Kuehne COMPANY

Concentrated Bleach

Redefining Industry Standards

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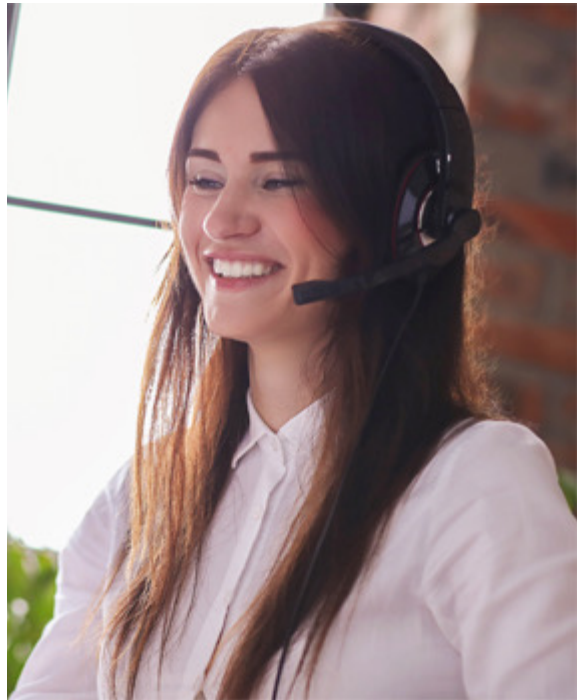
About

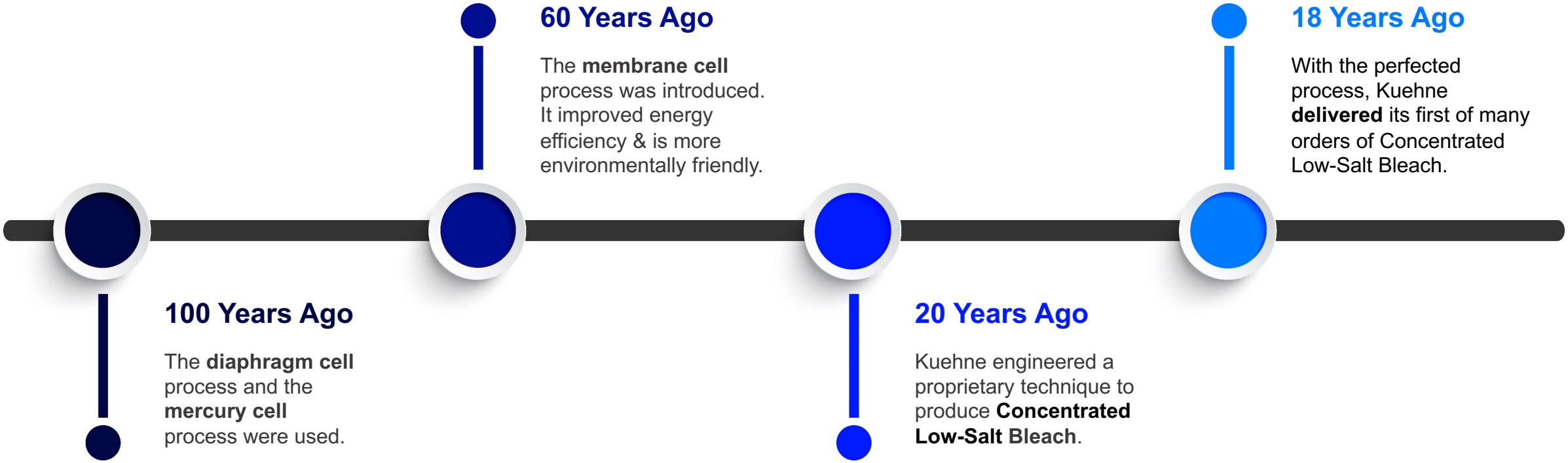
Third generation family owned and operated.

Kuehne Company

- Founded in 1919
- Three Strategically Located Plants
- State-of-the-Art In-House Laboratories
- Friendly & Knowledgeable Customer Service
- 24/7 Deliveries



Redefining Industry Standards



100 Years Ago

The **diaphragm cell** process and the **mercury cell** process were used.

60 Years Ago

The **membrane cell** process was introduced. It improved energy efficiency & is more environmentally friendly.

20 Years Ago

Kuehne engineered a proprietary technique to produce **Concentrated Low-Salt Bleach**.

18 Years Ago

With the perfected process, Kuehne **delivered** its first of many orders of Concentrated Low-Salt Bleach.

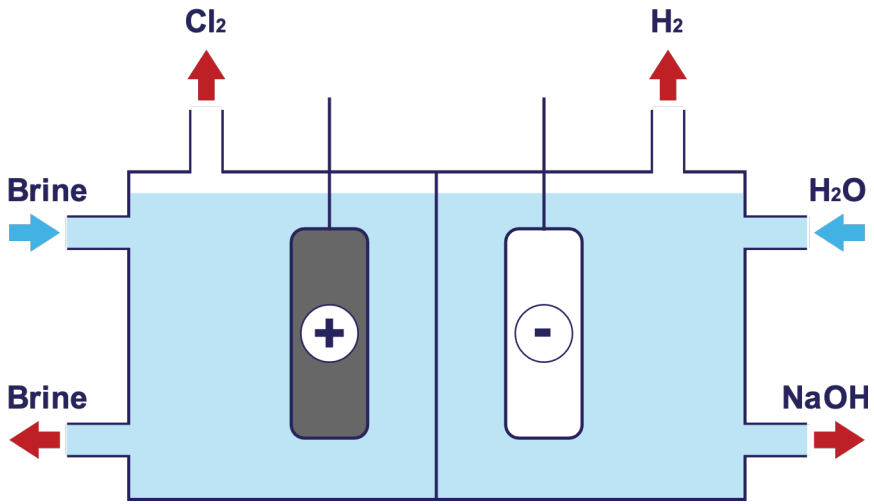
History of Water Disinfection

In **1908**, chlorine was used for the first time as a primary disinfectant of drinking water.

- **1984** Union Carbide Accident in Bhopal, India
- **1986** TCPA Program Enacted
- **2001** September 11 Terrorist Attack
- Sodium Hypochlorite is More Commonly Used

Electrolysis Technology

Large-scale electrolysis technology is utilized in the production of chlor alkali chemicals. A direct electrical current is applied to an aqueous sodium chloride solution (brine of salt and water) in a membrane cell. This interaction results in the production of chlor alkali chemicals.



Sodium Hypochlorite Production

Sodium hypochlorite (NaOCl) is produced through the reaction of sodium hydroxide (caustic soda) with chlorine. This reaction is highly exothermic.

- Salt
- Brine
- Electrolyzer
- Reactor

Importance of Purity

The stability of sodium hypochlorite is directly correlated to its purity. Higher purity levels are crucial for ensuring effectiveness and safety in various applications.

Factors Affecting Purity Levels

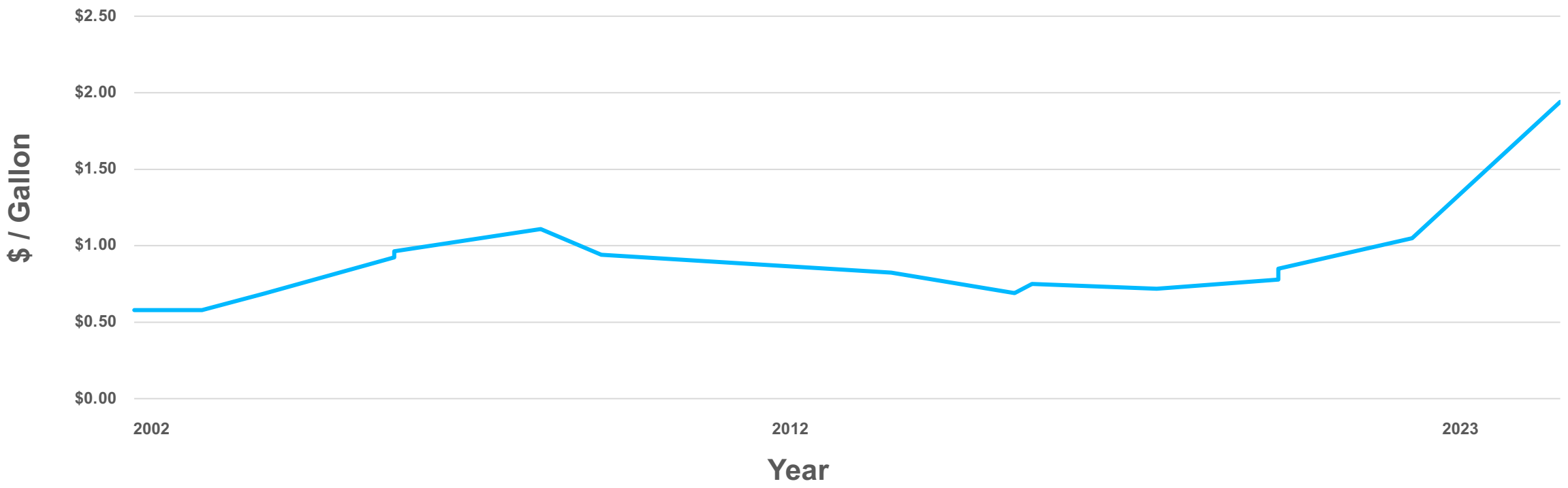
- Heavy Metals
- Storage Tanks & Piping
- Magnesium and Calcium

Sodium Hypochlorite Concentration Methods

There are various methods to express the concentration of Sodium Hypochlorite. The choice of expression method is typically a matter of preference, as they all convey the same information.

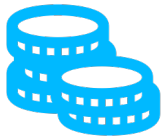
- Grams Per Liter (gpl)
- Trade %
- Weight %
- Weight % Sodium Hypochlorite

Market History



Cost Cutting Alternatives

01



Increased Overall Cost to Treat Water

02

Increases in Chemical and Transportation

03

Shortage of HazMat Drivers

04

Win / Win Options


Good Enough
Isn’t Good Enough
Just because something works,
doesn't mean it can't be improved.
Redefining Industry Standards
Concentrated Bleach

Benefits

01

Fewer Deliveries

Concentrated bleach is delivered and then diluted on-site.

02

Reduced Costs

Fewer deliveries result in lower administrative overhead.

03

Inherently Safer

Fewer operator interactions translate to reduced opportunities for accidents.

04

Environmentally Friendly

Less traffic due to fewer trucks on the road.

Fewer Deliveries

Concentrated bleach is delivered and then diluted on-site.

Dilution System

- Dilutes while offloading
- Preprogrammed
- Includes a bypass

Engineering Assistance

- Installation
- Maintenance
- Training

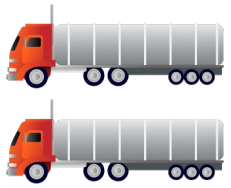
Reduced Costs

Fewer deliveries result in lower administrative overhead.

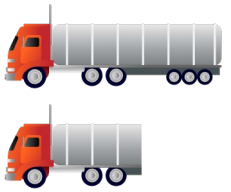
Less Headaches

- Fewer Orders Placed
- Fewer Orders Received
- Fewer Orders Processed
- Fewer Working Hours

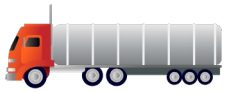
15%



20%



30%



Inherently Safer

Fewer operator interactions translate to reduced opportunities for accidents.

Prevents

- Loss of Productivity
- Employee Dissatisfaction
- Unnecessary Costs
- Tarnished Reputation

Environmentally Friendly

Less traffic due to fewer trucks on the road.

Added Value

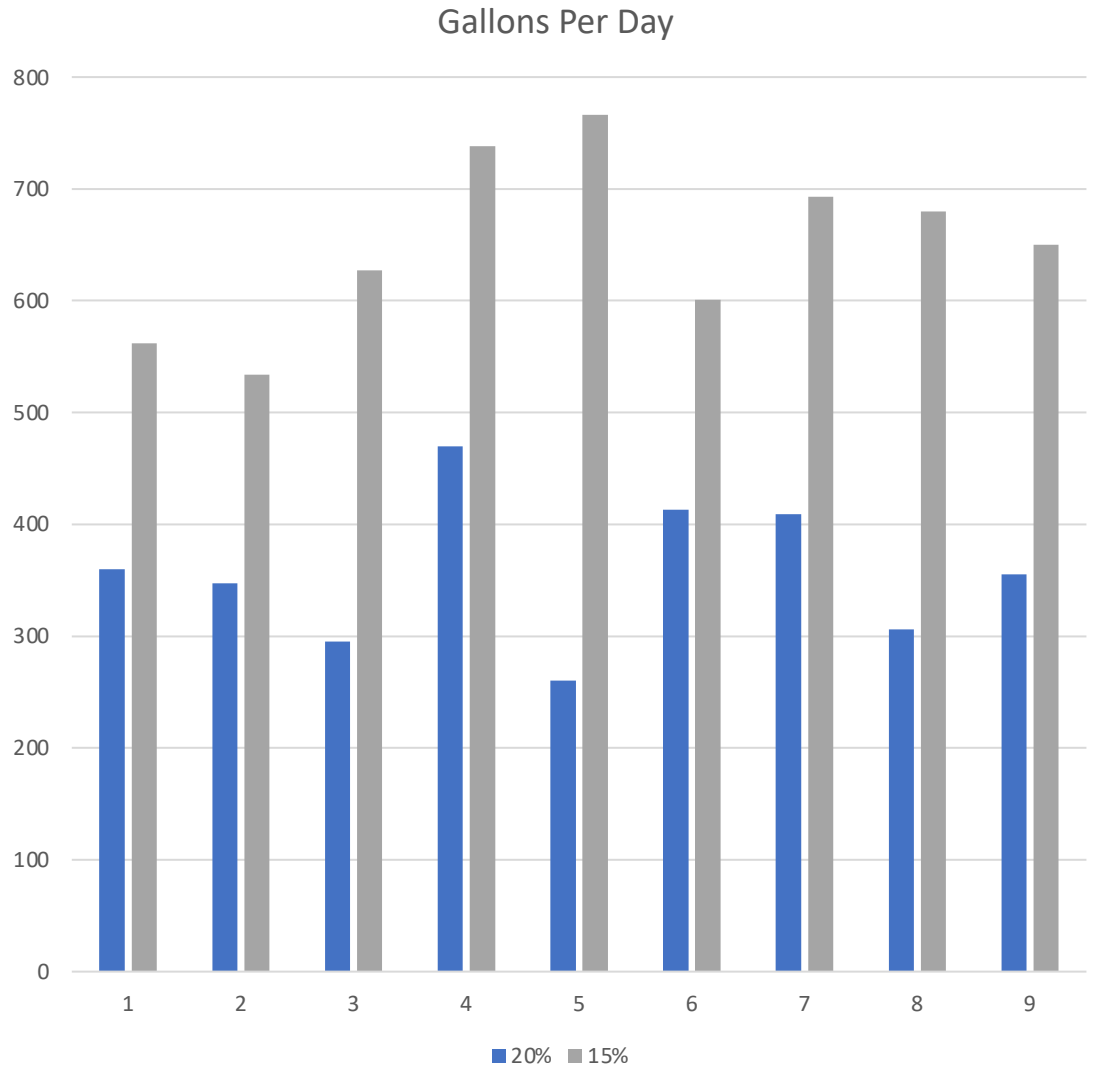
- Cleaner Air
- Significant Reduction in CO2 Emissions
- Healthier Communities
- Reduced Consumption of Diesel Fuel

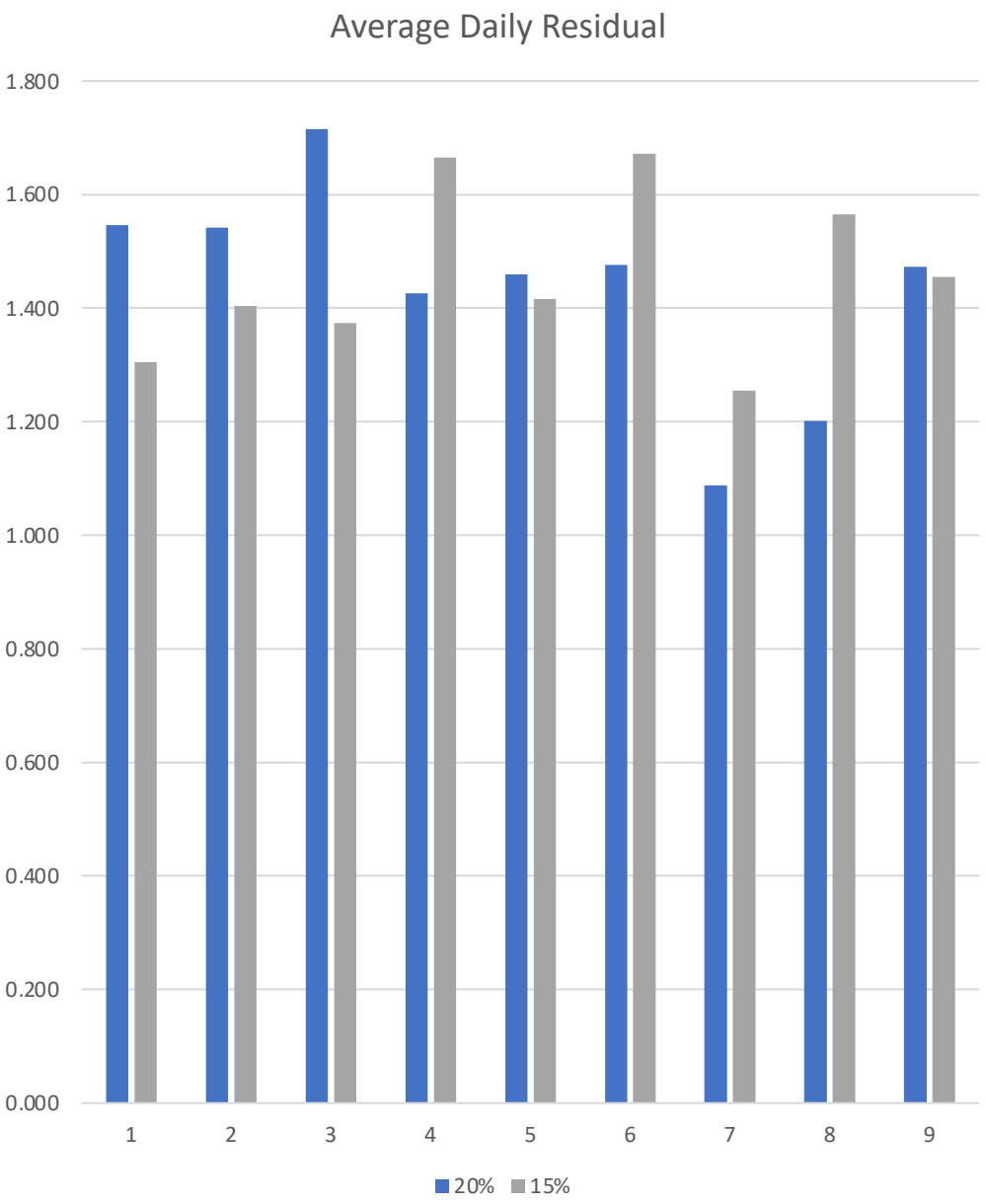
Case Study | OCUA

Average Daily Usage | Gallons Per Day

- **650** at 15%
- **357** at 20%

45% Reduction





Case Study | OCUA

Average Daily Residual

- **1.46 mg/l** at 15%
- **1.44 mg/l** at 20%

Similar Residuals Maintained at Reduced Dose Rates

Case Study | OCUA

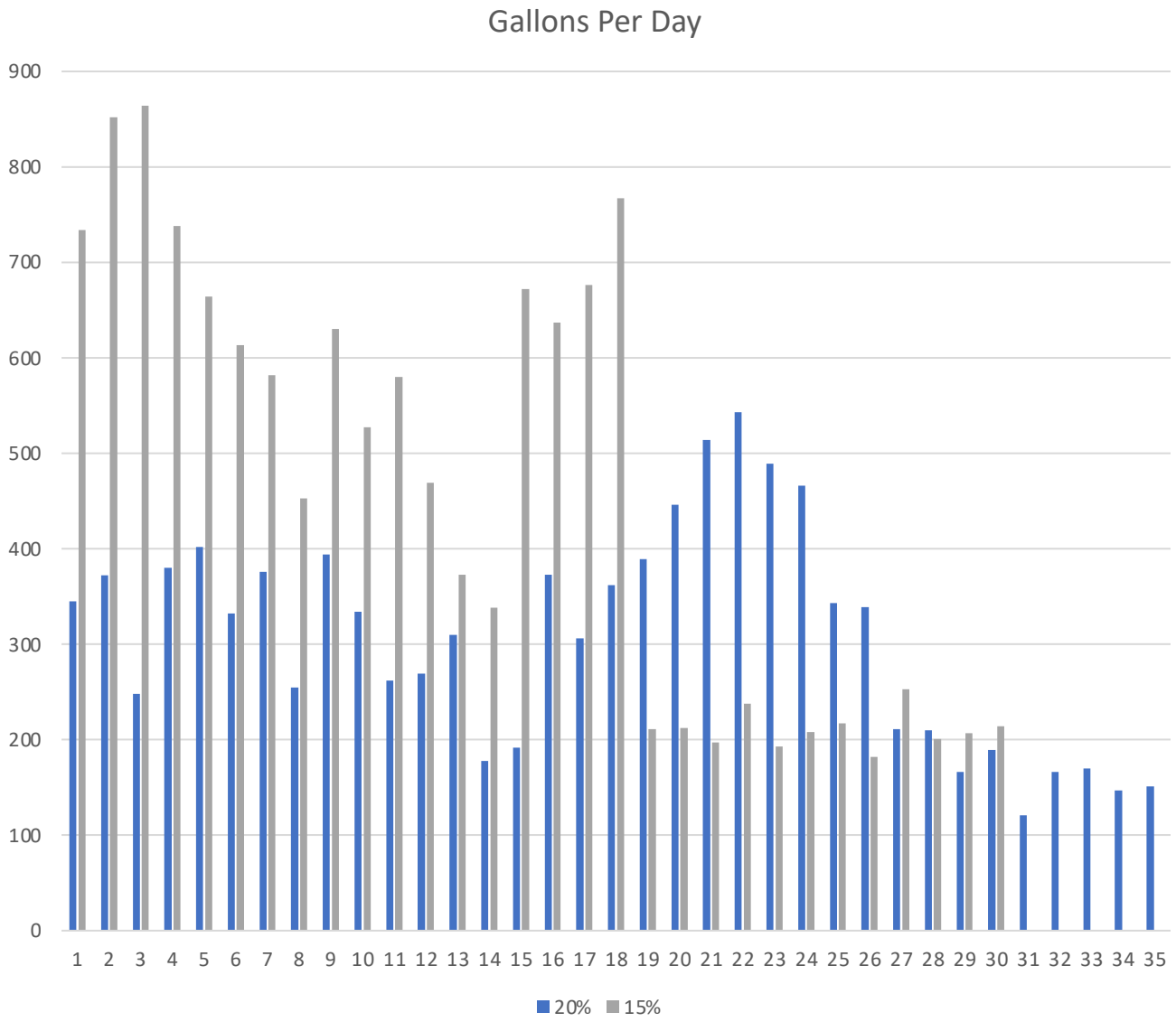
Switching over to 20% will result in the following savings for the Ocean County Utilities Authority.

Average Savings Per Day

- **$ 528**

Potential Savings Per Year

- **$ 193,000**



Case Study | ACUA

Average Daily Usage | Gallons Per Day

- **456** at 15%
- **307** at 20%

32% Reduction

Atlantic County Utilities Authority

Case Study | ACUA

01

1.5 – 2 ppm

15% prior to trial

02

1 – 1.5 ppm

20% at the onset of the trial

03

1 – 1.5 ppm

15% after the trial

04

Conclusion

Evaluating return to 1.5 – 2 ppm at 15%

ACUA
Atlantic County Utilities Authority

Case Study | ACUA

Switching over to 20% will result in the following savings for the Atlantic County Utilities Authority.

Average Savings Per Day

- **$ 170**

Potential Savings Per Year

- **$ 62,200**

ACUA
Atlantic County Utilities Authority

Storage and Piping

15% & 20% Sodium Hypochlorite

Storage Tank Materials

Relatively few materials of construction can withstand the highly reactive and corrosive nature of sodium hypochlorite.

- **Rubber-Lined Steel**
- **FRP**
  Fiberglass-Reinforced Plastic with Compatible Resin and Cure System
- **High Density Polyethylene**
- **Titanium**
- **Dual Laminate**
  FRP and PVC, CPVC, PVDF, PPL

Piping Materials

Improper selection of materials may result in damage to equipment and contamination of the product.

- **PVC**
  Polyvinyl Chloride
- **CPVC**
  Chlorinated Polyvinyl Chloride
- **FRP**
  Fiberglass-Reinforced Plastic with Compatible Resin and Cure System
- **PP**
  Polypropylene
- **Titanium**
  The Only Metal Suitable for Bleach

References

These sources have contributed to the information and insights presented here, providing valuable context and support. We encourage further exploration of these references for a deeper understanding of the topics covered.

- Chlorine Institute Pamphlet 96 *Sodium Hypochlorite Manual* www.chlorineinstitute.org
- White's Book of Chlorination
- Solvay Technical and Engineering Services

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