

Maintaining Optimal Water Quality Parameters to Manage Lead & Copper in Drinking Water

Goal: To maintain optimal water quality parameters in order to ensure optimal corrosion control treatment throughout the distribution system.

Background:

Water Quality Parameters (WQPs) are used to determine the corrosivity of drinking water, and if needed, to help determine the type of corrosion control treatment that the system should install and how the treatment should be operated.

WQP samples include analysis for:

- pH;
- Alkalinity;
- Calcium;
- Conductivity;
- Water temperature;
- Orthophosphate, if an inhibitor containing phosphate is used; and
- Silica, if an inhibitor containing silica is used.

WQP samples are collected at two separate locations:

- At entry points to the distribution system; and
- At representative taps throughout the distribution system.

Optimal Water Quality Parameters (OWQPs) are determined and used by operators to manage corrosion control treatment systems so that treatment most effectively minimizes lead and copper concentrations at users' taps.

Strategy for Achieving Goal:

The first step is to ensure the system has designated OWQPs. These should have been jointly determined by the system and the State (Water Supply Division) after follow-up WQPs were collected subsequent to the installation of corrosion control treatment. Common water quality control parameters include:

- (1) A minimum value or a range of values for pH measured at each entry point to the distribution system;
- (2) A minimum value for pH measured in all tap samples taken for water quality parameter determinations. Such value shall be equal to or greater than 7.0, unless it is determined that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;
- (3) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that is determined as necessary to form a passivating film on the interior walls of the pipes of the distribution system;
- (4) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples; and
- (5) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or range of concentrations for calcium, measured in all tap samples.

Optimizing corrosion control treatment is premised on maintaining water quality parameters at or above minimum values or within pre-determined ranges. Monitoring of OWQPs sometimes needs to be done on a daily basis (pH, for example) in order to manage a system properly, but for many monitoring can be done on a quarterly basis to manage the system for quality assurance and control.

LEAD & COPPER PROGRAM WATER QUALITY PARAMETER (WQP) QUARTERLY REPORT

System Name: _____

WSID: _____

Monitoring Year: _____

Sampling Quarter: 1st Quarter (Jan. – Mar.) 3rd Quarter (Jul. – Sept.)
 2nd Quarter (Apr. – Jun.) 4th Quarter (Oct. – Dec.)

Distribution System Samples:

| Sample Location | pH | Alkalinity | Calcium | Conductivity | Temperature | Orthophosphate* | Silica* | Langlier Index (+,-) |
|-----------------|----|------------|---------|--------------|-------------|-----------------|---------|----------------------|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| 6. | | | | | | | | |
| 7. | | | | | | | | |
| 8. | | | | | | | | |
| 9. | | | | | | | | |
| 10. | | | | | | | | |
| 11. | | | | | | | | |
| 12. | | | | | | | | |
| 13. | | | | | | | | |
| 14. | | | | | | | | |
| 15. | | | | | | | | |
| 16. | | | | | | | | |
| 17. | | | | | | | | |
| 18. | | | | | | | | |
| 19. | | | | | | | | |
| 20. | | | | | | | | |

** Record Only When Used to Control Erosion*

Entry Point Samples:

| Sample Location | pH | Alkalinity | Calcium | Conductivity | Temperature | Orthophosphate* | Silica* | Langlier Index (+,-) |
|-----------------|----|------------|---------|--------------|-------------|-----------------|---------|----------------------|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |

** Record Only When Used to Control Erosion*

Any questions concerning Water Quality Parameter sampling or the Lead and Copper Rule may be directed to the Lead & Copper Rule Manager at the Vermont Water Supply Division of the Department of Environmental Conservation by calling (802) 241-3422.