VSEP Vibes Newsletter

Welcome to the New Logic Research Newsletter.

Another Bottled Water VSEP Project

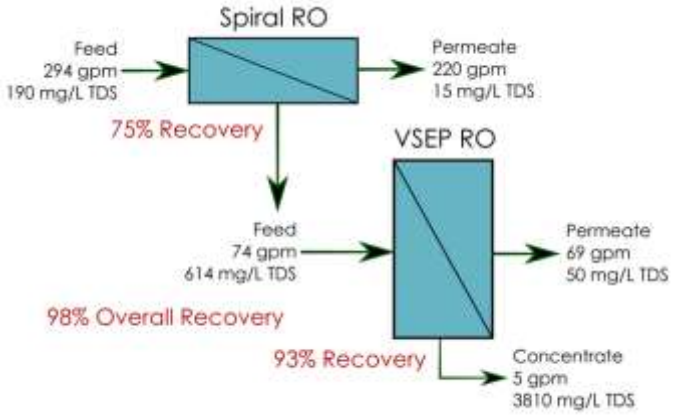
New Logic has installed 17 Beverage projects. The VSEP is used to volume reduce the concentrate from conventional spiral RO systems. VSEP is not limited by solubility because of the high shear. New Logic had supplied these kind of systems to all of the major bottled water companies except one. Now, New Logic has signed a supply agreement for a VSEP system to that last major bottled water company. This means just about everyone in the bottled water industry is using a VSEP system to reduce brine reject volume and increase water yield. These companies are doing this to enhance their sustainability footprint and also to secure permits from municipalities to build new bottled water plants.

With the contract just signed, New Logic will provide one VSEP RO system that will treat 75 gpm (17 m3/hr) of spiral RO reject leaving only 5 gpm (1.1 m3/hr) of final brine. The VSEP RO permeate will be used in the bottling process. A second system will be supplied to treat 170 gpm (38 m3/hr) of plant effluent which is mostly cleaning and flushing water. This is all water that came from the municipality and is used in the process of making bottled water but it is not part of the drinking water supply. The VSEP will filter this wastewater so it can be recycled and reused as cleaning, flushing water, and for cooling towers. This will vastly cut the amount of municipal water consumed and result in very small volumes of waste brine for disposal.

For bottled water companies that include membrane-filtered municipal water or well water, they have a significant volume of reject water that is discarded. Even though this may only be 10-20% of the total volume consumed, it can add up quickly. We can provide a solution that would take the efficiency from 75-90% to greater than 99%. We

have done this for many of these companies. We can also provide solutions for recycling of cooling tower blowdown, flavored beverage line wastewater, and other difficult waste streams.

The economics of resource recovery are not based solely on the value of the water that is recovered or the reduction in sewer fees, but in the public relations impact and the marketing value of the sustainability effort. And in cases where a new plant location is untenable due to strict sewer restrictions, VSEP becomes the enabling technology for the entire plant to exist.



Many people don't know about New Logic or VSEP, but we've been doing this for thirty-five years now.

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To-date, we have focused mostly on industrial water and wastewater, but with our unique ability to handle RO reject and other tough wastewaters, beverage companies have been increasingly interested in what we have to offer.

New Logic developed the VSEP vibratory membrane system to be able to handle difficult wastewater streams that exceed the limits of conventional Spiral RO membrane modules. By doing this, membranes can be considered for applications thought previously to not be possible. The open channel flow and the vibratory shear created by the resonant frequency allows for filtration of wastewater high in suspended solids, biological materials, and solutions near saturation that would scale a spiral membrane module. One of the best uses of VSEP is to filter the reject from other membrane systems. VSEP can be used to extend the use of RO membranes to increase the yield of treated water and reduce the volume of reject brine that is left over. RO groundwater desalination is an application where people have struggled with the use of membranes for a long time especially in the Southwest where Silica levels are high. One problem with inland desalination is the disposal of the salty reject that is left over. New Logic has now perfected a process for efficiently filtering spiral RO reject leaving a very small volume to dispose of. Because of this, more options are available for reject disposal including evaporation for complete Zero-Liquid discharge.

VSEP Lab Testing Activity

We have set up an excellent bench testing facility with lots of space and capabilities. Our requests for bench testing have increased rapidly. We currently are running five LP VSEP pilot machines full time.

The applications recently tested include:

Flue Gas Desulfurization (FGD) Effluent
Lithium Brine
Cement Wastewater
Phosphoric Acid Purification
LiOH Concentration
Gypsum Concentration
Magnesium Hydroxide Concentration
Vinasse Effluent
Acetaminophen Dewatering
Cow Manure

Bench tests upcoming include:

Digester Effluent
Cooling Tower Blowdown
Spiral RO Reject
Caustic Wash Purification
FGD Effluent
Evaporator Condensate
Landfill Leachate
Mining Pond Water

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Alfa Laval and New Logic Team-up

Scandinavian design is a design movement encouraged by government design institutes in the five Nordic countries. The design tenants are characterized by simplicity and functionality. These two form and function aspects of design are especially important for industrial companies. Complexity can lead to problems, more things can go wrong. Alfa Laval is a Swedish company founded by Gustaf de Laval in 1883. New Logic was founded in 1987 by some guys who trace their ancestry back to Bergen Norway. Their ancestors emigrated to balmy Minnesota during the great potato famine of the 1880s. At that time, Norway and Sweden were one country. So a partnership between Alfa Laval and New Logic seems like a perfect match. Both companies hold on to the design importance of simplicity and functionality.

Representatives of Alfa Laval recently came to New Logic in balmy Minden Nevada to discuss methods of cooperation. In addition to having design disciplines that are similar, these two companies also manufacture equipment that is complimentary and makes a perfect match. Both companies are in the business of providing practical solutions to industrial customers who face the challenge of becoming zero discharge. Increasingly companies that manufacture a product like electricity, food, or beverages are being told they cannot discharge any effluents, or must meet very strict regulations. These companies are experts in the product that they make and are always fine with capital spending to make more and grow their business. These customers are not so keen to make capital investments in becoming wastewater treatment operators and experts. That is where the simplicity and functionality of the equipment that both Alfa Laval and New Logic can provide really helps.

Alfa Laval is a leading global provider of products in the areas of heat transfer, separation and fluid handling. These include heat exchanges and evaporators. Alfa Laval aims to provide simple and functional solutions to its customers in various industries throughout the world. They deliver these products and solutions mainly in energy, the environment, food, and the marine industry.

New Logic provides its unique VSEP vibratory membrane filtration system to dewater effluent and brine so that the water can be recycled and the waste volume can be minimized. Its solution is simple and functional. New Logic's competitors supply treatment solutions that we call the "and then" process. These solutions are often very complex combinations of dissimilar technologies that must be used in series to get the same result you could get by just using VSEP. These will include treatment processes where you first use this, and then you use this, and then you use this and so on. Thus, the name the "and then" process. These multiple devices must work perfectly in unison.

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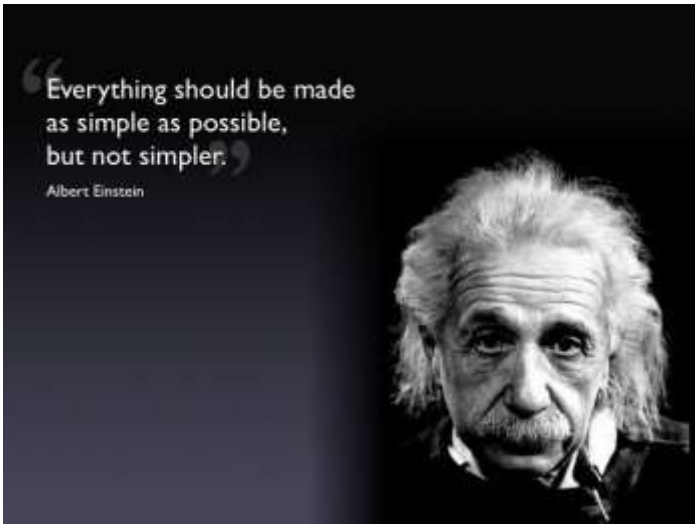

Increasing process liquid temperature reduces the viscosity and this will increase the throughput rate when using membranes. VSEP membranes can reduce the volume of brine slurry but cannot make dry solids. So an evaporator as the final step is naturally needed. A heat exchanger at the beginning can increase the temperature which improves the throughput rates of the VSEP. By combining efforts, New Logic and Alfa Laval can provide complete solutions from the beginning to the end for customers facing zero-liquid discharge requirements. These solutions are simple, functional, and don't require complex transformations within the clients organization.

Get to know New Logic – Katrin Torres

Katrin Torres is New Logic's Customer Relationship Manager and has worked for New Logic for 16 years. Her dedication to customer satisfaction is a cornerstone for our company. She was born and raised in Stuttgart in South Germany. This area is known as a manufacturing hub. Mercedes-Benz and Porsche have headquarters and museums there. The city is filled with greenspaces which wrap around its center.

From an early age she had a curious mind and enjoyed learning languages, philosophy and exploring other cultures. When she was 13, she travelled with her Ballet school to Provence, South France. She was intrigued by the language, food and culture. Meeting new people with different culture backgrounds has always interesting to her. That is what makes her so well suited for her current job at New Logic.

After college she started working in the insurance industry and enjoyed working with people and could use her language skills since as the head of the claims department she had to deal with many cases including cases from around the world. Every summer she traveled to Spain and learned a lot about art and food. Her favorite languages are German, English, French and Spanish. She enjoys speaking them whenever there is an opportunity. Having many language skills and a curious mind allowed her to evolve at New Logic. She starting with technical translations, then to Sales, then assistant to management, and to the position of CRM Manager. Outside from work she enjoys running around with her two Labs, hiking, and skiing with her husband in the beautiful Sierra mountains.

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VSEP University Update - USask

New Logic has supplied one of its LP VSEP pilot machines to the Ag research department at the University of Saskatchewan, or USask. They will use this filtration unit to research the use of VSEP for dewatering and concentrating the solids residue left over when ethanol is derived from wheat. This is known as wheat stillage. The University of Saskatchewan is a Canadian public research university, founded in March 1907 and located on the east side of the South Saskatchewan River in Saskatoon, Saskatchewan, Canada. New Logic supplied the test unit and recently sent one of its senior engineers to train graduate students on how to operate the equipment. New Logic has supplied these LP VSEP pilot machines to 20 Universities around the world.

The University of Saskatchewan is one of Canada's top research universities based on the number of Canada Research Chairs. There were 120 hectares (300 acres) set aside for university buildings and 400 ha (1,000 acres) for the U of S farm, and agricultural fields. In total 10.32 km^2 (3.98 sq mi) was annexed for the university.

Ethanol is produced by the fermentation of monosaccharides such as glucose and fructose. The monosaccharides are typically formed through the hydrolysis of any number of biomass options including wheat. The biomass source for Ethanol production varies depending primarily on local economics and resources. This can be considered an advantage in that regional development of fuel production facilities can optimize for the economics and resources of their own particular surroundings. The two largest producers of Ethanol, Brazil and the United States, use biomass sources that are high in carbohydrate content. Other cellulose feed sources are possible as well, such as grass or woodchips.

The Ethanol is removed from the water and solids by taking advantage of its lower boiling point. The Ethanol at this stage is typically 96% pure (4% water). In order to create anhydrous Ethanol, a secondary

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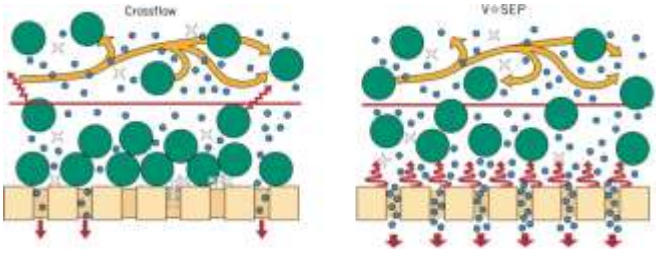
step is required. The water and solids left behind are called "stillage." The stillage can then be concentrated and used for many different purposes such as boiler fuel.

Removing the solids from the system can be very difficult and costly. The leftover biomass from the Ethanol production must be removed from the aqueous stream in order to have any value as incinerator fuel. V✧SEP is specifically designed to handle high solid liquid streams.



V✧SEP Vibratory Shear Enhanced Process

Customer Service is Everything

Lifetime tech support is included with every VSEP purchase. Most issues can be resolved remotely via internet access to the VSEP control. Sometimes, site visits are needed to resolve any problems. New Logic has assembled an extremely qualified and dedicated staff of field service engineers. Some of the field assignments can be very challenging, like a few weeks in Kazakhstan or trips to South Africa where it can take 3 days of travel to arrive. All of our engineers are assigned a basket of projects and check on them regularly to lend support. This work can be around the clock 7 days a week. New Logic's mission is to look after each project installed and make sure we have done all we can to make it a success.

The picture below is of senior engineer, Trevor Crabtrey, visiting a project experiencing trouble with customer staff turn-over and beginner operators looking for help. Even though we recommended a covering for the VSEP system, this client decided to go naked outdoors. Shortly after commissioning, this system took a direct hit from a hurricane. Even still, Trevor and the other engineers will go through thick and thin to lend a hand.

The VSEP machinery is very easy to install and is mechanically simple. Ironically, it has taken a great deal of engineering and prototyping to make the design so compact and simple. The design history has shown that the simpler the design, the better the machinery has performed. Even though New Logic Research is proud of its accomplishment and the performance of the VSEP system, we are continuously looking for ways to improve the design. This is especially true for difficult applications which have not been addressed by the typical mainstream filtering systems

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before. We want VSEP to be successful in all applications and or it to be far superior to anything else on the market.

While the machine design is simple and the system is easy to install, it is a finely adjusted performance machine and must operate within strict limits to avoid damage to the components. As with any mechanical device which is vibrating or spinning, adjustments and proper tuning are essential. If they are abused or used outside of their intended use, they must be replaced when damaged. It is absolutely essential for the operator of a VSEP system to have knowledge of the operating parameters which must be adhered to at their facility. The slightest deviation from the proper procedure can be very costly. As long as the machinery and filter pack are used as intended and the proper operating procedures are followed, the VSEP unit will provide many years of dutiful service.

Recent VSEP Systems Shipped:
Lithium Hydroxide Concentration, Arizona
Digester Effluent, Spain
University Research, Rutgers
Cow Manure, Colorado
Wood Pressate, Idaho
Detergent Effluent Missouri
Digester Effluent, Scotland
Cooling Tower Blowdown, Texas

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March 2024 Newsletter Edition