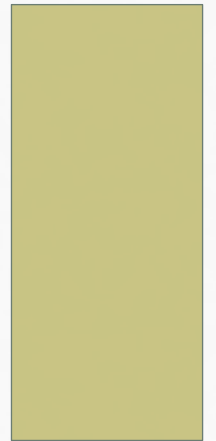


MEETING THE NEW GUIDELINES FOR WATER MAIN BREAKS AND BMP'S

DAVE STANLEY
HIGHLINE WATER DISTRICT





WATER MAIN BREAK

TACOMA WASHINGTON

Today we will look at:

1. Main break classifications.
2. Main break repair procedures
3. Customer notifications / Boil water advisories
4. Mitigation and public relation techniques

6 FACTORS FOR ASSESSING WATER QUALITY RISKS.

- 1. Pressure
- 2. Duration of Loss
- 3. Number of Connections
- 4. Field Conditions
- 5. Cross Connections and Backflow Events
- 6. Flushing

WATER MAIN BREAK CATEGORIES

Four Categories of Breaks

Type 1

Type 2

Type 3

Type 4

TYPE 1 BREAK

- Positive pressure maintained during the break.
- Pressure maintained during the repair.
- Unlikely contamination intrusion.
- No BWA or Bacteriological samples required.

TYPE 1 BREAK



TYPE 2 BREAK

- Controlled pipe repair with limited depressurization after shut down.
- Pressure maintained at break site until pipe exposed & hole dewatered, shut down limited to immediate valved off area with no loss of pressure elsewhere in the system.
- Limited possibility of contamination intrusion.
- No BWA required.

TYPE 2 MAIN BREAK



TYPE 3 BREAK

- Loss of pressure at break site or depressurization elsewhere in the system.
- Loss of pressure at the break site while pipe is still buried or submerged and/or pressure loss somewhere else in the system .
- Possible/actual contamination intrusion

TYPE 3 MAIN BREAK



TYPE 4 BREAK

- Catastrophic main break / water loss event resulting in complete loss of service.
- Water loss is extensive compared to system capacity, resulting in no pressure/no water. Storage loss leaves limited flushing capacity.
- Possible/actual contamination intrusion.



WATER MAIN BREAK RESPONSE PROCEDURES TYPE 1

- 1. Excavate below the break.
- 2. Maintain pit level below the break.
- 3. Disinfect parts, swab or spray repair site with a 1% chlorine solution.
- 4. Make repair with pipe still pressurized.
- 5. Back fill and compact.
- 6. Restore residual disinfectant level at break to background levels by flushing.
- 7. No Boil Water Advisory (BWA) / No bacteriological samples required.

WATER MAIN BREAK RESPONSE PROCEDURES TYPE 2

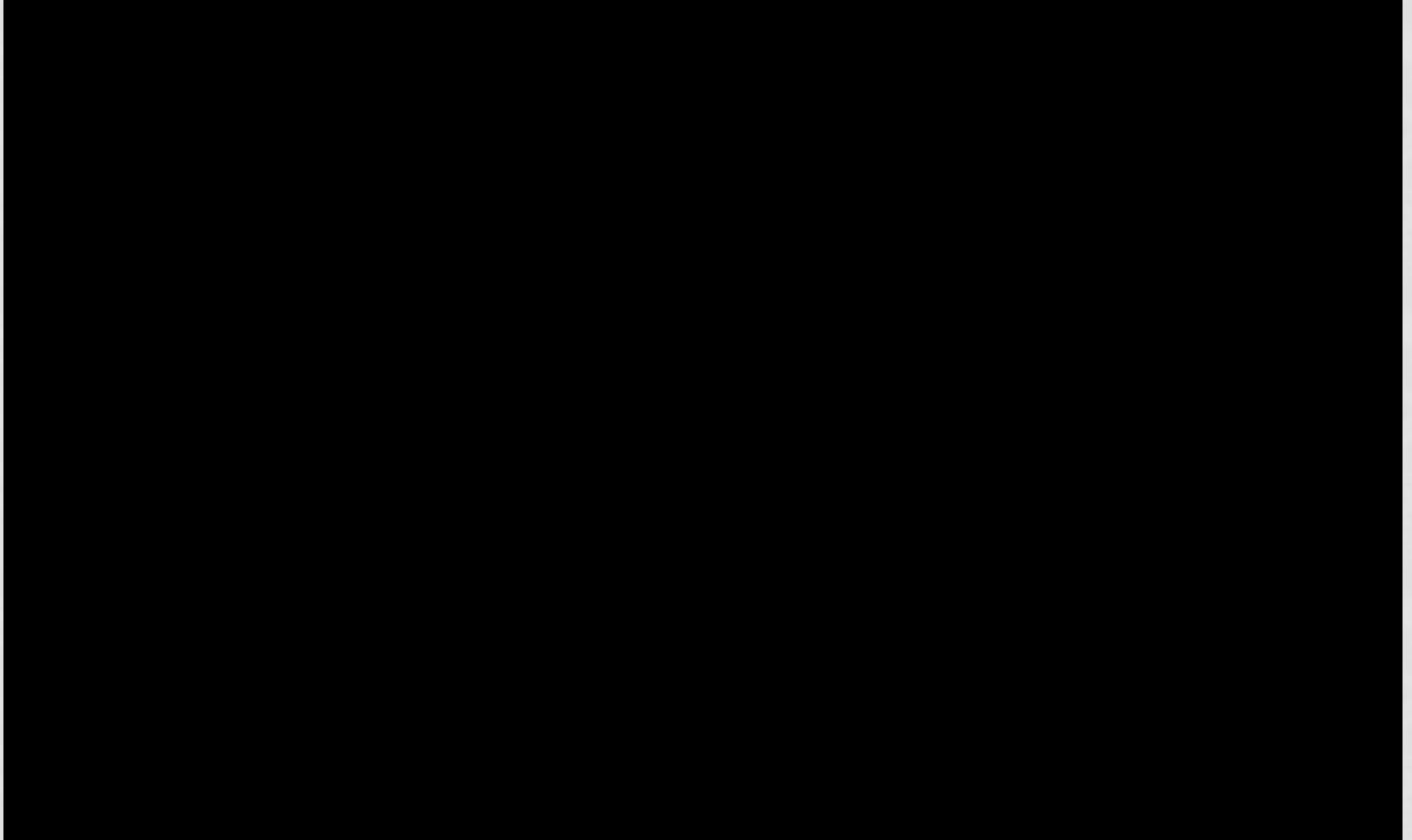
- Excavate to below break.
- Maintain pit water below break.
- Isolate / shut off customer services in affected area.
- Provide customer notice – door hangers, personal contact, email or call out.
- Controlled shut down with established procedures.
- Disinfect repair parts, swab or spray repair site with 1% chlorine solution.
- Make repair.

WATER MAIN BREAK RESPONSE PROCEDURES

TYPE 2 - CONTINUED

- Conduct low velocity flush to displace water in affected pipe – discharge to waste.
- Restore residual disinfectant level at break to background levels by flushing.
- Instruct customers to flush premise plumbing upon return to service. Verify service to all isolated customers.
- No BWA for impacted customers or water system.
- It is recommended you collect bacteriological samples to validate repair procedures – service may be restored prior to obtaining results.

TYPE 2 RESPONSE PROCEDURE



TYPE 2 RESPONSE PROCEDURE



WATER MAIN BREAK RESPONSE PROCEDURES

TYPE 3

- Assess environmental impacts – respond accordingly.
- Provide generic water main break information with call out and website.
- Evaluate possible contamination.
- Decide appropriate public notification message / methods.
- Issue BWA. Update website with specifics. Inform fire department of loss of pressure area.

WATER MAIN BREAK RESPONSE PROCEDURES

TYPE 3 - CONTINUED

- Isolate main and shut down services in affected area.
- Disinfect repair parts, swab or spray repair site with 1% chlorine solution.
- Make repair.
- Post repair disinfection may be needed if an uncontrolled break has allowed contamination to enter the system. (refer to AWWA Std C651 Section 4.11.33)
- Conduct scour flush (3 ft/sec) to remove any break related sediment in the isolation area.

WATER MAIN BREAK RESPONSE PROCEDURES

TYPE 3 - CONTINUED

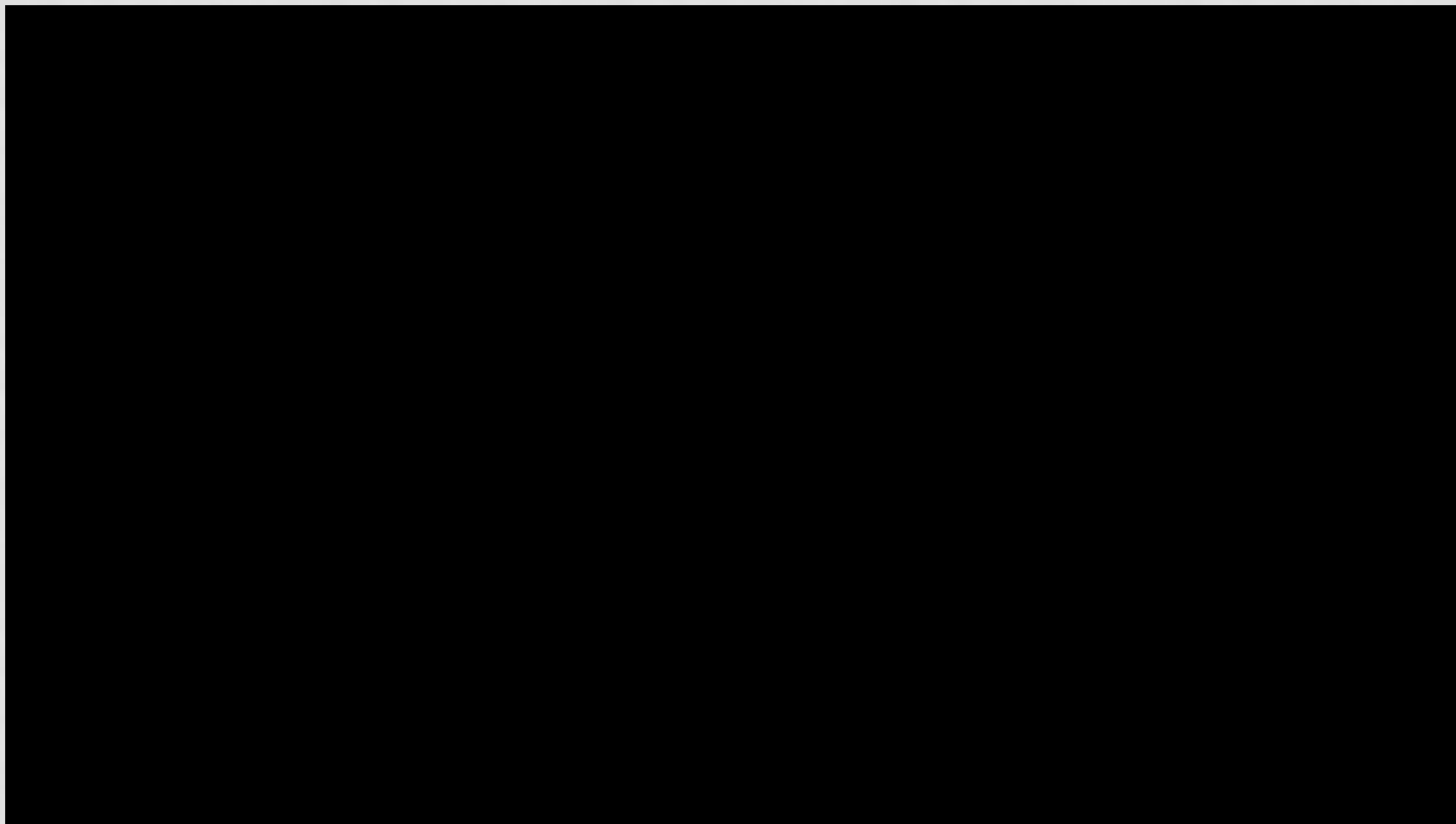
- Conduct low velocity flush throughout the widespread area subject to low pressures to displace water and restore background chlorine residuals.
- Restore residual disinfectant level at the break to background levels.
- Check residual disinfectant levels throughout the distribution system.
- Instruct customers to flush premise plumbing upon return to service.
- Collect bacteriological samples to verify effectiveness of response and provide basis for lifting targeted advisories.
- Rescind BWA based on water quality monitoring results.

WATER MAIN BREAK RESPONSE PROCEDURES

TYPE 4

- Response to a type 4 break/event will be the same as a type 3 response procedure with additional emphasis on the following:
- Assess utility capacity to deal with the event.
- Notify fire department of significant depletion in storage reserves.
- Storage tank depletion may also affect ability to adequately flush the distribution system following repairs leading to delays in fully restoring water service and lifting the BWA.
- Conservation messages may need to be included with the BWA notification.

TYPE 3/4 RESPONSE PROCEDURES



CUSTOMER NOTIFICATIONS BOIL WATER ADVISORIES

Four key elements to guide your decision:

- Was there a pressure loss at either the site or other locations in the distribution system.
- What possible types of contamination exist and what is the potential for entering the systems.
- What is the extent of the problem and what types of customers are affected.
- What is the effectiveness of the mitigation measures in response to the breach and loss of pressure.

CUSTOMER NOTIFICATIONS

BOIL WATER ADVISORIES

Break Type	None	Verbal	Website Call out	BWA	Fire Dept.	DOH	Media	Call for Conservation
Type 1	X							
Type 2	X	X						
Type 3		X	X	X	X	X		
Type 4		X	X	X	X	X	X	X

BOIL WATER ADVISORY

BWA



Serving the Southwest Metropolitan Area since 1946

BOIL WATER ADVISORY 5/17/16

Dear Valued Customer,

In the early morning of May 17, 2016, the District experienced a water main break in your neighborhood. [Please see the map of the affected area on reverse side of the notice]. If your property is NOT identified on the map, you are not affected by this advisory. The break resulted in a loss of water pressure to approximately 20 homes along your street.

As a precautionary measure, the District is advising customers on your street to boil their water or use bottled water for all human and animal consumption until we receive satisfactory water testing results. The testing typically takes approximately 24 hours to complete. We will alert you when your water is safe to drink.

Frequently Asked Questions - Can I use my tap water for ...?

Drinking	No	Coffee or Tea	No
Ice Cubes	No	Showers/Baths	Yes
Brushing Teeth	No	Washing Clothes	Yes
Baby Formula	No	Baby Bath	See Below*
Washing Vegetables/Fruit	No	Washing Dishes	See Below**
Preparing Food	No	Pet Water Bowl	Contact Veterinarian

*You may wash babies or children as long as they do not drink the water. Do not let babies suck on a washcloth as they will ingest some water.

** You can use your dishwasher if you use the sanitizing/heat cycle and commercial dishwashing detergent. You can hand wash dishes, rinse them in a diluted bleach solution – one teaspoon household bleach to one gallon water and let dishes air dry.

If you plan to boil your water for consumption, bring the water to a rolling boil for one minute. When it cools, refrigerate the water in clean covered containers.

Thank you for your patience. If you have any questions, please contact the following District personnel: Dave Stanley, Field Supervisor at 206-592-8912 or Mike Becker, Operations Supervisor at 206-592-8920.

Sincerely

Highline Water District



**Along 3rd Ave SW/3rd PI S
at SW 200th ST**



BACTERIOLOGICAL SAMPLING:

- Samples should be drawn after 16 hours of contact time.
- Samples should be collected downstream from the repair site within 200 feet of the length of pipe that was isolated. If direction of flow is not known, take a sample from both ends.
- Without flushing, create a small flow of water, draw your first sample. Leave the tap running, wait 15 minutes before pulling the second sample.

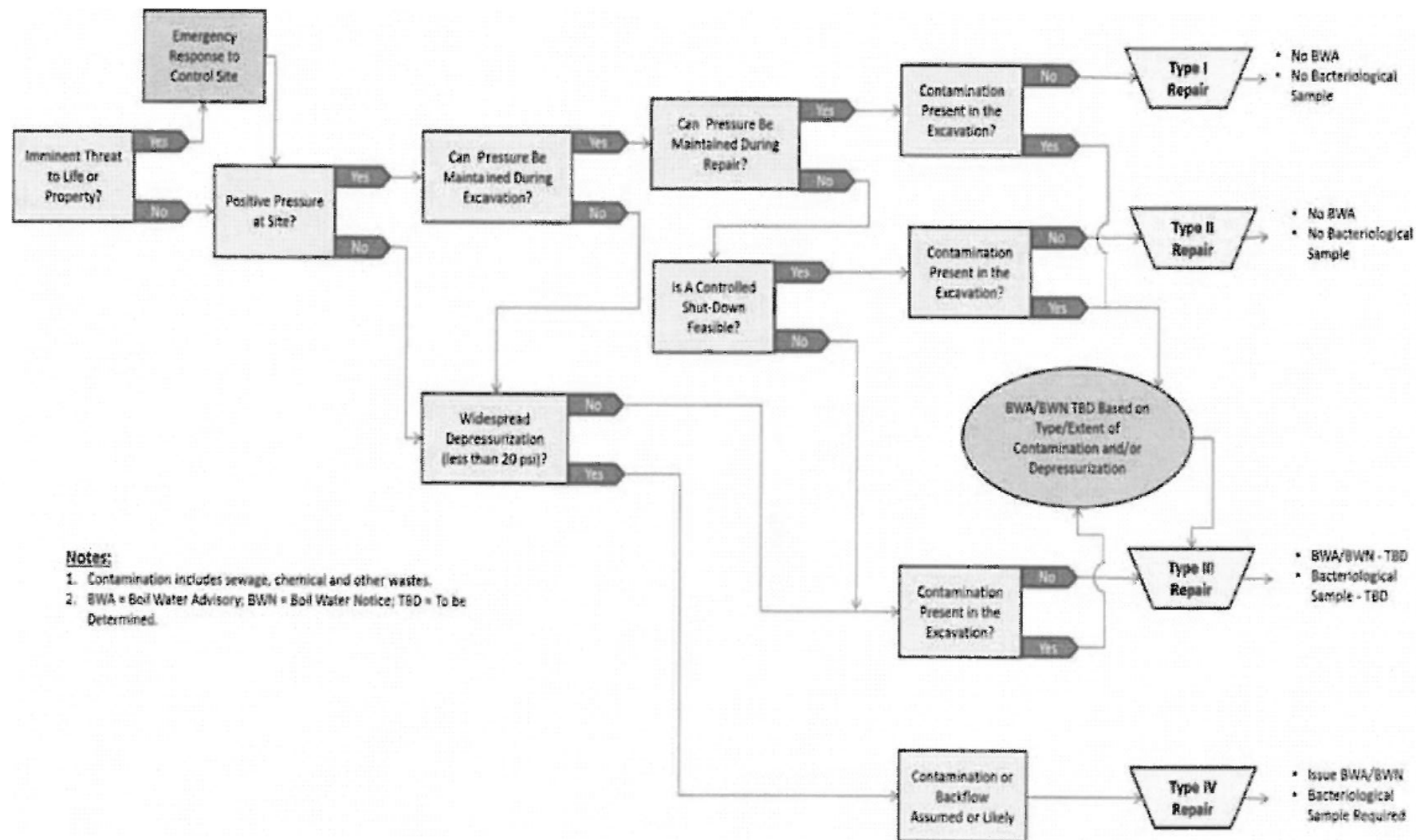


Figure 5.1 Main break risk triage flowchart

MITIGATION AND PUBLIC RELATIONS











MAIN BREAK @ 1732 S 234TH ST.

















THE END!

- Questions?

- Dave Stanley
- Highline Water District
- Dstanley@highlinewater.org
- 206-592-8912

- Water Research Foundation

- Effective Microbial Control Strategies for Main Breaks and Depressurization
- HDR Engineering & American Water