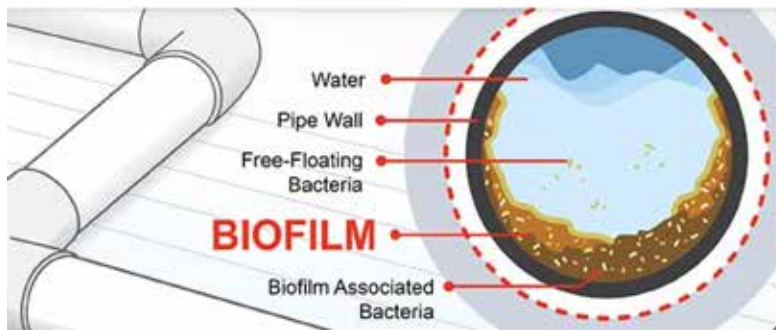


MAJOR ANNOUNCEMENT

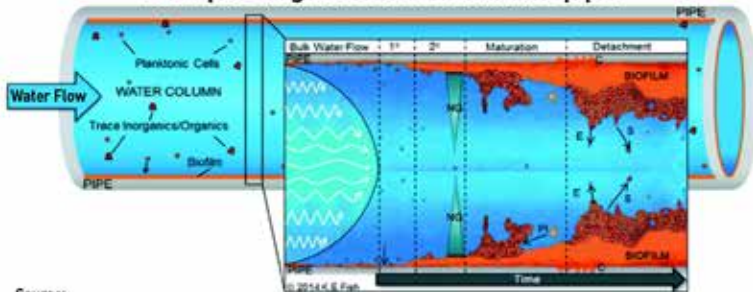
SWORDFISH Confirms That Copper & Plastic Pipe Can Test Positive for Lead

SWORDFISH Field Work & Independent Research Confirms Lead Can Accumulate on Copper & Plastic, Like Galvanized Pipe

BIOFILMS



Biofilm development within drinking water distribution systems incorporating water flow within the pipe.



Source: Characterising and understanding the impact of microbial biofilms and the extracellular polymeric substance (EPS) matrix in drinking water distribution systems, Katherine E. Fish, A. Mark Osborn and Joby Boxall.

CALCIUM DEPOSITS



Historical Data on Water Services May Not Capture The Current Risk From Lead, Without Verification

Representing a major development, recent academic research and field work performed by Electro Scan Inc. using its patented SWORDFISH technology, has confirmed that copper & plastic pipes can accumulate lead particles and test positive.

The good news is that field testing has shown that flushing and cleaning copper & plastics that test positive can substantially eliminate all traces of lead. Since lead can be encapsulated in biofilms and calcium deposits, removal (not replacement) can irradiate the risk of lead. **Contact Electro Scan for more details.**

HISTORICAL DATA

Effects of water chemistry and flow on lead release from plastic pipes versus copper pipes, implications for plumbing decontamination ☆

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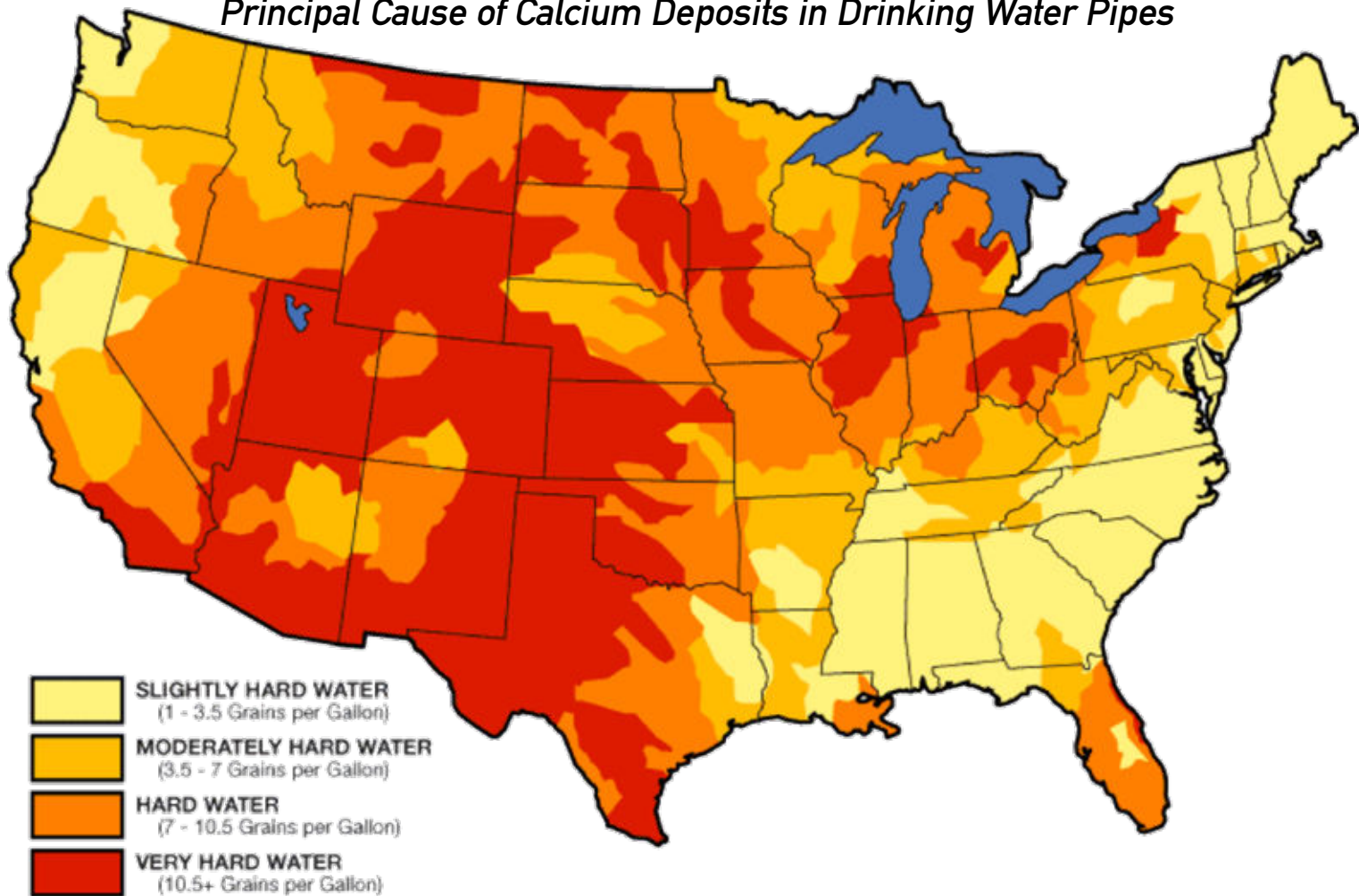
1. Introduction

Despite the efforts of water distributors to deliver clean and safe drinking water to consumers, the chemical and microbiological quality of water might deteriorate as water is conveyed through the plumbing materials (Ghoochani et al., 2022; Hawes et al., 2017; Salehi, 2022). Potable water plumbing systems are associated with several public health concerns due to their potential to release heavy metals such as Pb, Cu, and Zn, and promote microbial growth in tap water (Ley et al., 2020; Proctor et al., 2020; Salehi et al., 2020). Over the last two decades, plastic potable water pipes such as high-density polyethylene (HDPE) and cross-linked polyethylene (PEX) pipes have been widely used to convey potable water within both water distribution systems and building plumbing to reduce cost and ameliorate drinking water quality concerns caused by corrosion of metallic pipes (Walsh, 2011). Although

plastic potable water pipes have resolved historic corrosion concerns associated with metallic piping materials [e.g., galvanized iron, copper] (McFadden et al., 2011), they have also created additional concerns regarding their potential to leach organic compounds into tap water, which can sustain microbial regrowth (Salehi et al., 2018a; Wen et al., 2015). Migrating organic chemicals from plastic pipes can cause odor problems, promote microbial regrowth, and threaten the safety of tap water (Salehi et al., 2018a; Liu et al., 2017). Moreover, our prior research has shown that plastic materials could also serve as resting sites for the accumulation of heavy metals (Herath and Salehi, 2022; Salehi et al., 2018b; Hadiuzzaman et al., 2022). Previous research on lead fate in building plumbing systems has mainly focused on quantifying lead species in metallic pipes' surfaces, rather than polymers. Nevertheless, our field investigations have demonstrated that lead can also accumulate on the surface of PEX-A pipes (Salehi et al., 2017).

Water Hardness Areas in the United States

Principal Cause of Calcium Deposits in Drinking Water Pipes



**States With Greatest Risk of Lead Accumulation
In Drinking Water Pipes Having Calcium Deposits**

Arizona

Colorado

Illinois

Iowas

Kansas

Minnesota

Montana

New Mexico

Nevada

Oklahoma

South Dakota

Texas

Utah

Wyoming