

LAB TRIAL PRODUCES LOW CARBON, HIGH STRENGTH CONCRETE

HIGHLIGHTS

- Laboratory trials conducted in collaboration with Murdoch University under the recently announced licensing agreement have successfully produced low carbon concrete using Suvo Metakaolin.
- The five samples tested showed promising results, with an average strength of 52MPa, surpassing the strength of many traditional concrete applications.
- Metakaolin has the potential to reduce greenhouse gas (“GHG”) emissions by 50% compared to ordinary portland cement (‘OPC’).
- Cement production is the single largest industrial source of GHG and accounts for 8% of global emissions – equivalent to the entire global car fleet¹.
- The global concrete market is forecasted to be USD \$821.6 billion by 2026².

Suvo Strategic Minerals Limited (ASX: SUV) (“Suvo” or “the Company”) is pleased to provide results from its recently completed laboratory trials completed by the team at Murdoch University, targeting a reduction in the carbon footprint of concrete – the world’s single largest industrial emitter of GHG emissions (ASX Announcement 30 October 2023).

The trials comprised five samples which returned an average strength test of 52MPa, exceeding the strength of most concrete applications currently in use.

¹ Beyond Zero Emissions

² Global Estimate Markets Research & Consultants

As part of the laboratory trials undertaken by Murdoch University, Suvo's Metakaolin was used with other readily available inputs to create a low carbon, geopolymer concrete.

Geopolymer concrete is a low emission, environmentally-friendly alternative to traditional OPC. It's produced by chemically reacting aluminate and silicate-bearing materials with caustic activators like metakaolin, fly ash, ground blast furnace slag, and other waste-derived components.

In OPC production, about 50% of GHG emissions result from limestone combustion in a kiln at 1,400°C. The energy for the kiln constitutes 40%, while plant electricity and transportation account for the remaining 10%.

Based on scholarly research, the production of Metakaolin compared to OPC achieves a 50% reduction in GHG emissions as the production of Metakaolin necessitates a lower temperature (700°C compared to 1,400°C), hence a lower carbon footprint for energy required, and produces water rather than carbon dioxide (source: Cutting Cement Industry CO₂ Emissions through Metakaolin Use in Construction). This is stark contrast to what is currently available in the cement industry.

The trial led by Murdoch sourced Kaolin from the Company's Gabbin deposit. This was subsequently converted into Metakaolin by global cement technology specialist FLSmidth at their Bethlehem laboratory in the US. The Gabbin Metakaolin, produced by FLSmidth, was found to be of equivalent or superior quality to other market-available Metakaolin products (ASX Announcement: 28 April 2022).

The company is still investigating proprietary technology with Calix Limited (ASX Announcement: 19 April 2022) to further reduce GHG emissions by utilising their electric kiln technology which is powered by renewable energy.

Following the licensing agreement signed with Murdoch University earlier this week for a geopolymer concrete batching plant and a low carbon concrete formulation - 'Colliecrete', the Company intends to commercialise the Murdoch Technology by commencing studies to increase scale of the pilot plant to be able to produce Colliecrete and other geopolymer concrete formulations, using Metakaolin, and various readily available inputs such as other waste derived products like fly ash.

This initial laboratory trial using Suvo metakaolin has shown potential to significantly reduce GHG emissions and achieve impressive strength, surpassing many existing concrete applications.

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Non-Executive Chairman Aaron Banks commented:

“This is an outstanding first round trial result for the Company which could provide an entry into a large industry.

If the cement industry were a country, it would only be behind China and the United States of America in CO₂ emissions. The world use of cement is equivalent to building New York City every 40 days.

The opportunity to play a part in reducing emissions in the cement industry is analogous to the role of electric vehicles in replacing internal combustion engines in the global passenger car fleet.

It’s the next round of testing that we look forward to most. We now expect to start further testing with Pittong Kaolin and combining this with other mining companies waste products such as fly ash and slag, that might otherwise be committed to landfill, we will look to convert those waste streams into low carbon concrete.”

**Associate Professor, Chair of Environmental Engineering of Murdoch University
Martin Anda commented:**

“Because Australia largely ceased its own domestic production of Portland cement and now imports much of the required clinker and lime, as well as completed Portland cement, this could be a game changer for a new local industry and jobs.

Suvo Metakaolin exceeded expectations in the first round of trials achieving a higher compressive strength than that which is required in most concrete applications already.

We look forward to the next round of trials where we combine the Metakaolin with other mining companies waste derived byproducts from their mineral processing to further reduce the carbon footprint.”

Approved for release by the Board

-ENDS-

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Test results

Identifier	Mass (g)	Density (kg/m ³)	Ave. Diameter (mm)	Height (mm)	Area (mm ²)	Load (N)	MPa	Ave. MPa	2*Std Dev
SMK1.1	29.18	1508.42	24.71	40.35	479.42	21500	44.85	52.48	15.24
SMK1.2	29.99	1507.83	24.70	41.52	479.03	21040	43.92		
SMK1.3	31.03	1564.73	24.69	41.42	478.78	28100	58.69		
SMK1.4	28.16	1513.24	24.68	38.91	478.26	26300	54.99		
SMK1.5	27.02	1510.19	24.69	37.38	478.65	28700	59.96		

For further information, please contact

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Company Profile

Suvo Strategic Minerals Limited is an Australian hydrous kaolin producer and exploration company listed on the Australian Securities Exchange (ASX:SUV). Suvo is focused on production at, and expansion of, their 100% owned Pittong hydrous kaolin operation located 40km west of Ballarat in Victoria. Suvo's exploration focus is on near-term kaolin and high purity silica assets with 100% owned Gabbin (kaolin), Eneabba and Muchea (silica sands) projects located in Western Australia.

Pittong Operations

The 100% owned Pittong Operations, located in Victoria 40km west of Ballarat, is the sole wet kaolin mine and processing plant in Australia and has been in operation since 1972. Pittong comprises the Pittong, Trawalla and Lal Lal deposits located on approved Mining Licences MIN5408, MIN5365 and MIN5409 respectively.

At Pittong mining contractors deliver crude kaolin ore to stockpiles from the two currently operating mines, Pittong and Lal Lal. The plant takes its feedstock from the ROM and it is processed into four separate product forms for end users. These product forms are 10% moisture lump, high solids slurry, 1% moisture powder and 1% moisture pulverised powder. The solids slurry is used in paper and board manufacturing. The other products are used in paper, coatings, paint and specialist industries including rubber and pharmaceutical applications. Around 20–25kt per annum is supplied to various end users.

Gabbin Kaolin Project

The 100% owned Gabbin Kaolin Project (White Cloud) is located 215km northeast of Perth, Western Australia. The project area comprises four granted exploration licences (E70/5039, E70/5332, E70/5333, E70/5517) for 413km², centred around the town and rail siding of Gabbin. The generally flat area is primarily cleared farming land devoid of native bushland and is currently used for broad-acre cereal cropping. A mining access agreement is in place over the current resource area with the landowner and occupier.

The main rock types at Gabbin are primarily Archaean granite, gneiss, and migmatite. These rocks are overlain and obscured by Tertiary sand and Quaternary sheetwash. The weathering profile is very deep and contains thick kaolin horizons capped by mottled clays or laterite zones. The current JORC 2012 Mineral Resources are 72.5Mt of bright white kaolinised granite with an ISO Brightness of 80.5%.

Eneabba Silica Sands Project

The 100% owned Eneabba Silica Sands Project is located 300km north of Perth, Western Australia. The project comprises four granted exploration licences (E70/5001, E70/5322, E70/5323, E70/5324) for 169km². The project is located on the Eneabba Plain whose sandy cover is very flat to gently undulating. Outcrop is rare due to the accumulations of windblown and alluvial sand at surface. Below this is a thin hard silcrete or lateritic claypan which overlies deep white and yellow sands.

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