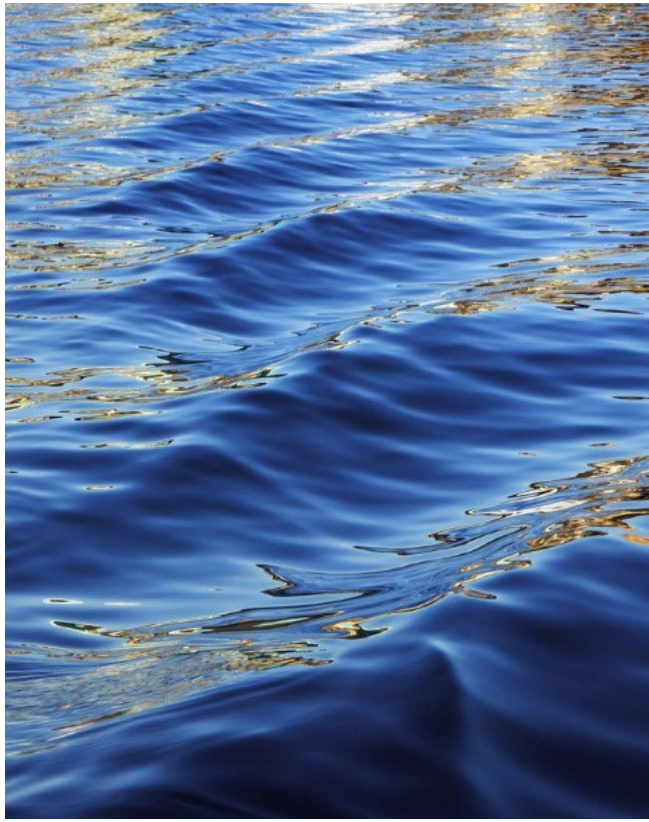
Primary Wastewater Treatment

Ecologix Environmental Systems

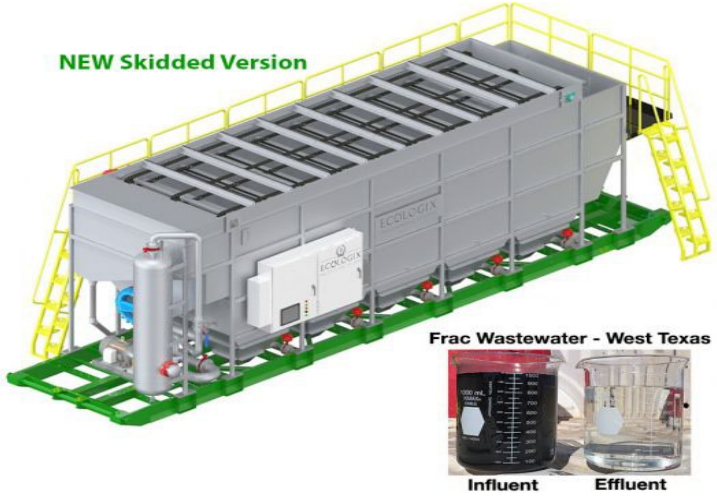
ECOLOGIX™
ENVIRONMENTAL SYSTEMS



Primary Wastewater Treatment

- **ITS 1500** : Frac Water Recycling Platform

- **E-DAF** : Enhanced Dissolved Air Flotation System



About Ecologix

Ecologix designs and integrates water & wastewater treatment solutions for industries and municipalities.

SERVICES PROVIDED TO OUR CLIENTS:

- Treatability studies
- Engineering
- Design
- Fabrication
- Installation
- Start-Up & Training
- System Operation

Who We Serve

INDUSTRIES

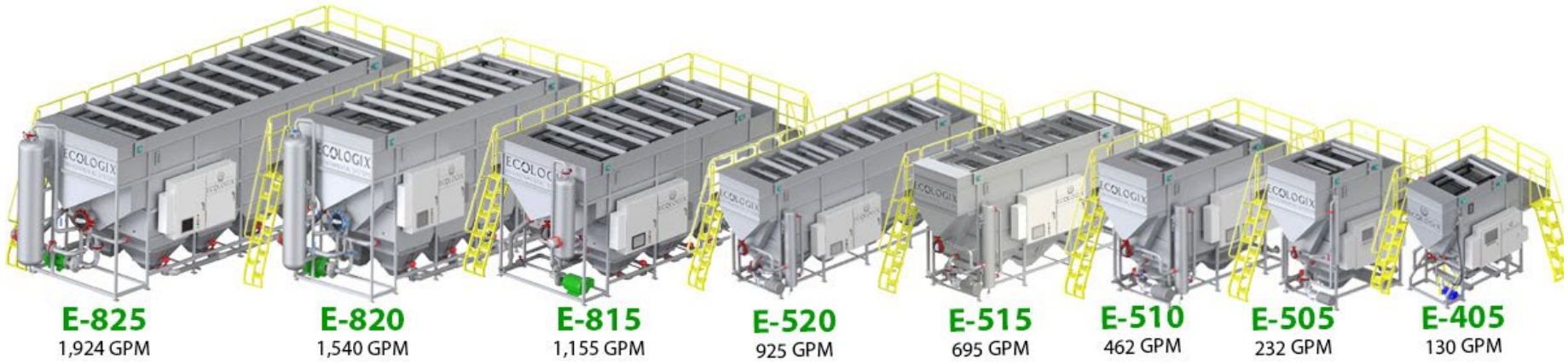
- Oil & Gas
- Automotive
- Food & Beverage
- Mining
- Municipalities
- Pulp & Paper
- Petrochemical
- Utilities

ITS - 1500

Introducing our industry leading Integrated Treatment System

Enhanced Dissolved Air Flotation (E-DAF)

The Complete Primary (phys/chem) Treatment System
Max Flow Rates: 130 - 3.700 US GPM



Features

- Reduced footprint
- High efficiency
- Air scouring – for automatic tube cleaning
- Whitewater pumps
- Countercurrent scraping
- Sludge grating/thickening
- Fewer moving parts
- Full movable SKID

Industries

- Meat processing / slaughterhouse
- Dairy processing (milk, cheese, yogurt)
- Confectionary/Candy manufacturing
- Bakery / baked goods
- Automotive industry
- Printing
- Cereal and snack foods
- Food processing and packaging
- Beverage factories (breweries, juice, soda)

E-825 Enhanced DAF

E-820 In Action

Frac Water Treatment for XTO Energy in Texas

Turbidity – 250ntu down to 0
Dissolved Iron – 30mg/L down to 0

Haliburton Study

In 2012, Halliburton experimented using produced water with TDS levels of up to 285,000ppm, here are the results:

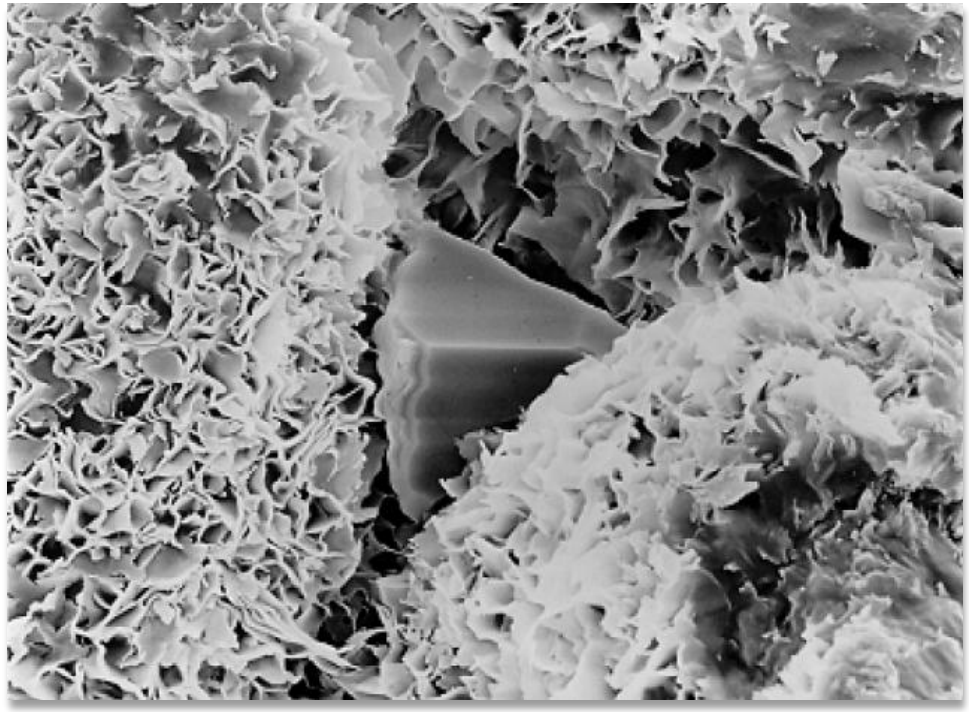
- **100% success rate** over 59 wells and 260 stages
- No production decrease vs. fresh water
- **Avg. savings per well $70K-$100K**, mostly due to reduced truck movements

The Bottom Line:

- TDS Removal – why pay to remove TDS when you can adjust fluid composition at a fraction of the cost?
- TSS Removal – Proppant permeability increases by 20% when TSS is removed

Fresh Water Causes Clay Swelling

- Hydraulic Imbalance - Formations with smectite clays swell when fresh water is introduced
- Swelling clay can result in a 2-40% reduction in well productivity
- “In heavy oil recovery, incompatible fluids are often injected into hydrocarbon reservoirs, which cause clay swelling and thus impair the formation permeability”[1]



1. Krueger, R.F. (1986): An Overview of Formation Damage and Well Productivity in Oilfield Operation, Journal of Petroleum Technology, Vol. 38, pp. 131–152.

TDS Reduces Permeability

- Fracture permeability through proppants suffers with presence of TSS and Colloidal Slime

Colloids are particles ranging between 1 and 1000 nanometers (millimicrons) in diameter, yet are still able to remain evenly distributed throughout the solution

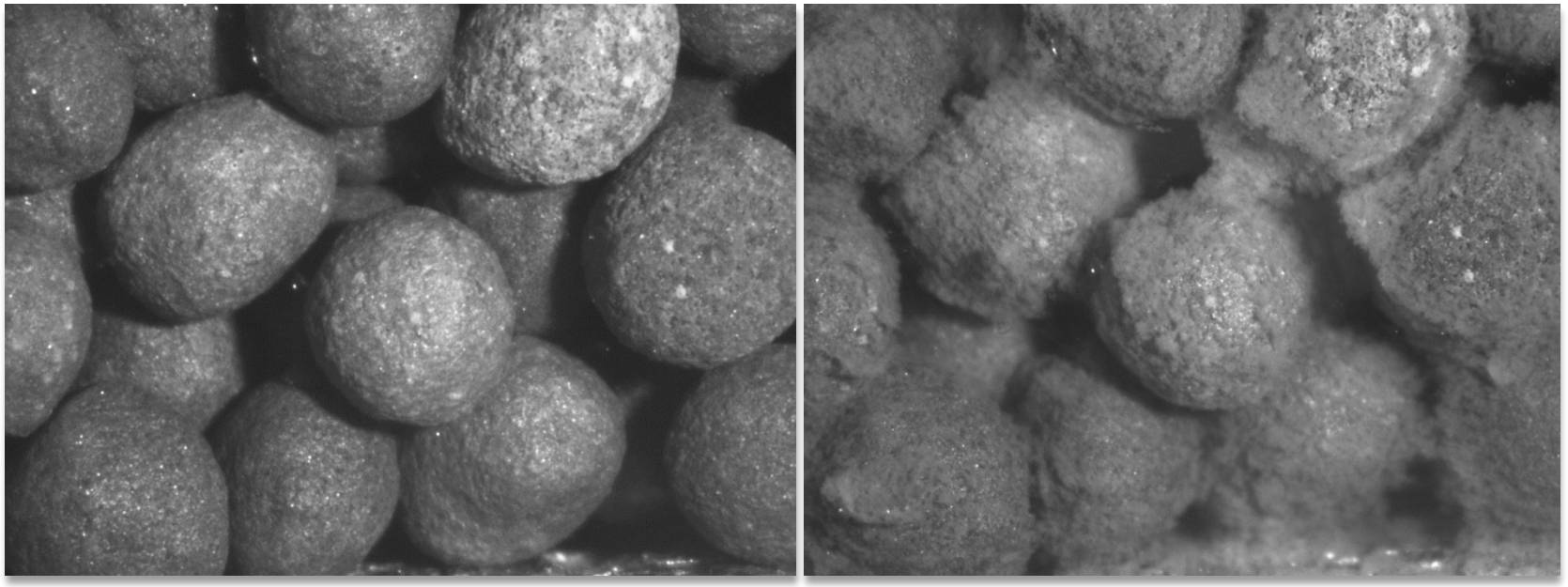
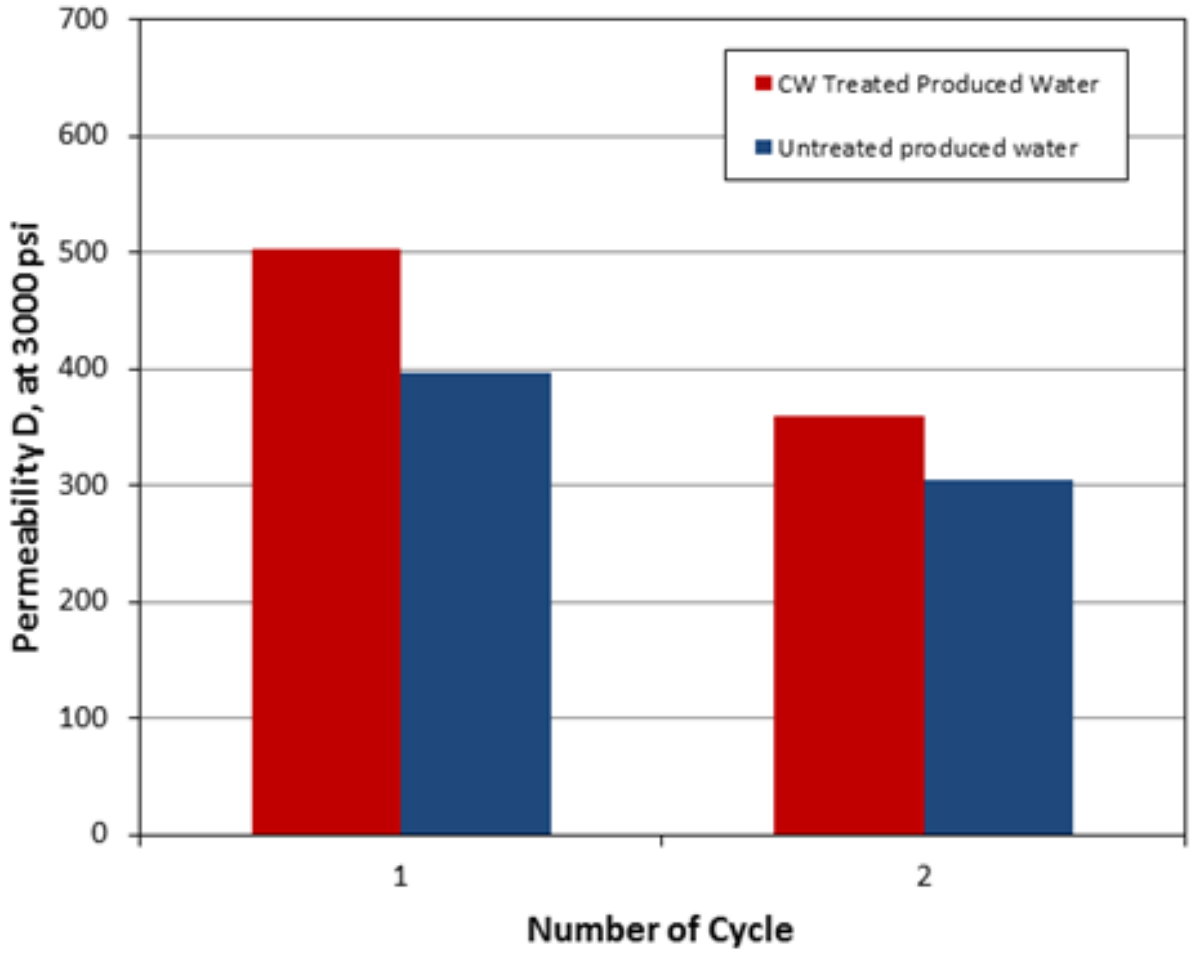


image source: Halliburton

TSS Impedes Well Productivity

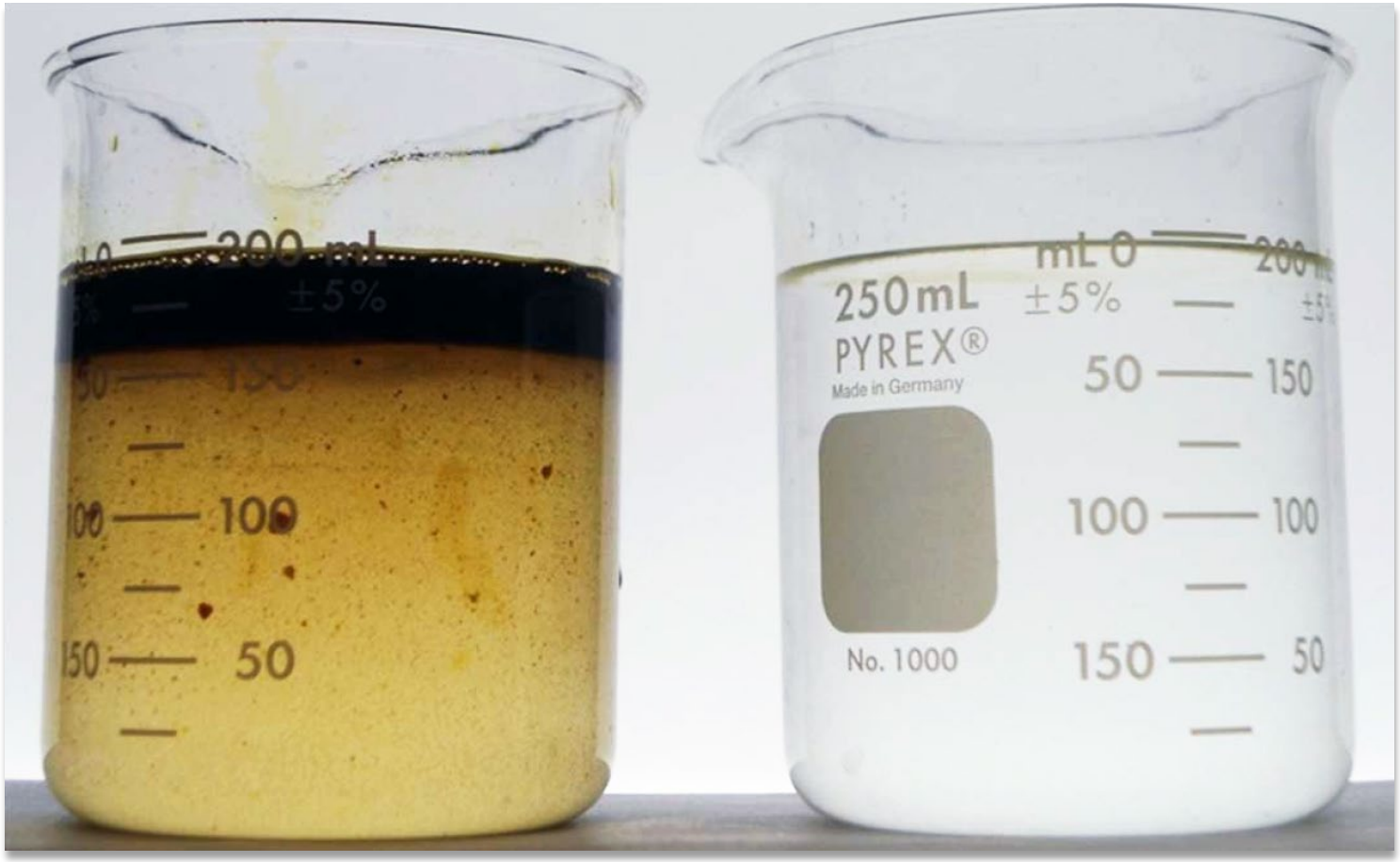


- Treated produced water maintains about 20% more permeability

data source: Halliburton

Impressive Results

TDS still 273,000mg/L



Raw Produced Water

Treated Produced Water

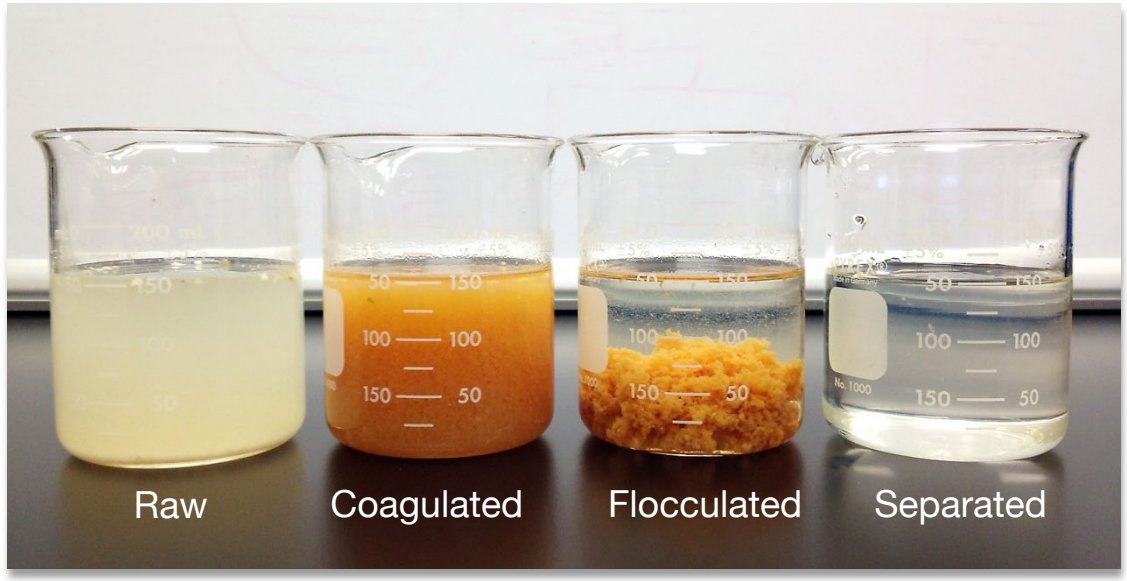
Chemical Treatment

Coagulation
Neutralizes negatively charged particles causing them to agglomerate

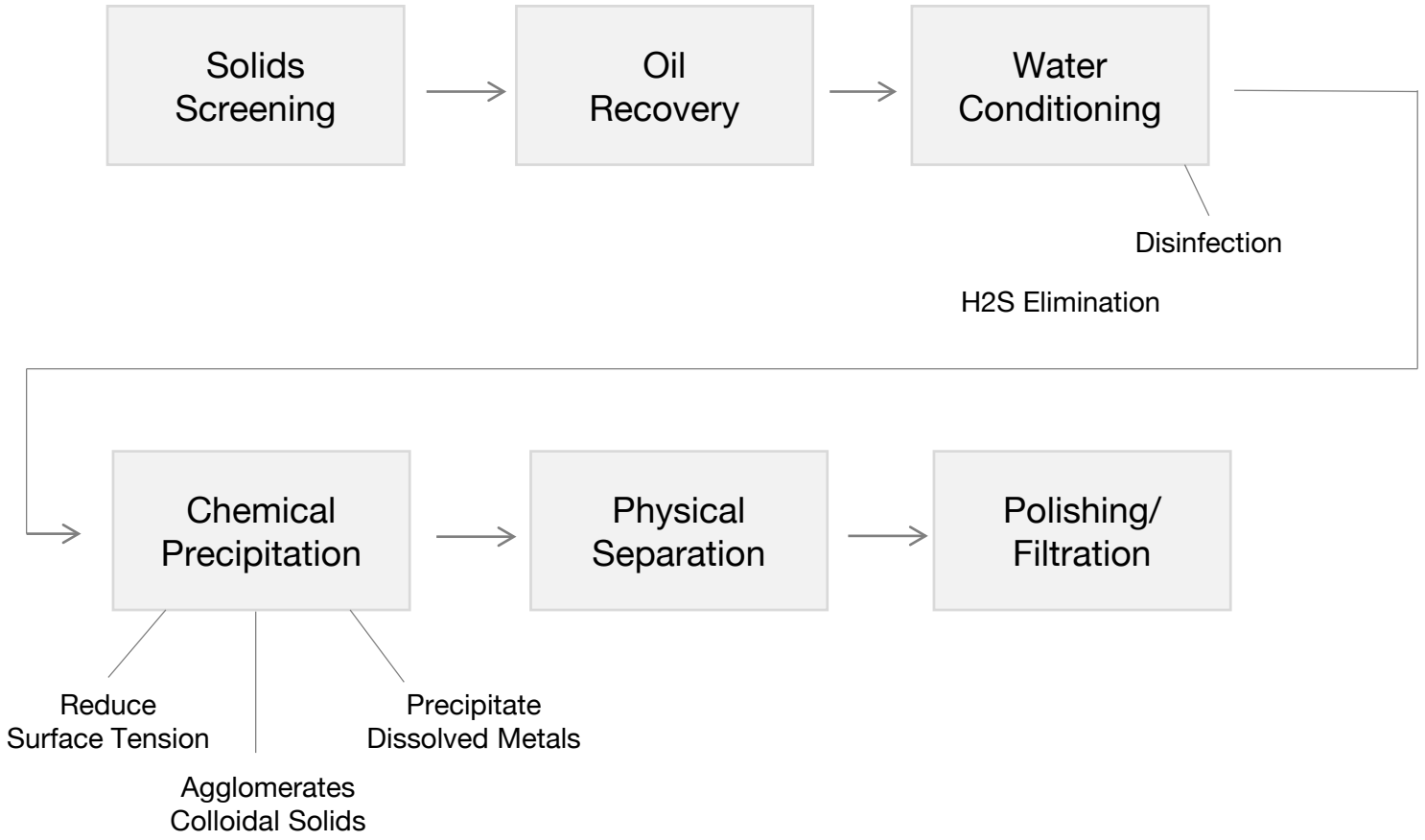
Flocculation
Forms bridges between the coagulated particles, generating large solids that can settle or float

Separation
removing formed sludge from the water, through either settlement or flotation

Coagulated water turns orange when using Iron-based chemistry



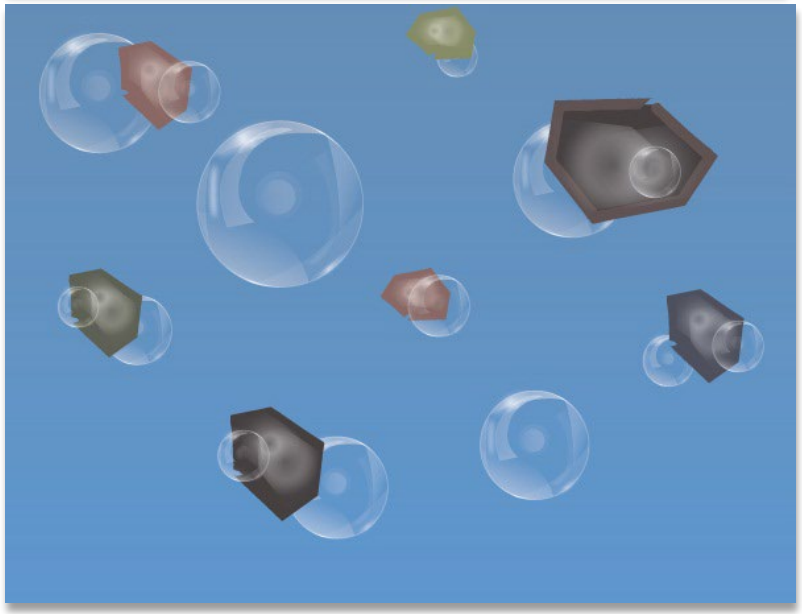
Treatment Process



Physical Separation

DISSOLVED AIR FLOTATION (DAF)

- Micro-bubbles attach to sludge and float
- Skimmer removes sludge from water
- Clean water flows out of system



Enhanced Floctube System

Max Flow Rates: 50 - 2000 US GPM

E-DAF **Enhanced** Floctube Upgrade

Our innovative DAF system has the option to include an enhanced floctube assembly to increase contact time and dramatically improve system performance.

Currently available configurations shown above.

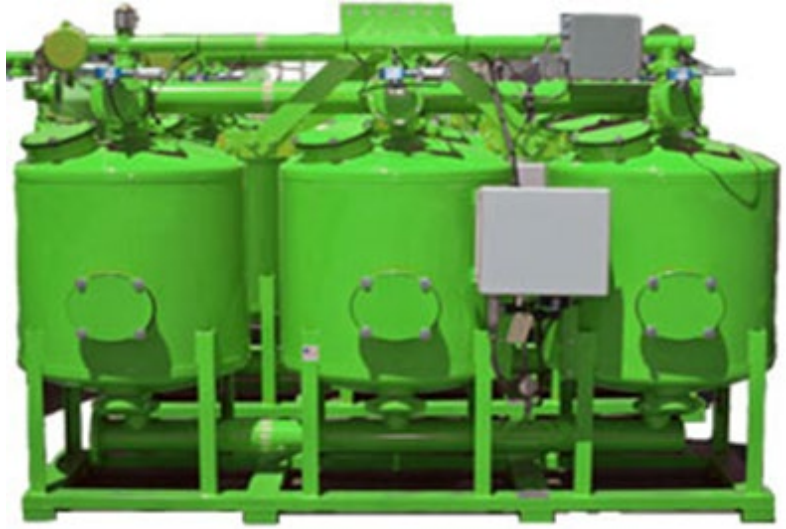
Chemical Reaction Tanks

E-DAF Chemical Reaction Tank Upgrade

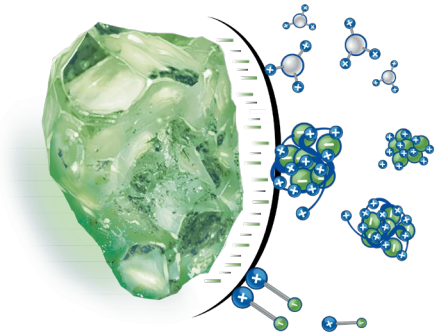
We also provide the option of adding separate chemical reaction tanks to our Enhanced DAF System.

- Easy Operation
- Greater flexibility for varying flow rates
- Enhanced efficiency

Polishing Post Filtration - AGFM



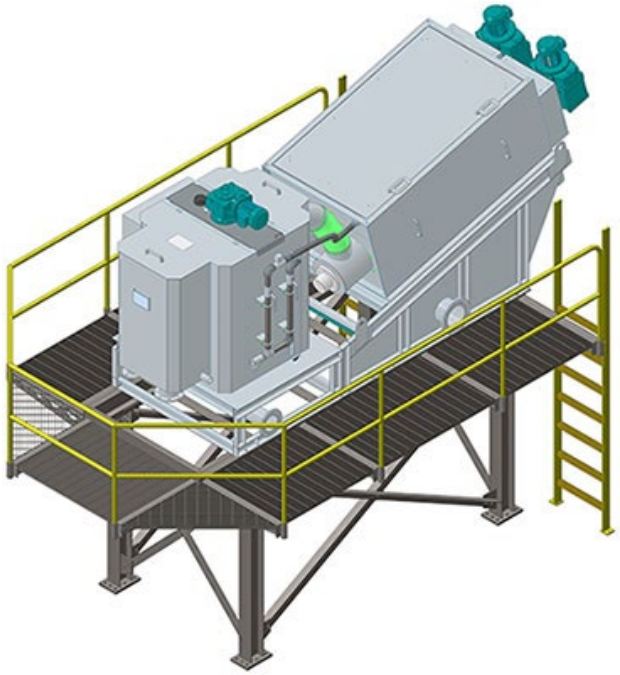
Advanced electro-static filtration



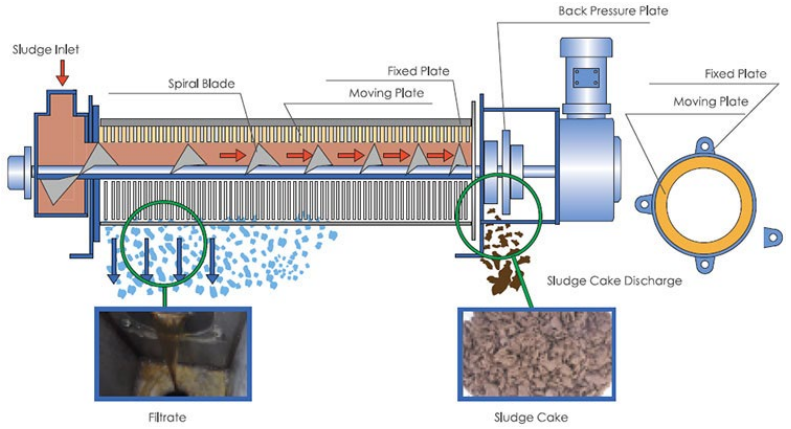
Our activation process strongly increases the negative electrical surface charge of the glass

- Removes organic pollutants & oils, TSS, VSS & Particles < 1 micron
- Over 30% lower running costs vs sand
- Activated to increase the surface area by 300 times over crushed glass or sand
- Filtration down to several microns at 100% efficiency without filtration aids
- Targeted for an efficient removal of priority metal oxides and other target constitutes
- Guaranteed prevention of channeling & biological fouling on the AGFM surface

Dewatering System – Multi Plate Screw Press (MPSP)



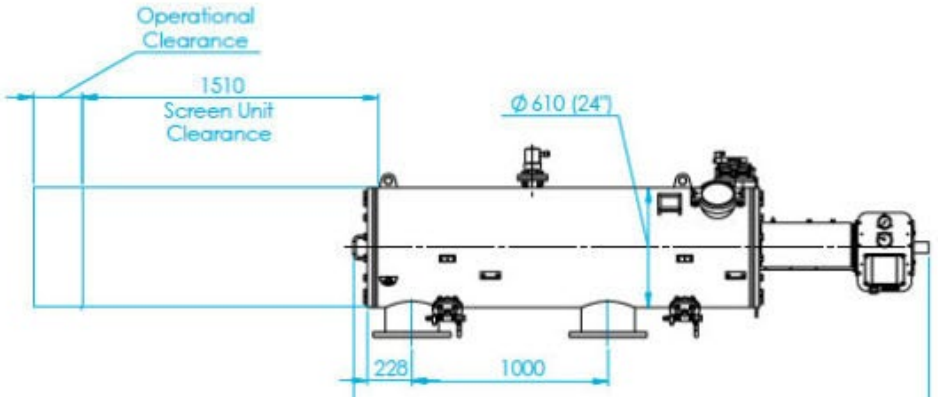
- Small Footprint
- Self Cleaning
- High Efficiency
- Low Cap Ex
- Low OP Ex



Self Cleaning Automatic Filters – Single Screen

Single Screen Automatic Filters

Reliable filtration down to 10 µm, flow rates from 50-5000 m^3/hr. Efficient removal of high volumes of TSS and organic matter including macro fouling.

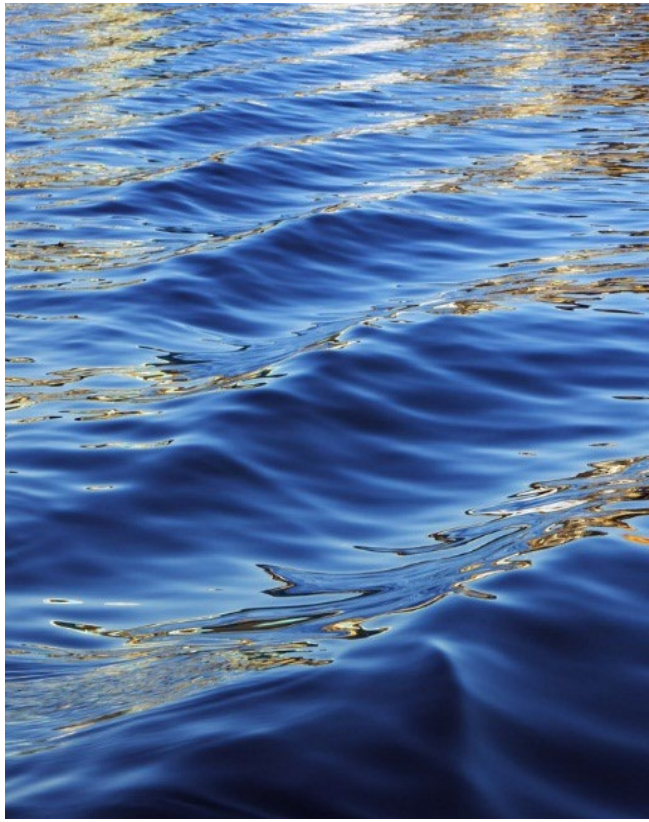


- Autonomous self-cleaning filtration cycle
- Enhanced strength & durability
- Multi-layered sintered structure
- Available screens: 10-100 or 500 µ

Secondary Wastewater Treatment

Ecologix Environmental Systems

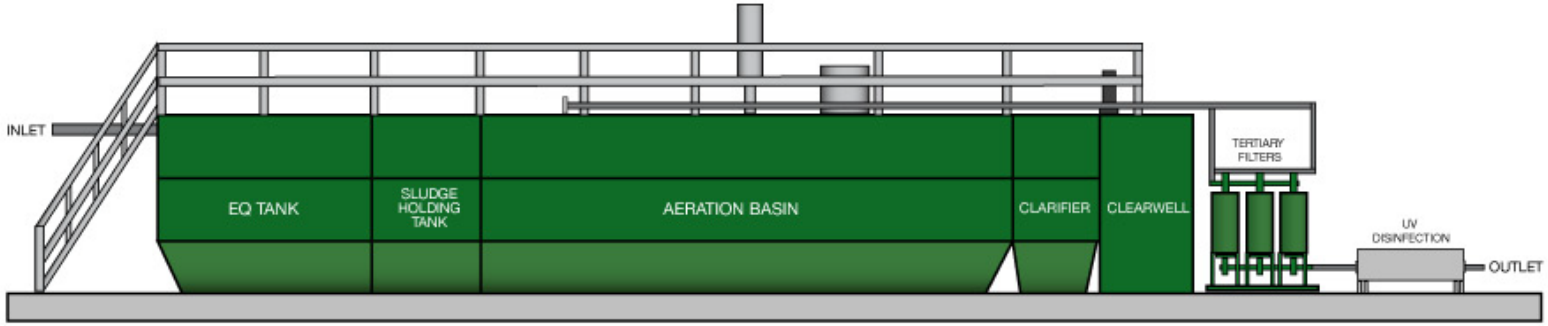
ECOLOGIX™
ENVIRONMENTAL SYSTEMS

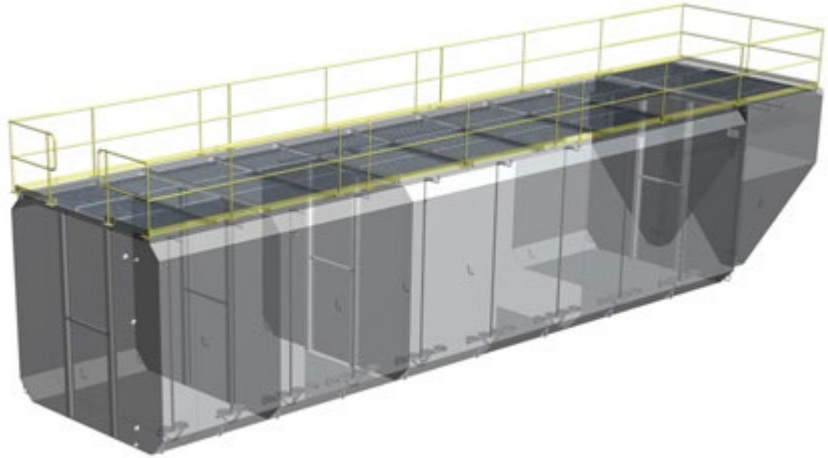


Bio-Clear Packaged Treatment Plant

Multi-stage packaged sewage treatment system is designed for developments like hospitals, hotels, and rural communities that are required to treat wastewater to levels suitable for discharge.

3,000 – 100,000 GPD Capacity

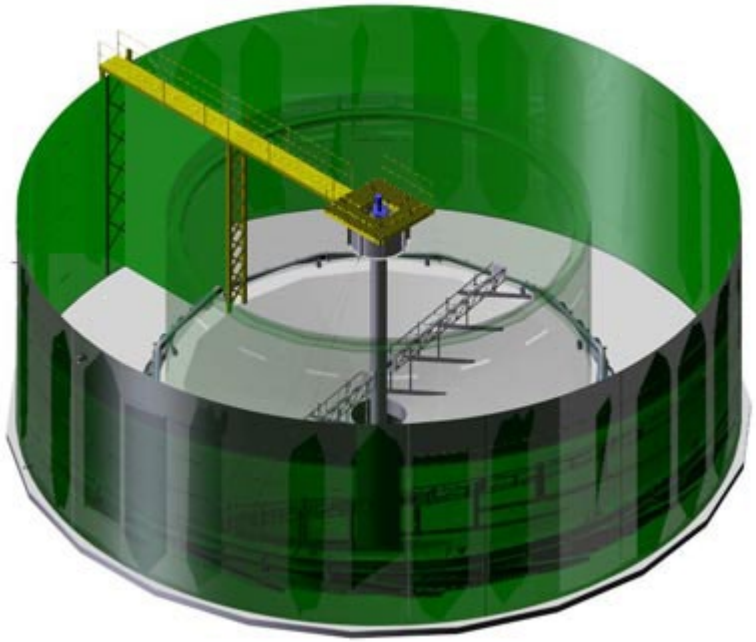




Integrated Bio-Reactor (IBR)

The Integrated Bio-Reactor (IBR) is a unique modification of the activated sludge process in which the clarifier is placed within the aeration tank. The above-ground design reduces system footprint and saves on costs associated with excavating and constructing traditional concrete basins.

100,000 – 1000,000 GPD Capacity



Moving Bed Biofilm Reactor (MBBR)

Ecologix MBBR is a highly effective biological treatment process based on a combination of conventional activated sludge process and biofilm media.

25,000 – 320,000 GPD Capacity

Membrane BioReactor (MBR)

Modular ultrafiltration membrane with uniform pore size and high rejection capacity.

Membrane Ultrafiltration (UF)

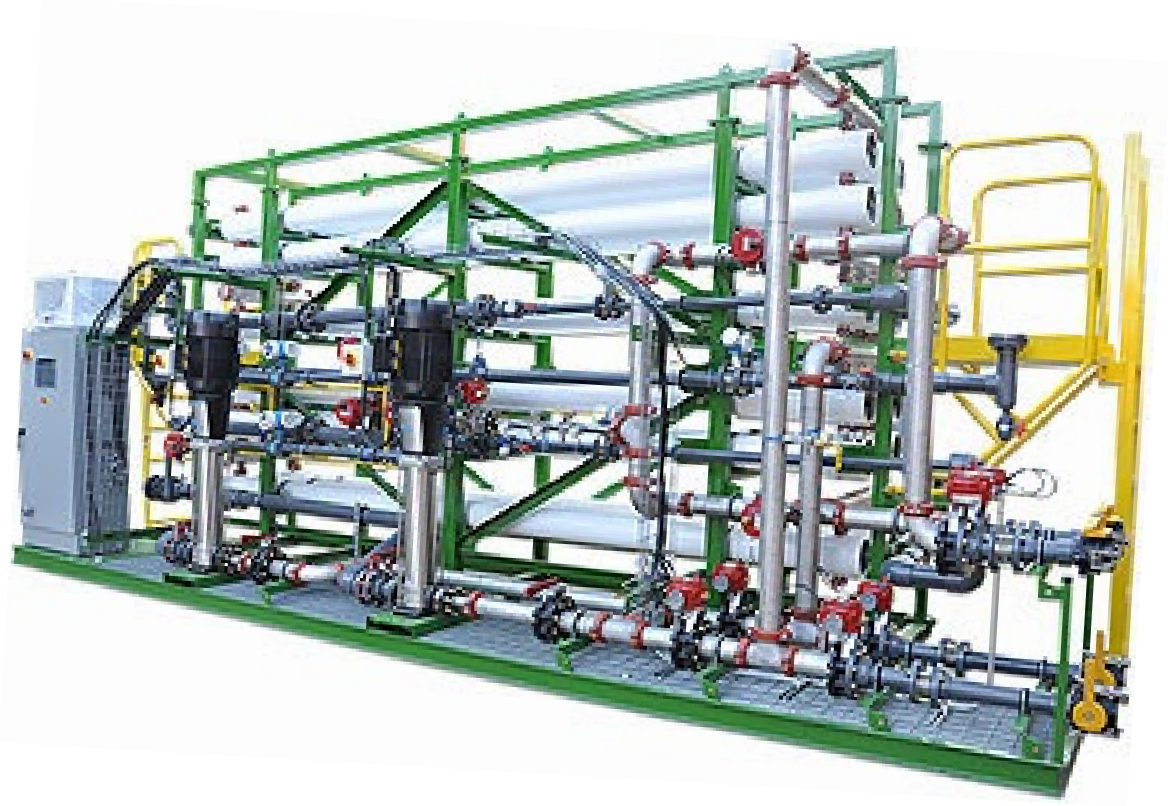
Process and waste water treatment from 25 – 2,500 GPM

- TSS/FOG pre-membrane reduction >70%
- TSS reduction to <2 mg/L
- Non-Soluble BOD reduction to <5 mg/L
- 100% membrane redundancy (optional)

Reverse Osmosis Membrane System (RO)

Reverse osmosis (RO) is the best alternative for high volume/high quality water treatment.

Reduction of TDS values > 90%



Contact Us

For All Your Primary Wastewater Treatment Needs

Contact Ecologix At:

678-514-2100
www.EcologixSystems.com