Primary Wastewater Treatment
Ecologix Environmental Systems
Primary Wastewater Treatment

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

- **E-DAF**: Enhanced Dissolved Air Flotation System
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
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)
Primary Wastewater Treatment: **E-825**
E-820 In Action

Frac Water Treatment for XTO Energy in Texas

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

Primary Wastewater Treatment: TDS

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
Primary Wastewater Treatment: Treatment Process

Solids Screening -> Oil Recovery -> Water Conditioning

- Disinfection
- H2S Elimination

Chemical Precipitation -> Physical Separation -> Polishing/Filtration

- Reduce Surface Tension
- Precipitate Dissolved Metals
- Agglomerates Colloidal Solids

Precipitate Dissolved Metals
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.
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

- 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 constituents
- Guaranteed prevention of channeling & biological fouling on the AGFM surface

Advanced electro-static filtration

Our activation process strongly increases the negative electrical surface charge of the glass.
Dewatering System – Multi Plate Screw Press (MPSP)

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

Primary Wastewater Treatment: MPSP
Single Screen Automatic Filters

Reliable filtration down to 10 μm, flow rates from 50-5000 m³/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
Mulit-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
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
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%
For All Your Primary Wastewater Treatment Needs

Contact Ecologix At:

678-514-2100
www.EcologixSystems.com