

CLEAN INNOVATION IN FOCUS

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THIS ISSUE FEATURING

**Ground Effects
Environmental Services Inc.**



Company Vitals

Incorporated:	<i>1998</i>
President:	<i>Sean Frisky</i>
Products/Services:	<i>Soil remediation & water/drilling mud treatment</i>
Market Niche:	<i>Oil and gas, remediation</i>
Geographic Market:	<i>Canada, USA, Germany, Asia-Pacific, the Middle East and the United Kingdom</i>
Current Number of Employees:	<i>25</i>
Estimated Annual Revenue:	<i>\$6-12M</i>



A Serial Inventor with a Big Heart for the Environment.

Sean Frisky always knew he wanted to be an entrepreneur – he wanted to work for himself. He had several small businesses as a youth that helped pay his way through University. In 1998, he was 29 years old and undertaking a co-op work term as part of his fourth year engineering degree, when he saw a market opportunity he could not walk away from. This opportunity would set the direction of his life and ultimately lead him to Prince Charles.

| 1998 |

Sean grew up on a family farm where the motto was, if something is broken – fix it. If you can do it better – do it. His co-op work term placed him at a refinery reviewing a competitor’s product. He could see that by simplifying the manufacturing process, he could reduce the rotating parts by 70%, lower the capital costs and, more importantly, increase equipment run times from 50% to 100%. His main competitor, by this time, had



Sean Frisky, Serial Inventor

He pitched the idea to the refinery, who took a chance on him. Sean wonders if, knowing what he knows now, he would have taken that leap. At that time he had little to lose and could see nothing but potential ahead of him, without truly

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developed a reputation of poor reliability in the industry. Sean offered the market a better quality product with lower maintenance costs and significantly less downtime at a competitive price.

understanding the risks involved. He had established a strong credit rating through his previous entrepreneurial endeavors, which enabled him to start Ground Effects Environmental Ltd. (GEE)

to manufacture and service multi-phase vapour extraction units. By carefully **branding his equipment**, Sean was able to create a strong market presence and eventually drove his main competitor out of the market.

| 2005 |

The multi-phase remediation kept Sean and his team busy in the summer but they were slow during the winter months. In 2005 **Sean set up a lab in his shop to “build new things”** and test new concepts. He also saw it as a way to keep his team employed. As an electrical engineer, Sean began experimenting using electrokinetics or electrical technologies to separate materials. His largest customer approached him with the problem of salt in the soil. Salt never goes away and if left in the soil it has the potential of destroying crops. For his customer, this was more of a social issue than the risk hydrocarbons represented. Sean developed the EK3, which removes salt and other contaminants from soil in situ. It was the first product to use electrokinetics as the separator. GEE worked on the product through to 2009, doing demos across the country. Despite this, the product never gained commercial success.

| 2007 |

By 2007 the multi phase extraction or remediation business was changing. The regulations forcing companies to remediate were becoming more relaxed, allowing customers to do more monitoring than remediating. **Sean saw the change coming** and he knew the negative effect it would have on his sales. Therefore **he had to adapt, and adapt quickly**, if he was going to survive. Though the EK3 was not commercially viable, it did prove the electrokinetic technology worked to separate materials. Sean reasoned that this technology could be applied to other

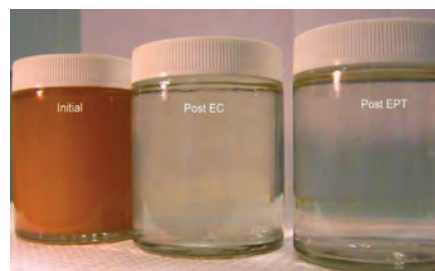
“Recognizing these opportunities saved the company.”

materials such as frac fluids and drilling muds in the oil and gas sector, and in other industries such as mining. Recognizing these opportunities saved the company.

It also marked the beginning of GEE’s transformation from a manufacturing and service company to an innovator of in situ electrokinetic technologies. Sean worked hard to create a **culture of innovation**. The first new product to be developed after the EK3 was the Electropure™ to extract water in situ from frac fluids. This addressed water consumption issues that were receiving a lot of media and press coverage, or as Sean says, “noise,” when he launched Electropure™. GEE had what Sean refers to as moderate success. Developing the Electropure™ led to large scale projects and to some of the best years the company has experienced. However sales eventually petered out as regulations were slow to materialize. Regulations are just coming into effect now. Sean needed a new product quickly. He was surviving on revenues from servicing multi-phase vapor extraction units and diminishing sales from the Electropure™.



Electropure™ Water Treatment System (above)



Electropure™ treated frac fluid (left)

| 2011 |

The next **large scale investment in product R&D** came almost by accident. In 2011 Schlumberger, the world's largest oilfield services company, was touring GEE's facilities with the intent to purchase the Electropure™ technology. A small project that GEE was working on in the lab caught their attention. Sean and his team were looking at how to apply the electrokinetic technology to remove ultrafine materials from oilfield drilling mud, enabling these fluids to be reused in the field.

Schlumberger indicated they were interested in the technology as this was a “massive” problem for them. They were paying to have the drilling fluids shipped to a landfill. GEE's product, the Electro Separation Cell (ESC™), could recover 80% of the original drilling fluid for reuse, significantly reducing disposal costs.

| 2012 |

This was the Cinderella story GEE was waiting for. They had the technology, the ESC™, and they had a customer, Schlumberger, the largest oilfield service company in the world. By 2012 GEE had developed a prototype, however Schlumberger had a change in personnel and the new manager decided not to pursue the project.

| 2014 |

GEE had invested their own capital and in 2014 secured \$3.5 million through the Western Innovation Initiative run by Western Economic Diversification Canada, to commercialize the ESC™. Their initial response was to compete with Schlumberger and market directly to oil and gas companies. This was an expensive option and would push their expertise and resources beyond their limits. Instead they decided to pursue the second largest industry player, Halliburton. At first, Halliburton turned down the opportunity. Sean learned that with large companies that control the market, the momentum is against you. This is especially true when you have a disruptive technology – a technology that forces a company to change how

they do things. If they say “no” there is zero risk. If they say “yes” and the technology proves not to be perfect, they may be fired. Consequently, they are slow to adopt new technology and there is little incentive to do something different.

He hired an ex-Halliburton VP as a Business Development Manager. He was able to reopen the negotiations and introduced GEE to the right people within Halliburton. Because he was local, he was able to address any concerns as they arose. Still it took eight months to negotiate a deal to get sales going.



ESC™ – Electro Separation Cell

| 2015 |

There is power in having a product versus a prototype. Early in 2015 Sean sent a random email on a whim through the website of National Oilwell Varco (NOV), the third largest industry player, explaining the ESC™. He received a call the very next day. They were actively looking to find a technology to remove ultra fines from oilfield muds. Within four months GEE had built and tested units in NOV's worst mud conditions. **The technology proved itself.** They were negotiating a three to five-year license agreement for the world when oil prices began to crumble. NOV had no choice but to put the project on hold.

GEE had started the process in 2011 to generate a new revenue stream for the company. It is 2016 and they have just now started to move the needle on this product. They have a partner in Asia, have built units for NOV and have a contract with Halliburton. They are also back in talks with Schlumberger. Now there is interest from all three companies. Talking to all three has created a tension in the market, where each has wanted to get in before the others.

“GEE had started the process in 2011 to generate a new revenue stream with the ESC™.”

While negotiations were underway with Halliburton and NOV, GEE **invested in the user interface** on the equipment. They would not be operating the technology themselves and it was clear that if operators experienced difficulties in the field they would not use the equipment. Using the iPad as inspiration, they made the interface intuitive, complete with icons, and it contains a host of email and web capabilities. Testing proved, almost immediately, that new users were able to use the product without reading the manual. This interface also enables the product to work in all geographic regions and in multiple languages.

The next step in becoming an innovator of in situ electrokinetic technologies was to outsource all manufacturing. GEE just does quality control and assembly at the plant. They out-sourced welding, painting, etc. This enabled them to stay in the black during difficult times and also allows them to scale up as necessary.

There is less stress and as an innovator, **more time can be spent on designs** and redesigns of products. Currently there is a renewed interest in water usage bringing the Electropure™ back to life. There have been more sales in the last three months than in the last three years due to changing regulations. Sean and his team redesigned, simplified and eliminated parts

in the Electropure™ to make it easier and more cost effective to use. He also applied a similar user interface for the operator.

Sean still applies the same principles to his products that he did as a student, simplify the process to make a superior product. This approach has caught the eye of many, both nationally and internationally. Prince Charles asked to tour the plant on his visit in 2012 and has invited Sean to London for tea several times to discuss his technology.

Sales are expected to be over \$4 million in 2016 and have reached a high of \$11 million. GEE employs 25 people. A serial inventor at heart, Sean in his last meeting with Schlumberger, suggested they could simplify the process and apply the same user interface for centrifuges. The idea seems to be sticking. He is back in the lab developing the concept. He has the right contacts, and the market potential? Well, it's huge.



During Prince Charles's visit to Canada in 2012, there was only one private company he visited – Ground Effects.



The Ground Effects Team

| Take-Away |

Build your network. In practice the network is larger than just your customers, it also includes employees, suppliers and other CEOs. It is also important to be open to advice. Sean has joined a CEO group and participates in CETAC workshops. Here Sean can share his experiences and learn from other companies who have faced similar challenges and who can provide fresh insights. This has been invaluable to the success of GEE. You never know where the next best idea may come from.

“Participating in CETAC-WEST workshops has been invaluable to the success of GEE. Sharing similar challenges and experiences offers fresh insights.”

– Sean Frisky





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