

MARCELLUS SHALE



Frac Water Treatment

Aquatech International Corporation, One - Four Coins Drive, Canonsburg, PA 15317



Aquatech Introduction - Overview



**Global Headquarters in
Canonsburg, Pa**



**Manufacturing Facility in
Canonsburg, Pa**

- Aquatech exists to meet the world's need for Pure Water.
- Leading player in the global water industry
- 28+ years of successful performance
- Worldwide offices in Canada, China, India, Italy, UAE, KSA and USA
- Over 1000 Major Projects in > 60 Countries
- Focus - Industrial and Infrastructure Markets

Process / Pure Water

Wastewater Treatment

Recycle and Reuse

Desalination

Zero Liquid Discharge

Aquatech Introduction - Technologies

Pre-Treatment

Clarifiers
Filters
Chemical Feeds
Oxidation
Sludge handling



Ion Exchange

Split flow
Counter current
Layered Bed
Condensate
Polisher
Specialty applications



Membrane

Microfiltration
Ultrafiltration
Nanofiltration
Reverse Osmosis
HERO™
FEDI
Membrane Bio
Reactor (MBR)



Desalination

Spray Film Multiple
Effect (MED)
Multi Stage Flash
(MSF)
Mechanical Vapor
Compression
(MVC)
Sea Water Reverse
Osmosis



Zero Liquid Discharge

Vertical tube falling
film evaporators
Seeded Slurry Brine
concentrators
Non – Seeded
evaporators
Forced Circulation
Crystallizers
Horizontal Spray
Film™ Evaporators
Submerged Tube
Evaporator
Rising Film
Evaporator
HERO™
Sludge Dewatering



Environmental Issues

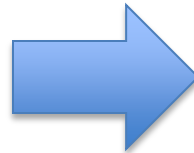
Limited disposal options require alternatives

Deep Well Injection (Disposal)

Pennsylvania has 8 total wells, with 7 still open. *All are private. Geology is, in general, not favorable to creation of new wells.*

West Virginia has approximately 70 wells.

Ohio has approximately 200 wells



What is being done? (Recycle and Reuse)

Blending with limited treatment

Wide range of various pre-treatment followed with blending. (Mobile)

Thermal technologies for full treatment. (Mobile and Central)

Solutions: What is being done?

Pre-Treatment (Various, Wide Range)

Method: Frac water undergoes limited treatment before blending with fresh water.

PT Types:

Ba	Softening
TSS	Hardness
Sr	O&G
Fe	Disinfection

Pros: Minimal investment (purchase or service), small and mobile/modular approach for ease of deployment



Aquatech – designed clarifier for TSS, etc. removal

Solutions: What is being done?

Central Facility for Treatment (ZLD)

Method: Water is treated with evaporator and crystallizer technologies.

Pros: Full range of water chemistry can be treated. Liquid waste is not generated. Approach is sustainable and 'green'.



Aquatech Evaporator for SAGD O&G in Canada

Solutions: What is being done?

Mobile On-Site Treatment

Method: Water is treated with small evaporator system.

Pros: No investment when offered as service, small and mobile approach for ease of deployment, “green” model



*Aquatech MoVap™
Water Treatment Rig*

Why a mobile solution?

Positive impact on production, cost , and environment

1. Reduced volume and cost of waste water disposal
2. Reduced volume and cost of off-site waste water treatment
3. Reduced volume and cost of sourcing fresh water for fracing
4. Reduced truck traffic to transport water
5. Enhanced community relationships from reduced truck traffic and noise
6. Improved production from reduced scaling from untreated water reuse



Aquatech MoVap™
Water Treatment Rig

Contact Information

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