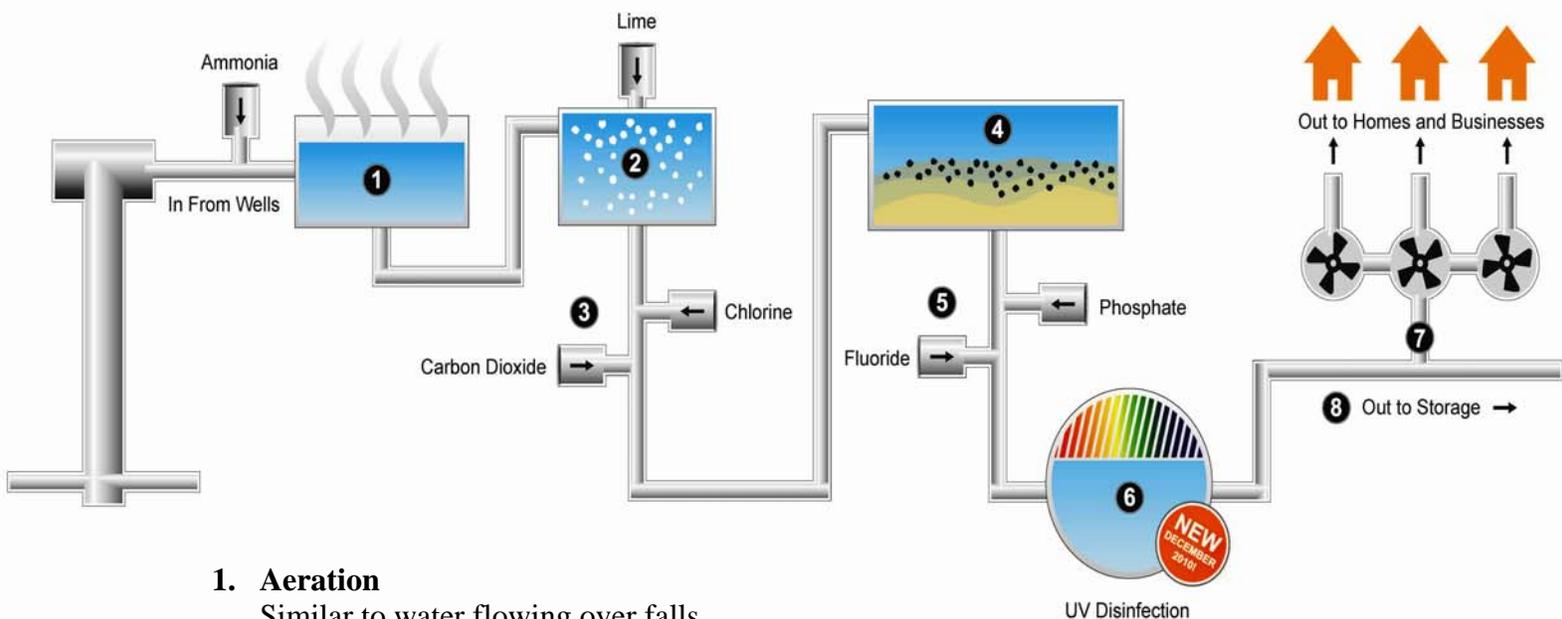


## CR Progress Fact Sheet: Ultraviolet Light Disinfection for Cedar Rapids Water

The City of Cedar Rapids Water Division has been committed to delivering clean, safe water to our customers for over a century. Recently the Cedar Rapids Water Division added an ultraviolet light disinfection system as an additional level of protection to the current water treatment process. The steps in water treatment process are described below:



**1. Aeration**

Similar to water flowing over falls  
Removes gases such as radon

**2. Softening**

Reduces deposits in water heaters  
Improves taste and smell of water

**3. Chlorination & Recarbonation**

Kills disease-causing bacteria  
Lowers water pH

**4. Filtration**

Removes remaining suspended matter

**5. Fluoridation & Phosphate Addition**

Promotes children's dental health  
Reduces possibility of lead leaching out of pipes

**6. Ultraviolet Light Disinfection**

Damages DNA of microorganisms so they do not pose a health risk

**7. Distribution**

Water delivered to homes and businesses

**8. Storage**

Ensures water supply during daily or seasonal fluctuations, and for critical episodes like fires or flooding

### **How does ultraviolet light (UV) disinfection work?**

- Ultraviolet light is a form of light that is invisible to the human eye. Specific wavelengths, between 100 and 280 nanometers (billionths of a meter) are categorized as germicidal – meaning they kill bacteria and viruses.
- Microorganisms in the water are exposed to ultraviolet light when they pass by special lamps. The UV energy instantly damages the genetic material (DNA) within the organisms.
- UV technology is highly effective against bacteria, including streptococcus and cholera; viruses including hepatitis A, polio, and rotavirus; and protozoa including cryptosporidium and giardia.
- Unable to reproduce, the microorganisms no longer pose a health risk.

### **Project Costs**

- Approximately \$40 million
- Paid for using a State Revolving Fund Loan for \$39,390,000 with the remaining expenses paid from the Cedar Rapids Water Division's Reserve Funds
- Expected added operations and maintenance costs for the UV disinfection system at both treatment plants is \$115,000 per year. Maintenance costs are minimal and consist of bulb replacement. Operating costs consist primarily of additional electric power. Some of these electrical costs will be offset by other efficiencies gained in the construction of the project; most notably the installation of more efficient high service pumps.

### **What is included in the Project?**

- Installation of Ultra-Violet Light Disinfection system at both water treatment facilities
- Upgrade the high service pumps at the J Ave Water Treatment Plant to new, more efficient models
- Improve J Ave Water Treatment Plant's emergency power generation capacity
- Improve the reliability of the power distribution system at the J Avenue Water Treatment Plant
- Install a fiber optic cable system at the J Avenue Water Treatment Plant to improve control capabilities and communication



*Chamber where water is exposed to ultraviolet light*