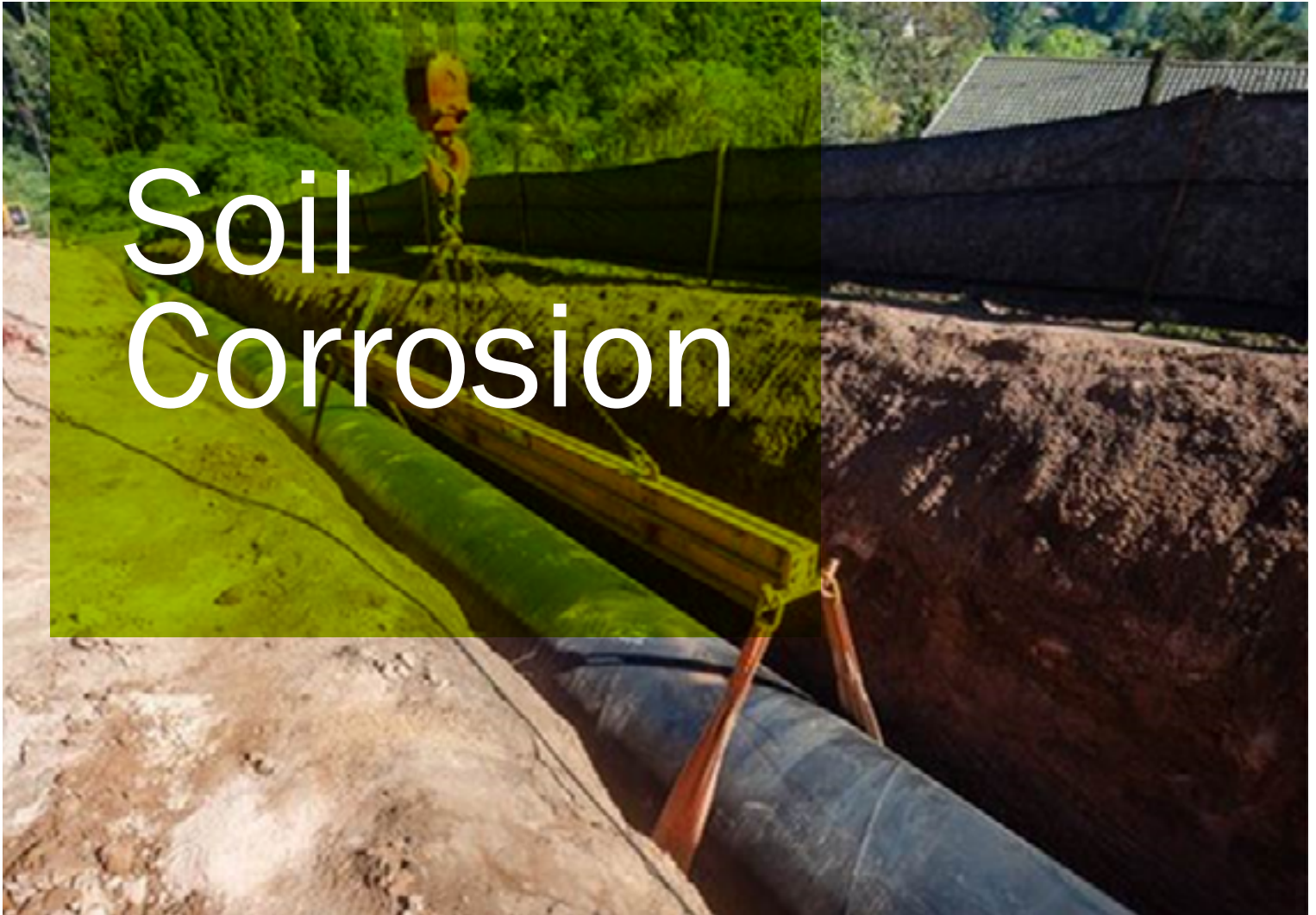


What measure can be taken to prevent it?

Soil Corrosion





Corrosion is the natural process of the destruction of metal by chemical or electrochemical reaction with its environment.

This brochure focuses on one such corrosion process which is the destruction of metal in a soil environment

Soils can be Corrosive



Accurate design, favorable production environments and adequate protection levels can prevent the harmful damage that can be brought about by soil corrosion.

Just like any other environment, soils can be corrosive. In corrosion engineering, this becomes an issue because a wide variety of the structures that people and industries rely on are buried under the ground, such as vessels, storage tanks and pipelines.

Soil corrosion can lead to financial losses and structural failure but there are measures that can be implemented throughout the design and production process to prevent it.

In order to do this, it is important to develop a fundamental understanding of the potential of soil to cause corrosion.

What is Soil Corrosion?

Soil corrosion refers to a very complex phenomenon that involves several variables. This may include chemical reactions with certain elements that occur in soils any variables in soil characteristics and properties that have a huge impact on the corrosion activity that occurs in buried structures.

For instance, carbon steel's response to corrosion in soil basically depends on the soil's nature and other factors in the environment, such as oxygen and moisture. Such factors are capable of producing intense effects in terms of the corrosion rate and severity of attack. In a worst-case scenario, a buried vessel may perforate within a year.

The Soil Corrosion Problem

The damage of corrosion could result in billions of dollars in expenditures. The most significant portion of losses related to corrosion involves the corrosion of metal or steel structures that are buried in soils. Metals that are in contact with materials such as soil can develop a corrosion potential. In most instances, the rate of corrosion can be so fast and the severity can be so extreme that it results in structural failure.

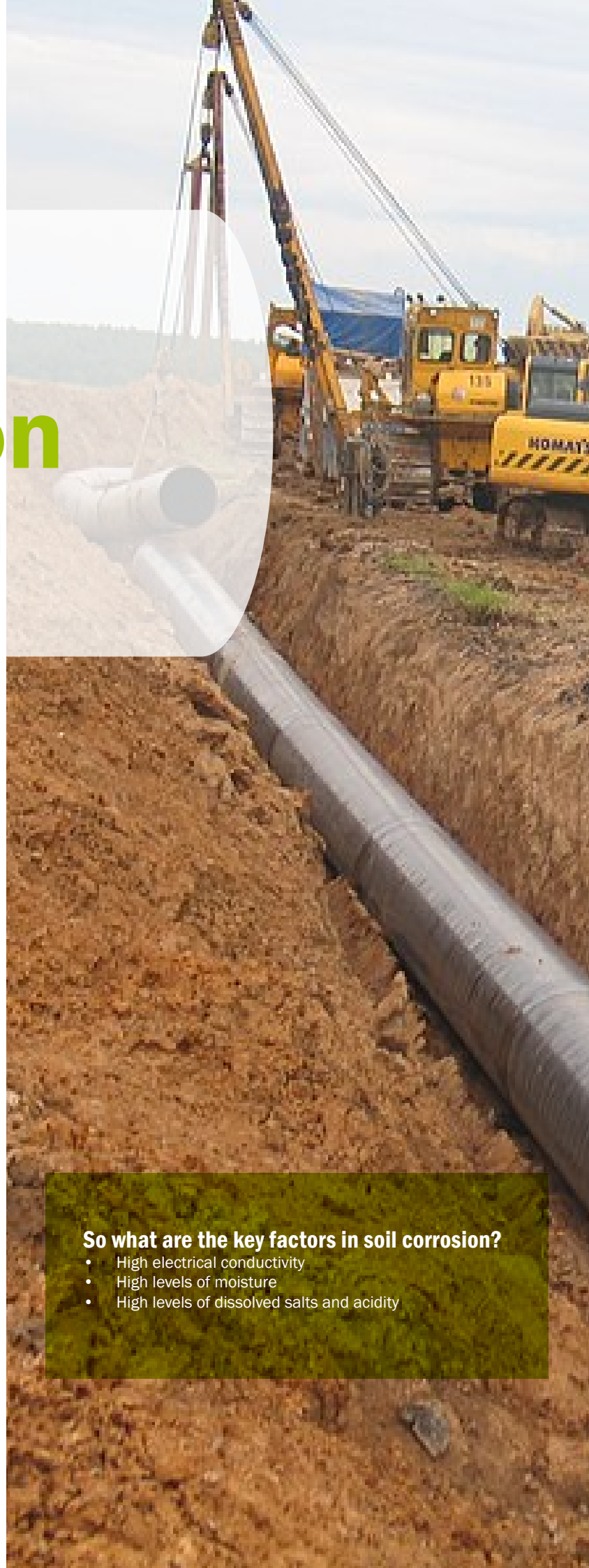
Thus, the mechanism of soil corrosion should be known, along with the strategies that should be implemented to avoid or mitigate the corrosion of metal when it comes in contact with soil. Essentially, there are basic issues that are significant to soil corrosion

These are as follows:

- Soil corrosivity can be associated with the aeration level, salt content, water retention and acidity of soil, as well as the existence of ionic species in the soil.
- Galvanic processes that occur when metals come in contact with soils.
- The mitigation strategies that are used in the practice of modern engineering.
- The use of sacrificial anodes to provide protection.

So what are the key factors in soil corrosion?

- High electrical conductivity
- High levels of moisture
- High levels of dissolved salts and acidity





1

Aeration

Aeration is described as the amount of air trapped in soil. Soil that is well aerated is less prone to corrosion because it has higher rates of evaporation and lower water retention.

2

Resistivity and Moisture Content

According to various studies, higher moisture content can reduce the soil resistivity, which can in turn increase the potential for corrosion.

3

Acidity or pH

Soils possess varying levels of acidity, ranging from a pH of between 2.5 and 10. When the pH level reaches 5 or below, fast corrosion rates are likely to occur.

4

Redox Potential

Redox, or oxidation reduction potential, refers to the activity or strength of oxidizers and reducers in relation to their concentration.

5

The Existence of Ionic Species

Chloride ions are harmful to metals and they have a direct role in metal anodic dissolution. The presence of chloride ions in soils could result in reduced resistivity.



How to Cor

**Our Product deactivates
salt water deposits from**

Soil corrosion affects almost all structures on Earth. As such, the right measures should be implemented by industries, especially design engineers, in order to avoid or at least prevent the damage that corrosion can cause.

Generally, soil corrosion can take place in almost all structures that are exposed to soil. Even so, accurate design, favorable production environments and adequate protection levels can prevent the harmful damage that can be brought about by corrosion in soils.

The longest pipelines are buried pipelines. They transport different petro products such as crude oil and natural gas, wastewater, potable water and other liquids, significantly influencing the economies of the developed countries as well as the developing countries. Corrosion of internal and external surfaces of pipelines is a

leading cause of failure of buried pipelines. Apart from huge financial losses due to damaged assets, corrosion causes catastrophic failures, accidents and loss of precious lives. In potable water systems, corrosion can lead to disruption, wastage and supply of water of inferior quality.

Soils with high sand content are less corrosive as they have higher electrical resistance. Shifting of soils can add to severity of corrosive pipe damage. Corrosive chlorides in soil result from tidal flows or ocean currents carrying saltwater droplets up to several miles away from the seashore.

Soils with fuel-generated combustion products containing sulfur compounds and nitrogen result in reduced resistivity and higher corrosion potential.

Even alkaline elements such as sodium, magnesium and calcium lead to higher corrosion potential, whereas granular types of soils reduce the corrosion potential.

Corrosion Prevention for Buried Pipelines

Source:
CorrosionPedia.com

Control Soil Corrosion

Prevents and removes corrosion, salt and scale from any surface, instantaneously.



Cathodic Protection

Cathodic protection is a corrosion control technique that is typically used to manage the corrosion of metal by transforming it into the cathode within an electrochemical reaction or cell.



Sacrificial Anodes


The use of galvanic anodes is one of the most effective ways of protecting various steel structures from the harmful effects of corrosion. A good example is zinc anodes, which are highly capable of providing galvanic protection to metals that are in contact with soils.



Protective Coatings

The use of protective coatings on metal structures buried under or in contact with the soil can significantly prevent the occurrence of soil corrosion.

Our Product Fights Rust, Corrosion & Salt Water

A large white pipe is being installed in a deep trench. The trench is dug into reddish-brown soil. The pipe runs from the foreground towards the background, where it disappears into the distance. The surrounding area is rural, with some green vegetation and trees visible in the background. The sky is clear and blue. The overall scene is brightly lit, suggesting a sunny day.

NaClear is easy to apply by just connecting an application device to a water source. Precision Fluid Systems has a patented device which functions with containers including 55 gallon drums. Also the device can apply various calibrated amounts of NaClear for various applications.

NaClear IS LAB TESTED!

B.A.W. Laboratories, Inc.
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Reference No: 87C11071-1562

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Michael R. Banker and D. Anner Wilson

NaClear

The Ultimate

Metal Protector

Removes salt & salt water from any surface and leaves a protective coating that preserves and extends surface life.
NaClear Fights: Rust, Corrosion & Salt Water!

Who We Are

We are a true industry leader, and our research and development efforts prove it!

Precision Fluid Systems

Precision Fluid Systems has four product lines which are all original inventions and manufactured in the USA. All of which can be used with our patented device for application:

- Corrosion Blocker ® SALT Remover
- Coldfire ® Fire Suppression Agent
- HCU (Humic Coated Urea) Liquid Green FLO®
- Foltec SG Complete Nutrient Products

Automatic Dispenser

Part of what makes us different is our patented "new generation" proprietary automated dispenser. The automatic dispenser provides a simple method of dispensing calibrated amounts our line of corrosion blocking, fire suppressant and fertilizer products.



INNOVATIVE

New product designed to protect virtually all metal surfaces from the destructive effects of chloride salts.



SAFE TO USE

Biodegradable, eco-friendly and safe to use on all metal surfaces.



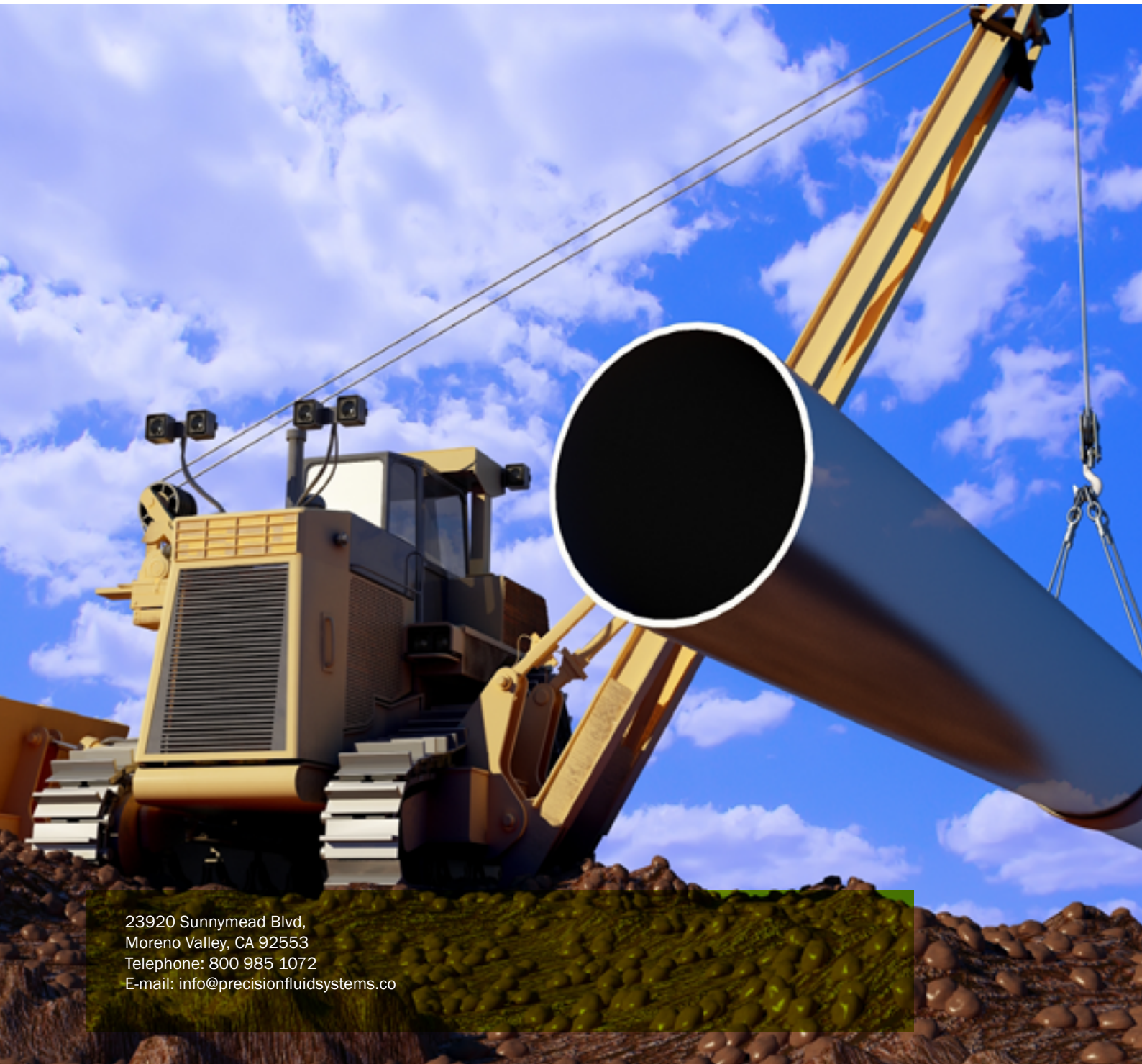
MONEY MAKING INVESTMENT

Using Salt-X for preventative maintenance on all equipment will extend its life.



ECONOMICAL

Salt-X is concentrated, just two ounces per gallon of water is sufficient for most types of applications.



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