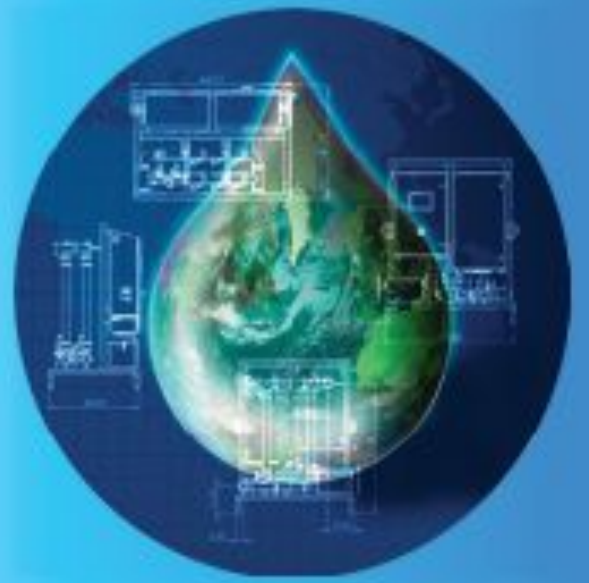
BIOIONIX

a more perfect solution



Proud Partners in Food Safety and Sustainability

SUSTAINABILITY WITH ROI:

ELIMINATE CHEMICALS AND SAVE WATER IN FOOD/BEV PROCESSING

- ❑ Achieve sustainability through **chemical elimination**, water savings, and a lower carbon footprint
- ❑ Develop your own powerful **natural cleaners and disinfectants** to replace toxic chemicals like PAA, bleach, and ammonia
- ❑ Create a **safer workplace** with effective, chemical-free sanitization solutions that require no PPE
- ❑ **Improve food safety** and quality by reducing foodborne illness risks, enhancing quality control, and extending shelf life
- ❑ **Cut costs** by producing your own natural and non-corrosive sanitizers, and **reconditioning process water** to save production time and disposal expenses

BIOIONIX

BIOIONIX® was founded by a NASA grant for space shuttle water reuse. While focusing on an out-of-world science, we inadvertently developed a new technology that safely and naturally disrupts and destroys the DNA and RNA of harmful diseases and pathogens.

We provide the technology that eliminates harmful pathogens and disease from our food supply.

Make **your own disinfection** from Farm to Fork

Water + Salt

BIOIONIX Activated Water

BIOIONIX™

Disinfect without Toxic Chemicals

What happens when you start eliminating toxic chemicals from your food plant?

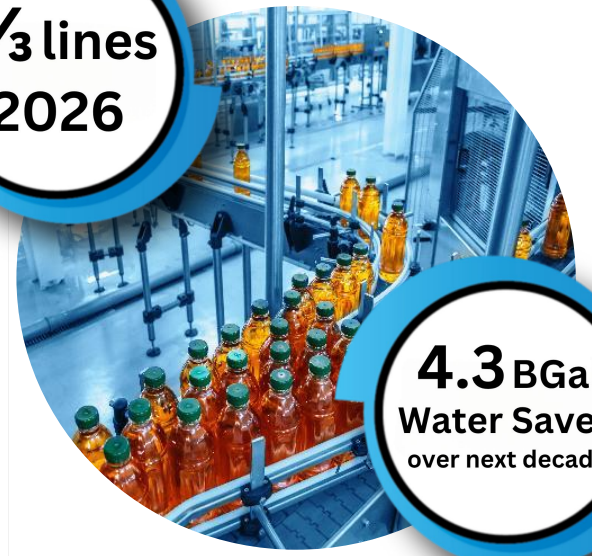
- You improve **taste and food quality**
- You create a **safer environment** for your employees
- You **save water** and help the planet
- You increase **consumer perception**
- And…you **save money**

BIOIONIX™

Case Studies:

Sustainability with ROI

Elimination of PAA



⅔ lines 2026

4.3 BGal Water Saved over next decade

97% Water Reuse

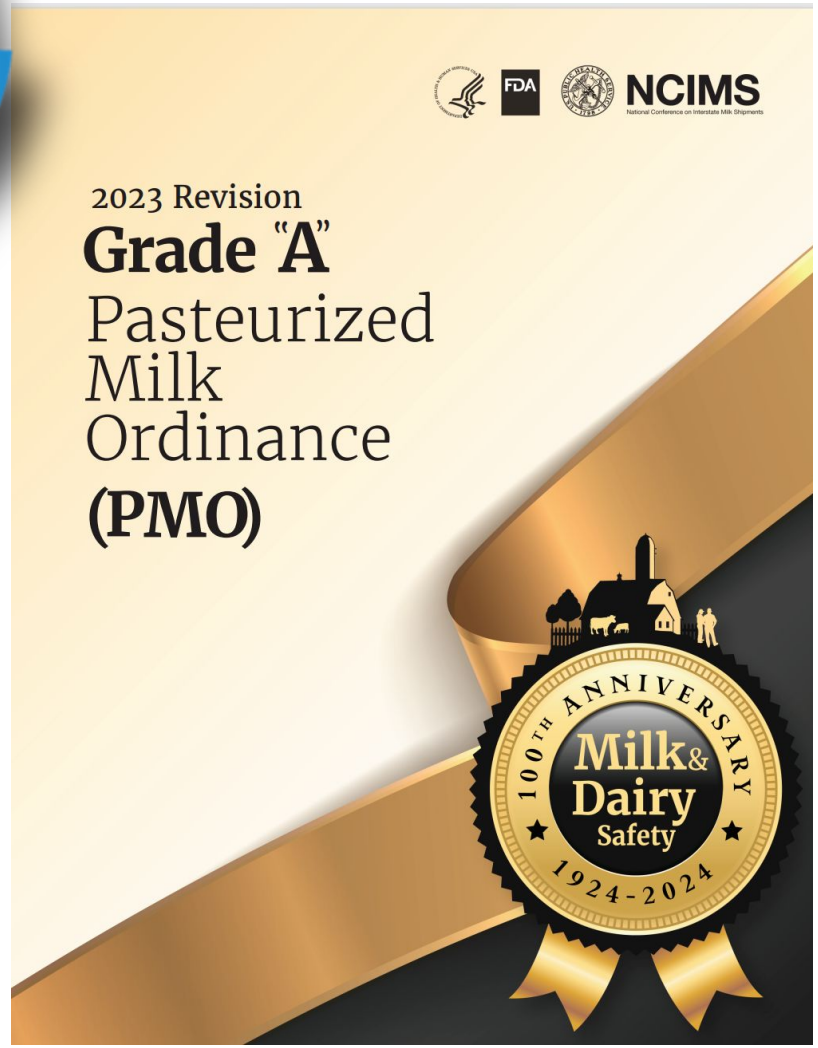
-- RTE Meat Partner

World Champion

The power to make YOUR own Sanitizer

PMO accepted

24/7 monitoring



EPA Registered Device: 103663-WI-1

of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Section 2(q)(1) and 40 CFR 156 including the manufacturer's registration number.

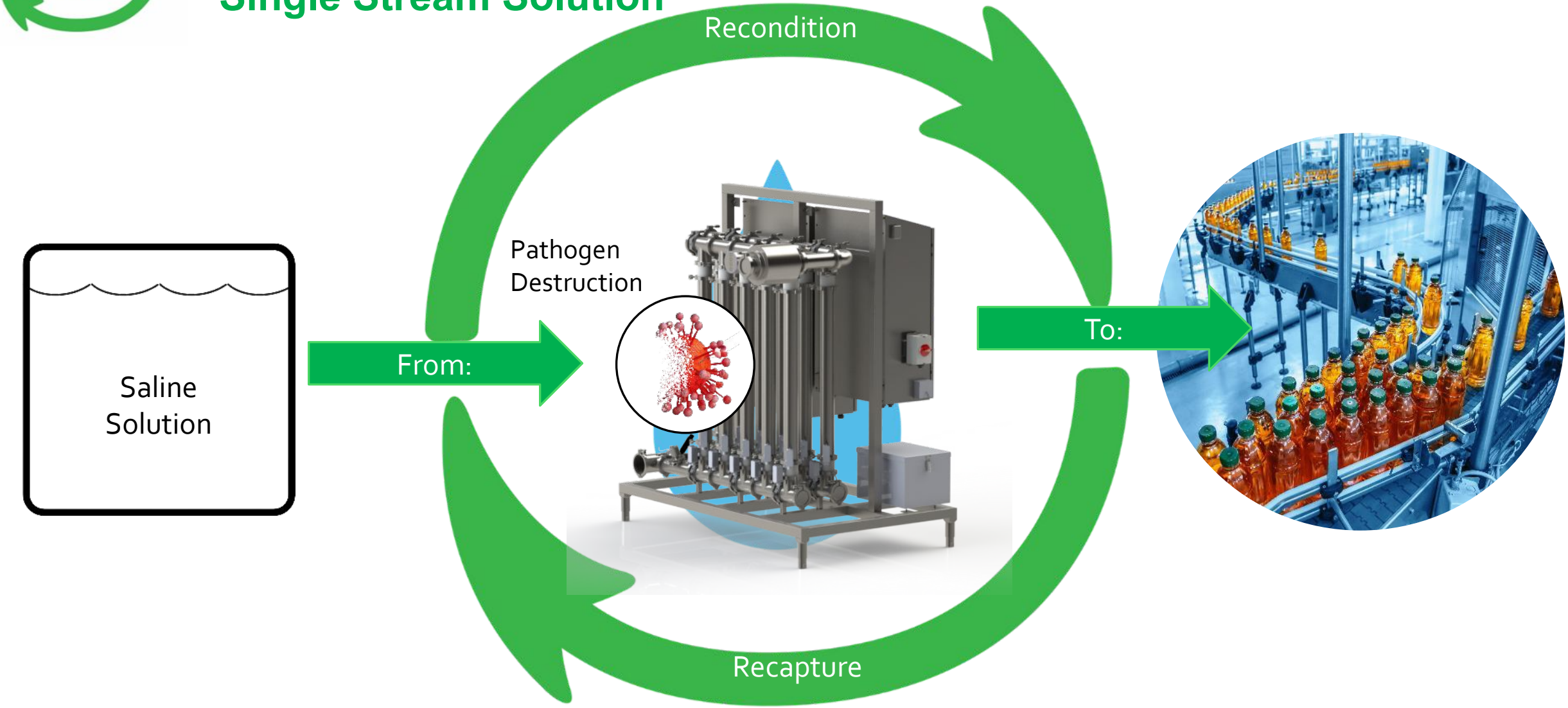
II. CRITERIA FOR THE ONSITE PRODUCTION AND USE OF ELECTRO-CHEMICAL ACTIVATION (ECA) GENERATED HYPOCHLOROUS ACID FOR THE SANITIZATION OF MULTI-USE CONTAINERS, UTENSILS, AND EQUIPMENT

The following is a list of criteria that are required for on-site generation of ECA generated hypochlorous acid that was produced onsite and used as a sanitizer for the sanitization of multi-use containers, utensils and equipment.

1. The ECA device manufacturer shall be registered with the EPA as a pesticidal device establishment pursuant to 40 CFR 152.500 and shall comply with the labeling requirements outlined in 40 CFR 156.10.
2. The minimum dilution percentage of the sanitizer shall be 50 parts per million (ppm) free available chlorine (FAC) with a minimum contact time of 30 seconds pursuant to the efficacy requirements for EPA DIS/TSS 4 Sanitizer rinses, for previously cleaned milk-contact surfaces, and less than 200 ppm FAC. The sanitizer produced shall meet the data requirements of 40 CFR Part 158 Data Requirements for Registration, Pesticide Assessment Guidelines – Subdivision G, 91-2(f), and its test documents shall be pursuant to Good Laboratory Practices (GLPs).
3. The salt used to generate the sanitizer shall be of food-grade quality rated at a minimum of 99.6% purity, and potable water shall be used to ensure quality and consistency of the sanitizer generated.
4. The ECA device and its solution concentrate storage containers shall be constructed of materials that do not impart toxic materials into the sanitizing solution either as a result of the presence of toxic constituents in the materials of construction or as a result of physical or chemical changes that may occur during the ECA process.
5. The ECA solution concentrate storage containers shall be labeled with the following:
   a. Contents;
   b. EPA Establishment Number for the ECA device manufacturer;
   c. Dilution percentage instructions for use and storage conditions, including the shelf-life;
   d. A list of its active and inert ingredients; and
   e. Other required standard safety data disclosures, formerly referred to as Safety Data Sheet (SDS).
6. The ECA device used to produce the hypochlorous sanitizer shall control and record the parameters to ensure that the ECA device is operating within its design limits and provides an effective real time notification or alarm and shall shut down when it falls out of the required range as recommended by the ECA device manufacturer.
7. Standard measurement methods such as FAC titration or chlorine test strips shall be used to verify that the concentration of the ready to use sanitizer being applied is in a range between 50 ppm and 200 ppm. Measurement equipment shall be checked, calibrated and measurements recorded. All records shall be accessible to the Regulatory Agency for inspection. Electronically generated records for FAC concentrations, if used, shall meet the criteria specified in Appendix H., V. of this *Ordinance*.

Water Savings: Activated Water Recirculation

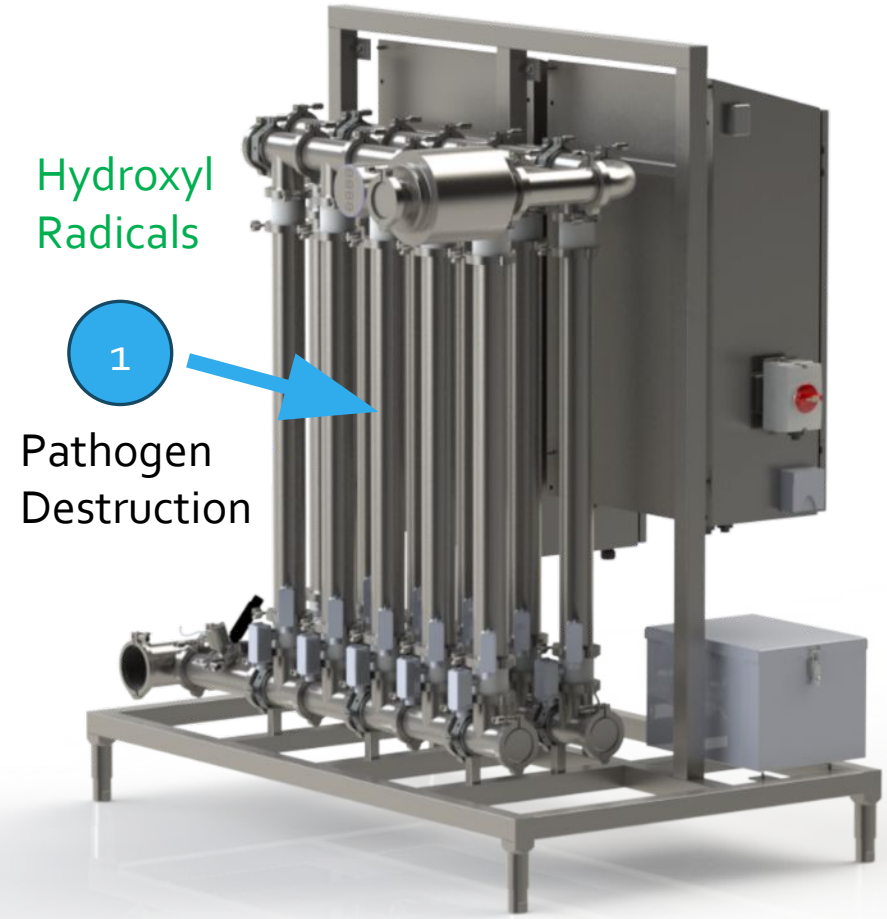
Single Stream Solution



The power to make YOUR own disinfection

How it Works: 3 Tiers

Activated Water



Hydroxyl Radicals

1

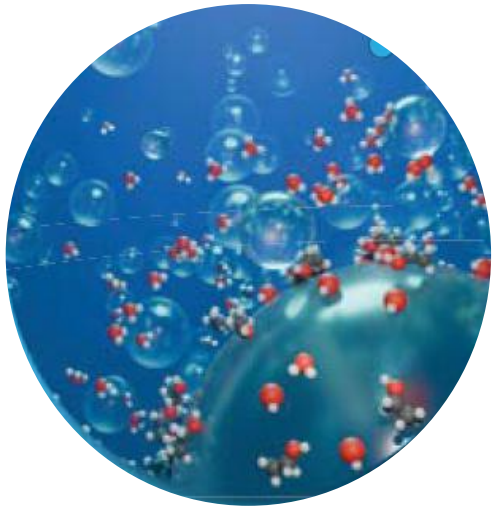
Pathogen Destruction

HOCl

2

Continuous Disinfection

Nanobubbles



3

Cleans while Sanitizing

EPA Registered Device: 103663-WI-1

Tier 1:
Complete Pathogen Destruction

Process Water

>0.25% salinity

Front

Tier 1:
Complete Pathogen Destruction

Pathogen Elimination

Process Water

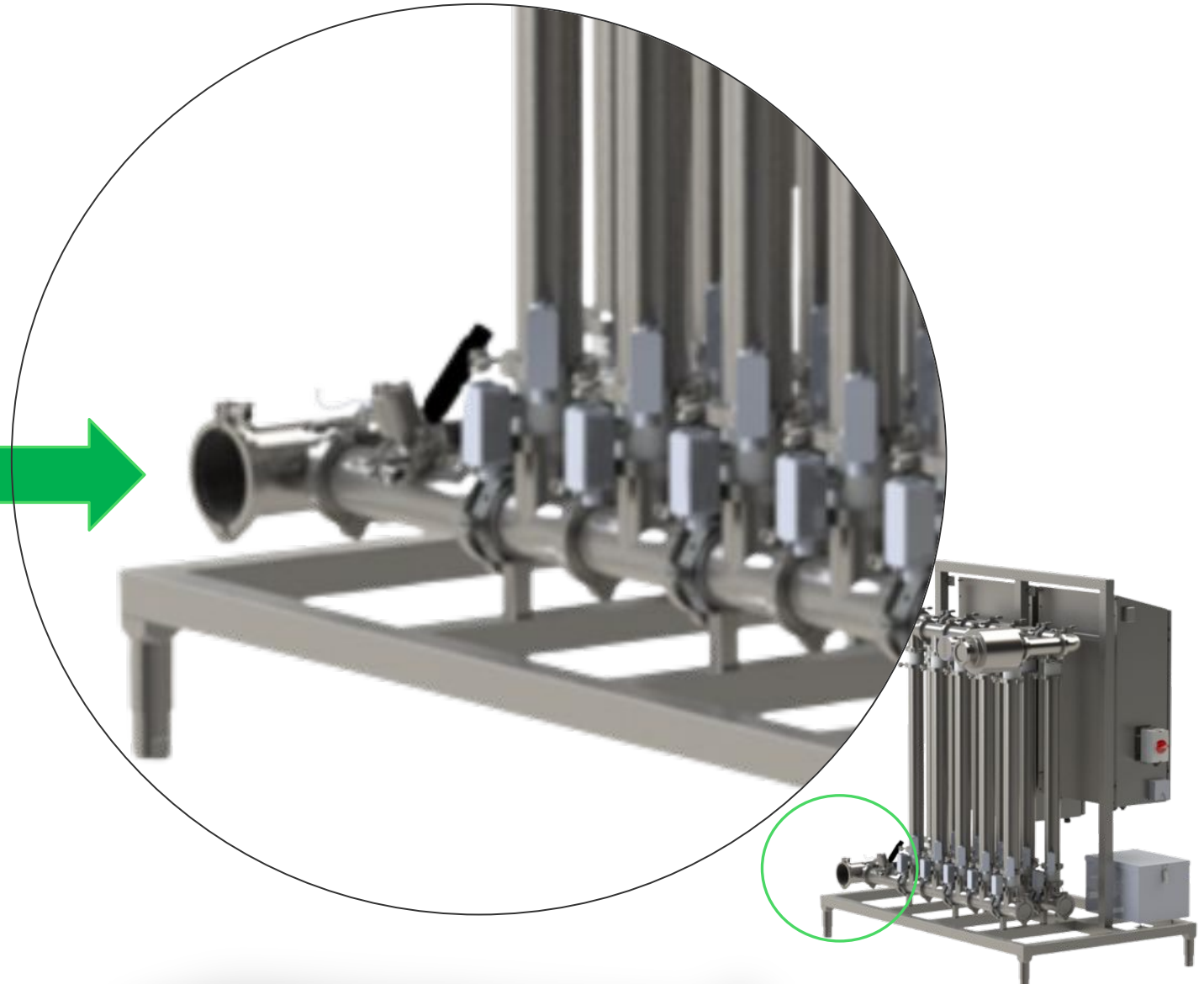
>0.25% salinity

Back

Tier 1:
Complete Pathogen Destruction

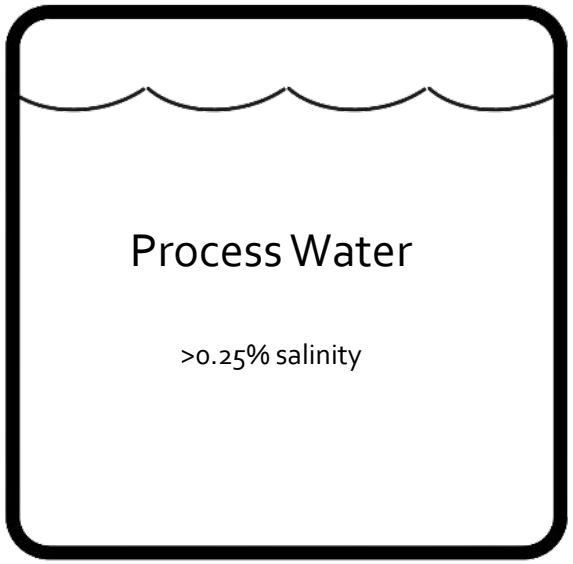
Process Water

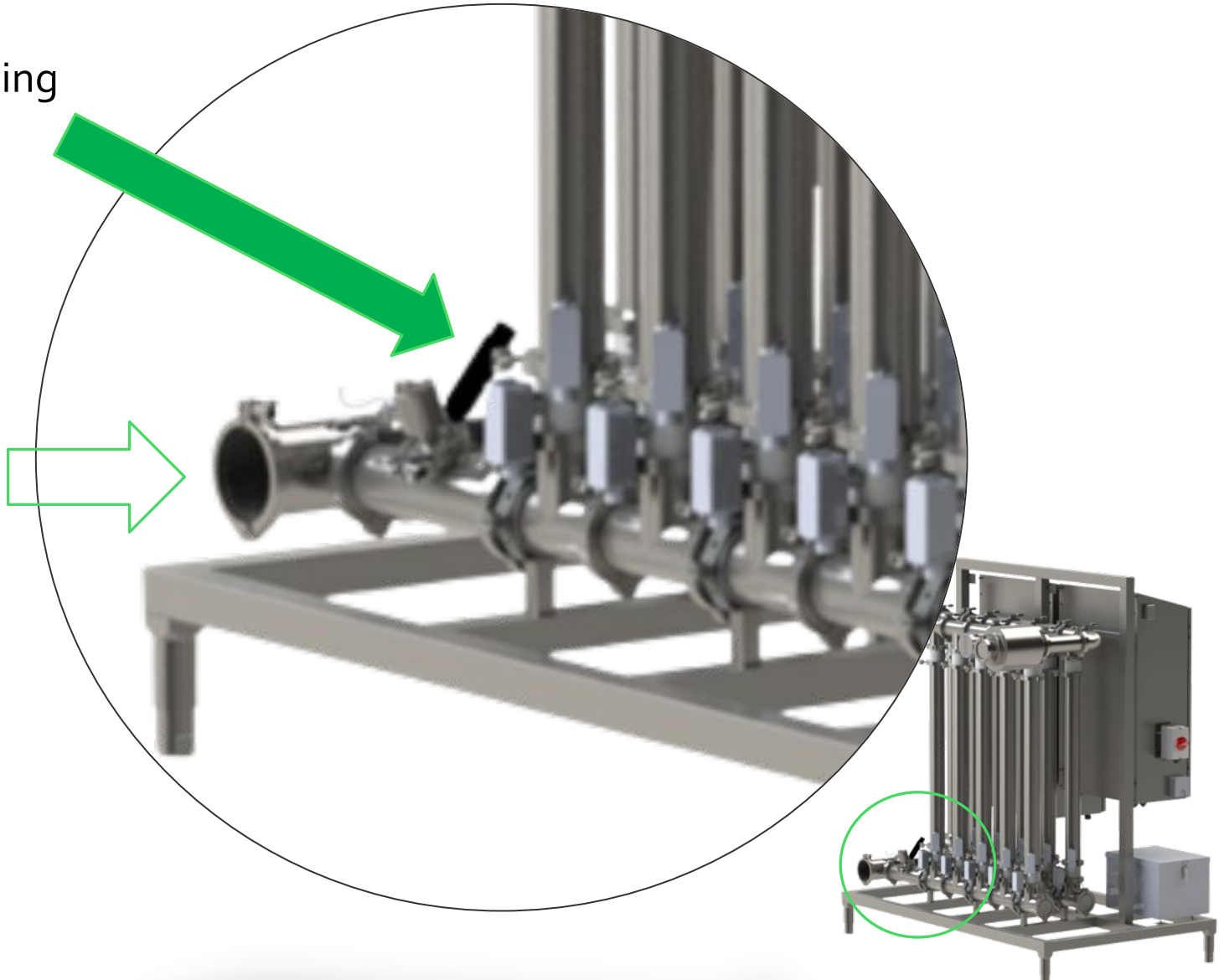
>0.25% salinity



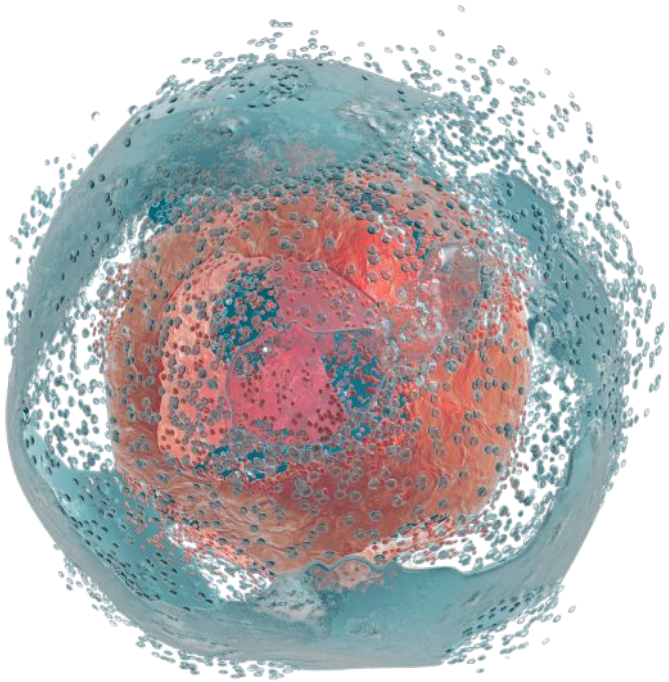
Tier 1:
Complete Pathogen Destruction

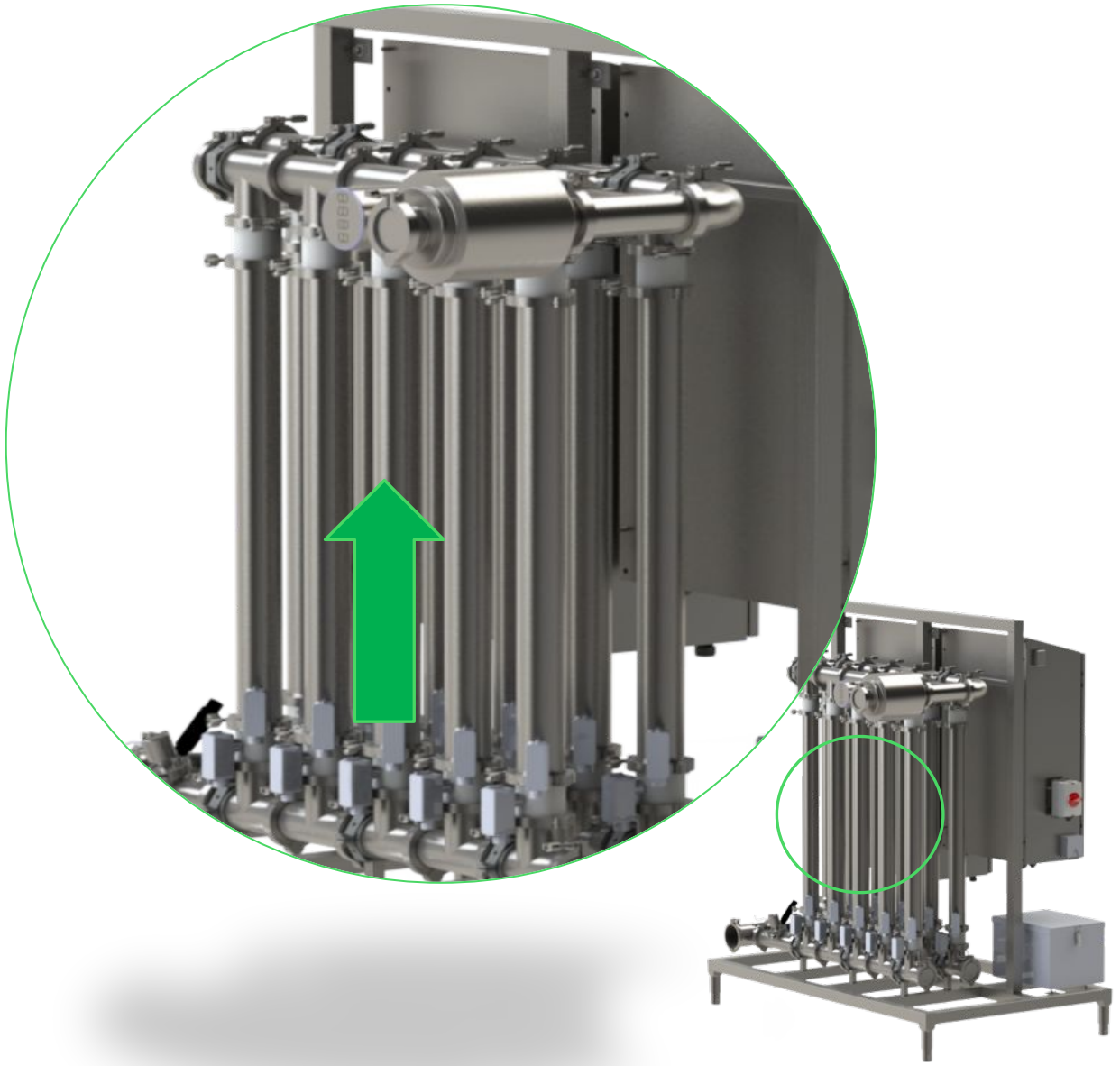
Analysis of incoming process water





Tier 1:
Complete Pathogen Destruction





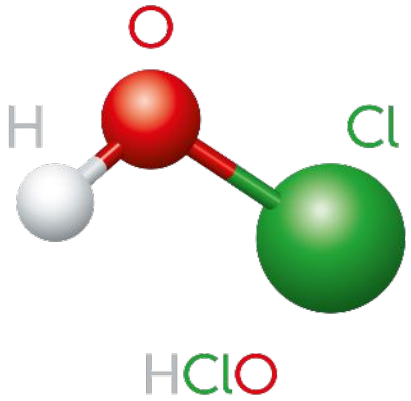
IN-CHAMBER KILL

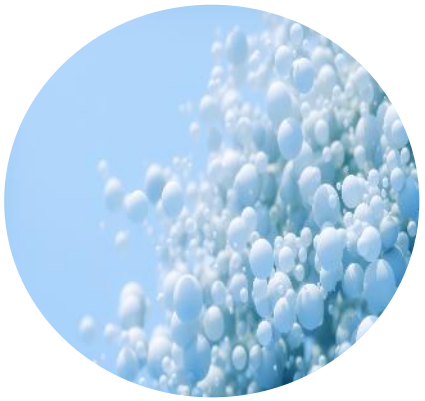
Electrical Energy - **destroys pathogens** (>5 to 7 Log) in the passing liquid stream.

Tier 2 & 3:
Recirculation: Disinfects & Cleans

Cleans & Disinfects

2 Biproducts:
Disinfect & Clean

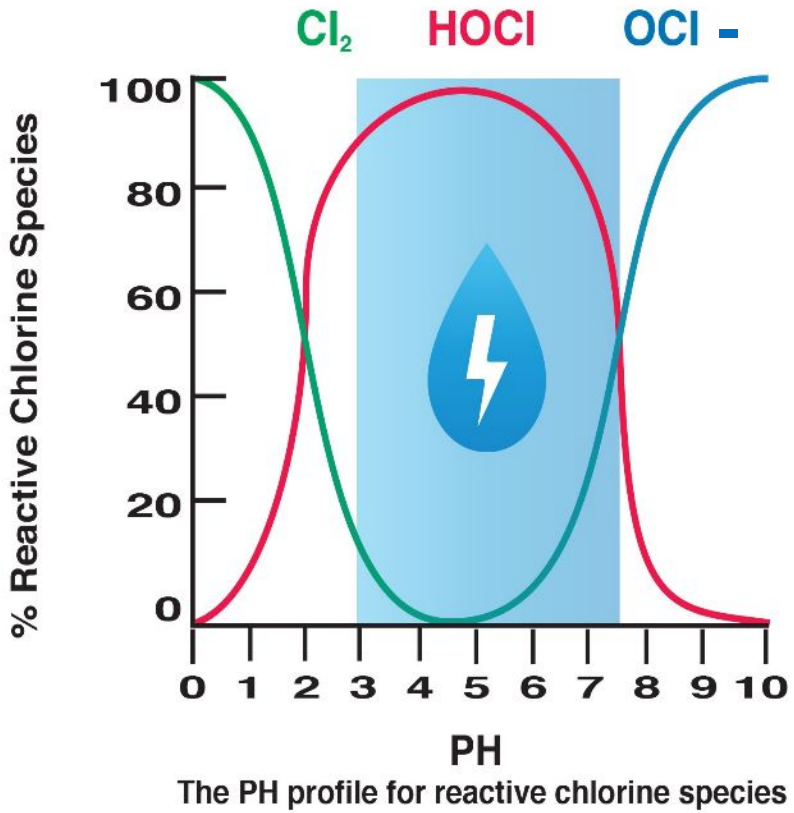




Artificial Immune System

Tier 2 & 3:
Recirculation: Cleans and Disinfects

HOCl: One of the safest and strongest natural solutions for killing diseases and harmful pathogens like Salmonella, E coli, bacteria, avian influenza, swine flu, covid and many more.

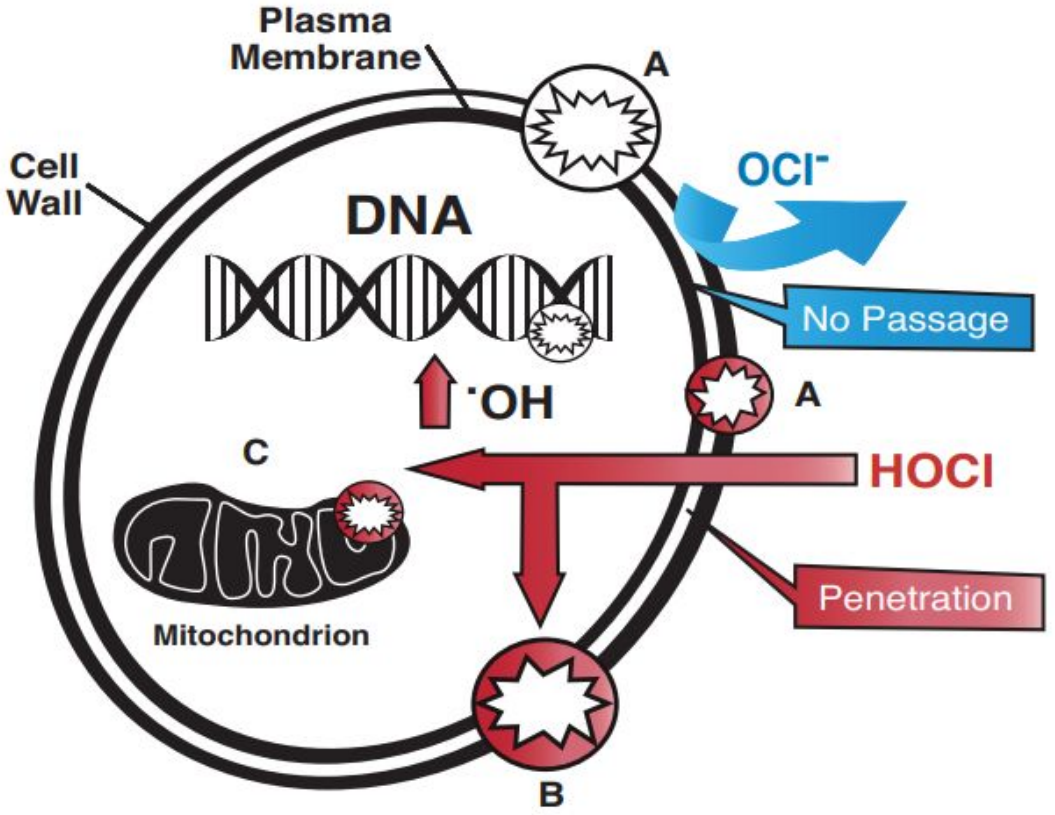


The PH profile for reactive chlorine species

Cl_2
(Chlorine Gas)
Toxic Gas

HOCl
(Hypochlorous Acid)
Sanitizer

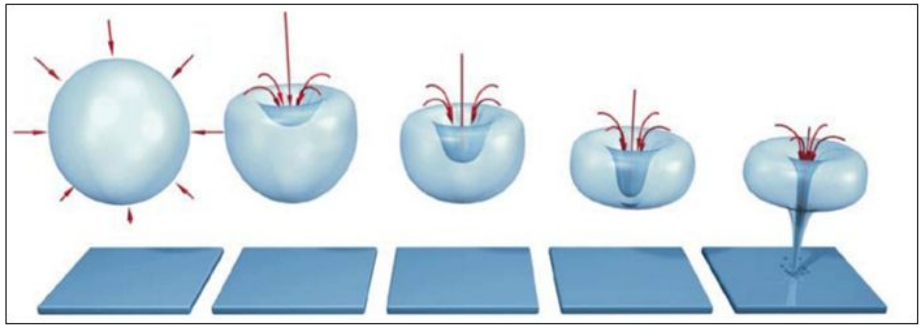
OCl -
(Hypochlorite)
Cleaner



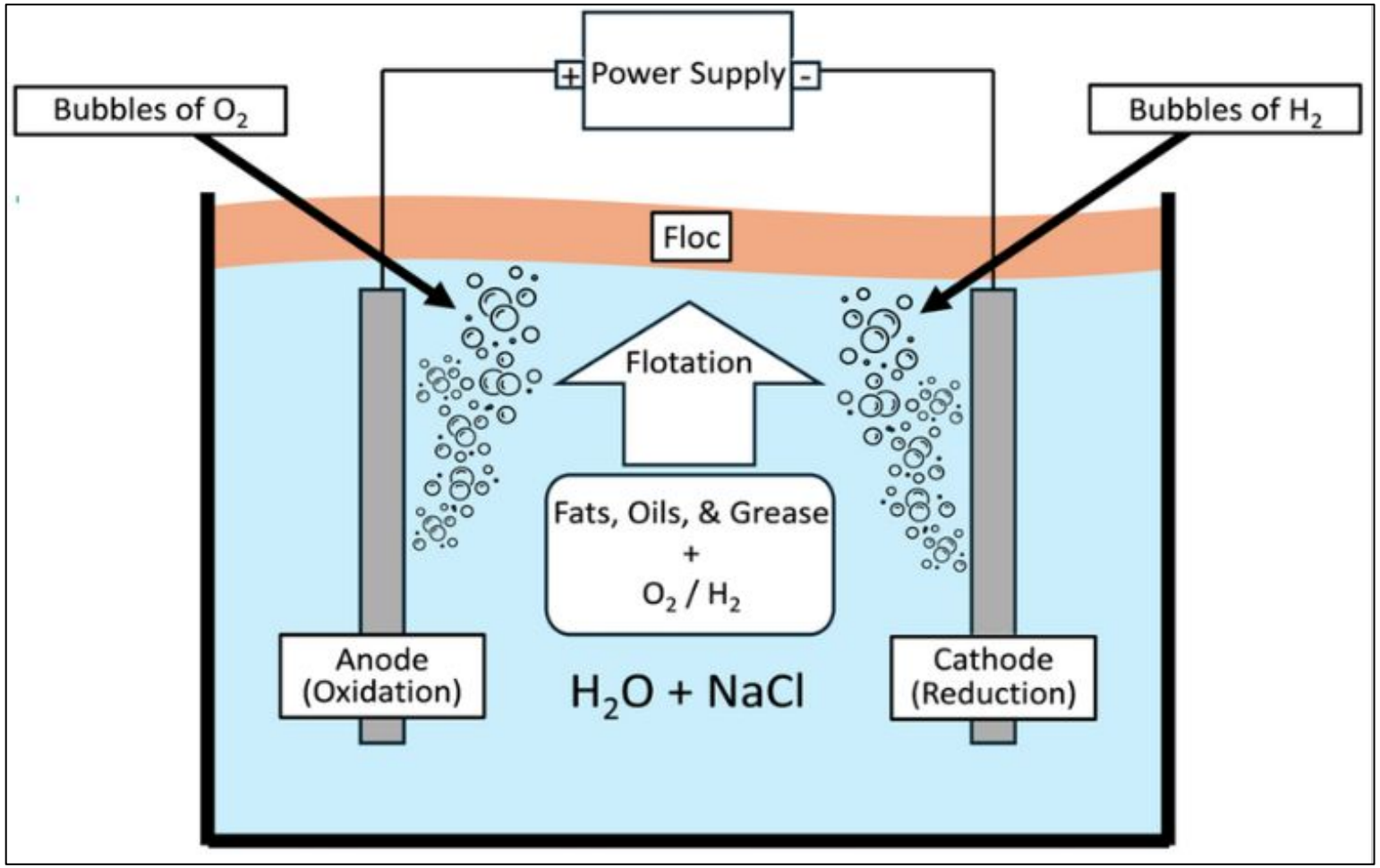
Supercharged Cleaners

Tier 2 & 3:
Recirculation: Cleans and Disinfects

Nanobubble charged surfaces promote electrostatic interactions with hydrophobic contaminants, such as FOG, allowing for the **removal of these substances from surfaces**.



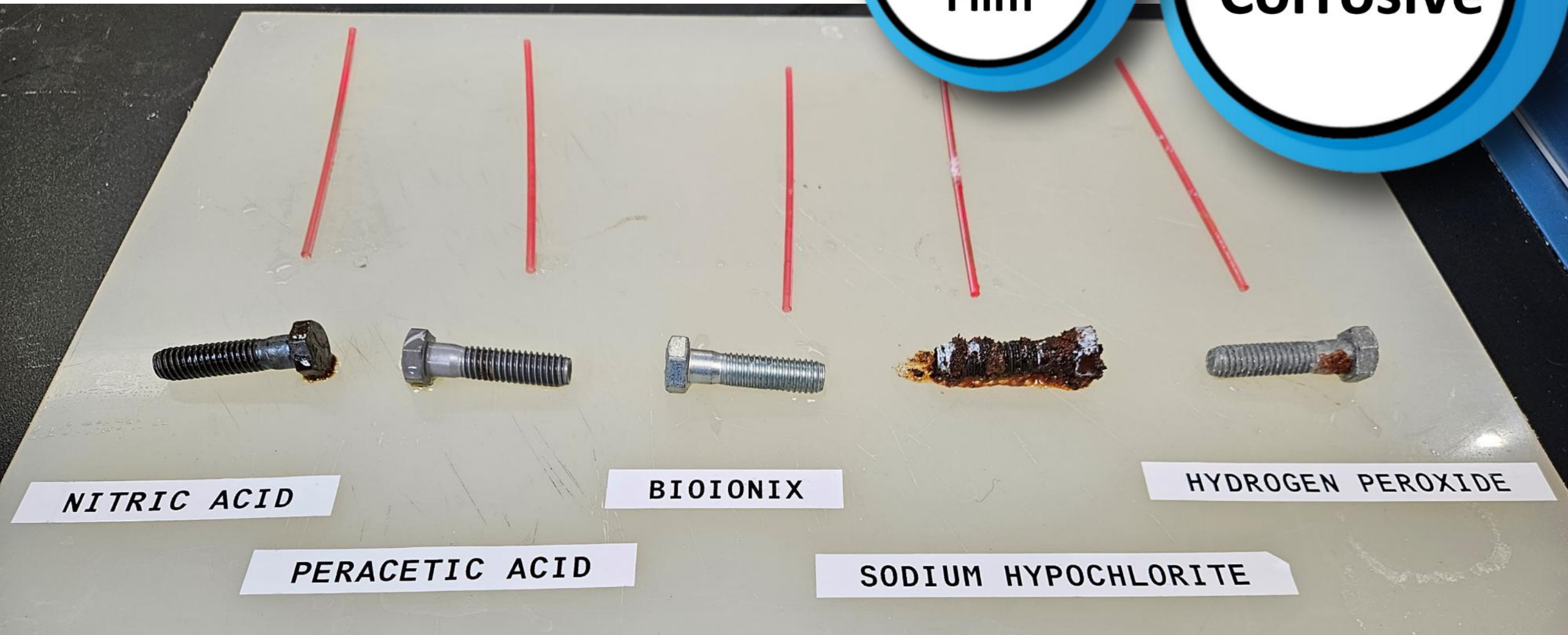
Jet impingement



BIOIONIX™ vs Chemicals

Protective Film

Non-Corrosive



24/7 Controls

Validation Reporting

Data-driven Decision-making

Custom performance and sustainability reporting

- 24/7 data collection
- Automated alerts
- Predictive maintenance

BIOIONIX BIOSAIF 24/7

BIOIONIX BIOSAIF 24/7

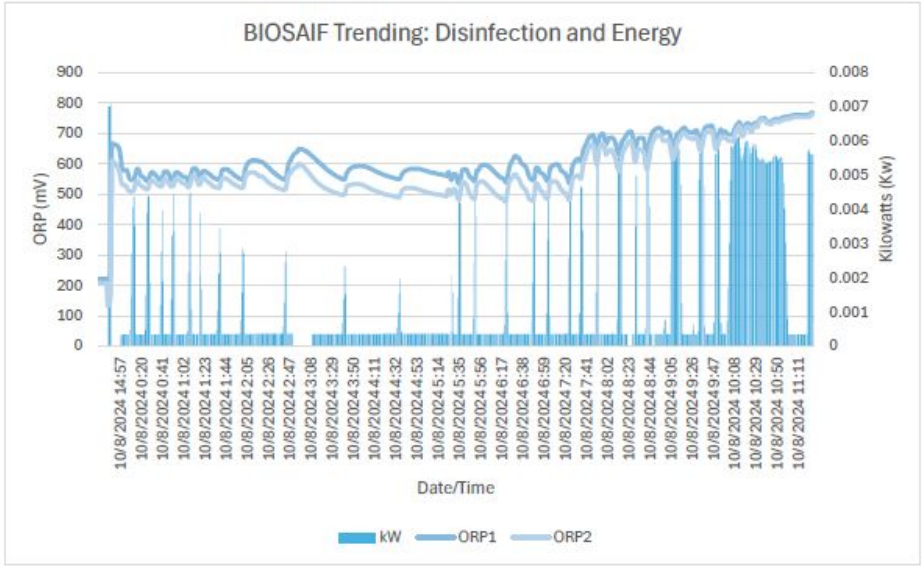
PATH TO ZERO

Client Partner	Best Partner Company
Date	10/22/2024

Operations Summary	
Operating Hours	11.80
Average Temperature (F)	104
Average Flow Rate (GPM)	110
Average ORP (mV)	592

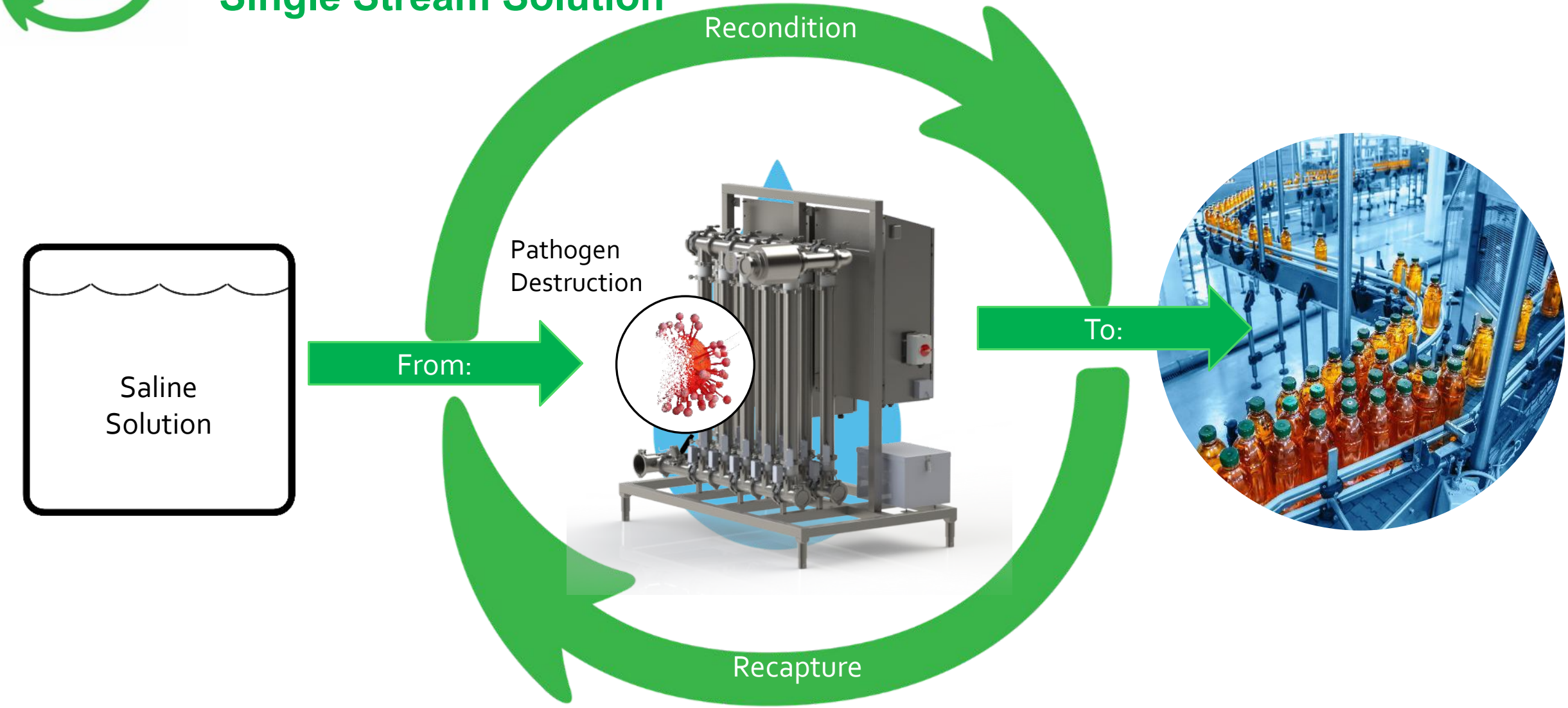
Daily Gallons Reconditioned	Daily Comparable Chemical Savings	Daily Energy Cost
73,279	$ 109.92	$ 0.10

Data Summary



Water Savings: Activated Water Recirculation

Single Stream Solution



Join Us on the **Path to Zero**

Your Sustainability **Partner**

97%
Water Savings
-- RTE Meat Partner

32 Mil
Gal Toxic Chemicals
ELIMINATED

160K Gal
water reconditioned per day
-- Beverage Partner

BIOIONIX™

Extra Slides

3-Tier Solution

The BIOIONIX® three-tier technology acts as an artificial immune system that advances food safety.

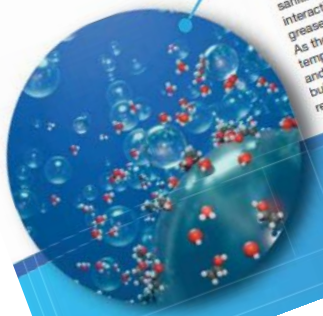
BIOIONIX
BIOSAIF™

Tier 1
PATHOGEN DESTRUCTION
BIOIONIX SuperOxidants™ safely destroy pathogens that flow through our first-tier patented chambers.

Tier 2
CONTINUOUS DISINFECTION
Release of an all natural, disinfection with controlled concentrations of hypochlorous acid (HOCl) circulates, providing continuous disinfecting properties that are 100 times stronger than bleach and safer to use and handle than toxic chemicals.

FDA FCN #2198

Tier 3
NANOBUBBLES: SANITIZING WHILE CLEANING
Through the generation of activated water, bubbles with diameters on the nano- and micrometer scales are formed. These bubbles have been found to persist in solution for over 24 hours and possess both cleaning and sanitizing capabilities. Their charged surfaces promote electrostatic interactions with hydrophobic contaminants, such as fats, oils, and grease (FOG), allowing for the removal of these substances from surfaces. As the bubbles burst, they produce jets of extremely high pressure and temperature, effectively cleaning contact surfaces of organic matter, biofilms, and solids. The suspended solids are then lifted out of the solution by the bubbles, enabling easy removal. During their collapse, the bubbles also release hydroxyl radicals, resulting in powerful localized disinfection.



Supports 3 Requirements for water reuse:
1. Microbial kill
2. Reduced turbidity (electroflocculation)
3. Water reuse in same or earlier process

Understanding Chlorine

The power to make your own disinfectant.

BIOIONIX
a more perfect solution

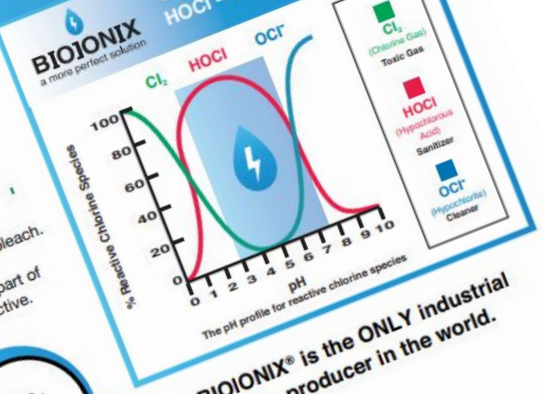
Bleach (hypochlorite) is misunderstood. Did you know that Bleach loses its disinfection power within 6 months?

- FDA lists hypochlorite as the #1 most recognized sanitizer.
- HOCl is THE sanitization power of bleach.
- BIOIONIX® focuses on the HOCl part of bleach, which is 100x more effective.

100X more effective than chlorine bleach

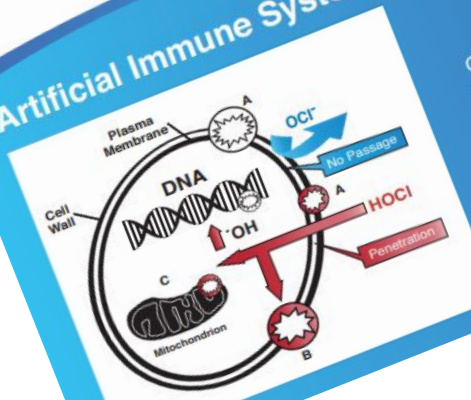
Non-Corrosive

Chlorine Species Chart
HOCl = Sanitizer



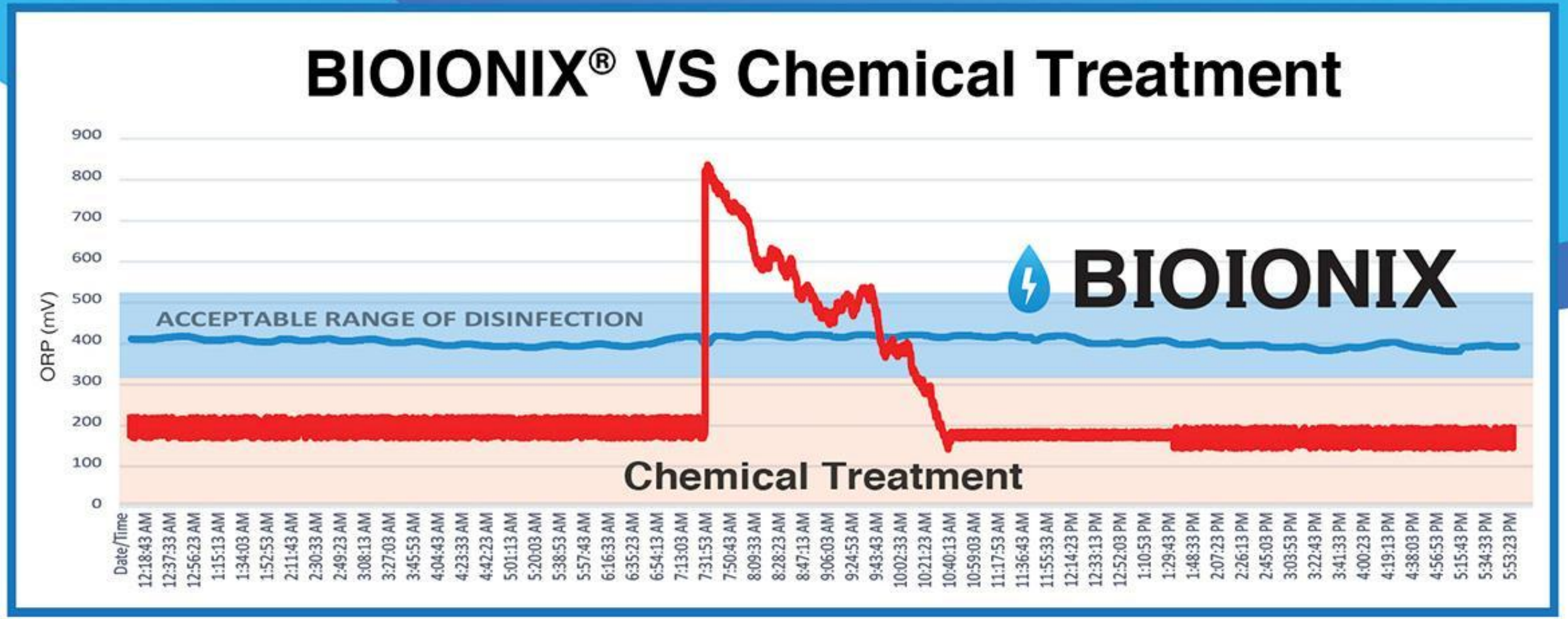
BIOIONIX® is the ONLY industrial scale producer in the world.

Artificial Immune System



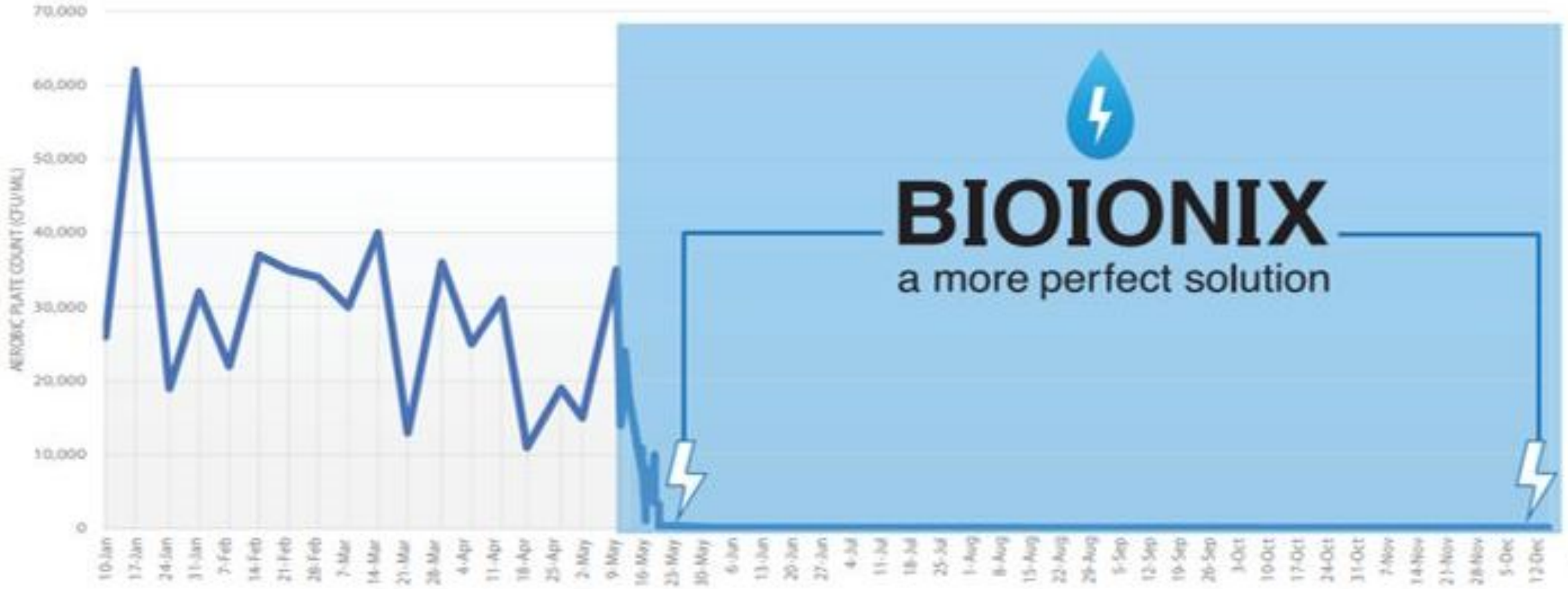
Our proven, approved, and patented technology uses non-chemical, natural SuperOxidants™ to disrupt and destroy the DNA and RNA of pathogens!

BIOIONIX VS CHEMICALS



* actual data from partner that used chemical shock treatment of brine

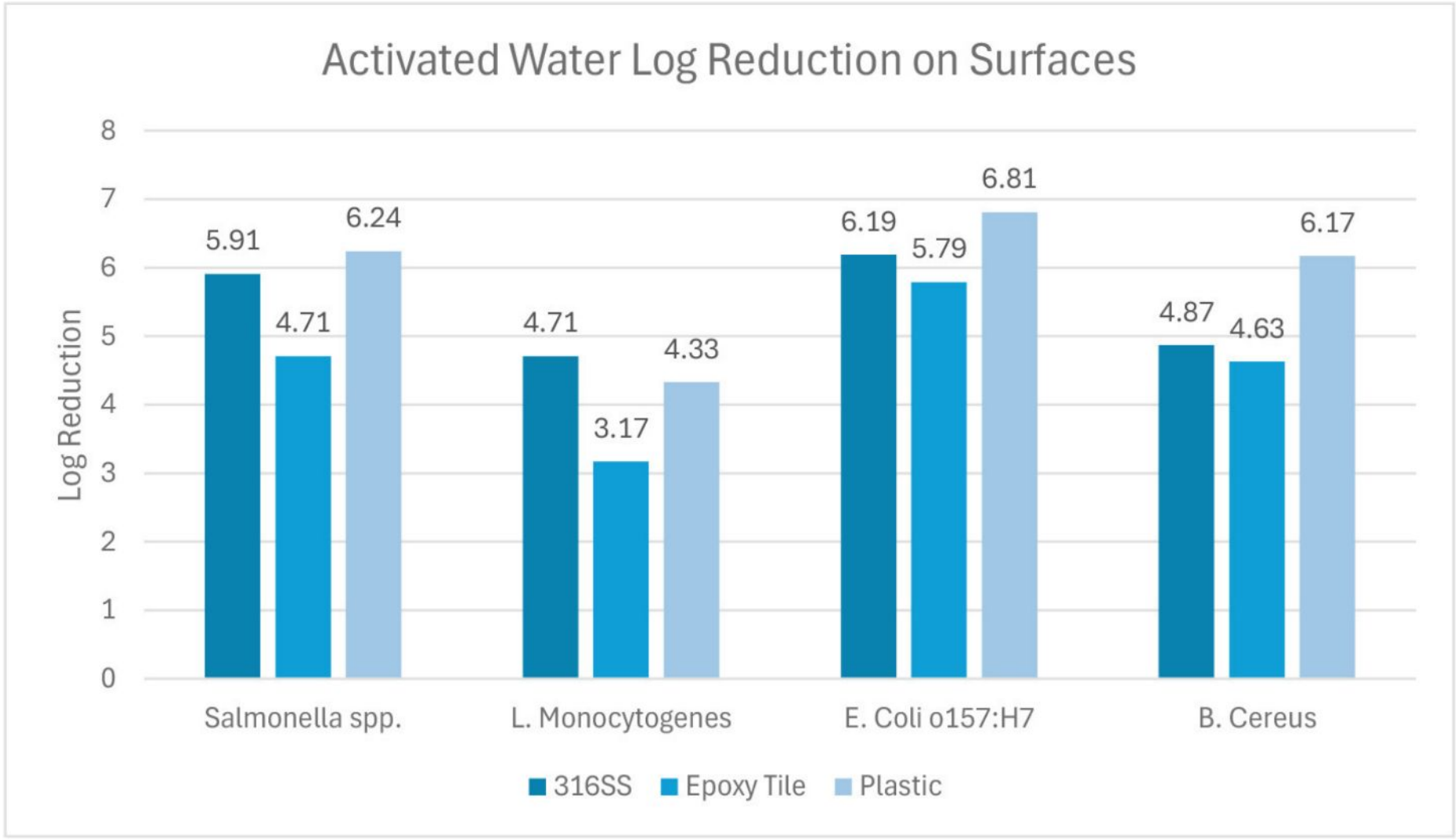
Microbial Intervention



APC Brine Data from QA of major cheese producer 2022

CIP **Sanitizer** Replacement - Validation

30-second Spray



Tier #1

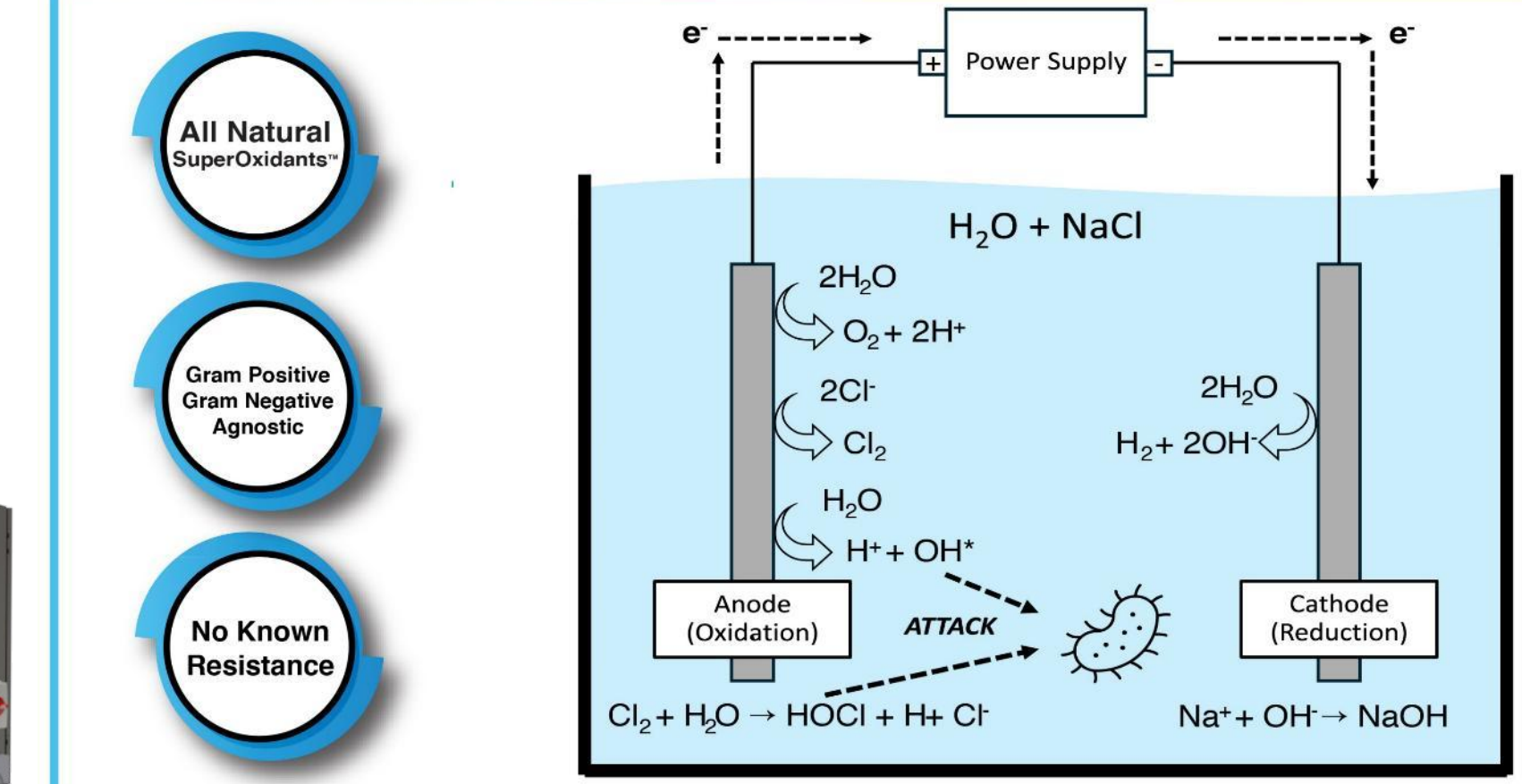
Pathogen Destruction

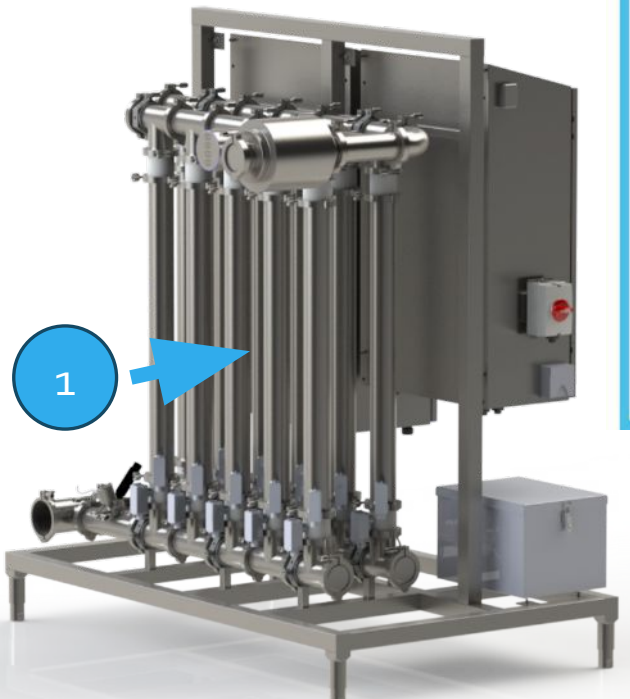
BIOIONIX™

a more perfect solution

Electrochemical Reactions

- **All Natural** SuperOxidants™
- **Gram Positive Gram Negative Agnostic**
- **No Known Resistance**





EPA Registered Device: 103663-WI-1