



## Flushing PARTICIPANT HANDOUT

### Overview:

This lesson shows the importance of a well-developed flushing program and the four steps needed to devise such a program.

### Learning Objectives:

At the completion of this lesson, participants should have the ability to:

- Be able to describe the importance of flushing
- Prepare a simple checklist for flushing a hydrant
- Identify the components in developing a flushing program

### Key Concepts:

#### Flushing – Step 1

Questions to determine the appropriateness of a flushing program

- Do you utilize **unfiltered surface water**?
- Do you utilize an **undisinfected groundwater** supply?
- Do you utilize a source of supply with **elevated iron and/or manganese**?
- Do you experience **positive coliform** or elevated levels of HPCs?
- Do you use **chloramination**?
- Have you implemented a **treatment change** that could affect water quality?
- Do you experience **frequent customer complaints**?
- Do you have **difficulty maintaining a disinfectant** residual in parts of the distribution system?
- Does your system **lack an aggressive valve/hydrant/tank exercise program**?
- Is the water entering the distribution system considered to be **corrosive**?
- Does **sediment** accumulate in your storage facilities?

#### Flushing – Step 2

- Determine flushing plan objectives
  - Planning is critical for obtaining water quality objectives and minimizing costs
  - Need to consider both WQ considerations and hydraulic/maintenance considerations
- Determine flushing approach
  - Unidirectional
  - Conventional
  - Continuous blow-off

### Notes:

## Step 3 – Implementing a Flushing Program and Data Collection

- Identify loops - Flushing should be conducted from the source to the periphery of the DS and from larger pipes to smaller. A loop should be able to be flushed during one work shift.
- Determine flushing velocities - For thorough scouring, pipe velocities should be targeted @ 6 ft/sec
- Develop step-by-step procedures - Include detailed instruction for sequencing of valve and hydrant opening and closing
- Complete a trial run
  - Verify the crew is prepared and can respond to unforeseen challenges
- Conduct flushing program
  - Ideally program is conducted during off-peak hours to minimize service disruptions
  - Have safety protocol in place
- Data collection
  - Baseline
  - During flushing

### Notes:

## Step 4 – Evaluating and Revising Program

Ask the following questions after flushing is complete

- Were water quality objectives met?
- What are the estimated costs/savings of the program?
- Were there any positive secondary impacts of the program?
- Were there any negative secondary impacts of the flushing program?

### Additional Resources:

- RCAP's Resource Library: [www.rcap.org](http://www.rcap.org)
- AWWA Video – Unidirectional Flushing
  - <http://www.awwa.org/store/productdetail.aspx?productid=7076>
- AWWA Water Distribution Operator Training Handbook
  - <http://www.awwa.org/store/productdetail.aspx?productid=36142344>
- AWWA Water Distribution Systems Handbook
  - <http://www.awwa.org/store/productdetail.aspx?productid=6435>
- WRF Report: Guidance Manual for Maintaining Distribution System Water Quality
  - <http://www.waterrf.org/Pages/Projects.aspx?PID=357>