

Chemical Feed Submittals: Determining When Chemical Feed Submittals Require Central Office Plan Review or DNR Representative Field Review

Sections NR 108.02(13)(b), NR 810.20, NR 811.08, NR 811.39, Wis. Adm. Code

Purpose: Changes to chemical feed equipment, including chemical doses, must be reviewed by the Department. The review may be performed by either Central Office plan review staff or DNR Field Representatives, depending on the scope of the changes. This document is intended to be used as a resource for field staff, municipal community's waterworks staff, and consultants to determine the appropriate review process for chemical feed submittals in compliance with the current code (chs. NR 108, 810, and 811). Common chemical feed equipment and chemical dose changes are referenced, and a limited number of possible scenarios are described. Any questions regarding changes that are not covered in this document can be directed to DNR staff to determine which type of approval is necessary. NOTE: The addition of a new chemical into the water supply must always be submitted for approval by Central Office plan review staff. In addition, nonconforming features must be updated when changes to chemical feed equipment are submitted for plan approval.

Background: This document was generated by the Department's Municipal Community (MC) Consistency Team. The MC Consistency Team was developed to ensure statewide consistency in program implementation. Differences in implementation approaches and approvals for changes to chemical feed equipment and chemical doses were identified through MC Consistency Team work. This document was developed to help field staff, municipal community's waterworks staff and consultants determine which type of review is required.

Document Organization: This document outlines examples of Central Office plan review approvals (left hand side) and DNR Field Representative review approvals (right hand side) in the following order:

- New chemical feed equipment.
- Disinfection chemicals submittals.
- Phosphate chemical submittals.
- pH adjustment chemical submittals.
- Sodium silicate chemical submittals.
- Fluoride chemical submittals.
- Bio-penetrant chemical submittals
- All other chemicals

Periodic Review Required: This document will be periodically reviewed by the MC Consistency Team.

Treatment Changes	Plan Review Approval			Field Approval		
	Scenarios When Plan Review Is Appropriate	Examples	Field Follow-Up Required	Scenarios When Field Review Is Appropriate	Examples	Field Follow-Up Required
Change to chemical feed equipment.	A change in equipment capacity or type of equipment will occur.	A system desires to switch from a Stenner peristaltic to an LMI positive displacement diaphragm chemical feed pump (or the reverse) OR A new feeder with a different capacity than existing feeder.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	When like-kind equipment replacement will occur. This is same type of pump and same capacity.	A system needs a new chemical feed pump and wants to switch from an LMI 6 gpd positive displacement diaphragm pump to a ProMinent 6 gpd positive displacement diaphragm pump.	<ul style="list-style-type: none"> • Ask for pump make and model, feeder settings, and anti-siphon equipment. • Verify entry point (EP) and distribution system (DS) residuals (EMOR) are consistent between old and new equipment for at least 1 month. • Check chemical feeder and settings at next sanitary survey.
Change to disinfection chemical OR elimination of disinfection completely.	All permanent long-term changes to dose and/or type of disinfection	Permanent switch from free chlorine to chloramines or chloramines to free chlorine.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	Temporary changes in disinfectant.	<ul style="list-style-type: none"> • Loss of pressure in distribution system, need to feed an emergency dose of 2 ppm free chlorine at a system that operates using chloramines. • Change to free chlorine for systems that operate using chloramines to burn out the nitrifying bacteria in the distribution system. 	<ul style="list-style-type: none"> • Check with system regarding their safe samples. • Verify they have documented chemical use in EMOR using comment section. • Verify that they've gone back to normal operations.

Treatment Changes	Plan Review Approval			Field Approval		
	Scenarios When Plan Review Is Appropriate	Examples	Field Follow-Up Required	Scenarios When Field Review Is Appropriate	Examples	Field Follow-Up Required
Change in disinfectant dose.	A change in dose (increase or decrease) that is > 0.5 ppm different from plan approval residual	A system has received a plan review approval to dose chlorine at 1.0 ppm; after some run time they want to decrease the dose to 0.4 ppm.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	An increase (or decrease) in dose within 0.5 ppm of plan approval residual.	A system initially starts up chlorine disinfection treatment with a design of 0.5 ppm chlorine. After start-up, the chlorine residual in system is less than expected, system wants to turn up dose to provide a chlorine dose of 0.7 ppm.	<ul style="list-style-type: none"> • Ask for new chemical feeder settings. • Ask if they will maintain at least 30 days of chlorine chemical storage. • Check dose on EMOR. • Check chemical feeder settings at next sanitary survey.
	When a change in dose causes the chemical feeder settings to exceed 90% of chemical feeder capacity.	If an increase in dose is needed, the field engineer should ask what the new chemical feeder settings will be. If the settings are greater than 90% of the pump capacity, a new feeder will be recommended. New chemical feeders have to go through plan review.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.			
Change in dose of polyphosphate used for sequestration (not blended polyphosphates for corrosion control)	A change in dose.	A system initially starts up sequestration treatment with a design of 1.2 ppm polyphosphate; additional sequestration is needed and an increase in dose to 1.8 ppm is desired.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	No field approvals for change in dose.		

Treatment Changes	Plan Review Approval			Field Approval		
	Scenarios When Plan Review Is Appropriate	Examples	Field Follow-Up Required	Scenarios When Field Review Is Appropriate	Examples	Field Follow-Up Required
Change in polyphosphate blend or orthophosphate (for corrosion control treatment)	A change to the type of phosphate, the blend of the phosphate, or change in supplier/brand of phosphate.	A system switches from Hawkins LPC-AM to Aqua Mag® or Aqua Mag® to Hawkins LPC-AM or changes from a 70 poly/30 ortho blend to a 60 poly/40 ortho blend.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	No field approvals for change in approved chemical.		
	A change in the dose.	A system wants to decrease their ortho dose from 1.0 ppm to 0.8 ppm.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.			
pH Adjustment	When EP pH <u>goal</u> changes > 0.2± pH units from approval letter	The original approval stated a pH adjustment to 8.1. The system wants to change pH to be >8.3 or <7.9.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	A chemical feeder setting change to adjust the EP pH <u>goal</u> that is within ±0.2 of	The original plan approval stated a pH adjustment to 8.1. The system wants to change the pH to be 8.2.	<ul style="list-style-type: none"> • Ask for new chemical feeder settings. • Check dose on EMOR. • Check chemical feeder settings at next sanitary survey.

Treatment Changes	Plan Review Approval			Field Approval		
	Scenarios When Plan Review Is Appropriate	Examples	Field Follow-Up Required	Scenarios When Field Review Is Appropriate	Examples	Field Follow-Up Required
pH Adjustment (continued)	When a change in dose causes the chemical feeder settings to exceed 90% of chemical feeder capacity	If an increase in dose is needed, and the settings will be greater than 90% of the pump capacity, a new feeder will be recommended by the field staff. New chemical feeders have to go through plan review.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	the approval letter.		<ul style="list-style-type: none"> Notify LCR coordinator to analyze impacts to water quality parameters related to corrosion control.
	A change in pH adjustment chemical.	A system switches from sodium hydroxide to sodium carbonate.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	Same chemical and same pH goal but switching percent active.	Seasonal changes in percent active chemical to prevent issues with freezing. No changes in dose and the chemical feeder size is able to feed both chemicals.	<ul style="list-style-type: none"> Ask for new chemical feeder settings. Check dose on EMOR. Check chemical feeder settings at next sanitary survey.
Sodium silicates for sequestration	A change in dose.	A system initially starts up sequestration treatment with a design of 20 ppm; after some run time a decrease in dose to 15 ppm is desired.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	No field approvals for change in dose.		
Sodium silicate for corrosion control.	A change in the dose.	A system wants to decrease their silicate dose from 12 ppm to 8 ppm.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	No field approvals for change in dose.		

Treatment Changes	Plan Review Approval			Field Approval		
	Scenarios When Plan Review Is Appropriate	Examples	Field Follow-Up Required	Scenarios When Field Review Is Appropriate	Examples	Field Follow-Up Required
Fluoride	Change in fluoride chemical.	A system switches from fluorosilicic acid to sodium fluorosilicate.	DNR Rep updates DWS with plan review letter specifics. Verify system using correct percent active in EMOR. Perform a startup inspection or check chemical feeder at next sanitary survey.	A decrease in dose associated with DHS/CDC recommendations OR elimination of fluoridation.	The system was feeding a fluoride dose of 1.1 ppm, and now wants to feed a dose of 0.7 ppm.	<ul style="list-style-type: none"> • Ask for new chemical feeder settings. • Check dose on EMOR. • Check chemical feeder settings at next sanitary survey. • Notify LCR coordinator to analyze impacts to water quality parameters related to corrosion control. • Notify DNR fluoridation coordinator
Bio-penetrant (i.e. Clearitas®)	A change in the dose.	A system wants to increase their bio-penetrant dose from 10 ppm to 16 ppm.	DNR Rep updates DWS with plan review letter specifics. Perform a startup inspection or check chemical feeder at next sanitary survey.	No field approvals for change in dose.		
All other chemicals	Check with Plan Review Staff.					
Note: <ul style="list-style-type: none"> • The addition of a new chemical into the water supply must always be submitted for plan review. • Chemical dose fluctuations associated with daily raw water quality changes do not need approval. 						