

# Good Plumbing Practices Protect San Francisco Bay

A Fact Sheet for Installers / Plumbers

## Copper Affects the Bay

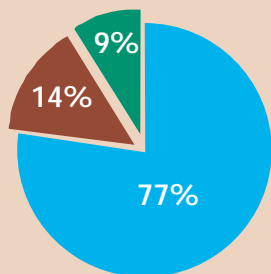
Copper enters San Francisco Bay through storm drains and from wastewater discharged from wastewater treatment plants. Copper is acutely toxic to plankton and affects the reproduction and growth of shellfish.

Much of the copper entering San Francisco Bay (about 77%) passes through storm drains and goes into the Bay untreated. The rest comes from wastewater, which moves from sewers through wastewater treatment plants and is discharged to the Bay.

All Bay Area wastewater treatment plants have permits to discharge into the Bay. These permits strictly limit copper discharges. Many permits also require pollution prevention programs to reduce copper — this is where plumbers come into play.

Of the 23% of copper from treated wastewater, about 60% is estimated to be from copper pipe corrosion. While that might seem like a small portion of the overall problem, copper from pipe corrosion is one source that can be easily reduced.

### Typical Breakdown of Bay Copper Sources



- stormwater sources
- wastewater: pipe corrosion
- wastewater: all other sources

\* Based on calculations for South San Francisco Bay, south of the Dumbarton Bridge.

## Reducing Pipe Corrosion Reduces Copper to the Bay

Your skilled installation techniques can greatly reduce pipe corrosion and help protect the Bay. Here are some ways you can make a difference:

### ◆ BEST MANAGEMENT PRACTICES

Follow the installation techniques specified by the ASTM B828 and the Copper Development Association in its Application Data Sheet for “soldering and brazing copper tube and fittings.”

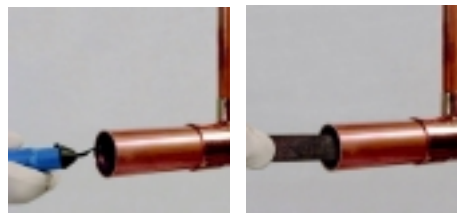
### ◆ SYSTEM DESIGN

Design each plumbing system to:

1. Minimize velocity
2. Minimize hot water temperature
3. Avoid stagnant sections
4. Minimize direction and size changes

### ◆ CAREFUL REAMING

Eliminate small burrs created from pipe cutting. This reduces turbulence and significantly decreases corrosion.

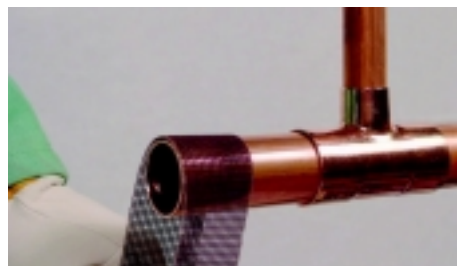


### ◆ PROTECTED STORAGE

Protect stored pipe from weather and damage so that installed pipe is as clean as possible.

### ◆ THOROUGH CLEANING

Remove all oxides, debris, and surface soil from tube ends.



Pitting in 6-year-old cold water pipe caused by excess flux at solder joint.

### ◆ IMMEDIATE AND REGULAR FLUSHING

Newly installed systems should be flushed soon after completion to remove excess flux and debris. For inactive systems, repeat flushing periodically.

### ◆ MINIMIZE FLUX USE

Avoid excess use of flux to protect both your health and the Bay. Excess flux residue can increase pipe corrosion which leads to copper discharges to the Bay. Warning: Flux is harmful if carried to the eyes, mouth, or open cuts. Some fluxes also absorb through the skin. Wear protective equipment.

### Less Corrosive Fluxes

The ASTM B813 flux standard limits flux corrosivity and requires that the flux be water flushable. While these are voluntary standards, the Copper Development Association encourages architects, engineers, contractors and building officials to specify and require the use of B813 fluxes.

All flux manufacturers make a B813 flux. B813 fluxes commonly available in California include:

- Everflux
- Harris Bridget
- Sterling
- Fry's Fire Eater
- LaCo Ultimate B813 Flux

Photo credits: (1) Copper Development Assoc., Application Data Sheet: Copper, Brass, Bronze; Soldering and Brazing Copper Tube and Fittings A1143-00/98. (2) Lewis, Richard, "A White Paper Review: History of Use and Performance of Copper Tube for Potable Water Service," Washington Suburban Sanitary Commission, 1999.