In our industry, we’re all acutely aware that acidic corrosion in our water and wastewater infrastructure is a serious, often hidden, problem.

At a Senate hearing, it was estimated that, on average, 25 percent of drinking water leaks from water system pipes before reaching the faucet.

The same committee was told it will take $335 billion to resurrect water systems and $300 billion to fix sewer systems.

*Washington Post article, January 2, 2012*
**CORROSION'S PRIMARY CAUSE:**

Sulfide gas is converted to corrosive sulfuric acid on infrastructure surfaces.

The acid dissolves concrete and metal on surfaces inside sewers and wastewater treatment plants, throughout the entire treatment and delivery process. Acidic Corrosion is prevalent in virtually every stage of the process – in your Collection System, your Headworks, in Primary and Secondary Clarifiers, in your Digesters, and in the Disinfection Processes. **Corrosion is a system-wide problem, requiring a system-wide solution.**

**SO, WHY ADD TO THE PROBLEM, RATHER THAN ADDING THE SOLUTION?**

Adding or creating ALKALINITY is the most direct and effective way to neutralize the problem of excessive acidity in our water and wastewater infrastructure. However, many common treatments either provide no acid neutralization, or actually consume alkalinity in their chemistry.

Alkalinity is the name given to the quantitative capacity of an aqueous solution to neutralize an acid.

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**LBS ALKALINITY PER GALLON**

<table>
<thead>
<tr>
<th>Alkalinity Addition</th>
<th>LBS Alkalinity Per Gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Alkalinity Additon</td>
<td>-4.43</td>
</tr>
<tr>
<td>Thioguard provides 272% More Alkalinity than Lime Slurry</td>
<td>13.38</td>
</tr>
<tr>
<td>Alkalinity Consumption</td>
<td>3.6</td>
</tr>
</tbody>
</table>

- **THIOGUARD®**
- **LIME SLURRY (25%)**
- **CALCIUM NITRATE**
- **IRON SALTS**
Thioguard® provides the greatest power to neutralize acid over long periods. 

Adding calcium nitrate (Bioxide) that provides no acid neutralization.

Adding iron salts (Ferrous Chloride) that is an acid, provides no acid neutralization and actually consumes alkalinity.

Thioguard® neutralizes:
- wastewater acid
- surface acid

H₂SO₄ - sulfuric acid attack
infrastructure distances while providing additional benefits to your WWTP plant's biological treatment processes. The chart above compares the alkalinity per gallon, among the most commonly used treatment options.

**ADDING TO THE LIFESPAN OF YOUR INFRASTRUCTURE - PREVENTING FURTHER CORROSION:**

In an acidic environment (pH=2), corrosion is rampant, tearing through 2” of concrete in as little as 8 years. When effective surface pH=4, similar corrosion levels are pushed out to 50+ years.

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**YEARS OF LIFE**

**2” Sacrificial Concrete**

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**THE ADDITION OF THIOGUARD® BOOSTS LIQUID & SURFACE pH LEVELS, PREVENTING THE ACIDIC CONDITIONS THAT SPEED UP AND ENCOURAGE CORROSION.**

By reducing the acidity in your system, you'll reduce corrosion dramatically, in some cases by as much as 100X, when compared to other treatments. Thioguard® is typically added through a single Feed Unit, and provides "corrosion-controlling" benefits throughout your system, from collection system source to treatment plant discharge.
The measured surface pH can then be used to correlate corrosion rate and subsequently, remaining years of useful life of a concrete structure.

The use of Thioguard® by direct addition has been demonstrated to elevate surface pH from a highly corrosive pH=0-2 up to a more desirable range of pH=5-9.

**STOP ADDING TO YOUR CORROSION PROBLEMS. START ADDING THE SOLUTION.**

*Thioguard is the ONLY commonly used product that has a direct mechanism to PREVENT CORROSION.* The benefits of adding Thioguard® to your treatment processes are not limited to the prevention or reduction of corrosion. You will also benefit from a reduction in the formation of sludge - significantly reducing your handling and transportation costs. The benefits are numerous and system-wide, making Thioguard® the Practical Choice for your system.
<table>
<thead>
<tr>
<th>EFFECT</th>
<th>THIOGUARD®</th>
<th>LIME</th>
<th>CAUSTIC SODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable pH</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>pH Spikes Above 9.0</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Alkalinity Supplements Above 25 mg/L without pH spikes</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Produces sludge</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Metabolic Stimulant</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Enhances Clarification and Dewatering</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Improves cake solids</td>
<td>YES</td>
<td>MAYBE</td>
<td>NO</td>
</tr>
<tr>
<td>Stabilizes biosolids</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Hazardous to handle</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Causes Pipe scale</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

**CORROSION: SURFACE pH = (X) INCHES OF CORROSION:**

![Corrosion Measurement Image]
Corrosion is Clearly a Major Problem. Thankfully, Every Problem Has a Solution.

THE SOLUTION TO YOUR CORROSION PROBLEM IS THIOGUARD®.

CALL TODAY: 1.800.227.4287

THIOGUARD.COM | 1.800.227.4287

OWNED, MINED AND PRODUCED IN THE USA

Thioguard Headquarters
300 Barr Harbor Suite 250 | West Conshohocken, PA 19548
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Thioguard | 300 Barr Harbor Drive | Suite 250 | West Conshohocken | PA | 19428-2998