Dechlorination of Potable and Superchlorinated Water
Training Agenda

• Why we need to dechlorinate
• Modifications to Arlington’s Standards and Specifications
• Dechlorinating potable water
• Handling superchlorinated water
• Construction Manager/Contractor Responsibilities
• Conclusion
Introduction

• Changing regulatory world

• MS4 (Municipal Separate Storm Sewer System) Permit
  – Allows certain non-storm water discharges that are not a significant source of pollutants
  – Reduce pollutant discharges

• Requires planning, training, implementation

• Protect water quality / environment
Introduction

- Chlorinated or potable water
- Very toxic to fish / aquatic life
- Gulf Branch Potable Water Discharge
  - Enforcement
  - County must take actions to safeguard against future incidents
- Little Pimmit Run super-chlorinated water discharge
- Focus on preventable discharges
- Operation changes
Standards and Specifications

• Section 02550 3.4.L (Discharge of chlorinated water)
  – Prohibits discharge of any chlorinated water
  – Requires discharge plan (to san sewer or tanker) for super-chlorinated
  – Holds Contractor accountable for any other impacts (erosion, washout, etc.)

• Responsibility on the Contractor
  – Methods
  – Execution
  – Compliance
Standards and Specifications

• Superchlorinated Water
  – Generally disinfection flushing

• More stringent requirements
  – Discharge to san sewer
  – Disinfection Plan (submittal per 01300)
  – WS Engineering will review Dechlorination Plan

• Be Careful
  – Don’t allow backflow into water system
  – Don’t overwhelm san sewer system
  – Adequate monitoring of discharge point
What’s Changed?

• Arlington has been dechlorinating water for years.

• The change? Anytime
  – Using a fire hydrant
  – Flushing a service
  – Pumping out a trench filled with potable water
  – Need to do best to dechlorinate

• Water from a broken main is EXEMPT
Chlorine Concentrations

• **Potable Water**
  – Generally between 0.2 and 4.0 mg/L total chlorine

• **Superchlorinated Water**
  – Generally >25 mg/L total chlorine
  – Can be much higher
  – Used to disinfect water mains before placed in service
Dechlorinating Planned Discharges of POTABLE Water
Potable Water
Basics of Chemical Dechlorination

• Water runs through LPD-CHLOR tablets (sodium sulfite)

• Chlorine/chloramines react with sodium sulfite

• With care, the resulting compounds are able to flow to the storm system
Safety and Dechlor Tablets

• Dechlorinating Potable Water
  • Nitrile gloves
  • Eye protection
  • First aid kits with eyewash bottles

• In your eye?
  • Use eyewash
  • Go to nearest Urgent Care
Safety

• Other concerns?
  – Talk to you supervisor or Justin Corwin (x3774) or Jerry Contey (x6834)
  – Dust masks, coveralls
Standard Equipment Used to Dechlorinate Water

Emergency Dechlorination Mats and Bags

Great for emergencies or "measures of last resort."

In a main break situation, chlorinated potable water may be flooding to where it will reach sensitive receiving waters.

First responders can use the Dechlormats to achieve significant dechlorination until the situation can be brought under control.

Dechlorstrip has 6 pockets and 2 heavy duty grommets - great for dechlorinating potable water where no other methods are available.

Dechlormat has 24 pockets and 8 heavy duty grommets that can be tent staked into the ground to keep the bag in place.

Great for water main breaks and emergency...
Standard Equipment Used to Dechlorinate Water

LPD-250 & LPD-250A Dechlorinating Diffusers

use with chlorine/chloramines of 4 ppm or less

For newly disinfected water mains use the COMBO KIT with the LPD-250 for Dechlorinating up to 300 ppm chlorine

- Traps Debris
- Diffuses Discharge
- Neutralizes Chlorine and Chloramine in Potable Water
- Connects to Hydrant or Fire Hose
- Flow Measurement Pitot
- Visual Tablet Consumption
- Adaptable for Low and High Volume Flow

VIDEO BELOW

LPD-250 in Service Video

- Dechlorination Guide
- Pitots Sold Separately
- Chlorine Testing
- Low Flow Inserts

Original LPD-250

New Aluminum Body - Only 17 lbs
Storage

- Only one bucket per truck
- Keep lid on
- Keep tablets dry
- Shelf Life? One Year
Flushing Potable Water
1-inch and Smaller Water Services
Flushing Potable Water
1-inch and Smaller Water Services
Flush Potable Water
Fire Hydrants – Basic Set Up

LPD-250 Diffuser – NOT attached directly to the Fire Hydrant

Ten tablets
Thirty Minutes
Flush Potable Water
Fire Hydrants – Basic Set up

LPD-250A – Lighter than the LPD-250

Use when need to attach directly to fire hydrant
Flushing Potable Water
Fire Hydrants - Accessories
For flows less than 200 gpm – use inserts

Gauge to Measure Flow

Can be used on either model
Flushing Potable Water Discharging from Blowoffs and Pumps
Dechlorination for Flushing Storm System

- Granular
- Add ~2 ounces per tank
Rules of Thumb – Draining Mains

• **For 12-inch and smaller mains**
  – More than an hour to drain?
  – call the Valve Crew at x6555.

• **For 16-inch and larger mains**
  – Check with the Project Engineer for approximate drain time

• If after allotted time pressure is measured on the line – call x6555
What happens if the valves aren’t holding?

• The Proj Eng, the CM & the Valve Crew should work together.

• If after ~50,000 gallons the potable water may need to be discharged to the sanitary sewer following same procedures as for superchlorinated discharges.
Bottom Line

• If it’s taking longer than expected to drain the main . . .

• . . . Work with Water Distribution to shut the water off

• AND dechlorinate!
Dechlorination –
It’s not just for the Valve Crew Anymore

• When dealing with **planned** potable water discharge

• Need to dechlorinate

• As a minimum use a diffuser or multiple mats by a storm inlet
Disposing/Dechlorinating SUPERCHLORINATED Water
Safety – Superchlorinated Water

• **Handling Superchlorinated Water?**
  – Eye protection
  – Nitrile Gloves
  – First aid kits with eyewash bottles

• **In your eye?**
  – Use eyewash
  – Go to nearest Urgent Care
Superchlorinated Water
Discharge to Sanitary

• Plan Requirements
  – A map showing the receiving manhole
  – Anticipated rate and duration of discharge
  – Plans for air gap
  – List of methods/equipment
  – Accommodations to maintain traffic
  – Pre-Approved by WS Engineering and WPCP
    • Travis Ostrom– 703.228.6567
    • Please give early notice!
Superchlorinated Water
Discharge to Sanitary

**FIVE Key Points**

1. Air gap MUST be maintained

2. Cannot cause surcharge to sewer service
Superchlorinated Water
Discharge to Sanitary

Key Points – Continued

3. **Maximum 200 gpm flow**

4. Clean and spray or swab new pipe, fittings, hoses, and valves with a **minimum 1 percent solution of chlorine** just before installation and connection to water distribution main.
Superchlorinated Water
Discharge to Sanitary

Key Points – Continued

5. Inspector must be onsite at the beginning of the discharge operation with the contractor monitoring the receiving manhole.
Determining the Flow Rate

- Contractor is responsible for operation

- There are gauges that can measure flow at the end of the hose
Tic Tock! How Long to Flush Mains?

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Volume per 100 ft of Pipe (gal)</th>
<th>Approximate Time for Flush x10 per 100 ft Pipe (min)</th>
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<tr>
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<td>15</td>
</tr>
<tr>
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<tr>
<td>48</td>
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<td>Check with Proj. Eng</td>
</tr>
</tbody>
</table>

Based on 200 gpm flow rate.
Alternative Methods for Handling Superchlorinated Water

- Filling a Tank/Tanker Truck
  - Drive truck to receiving manhole
  - Number of trips calculated in advance

- Other methods may be discussed at pre-construction meeting and shall be approved by Arlington County prior to implementation
Training Agenda

✓ Why we need to dechlorinate
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✓ Handling superchlorinated water

• Construction Manager/Contractor Responsibilities
• Conclusion
Construction Manager/Contractor Responsibilities
Prior to Notice to Proceed

• The **contractor** has to **read**
  – Memo to Industry on Dechlorination
  – Review these slides
  – Will be available online

• Provide the **CM** a signed acknowledgement
Prior to Flushing Superchlorinated Water

- The **Contractor** MUST submit a plan to be approved by Construction Manager
  - A minimum of **48 hrs** prior to discharge to approve plan

- CM must be on-site prior opening any valves
Prior to Flushing Superchlorinated Water

• The Construction Manager MUST
  – Check with WS Engineering if any concerns re: discharge plan
  – Be onsite prior to any discharge
  – Physically check that manhole is sewer not storm
  – Witness flow (verify not high)
  – Test to ensure that after the flush, the water is <4.0 mg/L.
What’s Changed?

Need to do our best
to dechlorinate all
planned potable and
superchlorinated
water discharges

‘Best’ is being prepared, being aware.
Be Prepared

• Have dechlor equipment available even if you don’t think you’ll need it

• Unplanned discharge?
  – Call Diana Handy at
    x0772
    571.221.6174
Equipment

• Do you need something?

  – Diffusers  - Mats
  – Dechlor Tabs  - Bins
  – First Aid Kits with Eyewash Bottles

• Your feedback is important!
Thanks for Making a Difference!
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