
AMPSCOT
SEACHANGE
TECHNOLOGIES

Barrels Per Year 24B

Cost Per Barrel $3

US Market $72B

NM State Land Office, 2016

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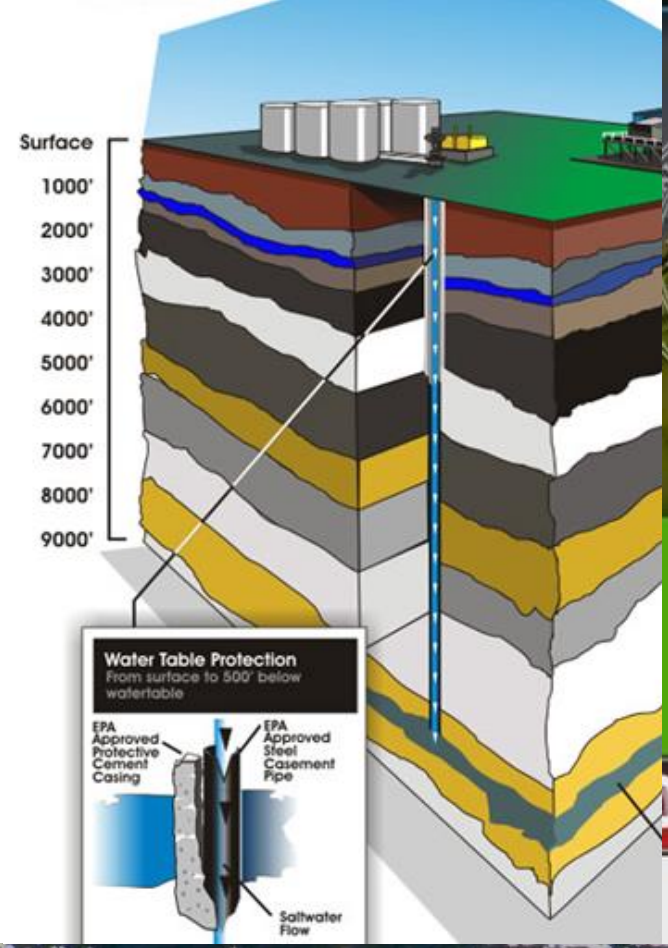

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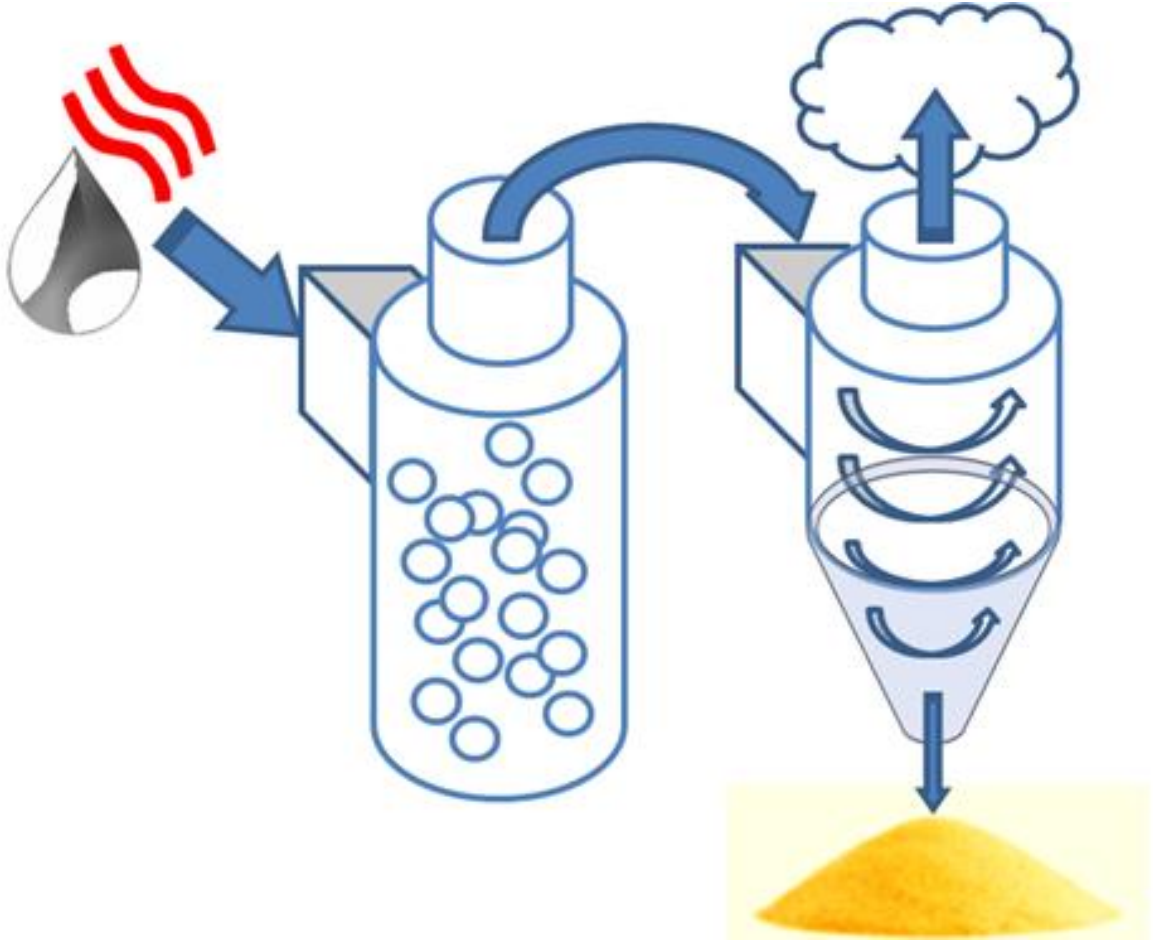

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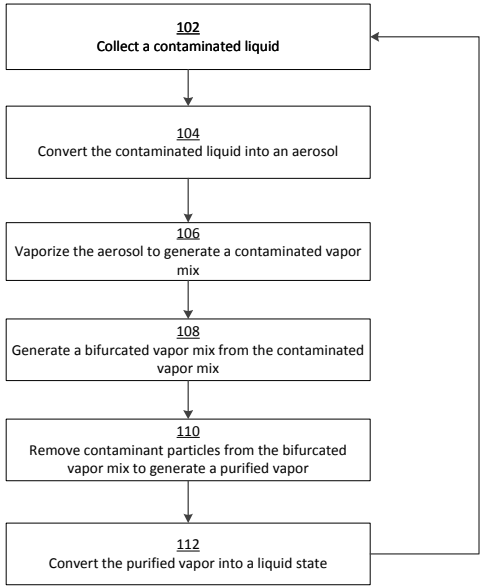
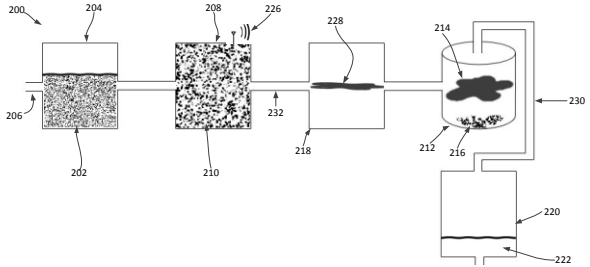
Intellectual Property

- Broad claims around process.
- US and PCT, May 2015, accelerated to Track 1 in 2016
- Strategy to extend with specific designs.

KILPATRICK TOWNSEND





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Dipak Mahato, PhD, Founder/CEO.

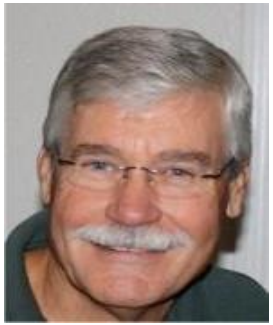
15 years R&D, patent development, NIH, Pfizer.

James Little, Engineering

NCSU Mechanical engineering, 15 years engineering and IT.

Kyle Harper, MBA, Business Development

15 years marketing and product launch.



Randy Marcuson, Advisor

CEO Embrex. UNC Kenan Flagler Leadership Immersion Program

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ati clean energy incubator
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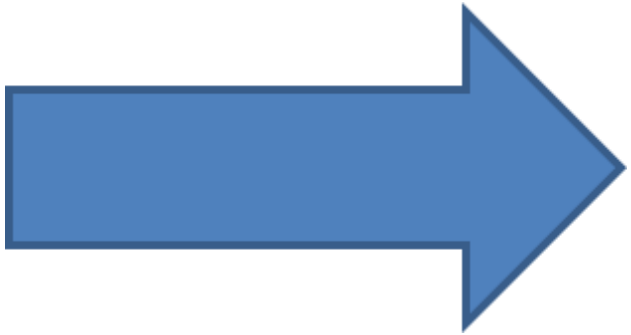
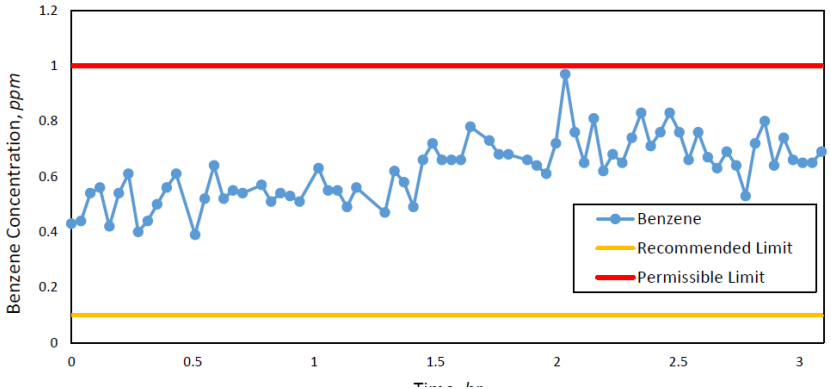
Validation



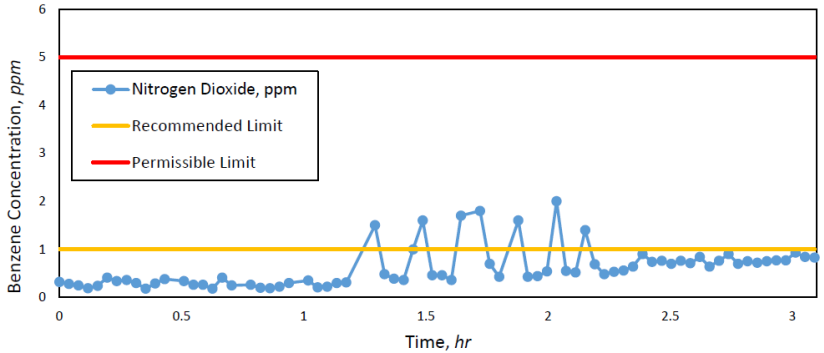
Emissions

Chemical	Formula	Class
Ammonia	NH3	-
Benzene	(CH)6	VOC/HAP
Carbon Dioxide	CO2	GHG
Carbon Monoxide	CO	NAAQS
Ethane	C2H6	VOC
Ethylbenzene	C8H10	VOC/HAP
Formaldehyde	H2CO	HAP
Methane	CH4	GHG
Nitric Oxide (NO)	NO	NAAQS
Nitrogen Dioxide (NO2)	NO2	NAAQS
m-Xylene	C8H10	VOC/HAP
o-Xylene	C8H10	VOC/HAP
p-Xylene	C8H10	VOC/HAP
Propane	C3H8	VOC
Toluene	C7H8	VOC/HAP

Benzene emission concentration as a function of time during SeaChange Field Trial (5/18/16)



Nitrogen dioxide emissions concentrations as a function of time during SeaChange Field Trial (5/18/16)



Energy use

- Original prototype was solely electric powered.
- No other costs (chemicals, disposables, pre-treatment, filters/membranes)
- Zero liquid discharge, and zero liquid output.

Table 3-6 *Comparison table the energy consumption of various water treatment technologies*

Seawater RO[1]	2.5-3.5	*kWh/m³*
PW RO[5]	10-15	*kWh/m³*
GPRI PW RO	26.5	*kWh/m³*
PW MVC[5]	19-26	*kWh/m³*
SeaChange Prototype	**75.3**	*kWh/m³*
PW MED[5]	200	*kWh/m³*
PW FO[5]	600	*kWh/m³*

Pilot System

- **Gas fired, reducing operating costs.**
- **Currently under construction.**
- **Estimated December 2016 completion.**

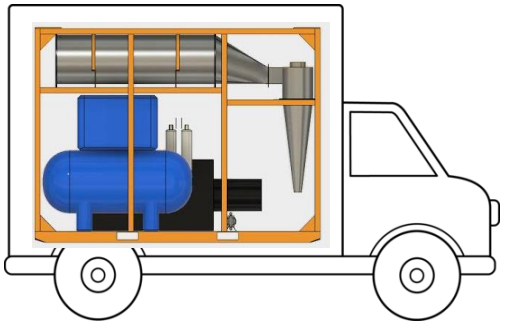
Energy requirement scenarios, based on thermodynamic model and power consumption.

Scenarios				
Incoming water temp (F)	70	150	70	150
TDS (PPM NaCl)	30000	30000	200000	200000
ambient air temp (F)	65	65	65	65
ambient air relative humidity (%)	25	25	25	25
Energy requirement per gallon				
Electricity, motors (kWh)	0.17	0.17	0.17	0.17
Thermal (BTU)	10250	9630	7375	6760

ASSUMPTIONS AND CONSIDERATIONS

- Our thermodynamic model contains a variety of factors, and only the most impactful are shown.
- NaCl is modeled as the sole TDS material, because the model incorporates the specific heat of dissolved solids.
- The model incorporates a 20% safety factor for thermal energy. The electricity requirement is based on equipment ratings.

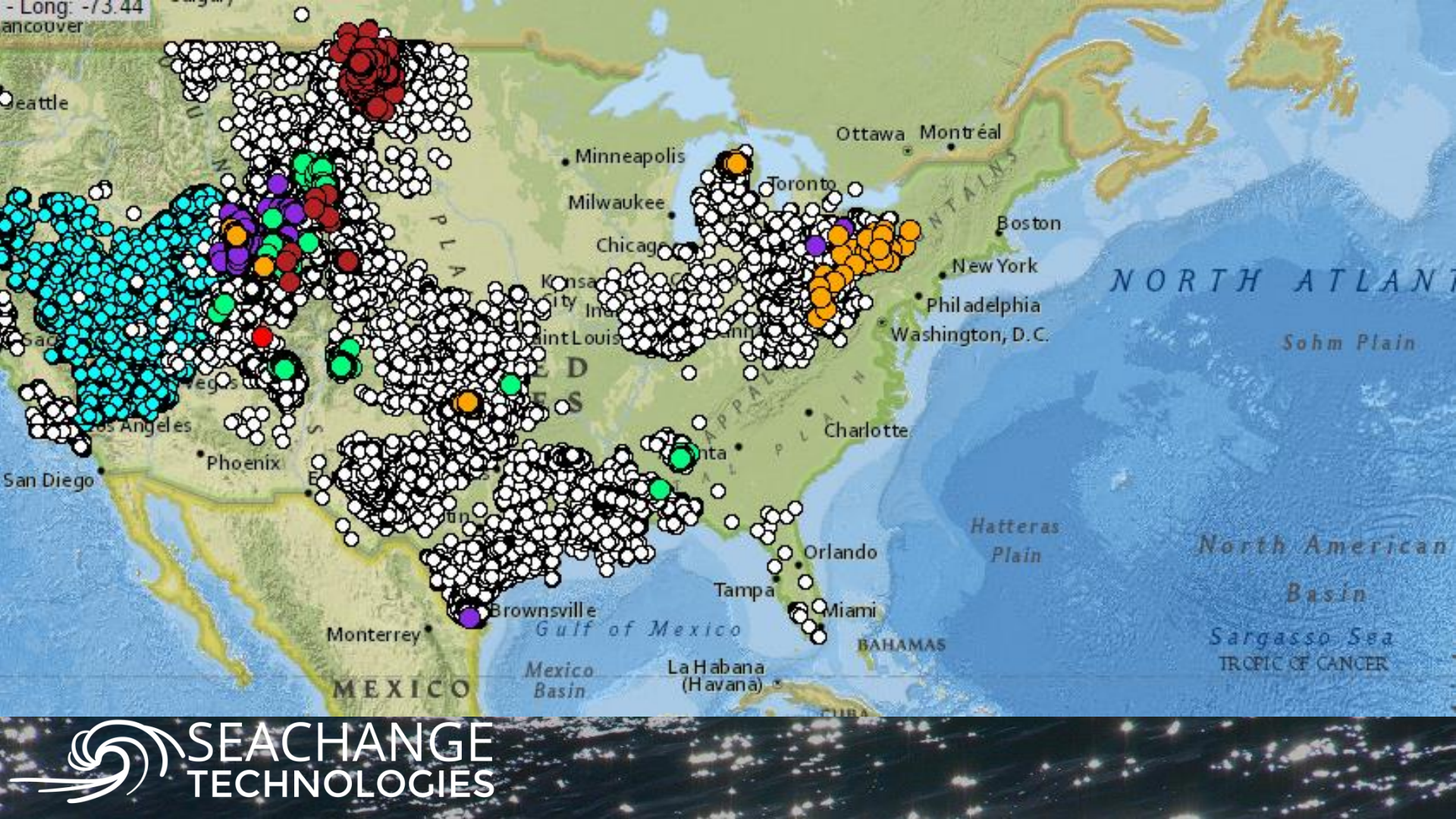
Business Model



Installation

Royalty fee

Service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Monterrey
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San Diego
Hatteras Plain
North American Basin
Sargasso Sea
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Thank you

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