Maine Water Utility Association April 2015

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Maine's MS4 Program

- 40 regulated entities 30 of which are municipalities
- http://www.maine.gov/dep/land/stormwater/ms4/documents.html
- 4 MS4 clusters: So. York County (5); Greater Portland-Biddeford/Saco to Freeport (14); Lewiston, Auburn, Sabattus, Lisbon (4); Greater Bangor-Milford to Hampden (7)
- 10 State and Federal Facilities which include MTA & MDOT
- MS4 is a MEPDES five year General Permit for Stormwater Discharge 1st issued 2003; last reissuance July 1, 2013 (3rd Permit Cycle) What is MS4?
- Hydrant Flushing is an allowable non-stormwater discharge so what's the big deal???
- Allowable does not mean exempt! The discharge must meet ambient WQ Standards

Maine's Ms4 Program

Hydrant flushing What's the Big deal ???

Water Quality violations or MEPDES MS4 Permit Violation(s)

Communities can enforce their non-stormwater ordinance

What's that mean?

Worst case – the MS4/community can through enforcement issue fines

MS4 Hydrant Flushing

If by the end of PY 3 - June 30, 2016, it is determined that hydrant flushing is a significant contributor of pollutants to MS4 & Utility is not implementing BMPs to meet ambient WQ Criteria the municipality shall update its IDDE Ordinance to allow enforcement of discharges that exceed WQ Criteria

Total Residual Chlorine (TRC)

Ambient Water Quality Criteria (AWQC)
06-096 CMR Chapter 584/ EPA 1986 Gold Book

Freshwater:

Acute – 0.019 mg/L or 19 ug/L

Chronic – 0.011 mg/L or 11 ug/L

Marine

Acute – 0.013 mg/L or 13 ug/L

Chronic – 0.0075 mg/L or 7.5 ug/L

Acute toxicity (lethality) based on 1-hr exposure.

Toxicity Made Easy

Hydrant Flushing Assumptions

Flow: 900 gpm or 2 cfs

TRC: 1.5 mg/L or 1,500 ug/L in distribution system

Receiving Water – Small stream

Avoiding acute toxicity:

$\frac{1{,}500 \text{ ug/L}}{19 \text{ ug/L}} \approx 80{:}1$

Toxicity Made Easy

If hydrant flow is 900 gpm (2 cfs) then receiving water flow must be around 80 times higher or

160 cfs to avoid toxicity.

Putting into the perspective of a pipe, a 48” concrete pipe placed at a 1% slope would flow full at around 150 cfs. So, before you flush, make sure pipe is flowing at or near full. Generally speaking, $\frac{d}{D}$ is directly proportional to $\frac{q}{Q}$.

Toxicity Made Easy

Caution - If one doubles or halves the size of a pipe, the area of the pipe increases or deceases by 4-fold. (πr^2). In the previous example, the 48” pipe carries around

150 cfs, a 24” pipe would not carry 75 cfs but more like 35 cfs.

If the hydrant flow rate and TRC levels in the distribution system were constant when flushing, one could develop a list of different pipe types and sizes to give to field crews which would simply allow them to look at how full a pipe is running to determine if the discharge would meet AWQC.

Example

Given:

- 48” concrete pipe at 1% slope, flowing 2/3rds full.
- Pipe flowing full = 150 cfs
- Flushing rate 450 gpm ≈ 1 cfs, TRC = 1.0 mg/l or 1,000 ug/L

Find: Ok to discharge to the stream?

Solution:

What is my dilution factor needed? $\frac{1{,}000 \text{ ug/L}}{19 \text{ ug/L}} \approx 50{:}1$

What flow in the pipe is need to meet AWQC?

(50)(1 cfs)=50 cfs. So if the 48”pipe is 1/3 full, then there is at least 50 cfs.


www.maine.gov/dep