

ASX Code: PSY

7 November 2014

Panorama Synergy's LumiMEMS™ Reader aims to advance the monitoring of potentially hazardous operational by-products in the Hydraulic fracturing (frac'ing) industry

Hydraulic fracturing, or "frac'ing" is the process of drilling and injecting fluid into the ground at a high pressure in order to fracture shale rocks to release the contained hydrocarbons. The practice has become controversial with regulators and environmentalists suggesting this releases dangerous chemicals, such as Benzene, into the surrounding environment and water supplies.

Many operators in this space largely reject these concerns.

Benzene is highly toxic and carcinogenic. Until now, the Regulators, to some extent have been caught in the middle of this global debate, but with limited tools to conclusively prove or disprove these claims.

Natural gas wells where this technique is being used are spread across the globe. There are more than 500,000 active natural gas wells in the US alone.

Benzene, is difficult to detect before it reaches dangerous levels in the environment. If it were being accidentally released, by the time current technology can detect it, damage to surrounding towns, people, crops and livestock is irreversible. The extremely large volumes of water used in hydraulic fracturing mean that there is a large risk to the contamination of ground water and surface water.

Panorama Synergy (**PSY**) and the University of Western Australia (**UWA**) are bringing to market a new innovation for the sensors that detect chemical or biological factors. These sensors are called MEMS sensors, MEMS being Micro Electro Mechanical Sensors. The actual sensors are microscopic. Reading the detection of the sensors' is the task of the MEMS reader. This breakthrough, an Optical Readout System, is the only one of its kind in the world and PSY and UWA have been granted the global patent.

The dramatically increased sensitivity of the **LumiMEMS Reader** means that we will be targeting sensitivities of "parts per trillion" in our benzene detection product, as compared to the "parts per billion" sensitivities available in current benzene detection devices.

This will allow Hydraulic Fracturing Operators and Regulators to more definitively determine whether this hazard is occurring, in time to take remedial action before major harm is caused. This certainty seems to be welcomed by both the operators who are keen to maintain their good standing in the community and provide access to readily accessible hydrocarbons, as well as the environmentalist and the communities near these operations, who are concerned as to the risks to health and the environment.

According to Terry Walsh, Managing Director of PSY, this is just one example of how the LumiMEMS Reader will enable us to monitor our environment in ways previously not possible.

“Whether it is employee safety in dangerous environments, air-borne viruses in hospitals or airports, air pollution in a city or country, or viruses threatening crops or livestock, the applications for the LumiMEMS sensor are enormous”, he said.

“The LumiMEMS Reader will allow us to understand our environment in much more detail than thought possible, and to react to it in a timely fashion, across healthcare, mining, transportation, agriculture and more. Removing the unknown and the uncertainty helps us to make better decisions, and reduces the fear of the unknown”.

Panorama Synergy had previously stated that its first prototype would be completed by the end of calendar year 2014. This prototype is being designed to detect Toluene, which shares the same characteristics as Benzene, so is a valid proxy for Benzene, while reducing the risks to the scientists of handling this very dangerous gas.

Lead scientist, Associate Professor Gino Putrino said:

"We are pleased to confirm that the timing for the prototype remains on track for this year. Whilst the basic science of the LumiMEMS Reader has previously been demonstrated and reported to the ASX, there are still a number of tasks in terms of building the larger toluene-specific prototype and also setting up testing protocols that allow us to safely handle toluene and supply it in very low concentrations for verification of the LumiMEMS toluene detector. Although prototype delays would have no major effect on the overall outcome, our focus on detail and the calibre of our team has allowed us to keep on schedule."

"It is exacting work, with the moving parts of the sensor being smaller than the width of a human hair. The people, skills and tools we have built at the Microelectronics Research Group at UWA over the last decade are a large part of the reason we have been able to make good progress on the project."

"We envisage the LumiMEMS sensor ultimately becoming the de facto optical reader of choice in the MEMS market. The MEMS industry is currently reported to be \$14b in size and growing quickly. The significant progress we have made on this project so far is a testament to UWA's status as the premier MEMS research facility in Australia, and our strong partnership with Panorama Synergy."

Further product announcements in other markets are anticipated, given the range of applications available, due to the commonality of the Optical Readout System design, almost regardless of the application.



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About Panorama Synergy

Panorama Synergy is a Perth-based technology company focused on the commercial and technological advancement of its optical readout system for MEMS, the LumiMEMS Reader™.

In partnership with UWA, Panorama's unique technology has been developed by a team of renowned scientists led by Gino Putrino, the chief architect of the MEMS optical readout system. The Company has an exclusive worldwide licensing agreement with the UWA for optical technologies related to MEMS sensors.

The company's Board includes Managing Director, Terry Walsh and Aidan Montague, Chairman, and Director Jeff Braysich. Mr Walsh and Mr Montague have extensive backgrounds in high technology. Mr Walsh was formerly Managing Director for Cisco Australia and New Zealand for five years and then CEO of Cisco Canada for the subsequent five years. Mr Montague served in various roles in Europe, was CEO of Cisco in South Africa, and as Director of Strategic Alliances for Cisco in Asia Pacific. Mr Braysich has extensive experience in the Capital Markets, working as a stockbroker, operating a Financial Services business and serves on various Boards.

As previously announced, Dr Jason Chaffey will be joining the Board on November 17th. Dr Chaffey has a PhD in MEMS and a successful track record of commercialising MEMS technology.

About MEMS

MEMS is an umbrella term used to describe a miniature device which integrates mechanical and electrical elements designed to work together to sense and report on the physical properties of their immediate or local environment, or, when signalled to do so, to perform a controlled physical interaction or actuation with their immediate or local environment.

MEMS sensors are used to detect the presence or absence of chemical and biological substances. They can be used to detect anything from explosives at an airport to the presence of certain types of cancer from your breath.

The current MEMS market is estimated to be \$14 billion in 2014, growing to over \$22 billion by 2018 according to a Yole Development report called "Status of the MEMS Industry", July 2013.

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