



Optimal Water Quality Parameters

Optimal water quality parameters (OWQPs) are designated at public water systems (PWS) to ensure that the corrosivity of the water is controlled within certain ranges or minimums to comply with the lead and copper rule.

What are OWQPs?

Optimal water quality parameters are minimums or ranges that signify optimal corrosion control treatment (CCT). The minimums or ranges vary from PWS to PWS based on the source, treatment, and distribution system pipe material. PWSs must operate within these ranges at all times. A PWS would be designated OWQPs in a director’s plan approval letter.

Why are they designated at my PWS?

Public water systems are designated with OWQPs if they have exceeded the action level for lead or copper, over 50,000 population, or if the director of Ohio EPA deems it as necessary. OWQPs are designated after installation of corrosion control treatment like a corrosion inhibitor, pH adjustment, or alkalinity adjustment.

Examples of OWQPs

Customized OWQPs will be designated for a PWS based upon the CCT determined to be necessary. The below tables provide an example of OWQPs. Reference your Director’s plan approval letter to determine what OWQPs are required. **Table 1** shows examples of the minimums or ranges that may be designated. The values vary depending on the water quality and treatment installed at each PWS.

Table 1: Example OWQP Ranges

Optimal Water Quality Parameters Ranges		
Entry Point	Total Alkalinity (mg/L as CaCO ₃)	≥ 50
	pH (S.U.)	≥ 7.4 and ≤ 8.0
	Orthophosphate (mg/L as PO ₄)	≥ 1.0 and ≤ 3.0
Distribution System	Total Alkalinity (mg/L as CaCO ₃)	≥ 50
	pH (S.U.)	≥ 7.4 and ≤ 8.0
	Orthophosphate (mg/L as PO ₄)	≥ 1.0 and ≤ 3.0

***Note: The ranges and minimums are examples only.**

Optimal Water Quality Parameters

Table 2 and **Table 3** show an example of the required frequency to sample at the entry point and in the distribution system, respectively. The number of tap sample locations in the distribution system will depend on the population per Ohio Administrative Code Rule 3745-81-87(A)(2)(a).

Table 2: Example OWQP Entry Point Frequency of Sampling

Parameter	Sampling Frequency
Total Alkalinity (mg/L as CaCO ₃)	Biweekly (Every 14 days)
pH (S.U.)	Biweekly (Every 14 days)
Orthophosphate residual and dosage (mg/L as PO ₄)	Biweekly (Every 14 days)

Table 3: Example OWQP Distribution Taps Frequency of Sampling

Parameter	Sampling Frequency
Total Alkalinity (mg/L as CaCO ₃)	Two samples from the same three taps per 6 months (at least a week apart)
pH (S.U.)	Two samples from the same three taps per 6 months (at least a week apart)
Orthophosphate (mg/L as PO ₄)	Two samples from the same three taps per 6 months (at least a week apart)

***Note: The number of taps per monitoring period are examples only.**

Where to collect, analyze, and report OWQPs

Collection Location and Frequency

Entry point samples must be collected at the first tap after all treatment. Usually they are required no more than 14 days apart. Samples collected for plant distribution monthly operating reports (MOR), under OAC Rule 3745-83-01, must be used for compliance with OWQPs. Distribution system samples must be collected at representative sites and the same sites must be sampled twice within the monitoring period. Refer to your Director’s plan approval letter for details on monitoring frequencies.

Analyze

pH must be collected on site using a pH meter with a minimum of a 2-point standard calibration. A color wheel is not an acceptable method. Orthophosphate can be analyzed at a certified lab or using an in-house test kit that follows either Standard Method 4500-P E, 4110 B, EPA 365.1, 300.0, 300.1, ASTM D515-88A, D4327-07,03, or D6508-00. Total alkalinity must be analyzed at a certified lab. Any other parameters must follow **OAC Rule 3745-81-89**.

Report

Entry point OWQPs must be submitted on the MORs. If there is a master meter with no MOR available, then report entry point monitoring for that meter on the WQP Reporting tool in eDWR. All distribution system tap sampling must be submitted on the WQP Reporting Tool in eDWR. However, if a certified laboratory analyzes the sample, then they are required to submit the result to Ohio EPA and the PWS does not need to report it on the WQP Reporting Tool. Instructions for submitting through the WQP Reporting tool can be found here:

<https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/28/documents/reporting/eDWR%20How%20To%20Report%20Water%20Quality%20Parameters.pdf>

All samples must be submitted to Ohio EPA by the 10th of the following month in which results are received. For example, if results are received on July 8, they are due by August 10.

Optimal Water Quality Parameters

pH and orthophosphate should be rounded to one decimal place. For example, 1.15 mg/L would round to 1.2 mg/L. Alkalinity is rounded to the nearest whole number. If more than one sample is collected on the same day, report the average.

How compliance is determined

Violations may be cited for various reasons. Most violations are listed in **Table 4** with the required steps to take after receiving the violation letter.

Table 4: Violations for OWQPs

Violations	Required Steps
Submitting OWQP results late	Tier 3 Public Notice
Not sampling using correct methods	Tier 3 Public Notice
Not sampling the correct parameters	Tier 3 Public Notice
Not sampling at the minimum frequency	Tier 3 Public Notice
More than 9 days of excursions	Tier 2 Public Notice, return to standard 6-month monitoring, provide updated CCT Recommendation

Excursions

An excursion is any daily value for a WQP that is below the minimum value or outside the range of designated OWQPs. The duration of an excursion is the number of days that elapse starting with the day the excursion first occurs, until the day the daily value is within the OWQP range or above the OWQP minimum for that WQP.

Excursions for multiple parameters that occur on the sample day are only counted once. Nine total excursions are allowed every six-month monitoring period (January to June and July to December).

An example is provided in **Table 5** for the entry point using the minimum and ranges in the example in **Table 1** (pH range of 7.4 to 8.0. Orthophosphate range of 1.0 to 3.0 mg/L. Alkalinity minimum of 50mg/L.)

Table 5: Example OWQP Entry Point Excursions

Date	pH	Alkalinity (mg/L as CaCO ₃)	Orthophosphate (mg/L as PO ₄)	Excursions
July 1	7.8	54	1.1	
July 2	7.6	48		1
July 3	8.2	47		1
July 4	7.6	50	0.9	1
July 5	7.9	52	---	1
July 6	7.7	55	---	1
July 7	8.0	54	---	1
July 8		56	1.5	
July 9	7.8	53		
Total excursions:				6

- Reviewing at the pH results, on July 3 the pH was above the maximum of 8.0. One excursion occurred on July 3.
- Reviewing at the alkalinity results, July 2 and July 3, both were below the minimum of 50 mg/L. Two excursions occurred, one on July 2 and one on July 3. Each day can only have one excursion, so the July 3 would only count as one even though the alkalinity and pH were both outside the ranges on that day.

Optimal Water Quality Parameters

- Reviewing at the orthophosphate results, the sample was collected on July 4 and that was below the required 1.0 mg/L. Since the next sample collected that was within the range was July 8, there are excursions on July 4, July 5, July 6, and July 7. In this example, there are six total excursions.

An example is provided in **Table 6** for the distribution system using the minimum and ranges in the example in **Table 1** (pH range of 7.4 to 8.0).

Table 6: Example OWQP Distribution System Excursions

Date	pH at 123 Main St	pH at 456 First St	pH at 789 Second St	Excursions
September 8	8.2			1
September 9	—	7.8	7.7	1
September 10	—			1
September 11	—		7.8	1
September 12	—			1
September 13	—			1
September 14	—			1
September 15	7.9			
September 16		7.6	7.5	
September 17				
Total excursions:				7

This example in the distribution system is looking just at pH, however, it would be valid for any parameter that is required. Reviewing the pH result at 123 Main St, the result was above the 8.0, so that is an excursion. Since no another sample was collected at that location until September 15 and that result is within range, there is an excursion for every day of no sample. There are a total of seven excursions in this example.