# Switching from Chlorine to Chloramine in the District's Drinking Water

## what, why, and what does it mean to you

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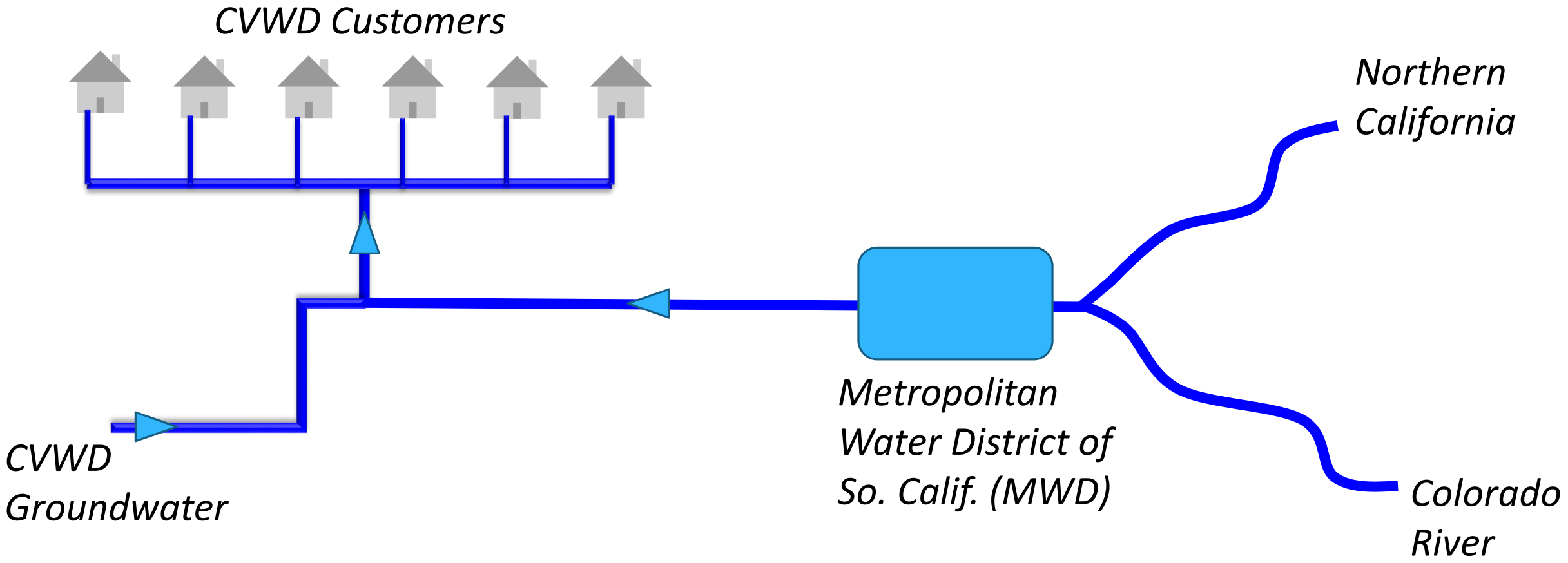
# Outline

1. Your drinking water system
2. Drinking water disinfection
3. What is chloramine and how does it differ from chlorine?
4. Why is the District switching from chlorine to chloramine?
5. What does it mean to you?
6. What should you do in preparation for the switch?
7. Q&A

# Your Drinking Water System



# Water Disinfection

1. The practice of disinfecting drinking water began more than a 100 years ago.
2. Drinking water disinfection is one of the greatest public health protection acts ever undertaken.
3. It is credited with the eradication of most water-borne diseases in the US.
4. All drinking waters are disinfected… in fact, it is the law, with few exceptions.
5. The District is required to maintain a disinfectant in the water throughout all of the distribution system pipes.

# Chlorine vs. Chloramine

1. Chlorine is a chemical molecule made up of two chloride ions, $Cl^-$, which is the main component of table salt.

2. Chlorine is highly reactive with organic matter.

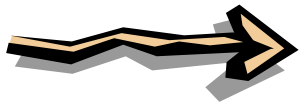
3. It is the same product in liquid bleach, which is used to “destroy” color stains since most color is organic material.

4. It is this reactive power of chlorine that makes it a strong disinfectant.

5. Chlorine continues to be the most commonly used drinking water disinfectant.

# Chlorine vs. Chloramine

1. Chloramine is a modified version of chlorine.
2. We make chloramine by adding a a small dose of ammonia to water containing chlorine.
3. The chlorine and the ammonia combine to form chloramine.

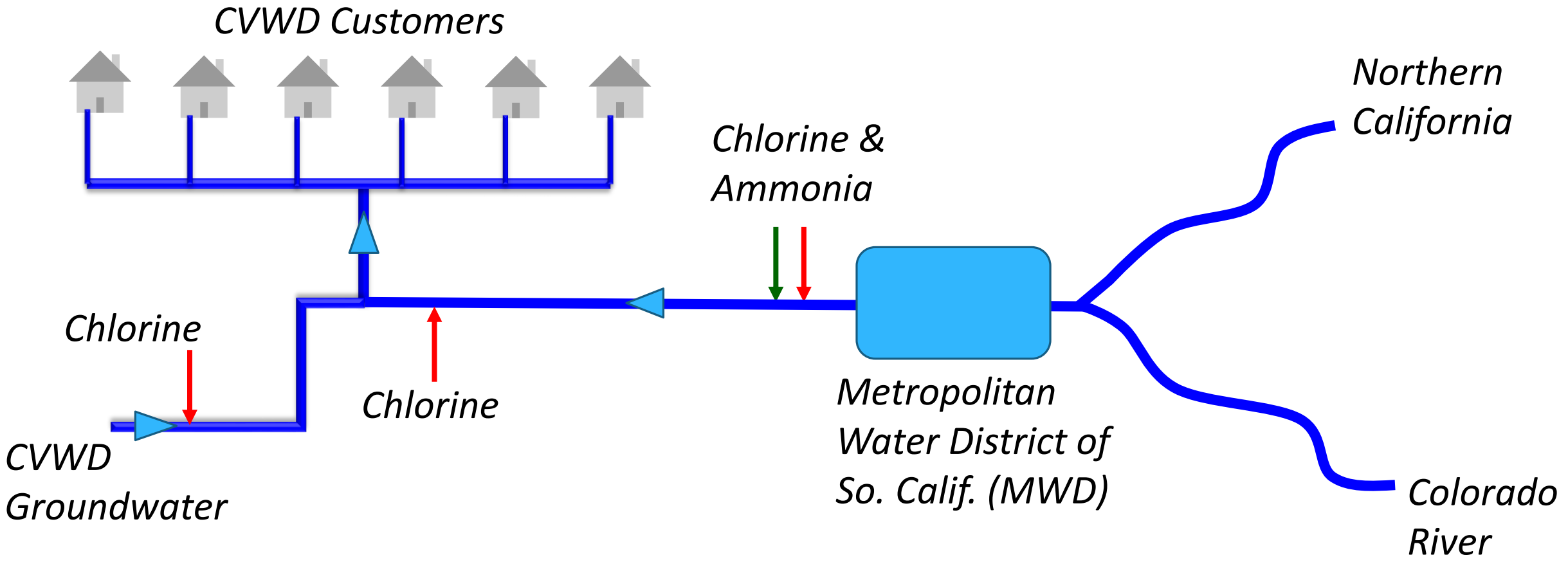
Chlorine + Ammonia  Chloramine

4. Chloramine is also a common water disinfectant.

# Blending Chlorine with Chloramine

1. If water containing chlorine is mixed with water containing chloramine, the two disinfectants will destroy each other.
2. The water from Metropolitan already contains chloramine, and has since the mid 1980's.
3. The District uses chlorine to disinfect its groundwater.
4. So either MWD water has to be converted to chlorine, or the District's groundwater has to be converted to chloramine.
5. For decades, the District converted MWD water from chloramine to chlorine, and maintained chlorine in the entire District service area.

# Current System Configuration



# The Challenge with Chlorine

1. All natural waters contain low levels of dissolved natural organic material (NOM) that washes into rivers and lakes
2. Chlorine reacts with the NOM to form trace levels of chemicals that we refer to as Disinfection By-Products, or DBPs.

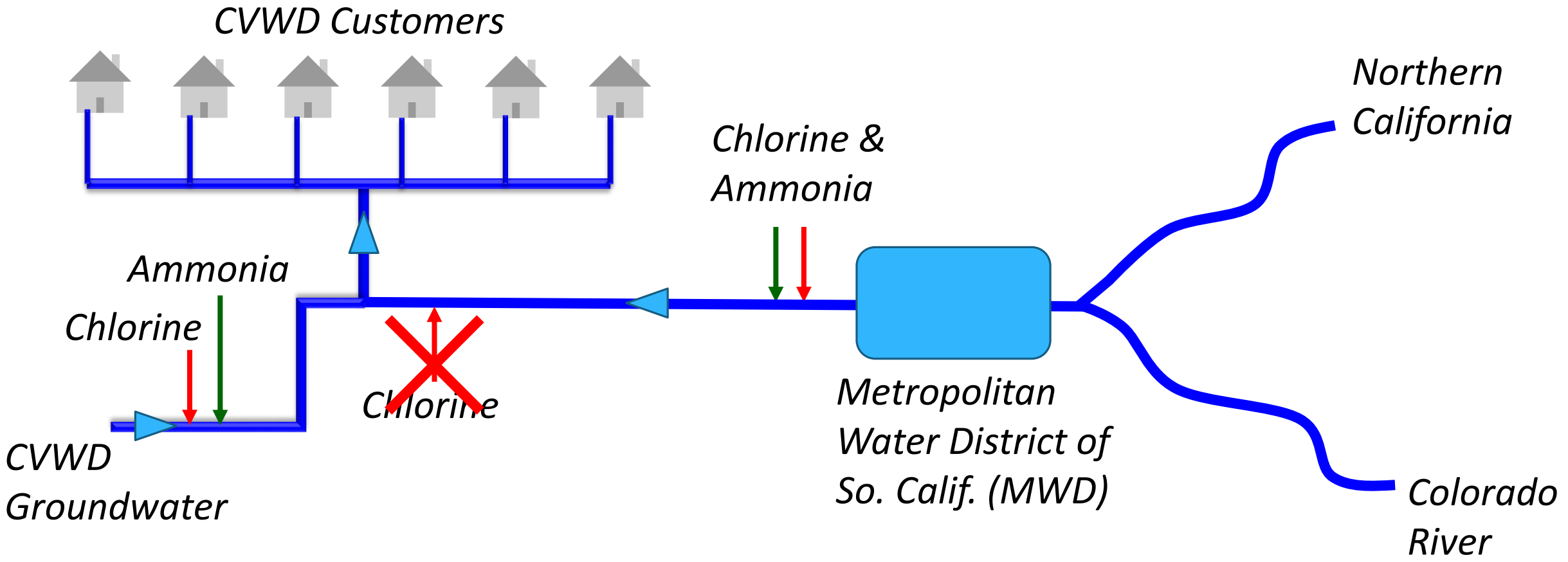
NOM + Chlorine → DBPs

3. The higher the NOM level, the more DBPs are formed.
4. There are two DBPs with upper limits on their annual average levels in drinking water, one of these is called trihalomethanes, or THMs.

# THMs

1. MWD water contains higher levels of NOM than the District's groundwater.
2. The District has been relying increasingly more on MWD water because of shortage of groundwater supplies as a result of the drought.
3. This has caused a steady rise in the levels of THMs in the District's drinking water.
4. Chloramine does not form THMs.
5. For this reason, the District may switch from chlorine to chloramine in the distribution system to lower the THM levels in the drinking water.

# Switching the System to Chloramine



# What are the downsides to Chloramine?

1. Certainly the water will be adequately disinfected regardless of which disinfectant is used in the system… that's never the issue.
2. You may detect a change in the taste of the water.  Few may like it, few may not, but the vast majority may not notice a difference.
3. There is a very remote chance you could experience some discolored water if you have old galvanized pipes.
4. But the two main issues we want to highlight are:
    1. Impact on aquatic animals
    2. Impact on dialysis machines

# Aquatic Animals

1. If you have an fish bowl, an aquarium, or a fish pond, you know that you don't use tap water with the chlorine in it.
2. You need to remove the chlorine from the water, which you do with an additive that you get from the pet-store, or using a special filter.
3. That's because chlorine is harmful to aquatic animals that breathe through gills.
4. The same applies to chloramine.
5. But because chloramine may need a different additive or filter, we want to make sure you check with your pet store and make sure that your system can handle chloramine.

# Kidney Dialysis Machines

1. Dialysis machines work the same way fish gills work!
2. They pass the blood next to a thin membrane with clean water on the other side.
3. Toxins in the blood pass through the membrane into the water.
4. But they don’t want anything in the water that can also pass through the membrane into the blood.
5. For this reason, all dialysis machines have special filters designed to remove chlorine from the water used by the machine.
6. The same applies to chloramine.
7. We want you to make sure the filter on your machine is designed for chloramine as well.

# Planned Schedule

1. The District may switch to chloramine as soon as Monday, October 1st.
2. If you don't have an aquatic pet, and if you don't use a dialysis machine, then there is nothing you need to do.
3. If you do, we want to make sure your aquarium or dialysis machine has the right treatment.
4. It is important that you do that before October 1st.

# We are Spreading the Word

1. Press release.
2. Notice to all District customers
3. Notices to all known pet-stores in the District's service area.
4. Posted a set of Q&A's on the District's website (www.CVWD.com).
5. Today's meeting.
6. Town Council meeting on September 20.

# Thank you!

Questions?