



MILWAUKIE

Dogwood City of the West

City of Milwaukie
Public Works Department

WATER LINE FLUSHING

Standard Operating Procedure #30.02

September 6, 2013

By

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Water Quality Coordinator

Approved:



Public Works Director

7-7-16

Date



Stormwater/Wastewater Supervisor

7-7-16

Date

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1.0 PURPOSE & APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish uniform procedures pertaining to the practices and reporting of Water Line Flushing as performed by the City of Milwaukie Public Works department. This procedure is written and implemented to reduce the impacts of chlorinated water entering the environment and to meet the requirements of the Stormwater Management Plan (SWMP).

The policies and procedures of this SOP are applicable to all City of Milwaukie personnel involved in the planning, preparation, conducting and reporting of Water Line Flushing within the City of Milwaukie city boundaries.

The operator or inspector may deviate from these procedures when necessary due to unexpected or unique circumstances that may occur in the field. Any deviation must be discussed with the Environmental Services Coordinator, supervisor or director, prior to implementation, except for an emergency situation effecting public health regarding the drinking water. The Water crew will attempt to use land disposal or sewer system, if not applicable, they will discharge to the storm system and treated as an illicit discharge. An example of this would be during an EOC situation, terrorist incident or presence of microbiological contaminants or non-potable contaminants,

2.0 METHOD SUMMARY

This procedure has been created to maintain drinking water distribution systems and fire hydrants and to ensure the quality of the drinking water being distributed, many activities are conducted that result in the discharge of chlorinated and super chlorinated water. These activities include fire hydrant flushing, water line pressure testing and maintenance, hydrostatic testing, water line flushing, leakage from water reservoirs, flushing of reservoirs and tanks, and other system discharges (from pressure relief valves, air vacuum valves, reservoir and tank overflows, and sampling activities).

Super chlorinated water:

Regardless of volume, super chlorinated water must not be discharged to surface waters or storm sewers. Non discharge alternatives must be used; these include sanitary sewer disposal (either by connecting to a sanitary sewer or by hauling to a sewage treatment plant) and land disposal or irrigation.

Best Management Practice (BMP) for Public Works personnel as listed in the Stormwater Management Plan issued by DEQ in 2012:

BMP Description: The City of Milwaukie conducts periodic water line flushing throughout the City to ensure the quality of the water system. Depending on the size of the discharge, the capacity of the receiving stream, and the level of chlorination required, discharges from water line flushing could potentially have an impact on streams with respect to concentrations of chlorine.

The City of Milwaukie requires all chlorinated water associated with the flushing of new and existing waterlines to be dechlorinated to a maximum allowable residual chlorine concentration of 0.1 mg/L or less, in accordance with DEQ's requirements for discharge. Chlorine residual is constantly monitored at all entry points to the City's distribution system and always monitored during water line flushing.

Dechlorinated water is disposed of on land when practicable. If land disposal is not feasible, the City of Milwaukie discharges dechlorinated waters to the storm sewer. Prior to discharge in

receiving waters, the City of Milwaukie ensures that adequate travel distance (1000' per DEQ guidance) is achieved after dechlorination, to minimize any additional impacts associated with surface disposal of water from water line flushing.

Receiving streams inside Milwaukie boundaries are of less than 50 cfs during normal flow conditions. Staff should be aware of this when flushing and follow guidance for low flow streams.

The attachment "Best Management Practice (BMP) for Disposal of Chlorinated Water" created by Department of Environmental Quality in 2007 is not as detailed and strict as the SWMP language. The SWMP language will take precedent over any other procedure.

The chlorination/dechlorination requirements are covered in pre-construction meetings and called out in contract documents. Engineering, stormwater, and drinking water staff have the ability to monitor chlorine residual.

3.0 DEFINITIONS

- 3.1 Super Chlorinated Water: water with a total chlorine residual greater than 4mg/L
- 3.2 Chlorinated Water: water with 4 mg/L or less total chlorine residual
- 3.3 Dechlor: chemical additive to neutralize Chlorine (Ascorbic Acid)
- 3.4 NSF: National Sanitation Foundation
- 3.5 MSDS: Material Safety Data Sheets

4.0 HEALTH & SAFETY CONCERNS

Exposure to Dechlor chemicals, follow all labeled and Material Safety Data Sheets (MSDS) cautions in material handling. Gloves and eye wear are highly recommended. High velocity water and water into traffic flow. Traffic safety in heavy traffic areas may be an issue as well.

5.0 PERSONNEL QUALIFICATIONS

Person supervising hydrant flushing must hold a Level I or greater Water Distribution Certificate. Other staff must be able to estimate water flow rates, determine chlorine residual and calculate the amount of Dechlor to dose.

6.0 EQUIPMENT & SUPPLIES

Equipment and supplies include: LaMotte 1200 chlorine residual analyzer or equivalent, Vita-D-Chlor (Ascorbic Acid) or NSF approved equivalent, Vita-D-Chlor, Neutral (Sodium Ascorbic) or NSF approved equivalent, fire hose, hydrant wrench, valve key, various types and sizes of diffusers and directional nozzles, traffic control devices, record keeping materials and hydrant flushing signage, materials to channel water flow and mitigate property damage, sand bags, tarps and splash boards.

7.0 PROCEDURAL STEPS

- 7.1 Discuss dechlorination procedures at pre-con meetings, if applicable
- 7.2 Determine area to be flushed
 Use public affairs coordinator to notify affected customers in determined areas or other media outlets, such as flyers, web sites, sandwich boards and radio.
- 7.3 Determine chlorine residual of water to be discharged
- 7.4 Determine if 1) land disposal or 2) sanitary sewer disposal is possible, if not then ensure that adequate travel distance (1000' per DEQ guidance) is achieved and discharge to receiving water does not exceed 0.1mg/l. If distance cannot be met, then Dechlor all water leaving the water system and entering the storm system or storm system components to a level of maximum allowable residual chlorine concentration of 0.1 mg/L or less.
- 7.5 Post hydrant or blow off (main line) flushing notices and set up traffic control
- 7.6 Place Dechlor in receiving basin and in curb line or water flow stream, if option 1 or 2 cannot be met.
- 7.7 Set up flush equipment and check basins for possible blockage and path of water to avoid any property damage
- 7.8 Flush, continually monitor flow for dechlorination and water damage to property or any unsafe situation
- 7.9 Record estimated flow in total gallons flushed and chlorine residual.
- 7.10 Check area for any damage, recover all equipment and signage.

8.0 RECORDS MANAGEMENT

Microbial sampling logs and daily logs document the water system chlorine levels and the telemetry SCADA system documents the chlorine residual at all entry points at all times. The personnel completing the work will record all reading for the duration of the project. The hard copy records will be on file with the Water Quality Coordinator and the Environmental Services Coordinator in the Public Works building. The report hard copies will be retained in accordance with the current City of Milwaukie records retention policy and Oregon Administrative Rules 166-200-120.

REFERENCES

- 9.1 City of Milwaukie Stormwater Management Plan (2012) Brown & Caldwell and City of Milwaukie
- 9.2 NPDES MS4 Discharge Permit # 101348 (March 16, 2012) Oregon Department of Environmental Quality
- 9.3 Oregon Department of Environmental Quality Management Practices for the Disposal of Chlorinated Water (updated 11/07)
- 9.4 Oregon Department of Environmental Quality Decision Matrix/Flow Chart for the Disposal of Chlorinated Water (1997)

Revision Record

Revision	Date	Author	Description of change

Attachment A

State of Oregon
Department of Environmental Quality Memorandum

Date: May 19, 1997

To: Interested Parties
From: Water Quality Division, DEQ
Subject: Chlorinated Water Discharges

Attached please find the *final* guidance on "Management Practices for the Disposal of Chlorinated Water." In December 1996, the Department distributed a draft version of this guidance and invited comments. In response to the comments received, the Department has revised the draft guidance. The following is a summary of the changes made to the draft guidance.

The final guidance includes a statement that the Department recognizes the importance of activities which result in the discharge of chlorinated water and supports the continuation of these activities. Other changes include redefining system water as containing up to 4 mg/l total residual chlorine in accordance with EPA's Proposed National Primary Drinking Water Regulations. Based on data gathered by water utilities, the Department has revised the typical distance necessary for chlorine dissipation from 1 mile to 1000 feet or more. While the Department expects all activities that generate chlorinated water to use non-discharge options where feasible, the final guidance states that the water should be dechlorinated when discharging to a stream with a flow rate of 50 cubic feet per second (cfs) or less. For larger streams (i.e. flow rate greater than 50 cfs), the Department believes that travel time and dilution within the storm sewer system, in addition to the dilution available in larger streams, will be adequate to prevent water quality impacts.

To aid water utilities and fire districts, the Department has included a flow chart that outlines a decision matrix that can be utilized for the disposal of chlorinated water. It should be noted that the management practices in the guidance were developed with information currently available. As more information becomes available and as water districts and fire departments gain experience with these management practices, the Department will revisit this guidance and revise it accordingly.

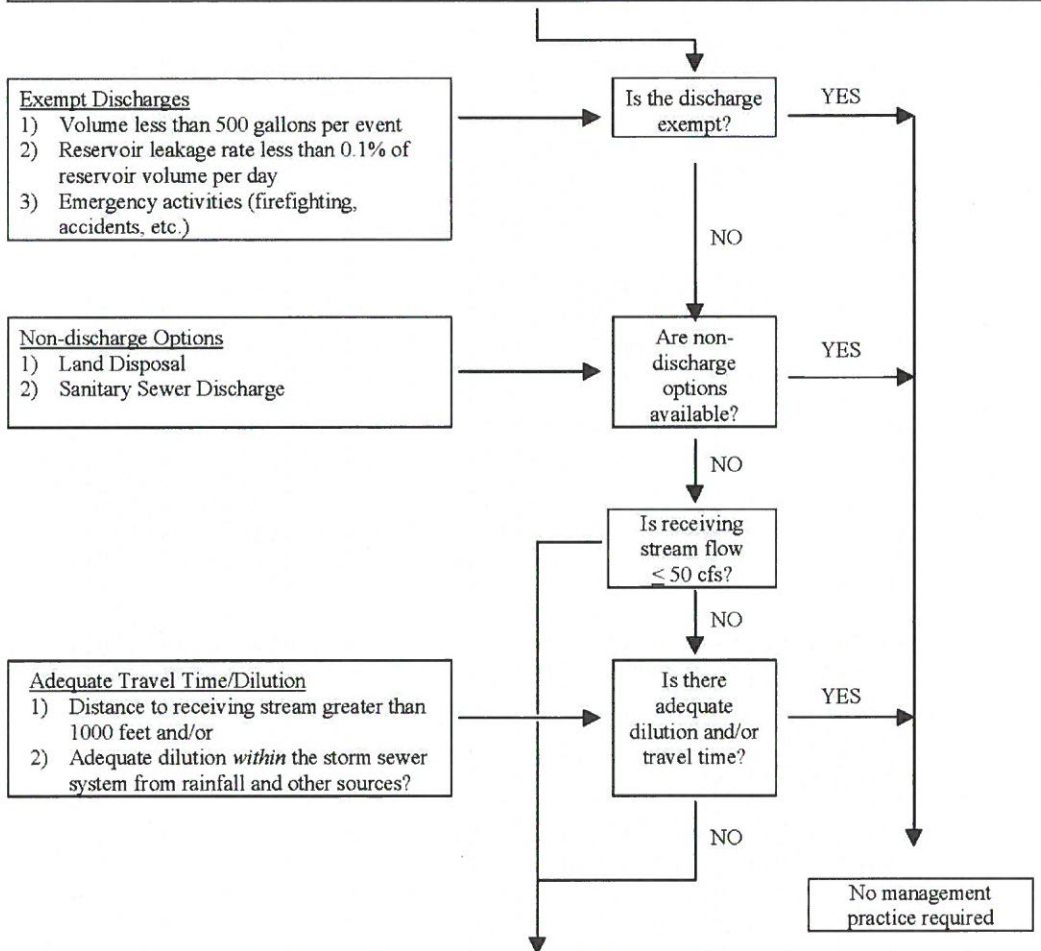
If you would like to submit information for consideration in future revisions to the guidance, please send it to the following address:

Department of Environmental Quality
Water Quality Division
811 SW 6th Avenue
Portland, OR 97204
Attn: Surface Water Management

We look forward to working with you in implementing practices that fit your needs while protecting the state's water resources.

Decision Matrix for the Disposal of Chlorinated Water

<u>Discharge Information</u>	
1) Activity Type _____	
2) Location _____	
3) Chlorine Concentration _____ mg/l	
4) Discharge Flow or Volume generated over time _____ cubic feet per second (cfs) or gallons per time	
<u>Additional Information (if applicable)</u>	
5) Expected Dilution <i>within</i> storm sewer system _____	
6) Distance to Receiving Stream _____ (feet/miles)	
7) Receiving Stream Flow _____ cfs	



<u>Discharge Options / Management Practices</u>
1) Dechlorinate to 0.1 mg/l total residual chlorine or less if discharge is to a stream with flow less than 50 cfs. Test prior to discharge.
2) Collect and hold water in a detention pond/tank to allow chlorine to dissipate. Chlorine concentrations should be 0.1 mg/l or less when discharging to a stream with flow less than 50 cfs. Test prior to discharge.

NOTE: Super-chlorinated water (i.e., water with chlorine concentrations above 4 mg/l) should not be discharged to surface waters or storm sewers. Non-discharge options such as land disposal or sanitary sewer discharge should be used.

MANAGEMENT PRACTICES FOR THE DISPOSAL OF CHLORINATED WATER



To maintain drinking water distribution systems and fire hydrants, and to ensure the quality of the drinking water being distributed, many activities are conducted that result in the discharge of chlorinated and super-chlorinated water. These activities include fire hydrants flushing, water line pressure testing and maintenance, hydrostatic testing, water line flushing, leakage from water reservoirs, flushing of reservoirs and tanks, and other distribution system discharges (from pressure relief valves, air/vacuum release valves, reservoir and tank overflows, and sampling activities). The Department recognizes the importance of these activities and wants them to proceed. Unfortunately, chlorine is toxic to aquatic life even in low concentrations. This fact sheet was developed by the Department of Environmental Quality (DEQ) to provide you with information on management practices that will minimize the impact of chlorinated water discharges. DEQ believes that as long as these management practices are followed, a discharge permit is not necessary for these activities.

SUPER-CHLORINATED WATER

(Defined as greater than 4 mg/l total residual chlorine.)

Regardless of volume, super-chlorinated water must not be discharged to surface waters or storm sewers. Non-discharge alternatives must be used; these include sanitary sewer disposal (either by connecting to a sanitary sewer or by hauling to a sewage treatment plant) and land disposal or irrigation.

CHLORINATED WATER

(Defined as containing up to 4 mg/l total residual chlorine.)

The following 'Best Management Practices' apply to chlorinated water discharges that exceed 500 gallons per event and reservoirs that leak excessively (i.e., greater than the typical design rate of 0.1 percent of the volume of the reservoir per day). Activities that result in discharges under these rates are not subject to the management practices specified below. Discharges of chlorinated water from emergency activities such as firefighting are also exempt from these practices.

- Wherever practicable, chlorinated water should be disposed so it does not enter storm sewers or surface waters. Non-discharge alternatives such as land disposal or irrigation and sanitary sewer disposal should be evaluated before considering a direct discharge to surface waters or a storm sewer.
- When non-discharge options are not feasible, chlorinated water may be discharged to a storm sewer if the travel time and/or dilution in the storm sewer system before the water enters a stream is sufficient to allow the dissipation of chlorine. Typically, a distance of 1000 feet or more should be adequate to allow chlorine to dissipate. Shorter distances may also be adequate if there is dilution available within the storm sewer system.
- When non-discharge options are not feasible and the travel time/dilution in the storm sewer system is either insufficient or unknown, the chlorinated water should be de-chlorinated when discharging to a stream that has a flow rate of 50 cubic feet per second (cfs) or less. Dechlorination should be sufficiently effective to reduce total residual chlorine concentration to 0.1 mg/l or less and the water should be tested before discharge. For discharges to larger streams (i.e., greater than 50 cfs), the travel time and dilution within the storm sewer system in addition to the dilution available in larger streams should be adequate to prevent water quality impacts.
- When non-discharge options are not available, the chlorinated water may be collected in a closed vessel or an open-air detention facility and held for sufficient time to allow the chlorine to dissipate. Detention time should be sufficient to reduce chlorine levels to 0.1 mg/l or less when discharging to a stream that has a flow rate of 50 cubic feet per second (cfs) or less. The water should be tested before discharge and the discharge rate should be controlled so that it is not greater than the expected discharge rate from the operation that yielded the water.

For further information, please contact the DEQ regional office in your area (refer to map on back).

DEQ REGIONAL & WATER QUALITY BRANCH OFFICES

