

**VIRGINIA DEPARTMENT OF HEALTH**  
**OFFICE OF DRINKING WATER (ODW)**  
**GUIDANCE ON MAIN BREAK TYPES AND RESPONSES**  
**For waterworks with permanent chlorination equipment installed and operating**

Type 1 Break	Type 2 Break	Type 3 Break	Type 4 Break
Positive pressure maintained during break	Positive pressure maintained during break	Loss of pressure at break site/possible local depressurization adjacent to the break	Loss of pressure at break site/widespread depressurization in the system
Pressure maintained during repair	Pressure maintained until controlled shutdown	Partial or uncontrolled shutdown; isolated quickly <sup>1</sup>	Catastrophic event/failure; widespread unmanageable pressure loss
No signs of contamination intrusion	No signs of contamination intrusion	Possible contamination intrusion <sup>1</sup>	Possible/actual contamination intrusion
Procedures	Procedures	Procedures	Procedures
Excavate to below break	Excavate to below break	Excavate to below break	Catastrophic failure response
Maintain pit water level below break	Maintain pit water level below break	Maintain pit water level below break / Document possible contamination	Document possible contamination
Repair under pressure	Controlled shutdown to minimize impacts	Notify customers in the vicinity	Notify customers in the vicinity, if possible
Disinfect repair parts, conduct repairs	Disinfect repair parts, conduct repairs	Disinfect repair parts, conduct repairs	Disinfect repair parts, conduct repairs
Check residual disinfectant level in distribution system	Conduct low velocity flush (flush 3 pipe volume)	Conduct scour flush (3 ft/sec for 3 pipe volumes)	Conduct scour flush (3 ft/sec for 3 pipe volumes)
No Boil Water Advisory (BWA), return main to service	Check residual disinfectant level in distribution system and ensure it is adequate	Check residual disinfectant level in distribution system and ensure it is adequate	Check residual disinfectant level in distribution system and ensure it is adequate
No bacteriological sample	No Boil Water Advisory (BWA), return main to service	Instruct customers to flush premise plumbing upon return to service	Instruct customers to flush premise plumbing upon return to service
	Collect one bacteriological sample downstream <sup>2,3</sup>	BWA - TBD; based on depressurization extent and potential presence of contamination <sup>1,4</sup>	Issue Boil Water Advisory (BWA); Contact ODW <sup>4,5</sup>
		If no BWA - Collect one set of bacteriological samples bracketing the site <sup>2,3</sup> (If BWA issued, use Type 4 procedures)	Collect two sets of bacteriological samples 16 hours apart <sup>2,3</sup>
			Lift BWA with concurrence from ODW

Notes 1-5 are on the following page.

## Office of Drinking Water Guidance on Main Break Types and Responses

### Notes:

1. The waterworks should consider the following factors when deciding whether a Boil Water Advisory (BWA) is necessary: sanitary conditions of repair trench, timeliness of the repair, adherence to American Water Works Association (AWWA) disinfection procedures (AWWA C651-14 Disinfecting Water Mains), disinfectant residual levels after repairs are completed, water clarity after flushing, and the extent of the depressurization area. If the waterworks cannot flush or disinfect the entire depressurization area, then it should consider issuing a BWA and performing additional bacteriological testing.
2. If any bacteriological sample is positive for total coliform, then the waterworks should collect additional samples until it receives results of two satisfactory samples (total coliform negative) collected 16 hours apart. Additional disinfection and/or flushing may be necessary. If the waterworks does not issue a BWA initially, then these results (total coliform positive) alone will not require that the waterworks issue a BWA.
3. If any bacteriological sample is positive for *E coli*, then the waterworks should immediately issue a BWA, perform flushing in the area, ensure adequate disinfectant residual levels in the area and collect additional samples until it receives results of two satisfactory samples collected 16 hours apart.
4. If the waterworks issues a BWA, then notify your ODW Field Office representative for additional guidance.
5. For situations that do not conform to the above guidelines or, if the waterworks is unsure how to proceed, then contact your ODW Field Office representative for guidance.