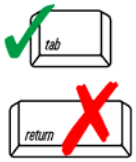
Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Drinking Water Program

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

Instructions to Applicant

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



The purpose of this Drinking Water Program (DWP) Facility Checklist is to assist the public water systems to prepare drinking water program permit applications that comply with current MassDEP regulations, policies, and guidelines. Completion of this checklist will ensure that the applicant has considered all minimum permitting aspects identified by the MassDEP Drinking Water Program. MassDEP may require additional information as regulations, standards, or procedures are implemented or revised.

A Massachusetts registered professional engineer must complete the appropriate section(s) of the checklist for the permit requested (including any brief explanations), sign the certification statement, and submit this checklist, brief explanations (where noted), and certification with the permit application (BRP WS 23A, BRP WS 23B, BRP WS 23C, BRP WS 24, BRP WS 25, BRP WS 29, BRP WS 34 or other BRP WS permit application). The DWP staff will use these documents to expedite the review/approval of the permit application.

MassDEP Guidelines & Policies for Public Water Systems:
http://www.mass.gov/dep/water/laws/policies.htm#dwguid

MassDEP Drinking Water Regulations 310 CMR 22.00:
http://www.mass.gov/dep/service/regulations/310cmr22.pdf

For this particular checklist it is understood when the following words are used that the words "fluoride," "chemical", "fluoridation", "feed", "pump", "NaF", or "feeder" shall mean sodium fluoride (NaF).

If more than one chemical application or treatment plant is proposed, a separate checklist will be required.

N/A means "not applicable."

A. Facility Information

PWS Name

City/Town | PWS ID # | Source(s) Code #

Treatment Facility | Permit Application #

Check form submitted: ☐ BRP WS 34 ☐ BRP WS 29 ☐ BRP WS 25

☐ BRP WS 24 ☐ BRP WS 23C ☐ BRP WS 23B ☐ BRP WS 23A

☐ other BRP WS MassDEP Transmittal #

Check construction status: ☐ New Construction ☐ Replacement or Upgrade Construction

B. Project Checklist

1. **Project description**, including any waiver sought from MassDEP requirements:

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

2. Pumping Facilities

Answer the following questions regarding pumping facilities. Please note that the questions and sections correspond with the standards contained in the Massachusetts Department of Environmental Protection Drinking Water Program's latest editions of Guidelines and Policies for Public Water Systems.

Chapter 5.1. Treatment – General Information	**Yes**	**No**	**N/A**
1. Will the engineer submit a copy of these proposed fluoride plans and specifications in one hard copy and one electronic copy on a compact disk in PDF format for DEP approval?	☐	☐	☐
2. Will a fluoride operation and maintenance (O&M) manual be prepared in accordance with DWP Policy 93-02 after construction?	☐	☐	☐
3. Will the staff be trained in the fluoride O&M procedures after construction?	☐	☐	☐
4. Will records be kept of such training and signed by both operator and trainer?	☐	☐	☐
5. Will a calibration curve be provided for all fluoride feed pumps (after construction) for the operator?	☐	☐	☐
6. Will the fluoride treatment pumping system be overseen by a certified operator who has been properly trained in the operation and maintenance of each piece of equipment, and will records of such training, signed by both the trainer and the operator, be maintained?	☐	☐	☐
Chapter 5.7.1 Plans, Specifications & Coordination with MassDPH			
1. Will the fluoride metering system be designed to add 0.9 to 1.2 mg/L of fluoride to finished water?	☐	☐	☐
2. Is fluoride construction planned to begin within 3 years of MassDEP permit approval?	☐	☐	☐
3. Will the fluoridated water be pumped to waste after construction to demonstrate optimal fluoridation under observation by MassDEP?	☐	☐	☐
Chapter 5.7.2 Fluoride Compound Storage			
1. Do the plans show a storage area for unopened bags of NaF to be stored inside a building on pallets, and isolated from other chemical storage?	☐	☐	☐
Chapter 5.7.3 Fluoride Chemicals, Chemical Feed Equipment, and Methods			
1. Do the specifications show the NaF to be approved by AWW Standard B701-06 or latest issue for Sodium Fluoride and NSF Standard 60?	☐	☐	☐
2. Is the fluoride injection point after any filters (if used with alum at a water filtration plant)?	☐	☐	☐
3. Is the fluoride injection point into the filter effluent or clearwell influent (if used at a water filtration plant) to guard against overfeeding?			
4. If a protected water flush or carry water tee is provided, is it teed in on metering pump discharge line within 10 feet of final injection point with interlock solenoid valve to help avoid slug feeding?	☐	☐	☐
5. Will the fluoride metering pumps be accurate to within plus or minus 5% of any desired feed rate?	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

	Yes	No	N/A
6. Are fluoride metering pumps flow paced or proportioned to water flow?	☐	☐	☐
7. Will two diaphragm-type anti-siphon or back-pressure valves be installed in the fluoride feed line, and both be easily accessible for annual operator inspection?	☐	☐	☐
8. Will all fluoride metering pumps be constructed so the pumps can not remain in "hand or manual" mode unless the switch is held in place by an operator?	☐	☐	☐
9. Will the fluoride metering pumps be electrically interlocked with respective raw water pump or thermal type flow switch drilled into pipeline?	☐	☐	☐
10. Will the fluoride metering pumps circuit include a nearby labeled pilot light showing when the interlock circuit is activated?	☐	☐	☐
11. If not hardwired, will the fluoride metering pumps use a 115 VAC twist lock type plug and receptacle for safety?	☐	☐	☐
12. Are the fluoride metering pumps of a positive displacement type and sized in specifications to have a stroke rate not less than 20 strokes per minute at 1.0 ppm fluoride?	☐	☐	☐
13. Will a small water meter with totalizer be installed on make-up water line to saturator for a daily reading by the operator?	☐	☐	☐
14. Will a MassDEP-approved-type reduced-pressure backflow preventer be installed on saturator make-up line exclusively for the saturator?	☐	☐	☐
15. Will a non-electrical-type saturator-overflow prevention system be installed on the make-up water line to avoid overflows of the saturator?	☐	☐	☐
16. Will the fluoride metering pumps be installed on saturator top or a shelf no more than 3 feet higher than saturator top?	☐	☐	☐
17. Will the suction line be designed to be as short as possible, and slope continuously upward to the pump with no false loops?	☐	☐	☐
18. Will the NaF saturator be of the upflow type and sized a minimum of 50 gallons?	☐	☐	☐
19. Will a softener of the ion-exchange type or throw-away type hardness reduction filter be installed on make-up water line if total water hardness is over 75 mg/L as calcium carbonate?	☐	☐	☐
Chapter 5.7.4 Protective Equipment			
1. Will personal protective equipment be provided at each fluoride injection point, consisting of:			
a. a pair of rubber or neoprene gloves?	☐	☐	☐
b. a respirator certified by the National Institute for Occupational Safety & Health (NIOSH) for high-efficiency dust with a soft rubber face-to-mask seal and replaceable cartridge?	☐	☐	☐

B. Project Checklist (cont'd)

	Yes	No	N/A
c. neoprene or rubber apron?	☐	☐	☐
d. splash-proof goggles or face mask?	☐	☐	☐
Chapter 5.7.5 Dust Control			
1. Will a covered 32-gallon (Rubbermaid-type) container be available at each saturator site to accommodate discarded NaF paper bags?	☐	☐	☐
Chapter 5.7.6 Testing Equipment			
1. Will fluoride testing equipment be provided consisting of specific ion type or SPADNS colorimetric method in compliance with 310 CMR 22.06(16)(b)?	☐	☐	☐
2. Will the fluoride testing equipment be portable and capable of being calibrated on a daily basis?	☐	☐	☐
Chapter 5.7.7 Fluoride Monitoring			
1. Will Massachusetts DPH and MassDEP be consulted to set up an approved fluoride monitoring and surveillance plan before fluoridation begins?	☐	☐	☐
2. If this is the first time fluoride plans are prepared, write in date(s) of Board of Health Fluoridation Order(s) under MGL Chapter 111, Section 8C: _____			☐
3. Write in name(s) of Board of Health in Question 2: _____			☐
4. Write in the natural fluoride content in mg/L at source(s) to be fluoridated: _____ mg/L.			☐
5. Will the applicant prepare and submit to MassDEP monthly Chemical Addition reports for NaF added pursuant to 310 CMR 22.15(4) requirements?	☐	☐	☐
Chapter 6.0.1 Plans & Specifications			
1. Are descriptions of feed equipment, including maximum, average, and non-zero minimum feed ranges (expressed in daily/monthly use and gallons/volume/weight per hour), provided?	☐	☐	☐
2. Are the locations of feeders, piping layout, and points of application shown?	☐	☐	☐
3. Are descriptions of storage and handling facilities provided?	☐	☐	☐
4. Are there specifications for the chemicals to be used?	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

	Yes	No	N/A
5. Are there operating and control procedures, including proposed application rates?	☐	☐	☐
6. Are descriptions of testing equipment and procedures provided?	☐	☐	☐
7. Do the plans include a chemical schematic of all fluoride equipment and piping including sampling and monitoring equipment?	☐	☐	☐
Chapter 6.0.2 Chemical Application			
1. Are chemicals applied at points and by means to assure maximum treatment efficiency?	☐	☐	☐
2. Are chemicals applied at points and by means to provide maximum safety to consumers?	☐	☐	☐
3. Are chemicals applied at points and by means to provide maximum safety to operators?	☐	☐	☐
4. Are chemicals applied at points and by means to assure satisfactory mixing of the chemicals with the water?	☐	☐	☐
5. Are chemicals applied at points and by means to prevent backflow, prevent back-siphonage, prevent bypassing of treatment units, and eliminate multiple points of feed through common manifolds?	☐	☐	☐
6. Is completed chemical injection point into a pipeline that uses an injection nozzle with corporation stop, ball check (to prevent backflow), and safety chain/cable, or uses a diffuser pipe into a basin?	☐	☐	☐
Chapter 6.0.3 General Equipment Design			
1. Will the feeders be able to supply, at all times, the necessary amounts of fluoride at an accurate rate, throughout the range of feed?	☐	☐	☐
2. Are the chemical-contact materials and surfaces resistant to the aggressiveness of the chemical solution?	☐	☐	☐
3. Are corrosive chemicals introduced in such a manner as to minimize potential for corrosion?	☐	☐	☐
4. Are chemicals that are incompatible **not** fed, stored or handled together?	☐	☐	☐
5. Are all chemicals conducted from the feeder to the point of application in separate conduits?	☐	☐	☐
6. Are chemical feeders as near as practical to the feed point?	☐	☐	☐
7. Is pump sized in specifications such that pump will not operate at a point no lower than 10% of feed range dial at any time for greater chlorinator accuracy?	☐	☐	☐
8. Is pump sized in specifications such that pump will not deliver more than 2,000 % of the optimal chemical dosage in mg/l to help prevent potential overfeeds?	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

	Yes	No	N/A
Chapter 6.1.1 Feeders and Metering Pumps			
1. Does the chemical feed system include a minimum of two feeders, of which the standby unit or a combination of units is of sufficient capacity to replace the largest unit during shutdown?	☐	☐	☐
2. Are spare parts available for all feeders to replace parts that are subject to wear and damage, such as anti-siphon valves, belts, tubing, etc.?	☐	☐	☐
Chapter 6.1.2 Control of Feeders and Metering Pumps			
1. Are feeders manually or automatically controlled in setting stroke length or speed, with automatic controls designed so as to allow override by manual controls?	☐	☐	☐
2. Is a means to measure treated water flow (in gpm and total gallons) provided?	☐	☐	☐
3. Are chemical feeders synchronized to start and stop (electrically interlocked with appropriate upstream water pump motor or thermal type flow switch) with the flow of water being treated as the primary electrical interlock?	☐	☐	☐
4. Will the chemical metering pumps interlock system be hard wired or use a twist type plug and receptacle?	☐	☐	☐
5. Will the controls be configured such that the chemical metering pumps are manually restarted by a certified operator following any alarm initiated shutdown?	☐	☐	☐
6. Will each hand, off, automatic (HOA) switch show proper signage on site explaining usage?	☐	☐	☐
7. Will the SOP include procedures to test any fluoride alarms and controls (both high and low) quarterly?	☐	☐	☐
8. If fluoride is proposed to be added to filter effluent or clearwell and backwash water is intermittently recycled to plant influent, will special pacing provisions be made to compensate for added fluoride content in the finished water?	☐	☐	☐
Chapter 6.1.6 Positive Displacement Solution Pumps			
1. Are positive displacement type solution pumps used to feed fluoride chemicals?	☐	☐	☐
2. Will the metering pump specified be capable of operating against maximum pressure head at the point of injection?	☐	☐	☐
3. Does each feeder have a pressure relief valve (that is safely tubed with cable ties or piped back into the saturator) on the discharge line for operator safety?	☐	☐	☐
4. Is there a clear minimum 500 ml calibration chamber (in ml) or mass flow meter mounted above each feed pump to aid the operator in setting the pump rate?	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

	Yes	No	N/A
Chapter 6.1.7 Liquid Chemical Feeders - Siphon Control			
1. Do liquid chemical feeders provide discharge at a point of positive pressure or provide vacuum relief; and provide an air gap or anti-siphon device?	☐	☐	☐
2. If a peristaltic pump is used, are 2 anti-siphon or back-pressure valves used on discharge line located where visible and easily accessible to the operator?	☐	☐	☐
3. Is the metering pump located above the top of the saturator and does it avoid use of a flooded suction?	☐	☐	☐
Chapter 6.1.9 Location of Chemical Feed Equipment			
1. Is the fluoride feed equipment located in a separate room to reduce hazards?	☐	☐	☐
2. Is the chemical feed equipment readily accessible with adequate space provided for servicing, repair, and observation of operation?	☐	☐	☐
3. Is the chemical feed equipment located either above or inside the containment area?	☐	☐	☐
Chapter 6.1.10 In Plant Service Supply			
1. Is the in plant service water supply (if used in this permit) ample in quantity and adequate in pressure to saturator not exceeding 80 psi using a pressure-reducing valve, if needed?	☐	☐	☐
Chapter 6.1.11 Chemical Storage and Process Tanks			
1. Is space provided for at least 30 days of chemical supply to meet average treated water demand?	☐	☐	☐
2. Is the saturator tank labeled "Sodium Fluoride"?	☐	☐	☐
3. Do containment areas provide:			
a. a bermed area capable of containing 110% of the volume of the chemicals stored within the area?	☐	☐	☐
b. no floor drains or sump pumps unless the flow is directed to a separate containment area or tank?	☐	☐	☐
c. an overflow with union from saturator to small overflow prevention tank located inside the containment area?	☐	☐	☐
d. separate containment area for saturator system?	☐	☐	☐
4. Is there no mixer in the saturator tank to avoid over-feeds?	☐	☐	☐
5. Is the saturator tank covered and does it have a hinged fill cover?	☐	☐	☐

B. Project Checklist (cont'd)

	Yes	No	N/A
Chapter 6.1.12 Feed Lines			
1. Are feed lines as short and straight as possible in length of run and:			
a. of durable, corrosion-resistant material?	☐	☐	☐
b. easily accessible?	☐	☐	☐
c. protected against freezing?	☐	☐	☐
d. readily cleanable?	☐	☐	☐
e. properly protected and secured?	☐	☐	☐
2. Does the suction feed line(s) slope upward from the saturator to the metering pump without loops to help avoid air-entrapment with a foot-valve?	☐	☐	☐
3. Are the feed lines color-coded light blue, labeled with chemical name (NaF), and show arrows for direction of flow?	☐	☐	☐
4. Are any outside underground feed lines in secondary containment?	☐	☐	☐
5. Is any outside underground secondary containment of feed lines sloped to a location where any leaks are visually noticeable?	☐	☐	☐
Chapter 6.1.14 Housing			
1. Are floor surfaces smooth, impervious, slip-proof and well drained?	☐	☐	☐
2. Is adequate ventilation and heating provided that conforms to all local and/or state codes?	☐	☐	☐
Chapter 6.3.4 Operator Safety			
1. Will an eyewash be installed between the saturator and the nearest means of egress?	☐	☐	☐
2. Will a sufficient amount of spill absorbent be stored on-site for any uncontrolled discharges?	☐	☐	☐
3. Will the MassDEP/MDPH standard operating procedure (SOP) for sodium fluoride be posted in a protective shop envelope on the wall next to saturator for the operator?	☐	☐	☐
4. Will the NaF material safety data sheet (MSDS) be available to the operator?	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

	Yes	No	N/A
Chapter 7.0 Pumping Facilities			
1. Are any fluoride analyzer discharges in compliance with DEP fact sheet "Registration of Discharges to the Ground From Pump Houses and Other Public Water System Facilities Including Discharges from In-line Analyzers"? http://www.mass.gov/dep/water/drinking/phdisreg.htm	☐	☐	☐
2. Is a representative labeled sample tap located 100 feet downstream available for daily fluoride testing of the treated water?	☐	☐	☐
3. Is a hydrant available to waste for adjusting the initial fluoride to optimum concentration?	☐	☐	☐
4. If an ion-exchange-type softener is used on saturator make-up water line, is a floor drain available that is connected to municipal sewer line or a holding tank?	☐	☐	☐
Additional Questions: Including Chapters 2 & 12			
Chapter 2.15 Operator Certification			
1. With the proposed fluoride addition, and including any additional treatment processes, indicate the water treatment plant classification for this facility pursuant to 310 CMR 22.11B(4)(a):			☐
☐ VSS ☐ I-T ☐ II-T ☐ III-T ☐ 1V-T			
2. Does the applicant's proposed staffing plan comply with the Certified Operator provisions of 310 CMR 22.11B? Submittal of plan is required.	☐	☐	☐
Chapter 12.1 Minimum Components of Emergency Response Plans			
1. Will the applicant's emergency response plan (ERP) be updated to include the fluoride chemical addition emergency procedures and notification pursuant to 310 CMR 22.04(13) and MassDEP Guidelines and Policies for Public Water Supplies, Chapter 12 – Emergency Response Planning Requirements Guidance, including Appendix O – Handbook for Water Supply Emergencies? http://www.mass.gov/dep/water/laws/policies.htm#dwguid http://www.mass.gov/dep/water/drinking/systems.htm#emerresp	☐	☐	☐

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

B. Project Checklist (cont'd)

3. Detailed Explanation

Please attach a brief explanation for any question answered "No" and "N/A" in the checklist. The brief explanation should explain why the applicant/applicant's engineer does not feel this item is necessary to maintain the integrity of the design and/or operation of the facility.

Detailed explanation of the following question(s) is attached:

Section #	Page #	Question #

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Drinking Water Program

Water Supply Facility Checklist for Fluoridation Using Sodium Fluoride Saturator for Permit Review/Approval

C. Certification

A. Applicant's Engineer

I hereby certify, as a Professional Engineer registered in Massachusetts, that the Drinking Water Facilities Checklist is a true and accurate representation on the information contained in my plans and specifications submitted with this permit application.

Signature/Stamp of Professional Engineer

Signature/Stamp of Second Professional Engineer (if needed)

Date

Date

Printed Name

Printed Name

Title

Title

Employer

Employer

Phone Number | Email Address

Phone Number | Email Address

B. Applicant

This checklist and attached permit application are submitted on behalf of water representative:

City/Town

Address

PWS Name | PWS ID # | Phone Number

Applicant Name/Title

Email Address

Applicant Signature

Date