UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
DRINKING
WATER

Batch Chlorination Guidance and Regulation

Utah Division of Drinking Water

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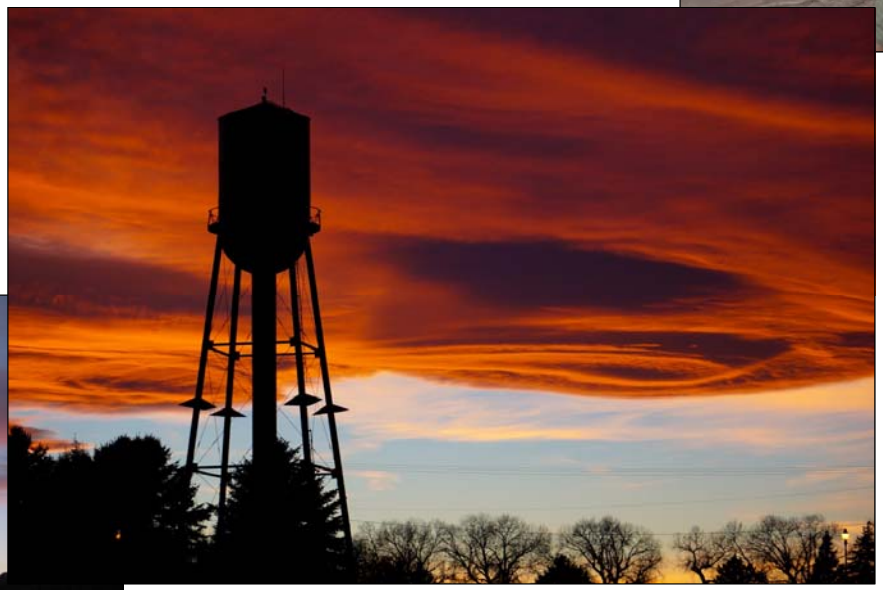
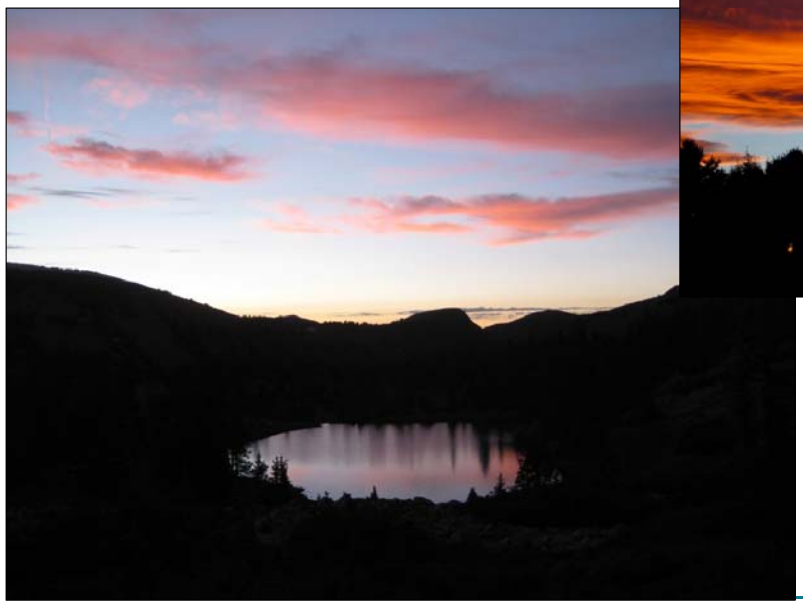




Batch Chlorination

- Batch disinfection is defined as:
  "the process of periodically adding a disinfecting agent to a water system, in lieu of performing approved continuous disinfection."

- Batch disinfection is further defined as:
  "when a system adds a disinfectant to avoid coliform positive samples."

Batch Chlorination

Examples may include but are not limited to:

- Manually adding disinfecting agent at the source or storage tank to address on-going water quality issues in the distribution system.

- The installation of some type of unapproved mechanical means of dispensing disinfecting agents into the distribution system.

Batch Chlorination – The Rules

R309-200(7) Disinfection

Continuous disinfection is recommended for all water sources. It shall be required of all ground water sources which do not consistently meet standards of bacteriologic quality.

R309-520-5 Secondary Disinfectants

Secondary disinfection provides an adequate disinfectant residual in the distribution system to maintain the quality of treated water by controlling microbiological contamination. Secondary chemical disinfection is achieved by maintaining a detectable disinfectant residual throughout the distribution system. Allowable secondary disinfectants are chlorine and chloramine.

R309-520-6 General

Intermittent or batch disinfection, such as adding hypochlorite tablets or concentrated hypochlorite solution to a tank, is not acceptable for ongoing operation if continuous disinfection is required.

Batch Chlorination

Is it really a thing??

Batch Chlorination - History

➢ Early 2015 –

- DDW starts tracking all emergency response incidents.

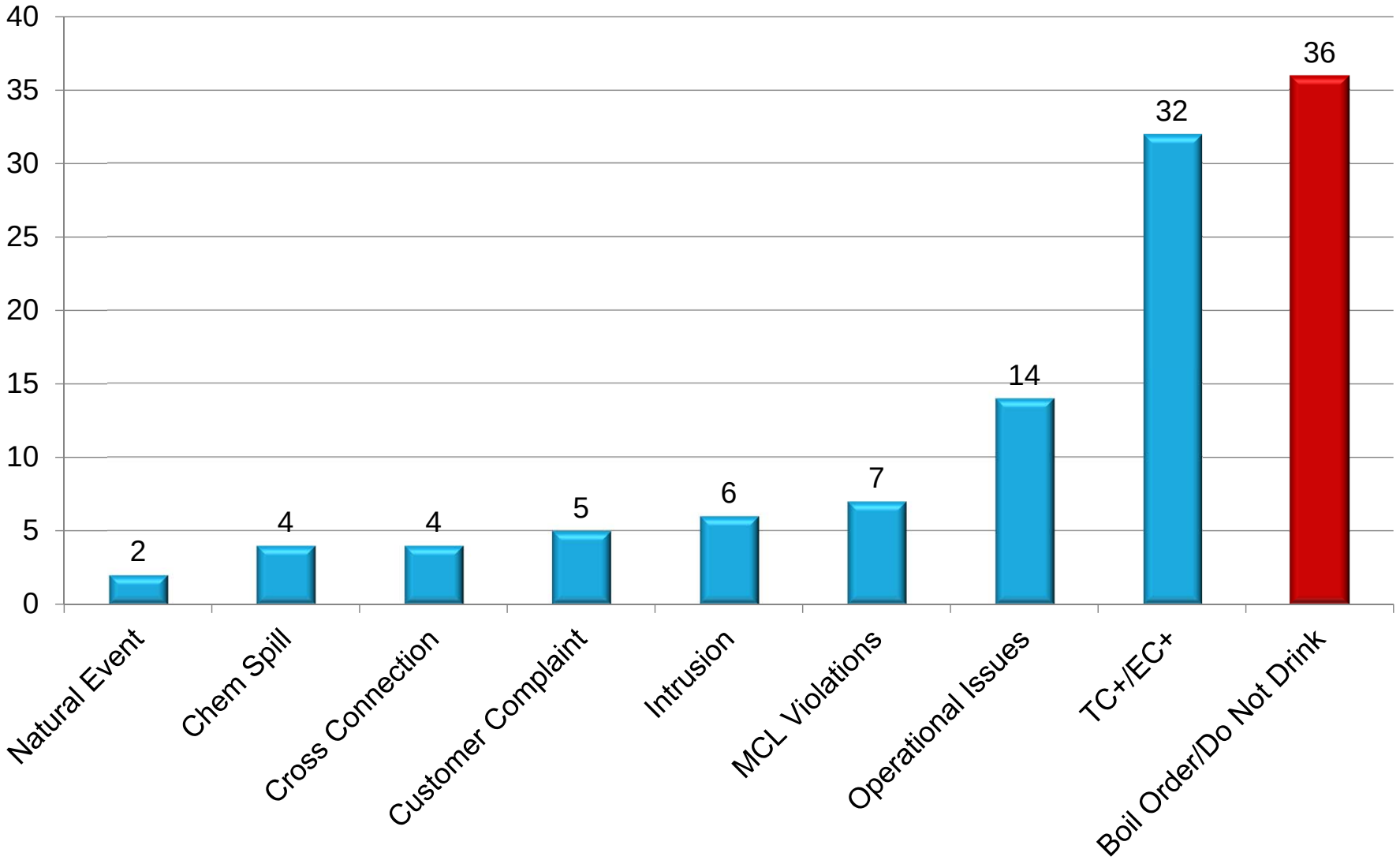
➢ August 2017 –

- Emergency Response Workgroup review of past incidents showed a high number of boil orders resulting from batching systems.

➢ January 2018-

- DDW Batch Chlorination Workflow was created.
- Designed to define batch chlorination, provide outline for technical assistance & enforcement.

Emergency Response Events



Batch Chlorination – Why is it bad?

- It masks quality issues and physical deficiencies
- It can harm infrastructure
- Changes water chemistry
- Uneven dispersal
- Unmonitored
- It can be harmful to public health

Why is it bad? - Biology

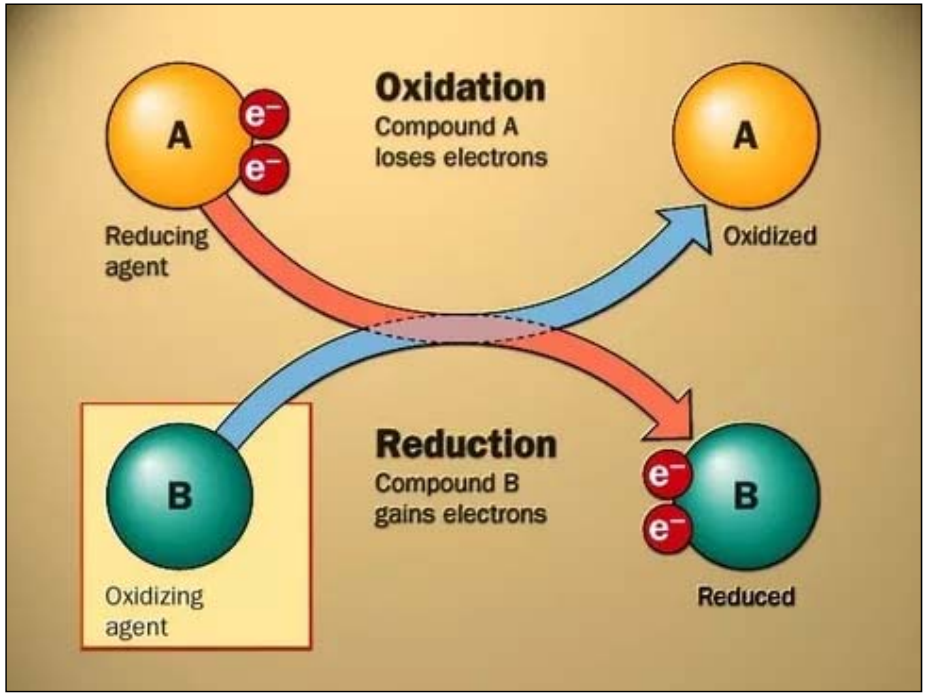
Germ inactivation for chlorinated water*

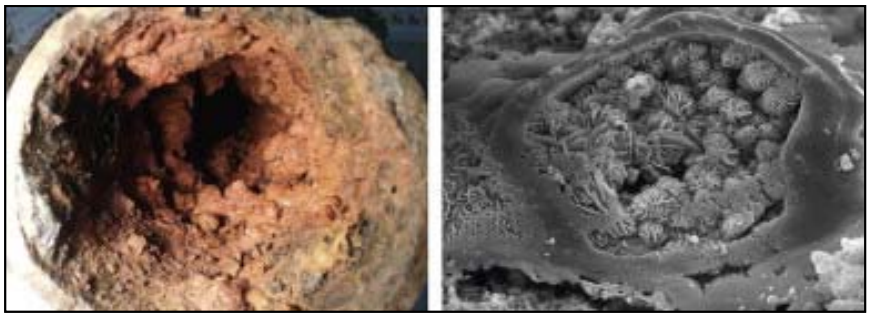
Germ	Time
E. coli O157:H7 Bacterium	Less than 1 minute
Hepatitis A Virus	About 16 minutes
Giardia Protozoan	About 45 minutes
Cryptosporidium Protozoan	About 15,300 minutes (10.6 days)

* Laboratory testing results using chlorine demand free water with 1ppm (1mg/L) 7.5, 77 °F (25 °C) and in the absence of cyanuric acid.

Why is it bad? - Chemistry

- Intermittent chlorination can harm infrastructure and can be harmful to public health





Why is it bad? - Corrosion

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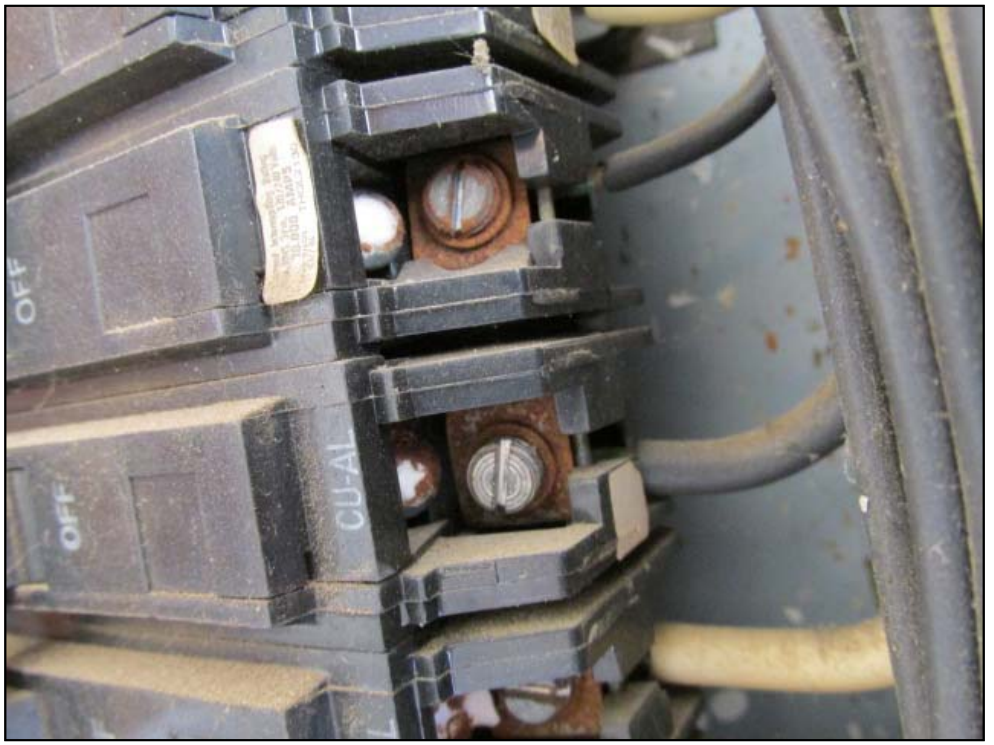


Why is it bad? - Aluminum Corrosion

Why is it bad? – Masking problems

Common Stories:

- System only chlorinates once a month to pass Bact-T samples
- System chlorinates between positive sample and repeat samples
- New operator takes over and Bact-T samples start failing

Batch Chlorination – Is it ever ok?

- Emergencies
- Seasonal Start-Up
- Temporary until permanent disinfection is installed

Chlorine Types

Gas

Liquid (Sodium hypochlorite)

Powder (Calcium hypochlorite)

Tablet (Calcium hypochlorite)

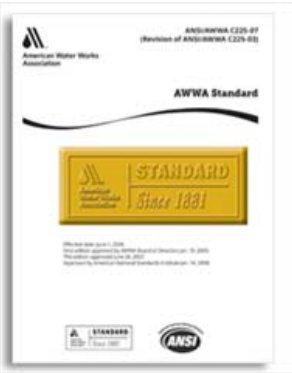
Approved Products and Methods

NSF

Certified to
NSF/ANSI 60

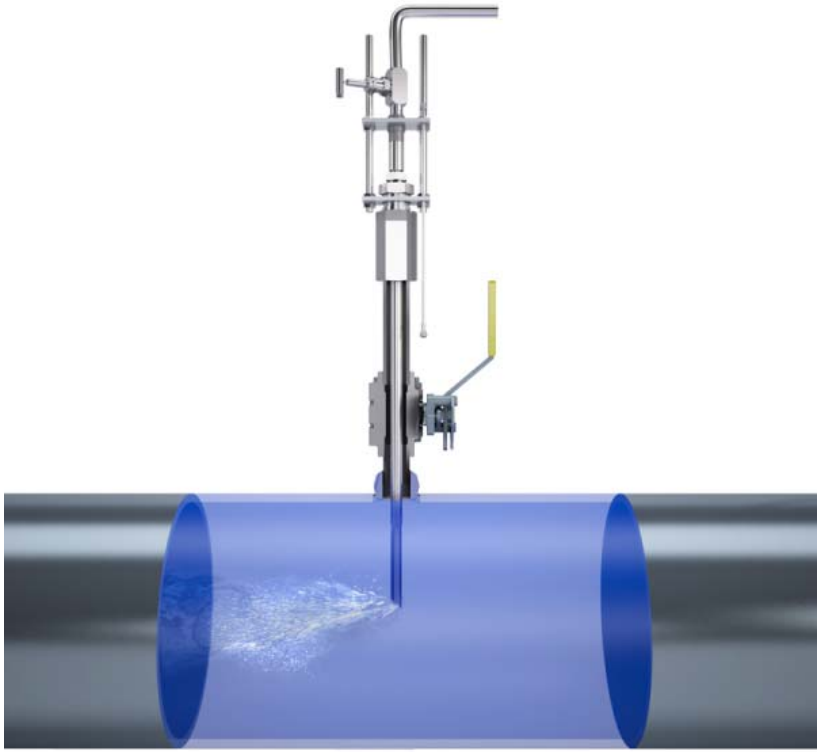
Approved Products and Methods

- AWWA C651-
  Disinfecting Water Mains



- AWWA C652 –
  Disinfection of Water Storage Facilities

Approved Products and Methods - Injector



Temporary Installation

H.E. Anderson Series #2

Batch Chlorination – How can you tell?

- Public calls
- Site visits
- Ask operators
- Random residual testing

Evidence

- White chalky residue
- Excessive corrosion
- Empty containers
- Undocumented equipment

Evidence

Evidence

Evidence

Evidence – empty containers

Evidence – empty containers

Undocumented Equipment

Sanitary Survey

GENERAL DISINFECTION

60. ---------- Water system follows AWWA disinfection procedures for new, repaired, or seasonal water mains and tanks.

SIG - 10pts - MR - D018 - DOES NOT USE AWWA DISINFECTION STANDARDS : R309-550-8(10) - R309-550-8(10) states that all new and repaired water mains, appurtenances, reservoirs and seasonal operating systems shall be disinfected in accordance with AWWA Standard C651. 10 demerit points shall be assigned.

Comments:

61. ---------- How often do you periodically disinfect all or any parts of your water system (ie batch disinfection) other than for repairs or maintenance?

SIG - 35pts - TR - TD25 - CL2 DISINFECTION PROCESS NOT CONTINUOUS: R309-200-5(7) - Rule requires continuous disinfection of groundwater sources that do not consistently meet bacteriological quality standards, all surface water sources, and groundwater sources under the direct influence of surface water. This significant deficiency must be corrected within 120 days of notification or have a compliance action plan approved by DDW.

Comments:

Survey Sections:

General Disinfection

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Sanitary Survey

GENERAL DISINFECTION

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Comments:

61. ---------- How often do you periodically disinfect any or all parts of your water system (ie batch disinfection) other than for repairs or

- ----------
- 0 - 2 times per year
- 3 - 4 times per year
- 4 - 6 times per year
- every month

SIG - 3 ECTION PROCESS NOT CONTINUOUS: R309-200-5(7) - Rule requires continuous disinfection of groundwater sources that do not consistently meet b all surface water sources, and groundwater sources under the direct influence of surface water. This significant deficiency must be corrected within 120 d rective action plan approved by DDW.

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Survey Sections:

General Disinfection

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DDW Actions When Batch Disinfection is Verified

- DDW adds deficiency TD25 (Cl2 disinfection process not continuous, significant deficiency). This deficiency will show on a system's IPS report.
- If the system does not resolve the TD25 significant deficiency within 120 days then a type 45 groundwater rule violation will be created (35 IPS points), and an NOV sent.
- The system can submit a Corrective Action Plan (CAP) to resolve the deficiency.
- In a Compliance Agreement/Enforcement Order (CA/EO) DDW will give the system a timeline in which to resolve the batch disinfection.

Questions?