



www.sfiaust.com.au | 1800 734 000

The Dead-End Danger Zone

How Uncirculating Water in Distribution System
Dead-Ends Can Pose a Health Threat to Consumers

Recognize Threats | Identify Hazards | Find Solutions

A large, white, rounded rectangular sign with a black border is centered on a background of yellow and black diagonal stripes. The word 'CAUTION!' is written in large, bold, black, sans-serif capital letters on the sign.

CAUTION!

"Valve Maintenance Solutions"

Step 1: Recognising the Threats

DEAD-END DANGER ZONE CONCERN #1 Falling Disinfectant Residuals

- Disinfectant residuals can begin to drop within 200 hours (8.3 days) in uncirculating water¹
- Depending on initial disinfectant residual levels, uncirculating water can become unsafe in 28 days or less¹
- Once disinfectant residuals fall below minimum levels, they become ineffective in controlling the growth and spread of microbial pathogens²

DEAD-END DANGER ZONE CONCERN #2 Falling Disinfectant Byproducts

- Disinfectant Byproducts (DBPs) form when naturally occurring organic material in water comes in contact with disinfectants and transform into TTHMs and HAAs³
- DBPs, when consumed, have been shown to cause health related issues, such as, atherosclerosis (heart disease) and kidney and/or liver cancers
- DBPs can begin to form in water in as little as 4-7 days⁴

¹ "Optimizing Distribution System Water Quality", an AWWA Webcast – January 2010

² EPA Guidelines for residual levels are 4.0 mg/L (ppm) maximum, .5 mg/L (ppm) minimum

³ EPA Guidelines for DBPs is .080 mg/L (ppm) for Trihalomethanes (TTHMs) and .060 mg/L (ppm) for Haloacetic Acids (HAAs)

⁴ How Old Is Too Old for Distribution System Water?, Opflow, March 2011

Step 2: Identifying Hazardous Dead-Ends

WATER QUALITY CALCULATOR

- Easy to use, just input data
 - Pipe Size
 - Dead-End Length
 - Number of Service Connections
 - Estimated Tank Turnover
- Automatically Calculates results
 - Total amount of water in dead-end main
 - Total amount of uncirculated water
 - # of days for total water turnover in pipe
 - Recommended flushing minutes per day, based on water turnover in pipe
 - Recommended flushing minutes per day, based on water age analysis
- Assist in identifying problem dead-ends

How Safe is the Water on Your Dead-Ends?

Insert information about Your Dead-End(s) Below in the YELLOW Cells to Find Out

Step One: Enter your pipe size in inches (2, 4, 6, 8, 10 or 12) → **12**

Step Two: Enter the length of your dead end waterline in miles → **1.00**

Total Amount of Water in Pipe (in gallons) → **31,021**

Step Three: Enter the # of Service Connections on the waterline* → **12**

Amount of Uncirculated Water (in gallons) → **26,821**

of Days to Consume Uncirculated Water (in gallons) → **6**

Estimated Water Tank Turnover (in days) → **2**

Automatic Flushing Solution (flushing minutes per day to keep water safe)** → **16**

FACTS ABOUT UNCIRCULATING WATER

- EPA recommended minimum disinfectant residual is .5 mg/L (level varies by state)
- Within 200 hours (8.3 days) disinfectant residuals begin to dissipate and drop
- Disinfectant byproducts (DBPs) can begin to form within 4-7 days. If the cell T22 is greater than 4, the water may begin to become unsafe for consumers
- Kupferle's EPA Approved Automatic Flushing Systems (AFS) keep residuals consistent and reduce the threat of DBPs forming by removing old water. AFS flush less water more often and help keep water safe for consumers.

*Avg household uses 300 gallons per day **Based on 150 gpm flow rate Click on images for more information

www.hydrants.com
800-231-3990

DISTRIBUTION DEAD-END ANALYSIS

- Complete distribution dead-end analysis
- Sorts dead-ends based on water age
 - Identifies high risk dead-ends for DBPs
 - Identifies potential for low residuals
- Includes recommendations on how to address water age issues
- Assists in the allocation of resources to address water age issues on identified dead-ends

ABC Water Company

Pipe Size	Dead-End Length in Miles	Total Water Volume	# of Service Connections	Total Uncirculated Water	# Days for Water Recycling	Recommended Daily Flush Times
CRITICAL						
10	5.8	324,886	34	112,646	9	54
12	3.9	121,079	36	107,399	6	47
6	5.7	44,181	14	35,141	6	17
8	5.4	74,407	16	67,917	10	36
8	8.3	114,366	21	106,806	14	60
HIGH						
6	5.4	41,855	16	36,095	6	13
4	10.3	35,484	12	31,164	7	13
4	2.6	8,957	5	7,157	4	1
6	6.7	51,932	23	43,652	5	13
8	8.1	111,610	41	96,850	7	38
MODERATE						
4	2.4	8,268	9	5,028	2	-3
6	3.8	29,454	19	22,614	3	1
4	5.1	17,570	12	13,250	3	0
4	4.7	16,192	11	12,232	3	0
6	6.2	48,056	41	33,296	2	-8
SAFE						
4	4.3	14,814	33	2,934	0	-23
10	2.1	45,217	53	26,137	1	-22
6	5.7	44,181	88	12,501	0	-59
8	9.1	125,389	143	73,909	1	-58

PORTABLE AUTOMATIC CHLORINE-ANALYZER FLUSHING DEVICE

- Built-in Programmable Logic Control (PLC) and Chlorine Analyzer
- Analyzes residuals and compares to programmed minimum level
- Automatically flushes when residuals fall below minimum level
- Flushes exact amount of water needed to reach desired residual level
- Portable analytic tool that records all data on residual levels and flushing times
- Data can be imported into a pre-formatted Excel file including tables, charts and graphs
- Data can be used to calibrate controllers on Kupferle's Eclipse line of Automatic Flushing Stations



Step 3: Solutions to Address Problems

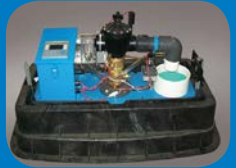
PERMANENT AUTOMATIC FLUSHERS W/ CHLORINE ANALYZER

- Designed for critical dead-ends that require constant residual /DBP maintenance
- Installs directly onto dead-end water main (requires line or solar power)
- Built-in Programmable Logic Control (PLC) and Chlorine Analyzer
- Analyzes residuals and compares to selected minimum level
- Automatically flushes when residuals are below minimum level
- Flushes exact amount of water needed to reach desired residual level
- Records data on residual levels and flushing times on micro SD card
- Import data into a pre-formatted spreadsheet that includes tables, charts and graphs
- Keeps water safe utilizing technology for the ultimate water flushing efficiency!

Model #9800i
freezing
climates



Model #9800WC-I
non-freezing
climates



PERMANENT AUTOMATIC FLUSHING DEVICES

- Designed for critical or high risk dead-ends requiring year-round residual/DBP maintenance
- Provides programmable flushing times to keep residuals consistent and remove DBPs
- Includes programmable hand-held controller (9-volt battery operated)
- Adjustable solenoid-valve flushes up to 760 lpm (1" and 2" models)
- Direct (sanitary/storm sewer) or diffused surface discharge models available
- Warm and freezing climates models, with lockable UV resistant enclosures
- Keeps water safe for consumers, while saving time, water and money!



Eclipse 9800WC



Eclipse 9400

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Eclipse 9700



MANUAL BLOW-OFFS

- Designed for moderate or safe dead-ends requiring annual or infrequent residual/DBP maintenance
- Easy to operate and repairable/maintainable from above ground – no digging!
- 2" 2 and 4" sizes, above and below ground, warm and cold (self-draining) models available for a variety of applications



Eclipse #2



MainGuard #77



MainGuard #7500



TF #500



TF #200