#### WHAT IS POTABLE WATER?

Potable water is the water in the public drinking water distribution system used for human consumption. This water is treated with chlorine to kill bacteria in the water, making it safe to drink.

#### HOW DOES THIS APPLY TO ME?

This BMP applies to the disinfection of water mains or any appurtenances on the drinking water distribution system that exposes the system to any contaminants. For example, when replacing a valve or pipe on a water line it is possible that it can be contaminated with dust or soil. Soil can contain many different kinds of bacteria that are harmful to the drinking water system. Chlorine is added to the drinking water system continually but it may not be enough if the water system is continually being contaminated with soil or other contaminants when there is a repair done on the water system.

#### WHY AND WHEN IS IT IMPORTANT TO DISINFECT POTABLE WATER MAINS AND APPURTENANCES?

When an alteration or addition to the distribution system is made the addition should be disinfected by chlorination. *Additions, repairs, or any other alterations should be done through Morenci Engineering group and Morenci Water and Electric*. The purpose of disinfection is to kill disease-producing organisms (pathogens) which may have entered into the water system. The pathogens involved are primarily those causing intestinal diseases such as typhoid, paratyphoid, infectious hepatitis, and dysenteries. Disinfection refers to the destruction of pathogenic and intestinal or fecal type bacteria in potable drinking water. The methods of chlorination should be followed as closely as possible to avoid possible water contamination to the potable water system.

**HOW CAN CONTAMINANTS BE PREVENTED FROM ENTERING THE WATER MAINS?**

1. Prevent contaminating material from entering the water pipeline during construction, repair or removal.

* Keep pipe strung or place watertight plugs on ends of pipe to keep dirt out.
* If water accumulates in the trench, the plugs must remain in place until the trench is dry.
* The interior of the pipe or equipment (such as a backflow prevention device) being placed on the distribution system must be cleaned and swabbed with a 5% hypochlorite disinfecting solution.

1. Flush to waste any material that may have entered the pipeline unless the tablet method is going to be used (see below).
2. Super-chlorination of any residual contamination using the *general method* or the*tablet method:*

**The General Method:**

* Flush prior to disinfection. The flushing velocity should NOT be less than 2.5 ft/sec.
* The water should receive a dose of chlorine, also fed at a constant, measured rate.
* The two rates should be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 mg/l free available chlorine. *Morenci Power* *House* or *Morenci Water and Electric* will record the chlorine residual at that time.
* During the application of the chlorine, valves should be manipulated to prevent the treatment dosage from flowing back into lines supplying the water.
* The chlorinated water should be retained in the main for at least 24 hours during which time all valves and hydrants in the section treated should be operated in order to disinfect the appurtenances. At the end of the 24-hour period, the treated water should contain no less than 10 mg/l free chlorine residual throughout the length of the main. *Morenci* *Power House* or *Morenci Water and Electric* will also need to record this residual.

**The Tablet Method:**

* Place tablets in each section of pipe and also in hydrants, hydrant branches and other appurtenances.

* All tablets within the main must be at the top of the main.

* Tablets placed in joints are either crushed and placed inside the annular space, or they are rubbed like chalk on the butt ends of the sections to coat them with calcium hypochlorite.
* Fill main with water moving at a velocity of less than 1 ft/sec.
* Water must remain in the main for at least 24 hours.
* Valves should be manipulated so that the strong chlorine solution in the line being treated will not flow back into lines supplying the water.

1. Flush to waste all super-chlorinated water prior to placing system into service.
2. Bacterial samples will have to be collected for examination by water distribution operators from *Morenci Power House* or *Morenci Water and Electric* from the end of the line, dead ends, or isolated areas. These tests take 24 hours. If the sample is positive for Coliform or E coli the entire disinfection procedure must be repeated until the bacterial results come back satisfactorily.

**WHAT ABOUT THE STORAGE TANKS**

1. Dry tank thoroughly.
2. Fill tank slowly to the overflow level with potable water to which chlorine has been added to produce a concentration of 50 mg/l in the full tank. *Morenci Power House or Morenci* *Water and Electric* must be called to check this residual.
3. The inspection manhole cover should be bolted down before filling the tank.
4. Fill the tank providing a thorough mix of the chlorine with the water and assure contact with all surfaces for disinfection.
5. After tank is filled, it should stand full for at least 24 hours.
6. After 24 hours, *Morenci Power House* or *Morenci Water and Electric* must test and record the chlorine residual, which cannot be less than 2 mg/l.
7. Completely drain to waste the chlorinated water.
8. Refill the tank with the potable source water.
9. Morenci Water and Electric must be contacted to take samples from the tank to record that the tank is of good sanitary condition.
10. If the bacteriological samples come back unsatisfactory, the disinfection method must be repeated until the samples come back satisfactorily.

**WHAT IF REPAIRS, RELOCATION, OR ALTERATION TO MAIN NEEDS TO BE PERFORMED**

If it is necessary to replace a valve, backflow prevention assembly, or add a service these appurtenances must be rinsed thoroughly then cleaned and swabbed, as necessary, with a 5% hypochlorite disinfecting solution before installing the equipment. As mentioned before, any changes to the distribution line shall be done through Plant Engineering and/or Morenci Water and Electric.

**WHERE CAN YOU FIND MORE INFORMATION?**

All of the above information was found in or copied from the *AWWA Standard for Disinfecting Water Mains C651 and AWWA Standard for Disinfection of Water-Storage Facilities C652.*

**QUESTIONS OR NEED HELP? CONTACT:**

**Plant Engineering Division Representatives**

**Power House Division Representatives**

**Morenci Water & Electric Division Representatives**

**Enviro Representatives Phone Extensions: Sal Robles 865-7934**

**Enviro Representatives Cell Phones: Sal Robles 965-7296**

**Environmental Services Office: 865-6000**

**Record of Change Information**

This chart contains a history of this document’s revisions. Only major changes that constitutes a substantive change to the procedure or process will be recorded. Minor changes, such as administrative updates, generalization, clarification, grammar and spelling errors, or rearrangement or placement of information will not be recorded.

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| **Version Number** | **Version Date** | **Section or Table Number or Entire Document** | **Description of Change** |
| 001 | 01/12/2007 | Footer Section | Format change, footer added. |
| 002 | 01/18/2008 | Entire Document | PD logo replaced with FM logo. All PD language in document replaced with either "Freeport-McMoRan Copper & Gold Morenci Operations" or "Morenci". Questions section expanded to include contact names, phone & cell numbers. |
| 003 | 04/24/2013 | Entire Document | 2013 review, updated contact information. |
| 004 | 10/23/2015 | Entire Document | Updated contact information. |
| 005 | 04/24/2017 | Entire Document | Updated contact information. |
| 006 | 10/04/2017 | Entire Document | Updated contact information. |