

## QUARTERLY ACTIVITIES REPORT

30 June 2015

### LATROBE MAGNESIUM PROJECT

#### 1. Cement Test Results from China Bulk Sample

Latrobe Magnesium Limited (ASX:LMG) has received very positive test results on its supplementary cementitious material (SCM) from its China sample. The testing concentrated on the wet and hardened properties of the SCM with ordinary portland cement and black coal fly ash mixes.

The SCM is a by-product of LMG's process of extracting magnesium from large volumes of spent fly ash in Victoria's Latrobe Valley. LMG is endeavouring to commercialise SCM as a company income generator.

The tests involved the preparation and setting of three shotcrete mixes – a pure GP mix, a 70% GP and 30% black coal fly ash mix and a 70% GP with 30% LMG SCM material mix. Shotcrete was chosen because this is a higher cost concrete with higher compressive strength than ordinary portland cement.

The LMG SCM mix behaved like a conventional pozzolan, lagging the pure GP cement mix over the first 7 days; but by 14, 28 and 56 days has caught up in compressive strength. The difference between the LMG SCM mix and the GP mix at 14, 28 and 56 days is not statistically significant.

Unconfined Compressive Strength Results:

Age (days)	Pure GP cement mix	Black Coal Fly Ash mix	LMG SCM Mix
7	43.5 MPa	34.5 MPa	35.0 MPa
14	48.2 MPa	43.2 MPa	47.0 MPa
28	52.5 MPa	50.7 MPa	52.7 MPa
56	59.7 MPa	55.3 MPa	57.7MPa

Test results indicated that the shrinkage characteristics of the SCM were similar to the fly ash. The initial setting time for the SCM material was slower than the fly ash. However, there was only one hour difference between the three mixes. LMG believed that this slower reaction was due to some process issues in China.

The durability test results whilst different was believed to be the result of the testing regime and not the material. The water penetration test results indicated similar characteristics in all three mixes.

Workability and consistency was assessed using slump standards and the texture was manually assessed. The mixes containing the SCM and fly ash were found to be superior to the cement mix primarily because the creaminess characteristics makes the concrete more pumpable and sprayable and thus more suitable for shotcrete.

In July, LMG has reprocessed some of the China sample and has performed mortar tests on the material to determine whether this slower reaction time was due to the material itself or the China process issues. The results for this material showed no slower set time and therefore LMG believe that it is a result of the process issues and not the material.

In the last month, LMG has also carried out cement characterisation tests at a respected cement laboratory. The results indicate that LMG's SCM fits the Australian Standards.

The revenue generated from this SCM product is critical in ensuring that LMG, when combined with its magnesium revenue, is cost competitive with China.

LMG produces up to 8 tonnes of SCM for every tonne of magnesium produced. LMG's price for its SCM will be set somewhere between the cost of black coal fly ash and the cost of cement delivered in Melbourne. These costs are between \$130-180 per tonne.

LMG's SCM is produced without emitting any CO<sup>2</sup>. Cement traditionally produces up to 0.9 tonnes of CO<sup>2</sup> per tonne of cement. LMG or its customers should therefore earn carbon credits of some 7 tonnes per tonne of magnesium produced.

## **2. Iron Removal Test Work**

The Company has completed a number of optimisation tests for the removal of additional iron in its beneficiated fly ash. The removal of iron has the capacity to reduce the operating costs of the smelter activities and improve the quality of the SCM.

LMG has experimented using the chemical, triisopropanolamine, instead of triethanolamine in its hydromet process and has achieved some very successful results in its second sulphur removal step. It is hoped that with this improvement that a higher iron removal will be achieved in its third step. These tests on the third step are currently being conducted and should be available within the next month.

### **3. Capital Raising**

On 15 April 2015, the Company announced the completion of a placement of 90 million shares at \$0.01 to raise \$900,000. On the same day, the Company announced a share purchase plan and the plan raised \$235,000.

The total funds raised by the Company was \$1,135,000 less the placement fees that were payable.

These moneys will be used to provide working capital and to assist with the financing of LMG's bankable feasibility study.



David Paterson  
Chief Executive Officer

23 July 2015

### **About Latrobe Magnesium**

Latrobe Magnesium is developing a magnesium production plant in Victoria's Latrobe Valley using its world-first patented extraction process. LMG intends to extract and sell magnesium metal and its cementitious material from industrial fly ash, which is currently a waste stream from brown coal power generation.

LMG has completed a pre-feasibility and an adjustment study validating its combined hydromet / thermal reduction process that extracts the metal. LMG is looking to complete its bankable feasibility study by December 2015. Construction of the production plant is due to start at the end of March 2016 with production to begin a year later. The plant will be in the heart of Victoria's coal power generation precinct at its site located at Tramway Road in Morwell, providing immediate access to feedstock, infrastructure and a workforce.

LMG plans to sell the refined magnesium under long-term contracts to Australian and American users. Currently, Australia imports 100% of the 10,000 tonnes annually consumed.

Magnesium has the best strength-to-weight ratio of all common structural metals and is increasingly used in the manufacture of car parts, laptop computers, mobile phones and power tools.

The LMG project is at the forefront of environmental benefit – by recycling power plant waste, avoiding landfill and being a low CO<sub>2</sub> emitter.