our last major note on Woulfe in December 2012 and all necessary major equipment had been specified. In October 2011, the company took delivery of Metso minerals front end crushing equipment and the Terex feeding equipment which represented the first equipment delivery to the mine site. The equipment was purchased at a significant discount to value. In addition Woulfe had indicated it would be purchasing new European-made crushing and grinding equipment.



The crusher was designed for 2.4 million tonnes per annum and the initial milling capacity will be 1.2 million tonnes per annum, but can be readily expanded to 2.4 million tonnes.

The flow sheet is conventional, with two-stage crushing followed by rod mill grinding and flotation, and tungsten concentrate further processed to produce APT.

In October 2011 the company received an explosives license, built an underground storage facility and initiated the first blast since closure in 1993. The F2 foot wall ore body was blasted. This zone will be the initial point of mining and representative of the initial years of operations. The mine has now been reopened from one level in the base of the valley floor to the top of the mountain and across the entire 1.2 km strike of the ore body. During the opening, many new target areas were discovered which were initially prepared by Korea Tungsten prior to the 1993 closure of the mine.

## **Mining**

The AMC Report, uses a cut-off grade of 0.4% WO<sub>3</sub> based on a more selective mining approach. Under the new scheme, the first phase of development of the Sangdong Property will be focused on the three immediately reachable levels, with a further 15 levels to be de-watered progressively after start-up of operations. The mine is anticipated to produce 450,000 tonnes of ore in Year 1 of production and reach the final 12 year life of mine capacity of 640,000 tonnes per year, in Year 2.

The main parameters of the proposed mining operation are:

- Life-of-mine (LOM) in Current Mine Plan of 12 years
- Time to Reach Mining Rate 2 years
- Probable Reserve of 13.3 million tonnes at a grade of 0.425 % WO<sub>3</sub>
- Recovery 81%
- Average Annual WO<sub>3</sub> Concentrate Production 3,828 to 4,705 tonnes
- Capex of US\$74.4 million compared to a previous projection of US\$151 million

As for the project economics, AMC estimated:

- Average annual revenue WO<sub>3</sub> concentrate of US\$62.1 million
- Earnings Before Sustaining Capital – Annual Average of US\$31.8 million
- Pre-tax IRR of 26%
- Project Total NPV @ 5% Discount Rate of US\$156 million

## **Conclusion**

This note is not the place to speak about the details of all four of Almonty's tungsten mines. I shall leave that to a future opportunity.

The level of advancement at Sangdong is exactly why Almonty is paying to get its hands on this project for, while not exactly “plug-n-play”, it is pretty near to being so, with a lot of the capex already having been expended at the time Dundee moved in to oust the Wesson’s in 2013.

One can see why Almonty have lighted upon this project as the “next off the cab rank”. The company has made a habit of buying up “oven-ready” Tungsten projects, with Sangdong representing number four in this process. It totally shortcuts the finding, testing, proving part and all the sunk capex and instead arrives in the final stages to “take the prize” and who can fault that?

Almonty’s goal is to become the “smartest guys on the block” in Tungsten and they have already achieved that goal with their first mine. Within another year or two they will have four producing Tungsten mines, diversified around the globe, with production costs that match or better the Chinese. This metal has been crying out for a consolidator and finally Almonty has arrived to claim the title.