



## Progress in Green Shale Gas Technologies: ecorpStim Research and Development Consortium Improves Cost Efficiency of Non-Flammable Propane (NFP) Stimulation Technology

### Press Release

Houston, July 28, 2014

eCORP Stimulation Technologies, LLC (ecorpStim) is pleased to announce advances expected to further improve the cost effectiveness of ecorpStim's non-water, non-chemical Non-Flammable Propane (NFP) stimulation technology, which is offered by the Company along with ecorpStim's proprietary Pure Propane Stimulation (PPS) stimulation technology. Both technologies eliminate the large quantities of water and chemical additives typically used in today's hydraulic fracturing.

With NFP, efforts are proceeding to dramatically reduce the cost of ecorpStim's non-flammable stimulation fluid, Heptafluoropropane (HFP).

HFP is a non-flammable, non-toxic, non-ozone depleting gas commonly used in medicinal inhalers and fire extinguishers. For these uses, HFP (was spelled HPF in this position) sterility and purity are of utmost importance.

ecorpStim and scientists at the Energy Safety Research Institute(ESRI) at Swansea University and the Department of Chemistry Rice University have an ongoing all-encompassing multi-disciplinary applied research program to enable HFP to be a cost effective stimulation fluid in common practice. The fundamental components being investigated include:

- Process engineering
- Commercial effects of HFP purity
- Advanced field separation and recycling

eCORP/ecorpStim Board Member, **D. Ronald Harrell, P.E.**, is also Chairman Emeritus of Ryder Scott, Co. Founded in 1937, Ryder Scott is one of the largest, oldest and most respected reservoir-evaluation consulting firms in the industry.

Mr. Harrell, who continues to stay current on developments concerning shale hydrocarbon exploration and exploitation, observed that "Time and time again we observe the effectiveness of multidisciplinary teams, such as the ecorpStim research consortium, where industrial, institutional and academic contributors come together to create major advancements such as those recently announced developments at ecorpStim."

According to Professor Barron, "To date HFP has been manufactured for specific applications requiring an extreme focus on purity of one isomer of the HFP compound. This novel application brought to our

research team by ecorpStim opens the door for examining a less costly manufacturing process. We are excited to have the opportunity to contribute to a new technology which is in concert with responsible energy development.” **Andrew R. Barron** is the Ser Cymru Chair of Low Carbon Energy and Environment at Swansea University and the Charles W. Duncan, Jr – Welch Chair of Chemistry at Rice University.

**John Francis Thrash, M.D.**, CEO of ecorpStim, stated that “today we are confident that this multi-disciplinary approach will make it possible to reduce the cost of HFP as used in this industrial application to a level at least one full order of magnitude lower than the current cost of pharmaceutical grade HFP, much like the difference between the cost of drinking water versus the cost of water used for intravenous injection, a difference of many orders of magnitude.

If HFP can be employed in full scale operations at this lower cost, in combination with ecorpStim’s development of highly efficient capture and recycling systems, the effective cost in the field of Non-Flammable Propane stimulation should prove to be equal if not less than the cost to produce gas utilizing presently available water fracing methods.”

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**About ecorpStim** - The company ecorpStim (eCORP Stimulation Technologies, LLC) was created in 2012 to provide European countries, as well as those with limited water resources, with alternatives to hydraulic fracturing, based on pure home grade propane and without the use of chemicals, or on heptafluoropropane (in the case of NFP Stimulation). [www.ecorpstim.com](http://www.ecorpstim.com)

**About eCORP International, LLC** - Founded in 1978, eCORP and its predecessor companies have extensive oil and gas experience including underground natural gas storage, natural gas transportation, enhanced oil recovery in conventional reservoirs using propane and butane, exploration for and production of conventional and unconventional (shale) reservoirs, electric power generation and marketing of electricity and gas. [www.ecorpintl.com](http://www.ecorpintl.com)

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