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How to Determine Compliance with Optimal Water Quality Parameters as Revised by the Lead and Copper Rule Minor Revisions

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How to Determine Compliance with Optimal Water Quality Parameters as Revised by the Lead and Copper Rule Minor Revisions

What Is The Purpose Of This Guidance Document?

On June 7, 1991, the Environmental Protection Agency or EPA published in the *Federal Register*, a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule. EPA also refers to this rule as the LCR or 1991 Rule. On January 12, 2000, EPA published minor revisions to the 1991 Rule. The purpose of the Lead and Copper Rule Minor Revisions (LCRMR) is to eliminate unnecessary requirements, streamline and reduce reporting burden, and promote consistent national implementation. This document focuses on those changes that may affect the way in which water systems and State Primacy Agencies will determine compliance with the optimal water quality parameter (OWQP) ranges or minimums. State have the option of continuing to use the approach outlined under the 1991 Rule, but EPA strongly encourages States to incorporate this new compliance procedure into their drinking water regulations. Systems should first check with their States before using this new compliance approach.

The LCRMR do not change the frequency with which water quality parameter (WQP) samples must be collected or which systems are required to conduct WQP monitoring. Unless required by the State, small systems (serving 3,300 or fewer people) and medium-size systems (serving 3,301 to 50,000 people) which do not exceed the lead or copper action level, are not required to conduct WQP monitoring. The LCRMR clarify that large systems (serving more than 50,000 people) that meet the criteria of §141.81(b)(3), by demonstrating that they have very low levels of lead and copper in the distribution system, are not required to conduct WQP monitoring. The LCRMR also clarify that systems that have completed treatment steps that are equivalent to those described in the 1991 LCR prior to December 7, 1992 (i,e., meet the criteria of §141.81(b)(2)) must continue conducting WQP monitoring after the State sets OWQPs.

OWQPs are set by the State after a system has collected WQP samples during two consecutive, 6-month monitoring periods, following the installation of corrosion control treatment. OWQPs are measured to determine whether a system is operating its corrosion control treatment at a level that most effectively minimizes the lead and copper concentrations at users' taps.

EPA revised the procedure for calculating compliance with OWQPs from that in the 1991 Rule based on concerns raised by several States and water systems. A major concern was that the 1991 compliance approach created a significant disincentive for sampling WQPs more frequently than required, since the more frequently measurements are taken, the greater the potential that some of the results will be outside the OWQP ranges or below the OWQP minimums set by the State. Under the 1991 Rule, a water system was out of compliance if the results of any WQP sample, or the average of the original sample and a confirmation sample, did not meet the State-designated OWQP ranges or values. Another concern was the "averaging" of results was not the best approach from an effective corrosion control perspective. A system might have to increase pH scale and cause other problems simply to set the average within range.

How Is This Document Organized?

This guidance document is structured to answer the following questions:

- What Special Terms Does A System or State Need to Know to Understand this Guidance Document?
- How Has the Procedure for Determining Compliance Changed?
- How Do the Monitoring Requirements Change When a System Is Out of Compliance?
- How Do the Revisions Affect Systems that Are Not Required to Collect WQPs?
- Have the Reporting Requirements Changed?
- What Key Points Should Systems and States Remember?

This document includes citations in brackets at the end of some of the sentences (e.g., [see §141.86(g)]). Wherever this document mentions a requirement that the system or the State ***must*** follow, EPA has included, in brackets, the citation from the federal regulations that contains the requirement. EPA also has included two appendices to this document. Appendix A contains seven examples that illustrate how to assess OWQP compliance under various monitoring scenarios. The monitoring frequencies in these examples range from multiple WQP samples collected per day, to triennial WQP monitoring. In addition, one example focuses on how to determine compliance for a system that operates seasonally. Another illustrates how to determine compliance for a small or medium-size system that is required to collect WQPs periodically due to intermittent exceedances of the lead or copper action level.

Appendix B contains federal regulatory language from the LCRMR that specifies:

- Continuing requirements for systems that have installed corrosion control treatment.
- Monitoring requirements for systems that meet the criteria of §141.81(b)(2).
- The revised procedure for determining compliance with OWQPs.
- The monitoring requirements for systems that no longer meet their OWQPs.
- Monitoring requirements after the State sets OWQPs.
- When systems must report WQP results to the State.
- Special State primacy conditions if a State elects to use a different formula for assessing compliance when a system monitors more frequently than daily at a sampling location.

Remember: The State's drinking water regulation may contain slightly different wording, and may even be more stringent than the federal regulations. In addition, the State's regulation may be organized differently than those portions of the federal regulation contained in Appendix B of this document. A system should contact the appropriate State agency for a copy of its regulations.

What Special Terms Does A System or State Need to Know to Understand this Guidance Document?

Term	Definition
1991 Rule	This refers to the Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper, or Lead and Copper Rule for short. This regulation was published in the *Federal Register* on June 7, 1991 (56 FR 26460). EPA modified this rule with technical amendments that were published in the *Federal Register* on July 15, 1991 (56 FR 32113), June 29, 1992 (57 FR 28786), and June 30, 1994 (59 FR 33860).
90^{th} Percentile Value	The highest concentration of lead or copper in tap water that is exceeded by 10 percent of the sites sampled during a monitoring period. This value is compared to the lead or copper action level, to determine whether an action level has been exceeded.
Action Level	The concentration of lead or copper in tap water which determines whether a system may be required to install corrosion control treatment, collect water quality parameter samples, collect lead and copper source water samples, replace lead service lines, and/or deliver public education about lead. *The action level for lead is 0.015 mg/L. The action level for copper is 1.3 mg/L.*
Confirmation Sample	Under the 1991 Rule, systems could collect a sample (known as a confirmation sample) within 3 days for any WQP value that was not within its OWQP range or above its minimum value. The result of this confirmation sample and the original value were averaged together to determine compliance. This approach is no longer used under the LCRMR.
Daily Value	This is a new term introduced under the LCRMR. "Daily values" are the sample results of WQPs and are calculated for each WQP at each sampling location. They are based on the sampling frequency for that WQP and sampling point.
Excursion	This is also a new term under the LCRMR. It refers to a "daily value" for a WQP at a sampling location that is below the minimum value or outside the range of values designated by the State.
LCR	An acronym for the Lead and Copper Rule. Also referred to in this document as the 1991 Rule.
LCRMR	An acronym for the Lead and Copper Rule Minor Revisions that were published in the *Federal Register* on January 12, 2000 (65 FR 1950).
OWQPs	An acronym for optimal water quality parameters. They are specific ranges or minimums that are determined by the State for each relevant WQP. OWQPs represent the conditions under which systems must operate their corrosion control treatment to most effectively minimize the lead and copper concentrations at their users' taps.

Term	Definition
State	Refers to the government agency that enforces compliance with drinking water regulations and assists systems in understanding and implementing these regulations. For most systems, this is an organization within the State government (e.g., Department of Natural Resources, Department of Environmental Quality, Department of Health). For DC, WY, and Native American Lands, the contact is often from the respective EPA Regional Office.
WQPs	An acronym for water quality parameters. After corrosion control treatment is installed, WQPs include: pH, alkalinity *(when alkalinity is adjusted)*, orthophosphate *(when an inhibitor containing a phosphate compound is used)*, silica (*when an inhibitor containing a silicate compound is used)*, and calcium *(when calcium carbonate stabilization is used as part of corrosion control).*

How Has the Procedure for Determining Compliance Changed?

Procedure under the 1991 Rule

Under the 1991 Rule, a system would be out of compliance if the results of any WQP sample were below the minimum value or outside the range of values set by the State. Systems were allowed to take a confirmation sample within 3 days of the original sample. If a system collected a confirmation sample, the results of the original sample and the confirmation sample were averaged to determine compliance. Since any sample (or the average of an original and a confirmation sample) falling outside the range or below the minimum could result in a violation, systems that collected samples more frequently than the minimum requirement had a greater potential for not meeting their OWQP levels and to be in violation. From the standpoint of process control, monitoring OWQPs more frequently than the minimum required by the regulations enables systems to detect problems and make corrections sooner.

Another reason for changing the compliance procedure is that an averaging approach may allow a system that is not using sound corrosion control treatment practices to remain in compliance. For example, assume a State sets a WQP pH range of 7.3 to 7.8 for a system. Suppose a caustic feed pump is used at the wellhead or at the end of a water plant feeding into the system, and the system is not adequately controlling the pump. The system collects a sample with a pH of 6.9. Three days later, they collect a second sample, and this one has a pH of 8.4 (also outside the OWQP range). The average (7.6) is within the range, but the process control is poor. This is a common affliction of lime feed treatment at many small and some medium-sized treatment plants. The goal of this monitoring is good process control and the current approach has the potential to reward poor process control as seen in this example.

The revised approach is also more consistent with the goals of corrosion control. Impacts on other rules must be considered, when systems select a corrosion control strategy [see §141.82(c)(5)]. Thus, the constraints imposed by other rules will also be factored into the OWQPs. The averaging

procedure in the 1991 Rule can affect compliance with other rules. The example in the preceding paragraph can be used to illustrate this problem. Suppose the pH upper limit of 7.8 was set because of problems with compliance with total trihalomethanes (TTHMs) at higher pHs. Thus, to maintain compliance with the LCR, the system could have problems meeting TTHMs. The *Lead and Copper Rule Guidance Manual Volume II: Corrosion Control Treatment,* September 1992, lists constraints that should be considered for the three types of corrosion control treatment. Many constraints may be affected if systems need to exceed the range for optimal corrosion control to produce an average that is within the OWQP range. The revised approach avoids this problem because the system is only required to be within the range and the range already incorporates the constraints. Thus, the revised approach is more protective of public health since other treatment processes can be adversely impacted under the current approach in the LCR.

Procedure under the LCRMR

The LCRMR do not change system WQP monitoring requirements, only the way in which compliance is determined.

Under the LCRMR:

1. **Compliance determinations are always based on a 6-month period**, regardless of the system's monitoring schedule (e.g., daily, biweekly, semi-annually, annually, triennially) or whether the WQP results are from an entry point or the distribution system [see §141.82(g)]. The start of the first 6-month period begins on the day the State has designated OWQPs, however, to make tracking easier, the start of the first 6-month compliance period can be either January 1st or July 1st.

2. **Systems cannot be outside the OWQP ranges or below the OWQP minimum for more than a total of 9 days** at a specific sampling point or combination of sampling points, or for a specific WQP or combination of WQPs during a 6-month period. The 9 days can occur anytime during the 6-month period and do not have to be consecutive. Nine days was selected because this number represents five percent of the total number of days in a 6-month period. Thus, a system must meet its OWQP specifications at least 95 percent of the time. The 9 days also allow systems to make necessary repairs that may be causing the system to not meet its OWQP specifications [see §141.82(g)].

3. **Confirmation samples are no longer used**. The results of all WQP samples collected during the 6-month period at a sampling location that is used for OWQP compliance must be reported to the State by the system and used in determining compliance. However, States have discretion to delete results of obvious sampling errors from this calculation [see §141.87(f)].

The LCRMR introduce two new terms with which States and systems need to become familiar to fully understand the new compliance procedure. The first term is **"daily value"**. Daily values are calculated for each WQP at each sampling location. The procedure for determining the daily value is based on the sampling frequency for that WQP and sampling point.

It is quite possible for a system to collect several samples a day for a given WQP at one sampling location and to conduct annual monitoring at another. Although the term "daily values" contains the word "daily", in many instances, the daily value represents a measurement that was collected more or less frequently than once per day. The table below explains how to calculate the daily value based on the sampling frequency for a given WQP.

> ***Note: A daily value is calculated for each sampling location and for each parameter, even if no monitoring occurred at a sampling location during the 6-month period being evaluated. This occurs when a system is on an annual or triennial WQP tap monitoring schedule (see example below).***

Daily Value Calculation Based on Monitoring Frequency	
If a system is monitoring for a specific WQP at a sampling site:	***Then the daily value is:***
More frequently than Daily	Calculated by averaging all the results measured at the sampling location for that WQP during the day. If both continuous monitoring results and grab samples are collected on the same day, both must be included in the calculation of the daily value. States can specify the frequency with which continuous monitoring results should be recorded. A State can also require systems to determine the "daily value" using another formula when they monitor more frequently than daily at the same sampling location. If a State elects to use a different calculation than that specified in the federal rule, it must describe the procedure in its revised primacy package [see §141.82(g)(1) and §142.16(d)(1)(ii)]. Systems should check with their States regarding the frequency of recording values and procedures for aggregating results.
Daily	Results of each daily sample for that WQP at that location.
Biweekly	Results of each sample collected during the 2-week period for that WQP at that location.
Semi-annually	Results of each sample collected during the 6-month period for that WQP at that location.
Annually or Triennially	The most recent measurement(s) taken, even if the measurement(s) was (were) collected during a previous monitoring period. **Example:** A system is on annual WQP tap monitoring during January - December 2000. It measures pH at the tap on January 10, 2000 (pH = 7.5) and June 20, 2000 (pH = 7.6). For the 6-month period of January to June 2000, there are two daily values because both measurements were collected during the 6-month period being evaluated. For the 6-month period of July to December 2000, only the most recent value of 7.6 is used.

Remember: If a system collects additional WQP samples during the monitoring period at a sampling point that is used to determine compliance with OWQPs, the results are included in the compliance assessment. However, States have discretion to delete results of obvious sampling errors from this calculation [see §141.82(g)].

The second new term is an **"excursion"**. An excursion is any "daily value" for a WQP that is below the minimum value or outside the range of OWQPs set by the State. 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. These dates are based on the date the system ***collected*** the sample, not the date the system received the sample results.

To determine the duration of the excursion:

1. **Count the first day that the sample is outside the OWQP range or below the minimum.** Use the date that the sample was collected and not the day the system or State received the results.

2. **Stop counting days when a sample result from the same location and for the same parameter meets the OWQP range, or is at or above the minimum value.** Do not count the day the sample falls within the OWQP range, or is at or above the minimum value in the calculation.

   For example, assume a water system measures entry point pH on a Monday and the results are below the State-set minimum. If the system again measures pH at the same entry point on the next day and the Tuesday daily value is within the State-set limits, the system will have had a one-day excursion. If, on the other hand, the system waits until Friday to measure pH as the same entry point and this Friday measurement is within the State-set limits, the system will have an excursion with a duration of 4 days (i.e., the system was outside the pH range for Monday, Tuesday, Wednesday, and Thursday).

3. **Repeat this procedure any time a measurement does not meet the OWQP specifications during the 6-month period being evaluated.**

To determine if a system is in compliance, count the total number of days that a system had an excursion for each sampling location and for each WQP. Multiple excursions that occur on the same day are only counted once. For example, if the system had an excursion for pH and alkalinity on the same day, this counts as only one excursion. To remain in compliance, a system cannot have excursions on more than 9 different days at a specific sampling point or combination of sampling points, or for a specific WQP or combination of WQPs during a 6-month period [see §141.82(g)].

The 9 days can occur anytime during the 6-month period and do not have to be consecutive. Thus, a system that had excursions for pH at sampling point 1 for 4 days and excursions for pH at sampling point 2 on 6 different days, would be out of compliance.

Other Points to Keep in Mind

Unresolved Excursions from a Previous Monitoring Period

Keep in mind that although compliance is determined in discrete 6-month periods, an unresolved excursion from a previous monitoring period may count in the next 6-month monitoring period. This is because an excursion continues until:

1. The system collects a sample at the same sampling location and for the same WQP that again is within the OWQP range, or is at or above the OWQP minimum, or

2. The system is at or below both action levels and is no longer required to collect WQPs. Small and medium-size systems (i.e., ones that serve 50,000 or fewer people) that no longer exceed the lead or copper action level, and systems that meet the criteria under §141.81(b)(3) are not required to collect WQP samples.

To illustrate these points, assume that a system is below the OWQP pH minimum of 7.0 at its one tap sampling point on June 25, 2001. This excursion continues until the system again monitors pH at its tap sampling point and the result is at or above the minimum of 7.0. Assume that the system does not collect another pH sample that is above the pH minimum until July 3, 2001. How should this excursion be counted?

During the January to June 2001 compliance period, the system had a 6-day excursion. The excursion began on June 25th and continued to the end of the 6-month monitoring period of June 30th, for a total of 6 days. During the July to December 2001 compliance period, the system had a 2-day excursion. The excursion is counted from the beginning of the July to December compliance period (i.e., July 1st) and ends when the system again is above the pH minimum at the tap sampling point (or July 3rd in this example). The day that the system is above the minimum does not count. Therefore, the system has an excursion on both July 1st and July 2nd.

Assume a slight variation on the above scenario. The system is below the OWQP pH minimum of 7.0 at its one tap sampling point on June 25, 2001. However, the system conducts lead and copper tap monitoring on July 3rd and is below both action levels. The system serves 50,000 or fewer people and is not required to conduct WQP monitoring during July through December 2001. How should this excursion be counted?

For the compliance period of January to June 2001, the system has a 6-day excursion. For the compliance period of July through December 2001, the system has 2 days with excursions. On July 3rd, the requirement to conduct WQP monitoring is no longer applicable (unless the State requires the system to continue monitoring), and therefore, the system incurs no additional excursions. **Note**: The LCRMR contain a provision that allows States to require continued WQP monitoring even after a small or medium-size system is at or below both action levels should the State believe this monitoring

is needed to insure adequate process control. Also note, that if the system did not collect its lead and copper tap sample until July 10th or later, it would be out of compliance with its OWQPs because it would have more than 9 days with excursions. If in the future, the system again exceeds the lead or copper action level and is required to collect WQP monitoring, the unresolved excursion is not considered. An unresolved excursion from a previous monitoring period is not considered for a small or medium-size system if the 6-month period being evaluated was preceded by a 6-month OWQP compliance period in which the system was not required to conduct WQP monitoring because the system was at or below the lead and copper action levels. ***This is the only instance in which you do not consider an unresolved excursion from a previous monitoring period.*** This point is also illustrated in Example 7 in Appendix A.

Seasonal Systems

For NTNCWSs that are closed for a portion of the year, do not count the months that the system is not open and providing water when counting the number of days with excursions. This point is illustrated in detail in Example 6 in Appendix A.

Systems with Multiple Treatment Plants

If a system has multiple treatment plants with different OWQP specifications and the plants are not interconnected, the plants should be treated as separate systems for the purpose of assessing compliance with OWQPs. Assume that a system has two treatment plants. Excursions that exist at Treatment Plant 1 would be considered separately from any excursions that occur at Treatment Plant 2. Thus, if the system had 4 days during a 6-month period with excursions at Treatment Plant 1 and 4 days with excursions at Treatment Plant 2 during the same 6-month period, the system would be in compliance because it would not have exceeded the 9-day excursion limit.

When A Procedure Other Than Averaging May Be Appropriate

States have the option to designate a different formula than that outlined in §141.82(g)(1) for aggregating multiple measurements collected during the *same day* for a WQP at a sampling location. Section 141.82(g)(1) specifies that the daily value of a WQP is the average of all results collected during the day at a given site, regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both.

Some States may elect to use an alternative methodology for calculating daily values for OWQP requirements. If so, the State must explain their alternative method and provide justification sufficient to show it is at least as stringent as the average of the daily values described in §141.82(g)(1).

In considering this option, States may have reason to believe an alternative formula may be more representative for calculating daily values for WQPs for some systems. Examples of situations which may trigger an alternative methodology include the following:

- For systems performing continuous monitoring of a WQP(s), the State may prescribe the monitoring frequency at which data would be used for calculating the daily value. For example, values recorded every four hours may be used to calculate the daily average.

- For systems with large fluctuations in the values obtained for a WQP(s) the extreme value most detrimental to corrosion of distribution system piping may be required to be reported (e.g., the lowest pH value obtained).

- For sample locations at a common header which is served by multiple sources (and where water quality fluctuates based on the particular sources in service at the time of sampling), a formula representing the water quality contribution of the source providing the most water may be required.

How Do the Monitoring Requirements Change When a System Is Out of Compliance?

The LCRMR do not change what occurs if a system is out of compliance with any of its OWQPs. However, the LCRMR contain language that helps clarify a system's monitoring requirements in the event that it is out of compliance with its OWQPs. This language has been provided in Appendix B [see §141.86(d)(4)(vi)(B) and §141.87(e)(4)].

If a system is out of compliance, it must:

1. Report the violation to the State within 48 hours of determining the noncompliance [see §141.31(b)].

2. Deliver public notification to its customers. Refer to §141.201 & §§141.203 - 141.206 or to EPA's *Public Notification Handbook* (EPA 816-R-00-010, June 2000). The Handbook is available on EPA's website at www.epa.gov/safewater/pn.html.

3. Include a discussion of the violation in its consumer confidence report (*applies to community water systems only*). Refer to §§141.151 - 141.155 or to EPA's *Preparing Your Drinking Water Consumer Confidence Report* (EPA 816-R-99-002, March 1999). This document is available on EPA's website at www.epa.gov/safewater/ccr1.html.

4. Return to standard monitoring for lead and copper tap and WQP tap monitoring, if the system was on a reduced monitoring schedule [see §141.87(e)(4)].

- **Note:** It is important for a system to correct the problem as soon as possible, and to continue meeting all other OWQPs. If a system operates within the OWQP ranges, or is at or above the minimum OWQP values for all WQPs at both entry point and distribution system sampling locations for two consecutive, 6-month monitoring periods, it can again qualify for reduced lead and copper monitoring and WQP tap monitoring.

How Do the Revisions Affect Systems that Are Not Required to Collect WQPs?

The LCRMR do not change which systems are required to conduct WQP monitoring. However, the LCRMR add language that clarifies the intent of the 1991 Rule with respect to which systems are required to conduct WQP monitoring. These clarifications are as follows:

- A system that completed treatment steps equivalent to those described in the 1991 LCR, prior to December 7, 1992, must routinely monitor for WQPs after the State designates OWQPs *(unless it serves 50,000 or fewer people and no longer exceeds an action level)* [see §141.81(b)(2)];

- A system that is deemed to have optimized corrosion control under §141.81(b)(3) (i.e., has very low levels of lead and copper in the distribution system) ***is not required*** to conduct WQP monitoring;

- A system that has installed corrosion control treatment, but is not required to conduct WQP monitoring *(because it serves 50,000 and no longer exceed the action level, or meets the criteria of §141.81(b)(3))*, must take additional actions that the State specifies which are needed to ensure the continued operation and maintenance of the corrosion control treatment. A State may decide that these actions should include WQP monitoring [see §141.81(b)].

The LCRMR also add language that clarifies when small and medium-size systems that were on a reduced lead and copper tap monitoring schedule, but subsequently exceed the lead or copper action level, must begin collecting WQP samples. For these systems, the end of the 6-month period for WQP monitoring is synchronized with the end of the reduced lead and copper tap monitoring period during which an AL was exceeded. This revision was made to correspond to the new OWQP compliance procedure which is based on 6-month compliance periods. For example, if a PWS on annual monitoring during January 1, 2001 to December 31, 2001 exceeded an AL, the corresponding WQP monitoring period would be July 1, 2001 to December 31, 2001 [see §141.86(d)(4)(vi)(B) and §141.87(e)(4)].

Have the Reporting Requirements Changed?

The LCRMR clarify that systems must report WQP monitoring results to the State no less frequently than ten days after the end of each 6-month monitoring period. However, States can require systems to report this information more frequently [see §141.90(a)(1)(viii)].

The LCRMR have not changed the requirement for systems to report violations to the State. If a system determines that it is out of compliance because it has had excursions on more than 9 days in a 6-month period, the system must report this information to the State within 48 hours of making this determination [see §141.31(b)]. The system must also deliver public notification in accordance with the requirements that are specified in §141.201 & §§141.203 - 141.206. Community water systems must also include a information about this violation in its consumer confidence report [see §§141.151 - 141.155].

The LCRMR do not change the frequency with which States must report violations to EPA. States must continue to report violations to EPA quarterly. EPA has developed detailed State reporting guidance for the LCRMR. This guidance explains how to report OWQP compliance violations and defines return to compliance for these violations. For more detail, refer to Appendix B of the *State Implementation Guidance for the Lead and Copper Rule Minor Revisions*, February 2001, EPA 816-F-99-015. A copy of this guidance is available at EPA's website at www.epa.gov/safewater/standards.html.

What Key Points Should Systems and States Remember?

A "daily value" is calculated for each WQP and each sampling point separately. You must also consider all sampling points collectively to determine if the system is in compliance.

The procedure for determining the "daily value" of a WQP is based on how often the system collects samples for that WQP at a sampling location.

A daily value is calculated for each sampling location and for each parameter, even if no monitoring occurred at a sampling location during the 6-month period being evaluated.

Compliance determinations are always based on a 6-month period, regardless of the system's WQP monitoring schedule.

To remain in compliance, a system cannot be outside the OWQP ranges or below the OWQP minimum for more than a total of 9 days during a 6-month period [see §141.82(g)]. The 9 days need not be consecutive.

Confirmation samples are no longer used, but the results of all samples collected during the 6-month period at sites used to assess compliance with OWQPs must be reported and used in determining compliance [see §141.82(g)].

To determine the beginning date of an excursion, use the date the sample was collected and not the date the system or State received the results.

To determine the duration of the excursion, do not count the day the sample meets the OWQP specifications. This sample must be for the same WQP and at the same sampling point for which the excursion occurred [see §141.82(g)].

Count multiple excursions that occur on a single day as one excursion.

Consider unresolved excursions from a previous monitoring period, ***unless*** the system serves 50,000 people and was not required to conduct WQP monitoring in the previous period(s) because it was at or below the lead and copper action levels.

For a seasonal system, do not consider the days that the system is closed down and not delivering water when calculating the length of an excursion.

APPENDIX A

Examples of How to Determine Compliance with OWQPs

Example 1: How To Determine Compliance At Different Monitoring Locations And For Different WQPs

Example 2: How To Determine Compliance When Additional Samples Are Not Collected In A Monitoring Period Following An Excursion

Example 3: How To Calculate Daily Values When A System Monitors More Frequently Than Daily At A Sampling Locations

Example 4: How To Determine Compliance When A System Monitors Annually At A Sampling Location

Example 5: How To Determine Compliance When A System Monitors Triennially At A Sampling Location

Example 6: How To Determine Compliance For A System That Operates Seasonally

Example 7: How To Determine Compliance For A Small or Medium System With Intermittent Exceedances

EXAMPLE 1: How To Determine Compliance
At Different Monitoring Locations And For Different WQPs

EXAMPLE DESCRIPTION

Purpose of this example: This example is the most detailed of the 7 examples included in this guidance. The purpose of this example is to demonstrate how to determine compliance for different monitoring frequencies and to provide a total compliance picture for one system during a 6-month compliance period. It is also designed to emphasize that you must evaluate each sampling point and each WQP independently, and then look at all excursions collectively to determine whether the system is in compliance with its OWQP requirements.

Compliance Period: January - June 2001

System description: The system has 1 entry point and 1 distribution ("tap") site. It monitors biweekly at its entry point and every six months at its tap site. The system's treatment is pH & alkalinity adjustment, using lime & sodium bicarbonate.

State Action: The State designates the following OWQPs:

pH = 7.5 at entry point
= 7.2 at tap site

alkalinity (mg/L as $CaCO_3$) = 40 at entry point
= 35 at tap site

MONITORING RESULTS

A. Entry Point Monitoring pH Results

This portion of the example shows how to determine compliance for pH at the system's entry point. Please note in the table below that the system sampled more frequently than biweekly following an excursion. These results were also used to determine compliance. Each value below the OWQP pH minimum of 7.5 is shown in bold. This format is similar for all examples.

Entry Point pH Results for the 6-month Monitoring Period of January - June 2001					
State-specified pH minimum = 7.5					
Collection Date	Result = Daily value	Collection Date	Result = Daily value	Collection Date	Result = Daily value
Jan. 3	8.1	March 3	7.6	April 28	7.8
Jan. 17	8.2	March 13	7.8	May 8	7.8
Jan. 31	7.8	March 27	7.0	May 22	7.8
Feb. 14	7.8	March 29	7.9	June 5	8.2
Feb. 28	7.2	April 10	7.6	June 19	7.8

Remember, to determine the total number of days for which the system had excursions:

1. Count the first day the sample is below the pH minimum value. Use the date the sample was collected and not the date the sample results were received.
2. Stop counting when a sample result from the same location and for the same parameter is at or above the minimum (in this example a sample taken from the entry point and measured for pH). Do not count the day the sample is at or above the pH minimum value in the calculation.
3. Repeat this procedure for each pH reading that falls below the pH minimum value (or 7.5 in this example).

The following table below shows the number of days where the pH level was less than 7.5.

Number of Days that the System Had Excursions		
Collection Date of Sample That Began the Excursion	Number of Days with Excursions	
Feb. 28	Feb. 28 - March 2	3 days
March 27	March 27 - 28	2 days
Total Number of Days with Excursions	5 days	

B. Distribution (Tap) Monitoring pH Results

This part of the example demonstrates how to determine compliance at the system's distribution (or tap) sampling location. The system is on semi-annual monitoring and at a minimum is required to collect two sets of tap samples at each location. The pH monitoring results are shown in the table below.

Distribution Sample pH Results for the 6-month Monitoring Period of January - June 2001			
State-specified pH minimum = 7.2			
Date	Result = Daily Value	Date	Result = Daily Value
Jan. 17	8.1	May 24	7.0
May 22	6.8	May 25	7.1
May 23	6.9	May 26	8.0

The table below summarizes the number of days where the pH level was less than 7.2.

Number of Days that the System Had Excursions		
Collection Date of Sample That Began the Excursion	Number of Days with Excursions	
May 22	May 22 - 25	4 days
Total Number of Days with Excursions	4 days	

C. Entry Point Monitoring Alkalinity Results

This part of the example demonstrates how to assess compliance for alkalinity at the system's entry point. The procedure is the same as that shown in Part A.

The following table shows the alkalinity results for samples collected at the entry point.

Entry Point Alkalinity Results For January - June 2001					
State-Specified Alkalinity minimum = 40 mg/L as $CaCO_3$					
Collection Date	Result = Daily Value	Collection Date	Result = Daily Value	Collection Date	Result = Daily Value
Jan. 3	45	March 13	50	May 8	45
Jan. 17	42	March 27	35	May 22	32
Jan. 31	45	March 29	45	May 23	33
Feb. 14	41	April 10	32	May 25	45
Feb. 28	35	April 11	45	June 5	40
March 3	55	April 24	43	June 19	42

The following table below shows the number of days where the alkalinity concentration was less than State-specified minimum of 40 mg/L as $CaCO_3$.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursion	Number of Days with Excursions	
Feb. 28	Feb. 28 - March 2	3 days
March 27	March 27 & 28	2 days
April 10	April 10	1 day
May 22	May 22 - May 24	3 days
Total Number of Days with Excursions	9 days	

D. Distribution (Tap) Monitoring Alkalinity Results

This part of the example demonstrates how to assess compliance for alkalinity at the tap monitoring location. The procedure is the same as that shown in Part C. It is included to emphasize that you must evaluate each sampling location independently [see §141.82(g)].

The table below contains the alkalinity sample results from the distribution sampling location.

Distribution (Tap) Alkalinity Results For January - June 2001			
State-Specified Alkalinity Minimum = 35 mg/L as $CaCO_3$			
Collection Date	Result = Daily Value	Collection Date	Result = Daily Value
Jan. 17	40	May 24	34
May 22	25	May 25	30
May 23	30	May 26	38

The table below shows the number of days where the alkalinity concentration was less than State-specified minimum of 35 mg/L as $CaCO_3$.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursion	Number of Days with Excursions	
May 22	May 22 - 25	4 days
Total Number of Days with Excursions	4 days	

E. Overall Compliance with Optimal WQPs

For the compliance period of January to June 2001, the system's compliance with OWQPs can be summarized as follows:

Example System 1 Overall Compliance with WQPs for January - June 2001 (T indicates an excursion)				
Day w/ excursion	Entry Point		Tap	
	pH	alkalinity	pH	alkalinity
Feb. 28, 2001	T	T		
Mar. 1, 2001	T	T		
Mar. 2, 2001	T	T		
Mar. 27, 2001	T	T		
Mar. 28, 2001	T	T		
Apr.10, 2001		T		
May 22, 2001		T	T	T
May 23, 2001		T	T	T
May 24, 2001		T	T	T
May 25, 2001			T	T
Total Number of days w/ excursions = 10 days				

The system is out of compliance during the monitoring period of January - June 2001 because it had excursions on more than ***9 different days*** in a 6-month compliance period. Although, the system had no more than 9 days with excursions for an individual parameter at a specific sampling location, when considering all OWQP measurements, the system had excursions on 10 different days. Multiple excursions that occur on the same day are only counted once. In this example, the system had multiple excursions on all but one day.

EXAMPLE 2: How To Determine Compliance When Additional Samples Are Not Collected In A Monitoring Period Following An Excursion

EXAMPLE DESCRIPTION

Purpose of this example: This example emphasizes that an excursion continues for a given WQP and monitoring location until the system collects a sample at the same location and for the same WQP that is within the OWQP range, or is at or above the minimum set by the State.

Compliance Period: January - June 2000

System description: This example focuses on the pH results at a system's two tap monitoring sites. The State designates a minimum pH of 7.2 for both tap sampling points. The system is on semi-annual schedule for WQP tap monitoring.

MONITORING RESULTS

Distribution (Tap) Monitoring Alkalinity Results

The following table contains the pH sample results from the two distribution sampling locations.

Distribution pH Results For The 6-month Monitoring Period of January - June 2000			
State-specified pH minimum = 7.2			
Tap Sampling Point 1		**Tap Sampling Point 2**	
Collection Date	Result = Daily Value	Collection Date	Result = Daily Value
Jan. 17	8.1	Jan. 17	8.0
May 22	**6.8**	**May 22**	**6.7**
May 23	**6.9**	May 23	No sample collected
May 24	**7.0**	May 24	
May 25	**7.1**	May 25	
May 26	8.0	May 26	

Tap Sampling Point 1

The system had excursions at this sampling point for 4 days (May 22 though May 25) during January through June 2000, as shown in the table below.

Number of Days that the System Had Excursions At the Tap for pH		
Collection Date of Sample That Began the Excursion	Number of Days with Excursions	
May 22	May 22 - 25	4 days
Total Number of Days with Excursions	4 days	

Tap Sampling Point 2

The system had excursions totaling 40 days at Tap Sampling Point 2. The duration of the excursion was from May 22nd to the end of the 6-month period or June 30 in this example, as shown in the table below.

Number of Days that the System Had Excursions At the Tap for pH		
Collection Date of Sample That Began the Excursion	Number of Days with Excursions	
May 22	May 22 - June 30	40 days
Total Number of Days with Excursions	40 days	

The system's last measurement at Tap Sampling Point 2 was below the OWQP pH minimum, so each subsequent day that the system did not collect a sample was an excursion. The system was out of compliance on the 10th day of the excursion or May 31 in this example.

Another point to this example is that the system cannot use the sample collected on May 26th at Tap Sampling Point 1 to demonstrate that it was above the pH minimum at Tap Sampling Point 2. Each sampling point is evaluated independently. ***A sample collected at one location cannot be used to demonstrate compliance at a different sampling point.***

EXAMPLE 3: How To Calculate Daily Values When A System Monitors More Frequently Than Daily At A Sampling Location

EXAMPLE DESCRIPTION

Purpose of this example: The purpose of this example is to describe how to calculate daily values when a system collects more than one sample per day. This example focuses on the pH reading at one sampling location.

System description: The system installs an in-line pH meter to record its entry point pH levels. The State-specified pH minimum for this system is 7.5. The system records these levels 3 times per day. The results shown in the table below are for July only.

MONITORING RESULTS

Entry Point pH Results For The Month of July 2000									
State-specified pH minimum = 7.5									
Date	pH Measurements			Daily value	Date	pH Measurements			Daily value
7/1/00	8.1	8.0	8.0	8.0	7/17/00	7.8	8.1	8.1	8.0
7/2/00	7.9	8.0	8.0	8.0	7/18/00	7.9	8.6	7.8	8.0
7/3/00	8.1	7.9	7.9	8.0	7/19/00	7.9	8.0	8.0	8.0
7/4/00	7.9	8.2	8.0	8.0	7/20/00	8.1	8.1	8.0	8.1
7/5/00	8.1	8.0	7.9	8.0	7/21/00	7.9	8.0	8.0	8.0
7/6/00	8.1	7.9	8.0	8.0	7/22/00	8.0	8.1	8.0	8.0
7/7/00	8.2	8.1	7.7	7.9	7/23/00	8.1	8.1	8.0	8.0
7/8/00	7.8	7.8	7.8	7.8	7/24/00	8.1	7.8	8.1	8.0
7/9/00	7.8	7.7	7.6	7.7	7/25/00	7.9	8.0	7.9	8.0
7/10/00	7.3	7.6	7.2	**7.3**	7/26/00	8.0	7.9	8.1	8.0
7/11/00	7.9	7.9	8.0	8.0	7/27/00	7.9	8.1	7.9	8.0
7/12/00	8.2	8.0	7.9	8.0	7/28/00	8.0	8.0	7.9	8.0
7/13/00	6.8	7.4	6.7	**6.9**	7/29/00	7.9	7.9	7.9	7.9
7/14/00	6.7	7.4	6.8	**7.1**	7/30/00	7.9	8.0	8.1	8.1
7/15/00	8.3	8.2	8.2	8.2	7/31/00	8.1	8.0	8.0	8.0
7/16/00	8.2	8.0	8.0	8.1	----	---	---	---	---

The daily value is calculated by averaging the results of each pH sample collected during the day. This includes any additional samples that the system collects at this sampling location for pH to assess/fix the problem. The State has discretion to delete results of obvious sampling error from the calculation [see §141.82(g)]. Please note that to calculate the "true" pH average, you must convert pH to the hydrogen ion concentration, take the average, and then convert the average back to pH. However, straight averaging of pH samples (as shown in this example) is acceptable for assessing compliance. Systems that take multiple samples per day are not expected to experience large fluctuations in pH. The two methods for calculating pH yield similar averages when the pH readings that are being averaged fall within a limited range.

Remember: A State may develop a different formula for determining compliance when multiple samples are collected at the same location and on the same day if it have outlined this procedure in its primacy package and this alternate formula is approved by EPA.

During the month of July, the system had 3 days with excursions. This is shown in the table below.

Number of Days that the System Had Excursions		
Collection Date of Sample that Began the Excursion	**Number of Days with Excursions**	
July 10	July 10	1 day
July 13	July 13 & 14	2 days
Total Number of Days with Excursions	**3 days**	

To determine whether the system is in compliance during the entire July through December 2000 time period, the system and State must also consider whether there were any excursions during the months of August through December [see §141.82(g)]. In this example, assume the system did not have any excursions for the four months of August through November. However, this system had excursions during December. The pH monitoring results for entry point samples for December are shown in the table on the next page.

Entry Point pH Monitoring Results For The Month Of December 2000									
State-specified pH minimum = 7.5									
Date	pH Measurements			Daily value	Date	pH Measurements			Daily value
12/1/00	8.1	8.0	7.9	8.0	12/17/00	8.0	8.1	8.1	8.1
12/2/00	7.9	8.0	8.0	8.0	12/18/00	8.1	8.1	8.0	8.1
12/3/00	8.0	8.0	8.1	8.0	12/19/00	7.9	8.6	7.7	8.1
12/4/00	8.2	7.9	8.1	8.1	12/20/00	7.8	7.5	7.8	7.7
12/5/00	7.5	8.3	8.2	8.0	12/21/00	8.2	8.4	8.1	8.2
12/6/00	8.1	7.5	8.0	7.9	12/22/00	8.7	7.3	7.9	8.0
12/7/00	8.0	8.1	8.1	8.1	**12/23/00**	7.2	7.2	7.3	**7.2**
12/8/00	7.9	7.9	7.8	7.9	**12/24/00**	7.3	7.3	7.3	**7.3**
12/9/00	7.9	7.9	8.0	7.9	**12/25/00**	7.2	7.4	7.3	**7.3**
12/10/00	7.9	7.8	7.6	7.8	**12/26/00**	7.2	7.2	7.2	**7.2**
12/11/00	7.4	7.3	7.4	**7.4**	**12/27/00**	7.2	7.2	7.0	**7.1**
12/12/00	7.4	7.4	7.4	**7.4**	12/28/00	7.9	8.1	7.6	7.9
12/13/00	7.4	7.3	7.6	**7.4**	12/29/00	8.0	8.3	7.4	7.9
12/14/00	7.6	7.2	7.2	**7.3**	12/30/00	7.6	7.6	7.5	7.6
12/15/00	7.5	8.2	8.1	7.9	12/31/00	7.7	7.6	7.8	7.7
12/16/00	8.0	8.0	8.0	8.0	--	--	--	--	--

During the month of December, the system had excursions on 9 days. This is shown in the table below.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursion	**Number of Days with Excursions**	
December 11	December 11 - 14	4 days
December 22	December 22 - 26	5 days
Total Number of Days with Excursions	**9 days**	

Is the system in compliance?

No, the system is ***out of compliance*** because it had excursions for a total of 12 days during the 6-month monitoring period of July through December 2000, as follows:

Number of Days the System Had Excursions during July - December 2000	
July	3 days
August	0 days
September	0 days
October	0 days
November	0 days
December	9 days
Total	12 days

EXAMPLE 4: How To Determine Compliance When A System Monitors Annually At A Sampling Location

EXAMPLE DESCRIPTION

Purpose of this example: This example illustrates how to determine the "daily value" for a "tap" (distribution) sampling point, when monitoring is conducted annually. This example focuses on one parameter (alkalinity) for one sampling location (within the distribution system).

System description: In this example, the system serves 105 people and is on annual WQP tap monitoring. It is required to collect 2 samples from its 1 WQP tap monitoring location. The State has designated an alkalinity minimum of 85 mg/L as $CaCO_3$ at this sampling location. The monitoring period for this system is January through December 2000.

MONITORING RESULTS

Distribution (Tap) Alkalinity Results For January - December 2000	
State-Specified Alkalinity Minimum = 85 mg/L as $CaCO_3$	
Collection Date	Monitoring Results (in mg/L as **$CaCO_3$**)
March 8, 2000	90
June 28, 2000	**80**

To determine compliance:

Step 1: Divide the compliance period into 6-month periods.

In this example, the two compliance periods are January 1 - June 30, 2000, and July 1 - December 31, 2000.

Step 2: Determine if the daily values are above the State-specified minimum.

During January - June, the system had two "daily values" because both samples were collected during the January - June compliance period. The March 8th alkalinity sample of 90 mg/L as $CaCO_3$ was above the State-specified minimum. However, the June 28th alkalinity reading of 80 mg/L as $CaCO_3$ was below the OWQP minimum. Therefore, beginning on June 28, 2000, the system had an excursion.

During July - December, no samples were collected. Therefore, the daily value is the most recent sample collected during the previous monitoring period, or 80 mg/L in this example.

Step 3: Calculate the duration of the excursion.

For the January - June compliance period, the duration of the excursion is from June 28 to the end of the compliance period (June 30, 2000). The length of the excursion is 3 days as shown in the table below.

Number of Days that the System Had Excursions during January to June		
Collection Date of Sample that Began the Excursion	**Number of Days with Excursions**	
June 28	June 28 - 30	3 days
Total Number of Days with Excursions	**3 days**	

Therefore, for the compliance period of January - June, the system was in compliance, if it had no more than 6 additional days in the monitoring period with excursions.

For July - December, the duration of the excursion is from July 1 to the end of the compliance period of December 31, 2000. The system had an unresolved excursion from the previous monitoring period. The excursion continues until the system collects an alkalinity sample from the tap sampling site that is at or above the State-specified minimum. The system did not conduct any WQP tap monitoring during the July - December 2000, therefore, the excursion continues for the entire 6-month period. The length of the excursion is more than 9 days (184 days to be exact), as shown in the table below. Therefore, for the compliance period of July - December, the system is ***out of compliance***.

Note: A system should keep in mind that it should collect additional samples following an excursion to assess and fix any problems. The system in this example was on annual monitoring and met its WQP tap monitoring requirements by collecting two samples at its tap sampling site. However, it should have continued to conduct WQP tap monitoring until it was again operating above the State-specified alkalinity minimum.

Number of Days that the System Had Excursions during July - December		
Collection Date of Sample that Began the Excursion	**Number of Days with Excursions**	
June 28	July 1- Dec 31	3 days
Total Number of Days with Excursions	**184 days**	

As a result of being out of compliance, what must this system do?

1. Report its noncompliance to the State within 48 hours of becoming aware of the violation [see §141.31(b)].
2. Deliver public notification for a LCR treatment technique violation [see §§141.201, 141.203, 141.205, and 141.206].
3. For community water systems only, include information about this violation in its consumer confidence report [§§141.151 - 141.155.
4. Collect WQP samples in the distribution system every six months at the standard number of sites. In addition, if the system was on reduced lead and copper tap sample, it must now monitor every six months at the standard number of sites [see §141.87(e)(4)]. The first 6-month monitoring period for standard WQP and lead and copper tap monitoring is January - June 2001 in this example. The system can again qualify for reduced WQP tap and lead and copper tap monitoring if it again meets it OWQPs for two consecutive, 6-month periods.

EXAMPLE 5: How To Determine Compliance When A System Monitors Triennially At A Sampling Location

EXAMPLE DESCRIPTION

Purpose of this example: This example demonstrates how to calculate compliance for a system on a triennial WQP tap monitoring schedule. It focuses on one WQP (orthophosphate) at one distribution sampling location.

System description: This system uses a phosphate inhibitor. The State has set a minimum orthophosphate concentration of 0.5 mg/L at one of its tap sampling points. The system met its OWQPs at each of its sampling locations and can now collect WQPs within its distribution system at a frequency of once every three years. The three-year compliance period is January 1, 2000 through December 31, 2002. This system collects a sample on March 28, 2001.

A. Compliance Periods January - June 2000 and July - December 2000

As stated in the system description above, the system is on triennial WQP tap monitoring and collects a sample on March 28, 2001. Thus, the system is not required to and has not conducted any WQP tap monitoring during the compliance periods of January - June 2000 and July - December 2000.

Is the system in compliance during January - June 2000 and July - December 2000?

Assume that the system has no excursions for the other WQPs at this site or at any of its other monitoring locations. The system is ***in compliance*** for these two monitoring periods, although it has not collected a sample during either of these compliance periods. Remember, if a system is on annual or triennial monitoring and no sample was collected during the 6-month period that is being evaluated, the daily value is the most recent sample collected, even if it occurred in an earlier 6-month period. As stated above in the system description, the previous samples met the OWQP levels. In fact, the system could not be on triennial WQP tap monitoring if it had not meet its OWQPs for 3 consecutive years.

B. Compliance Period January - June 2001

The system collected a sample on March 28, 2001 that was below the orthophosphate minimum set by the State, and therefore, had an excursion. Assume this system took additional samples during this compliance period as follows:

Tap Orthophosphate Results for January - June 2001			
State-specified orthophosphate minimum = 0.5 mg/L			
Collection Date	**Result**	**Collection Date**	**Result**
March 28	**0.4**	March 30	0.7
March 29	**0.4***	April 1	0.8
* Result is average of 2 samples collected on March 29th (1st = 0.2 mg/L; 2nd = 0.6 mg/L)		**June 28**	**0.4**

Is the system in compliance during January - June 2001

Assume that the system has no excursions for the other WQPs at this site or at any of its other monitoring locations. The system is ***in compliance*** because it had excursions on 5 days during the 6-month compliance period. The start of the excursion is on March 28th. The system still has an excursion on March 29th because the average of the two samples collected on this date is 0.4 mg/L. Remember, all of the samples collected at this sampling location for orthophosphate during this 6-month period must be considered in the compliance assessment, except those that the State has determined are sampling errors [see §141.82(g)]. Whenever, a system collects more than one sample in a day, the daily value is the average of these samples, (unless the State has an outlined an alternative approach in its primacy revision package that has been approved by EPA). The sample collected on March 30th is again above the minimum set by the State. Thus, the duration of the first excursion is 2 days.

The system again has an excursion on June 28th and did not collect another sample during the period of June 28 - 30. The duration of the second excursion is 3 days. The system is in compliance for the monitoring period of January - June 2001 because the number of days with excursions did not exceed 9 days. The table below shows the number of days with excursions.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursions	Number of Days with Excursions	
March 28	March 28 & 29	2 days
June 28	June 28 - 30	3 days
Total Number of Days with Excursions	5 days	

C. Compliance period July - December 2001

The system collected samples during this compliance period as follows. Please note that the system collected additional samples following its excursions.

Tap Orthophosphate Results for July - December 2001			
State-specified orthophosphate minimum = 0.5 mg/L			
Collection Date	**Result**	**Collection Date**	**Result**
July 2	0.6 mg/L	**October 4**	**0.4**
September 30	**0.2**	**October 5**	**0.4**
October 1	**0.3**	October 6	0.6
October 2	**0.3**	December 15	0.5
October 3	**0.4**	**December 22**	**0.4**

Is the system in compliance during July through December 2001?

No, the system is out of compliance because it had excursions on more than 9 days as shown in the table below.

Number of Days that the System Had Excursions		
Collection Date of Sample That Started the Excursion	Number of Days with Excursions	
June 28	July 1	1 day
September 30	September 30 - Oct. 5	6 days
December 22	December 22 - 31	10 days
Total Number of Days with Excursions	17 days	

This system had three separate excursions during the compliance period of July through December 31, 2001. Although the first sample collected during this compliance period was above the minimum (the July 2nd sample), the system had an excursion during the previous period for which it never collected a sample to demonstrate it met the OWQP for that sampling point. Until the system collected this sample, it still has an excursion. Because the system did not collect such a sample until July 2, it had an excursion on July 1. The length of the excursion is counted from the beginning of the July to December 2001 compliance period (or July 1st in this example) until a sample is collected at this sampling location that meets the OWQP minimum for orthophosphate (or July 2nd). Remember, you must consider if there are any unresolved excursions from a previous monitoring period.

The second excursion lasted from September 30th until October 5th. The third excursion lasted from December 22nd to December 31st because the system did not collect a sample subsequent to the December 22nd sample that demonstrated it met its OWQP for orthophosphate at this sampling location.

D. Compliance period January - June 2002

A system that is on reduced WQP tap, or lead and copper tap monitoring and that is out of compliance with its OWQPs, no longer qualifies for reduced lead and copper or WQP tap monitoring. During the compliance period of January - June 2002, the system will be on semi-annual monitoring and collecting WQP samples at the standard number of sites. This does not impact the system's tap entry point monitoring frequency which remains at a minimum of every two weeks.

Assume the system collects a sample on January 3rd and June 2nd. Both of these samples are above 0.5 mg/L. The number of days that the system had excursions is summarized below.

Number of Days that the System Had Excursions		
Collection Date of Sample That Started the Excursion	Number of Days with Excursions	
December 22	January 1- 2	2 days
Total Number of Days with Excursions	2 days	

Is the system in compliance during January through June 2002?

The system has one excursion from January 1st to January 2nd because there is an outstanding excursion from the previous compliance period. The system had an excursion on December 22, 2001 and the system did not collect a sample that demonstrated it was above the minimum value for orthophosphate at its tap sampling point until January 3rd. The length of the excursion is counted from the beginning of the January 1 to June 30, 2002 compliance period (i.e., January 1st) until a sample is collected at this sampling location that meets the OWQP minimum for orthophosphate (or January 3rd in this example). The length of the excursion is 2 days. Thus, the system is in compliance if the system does not have excursions on more than 7 other days for other WQPs at this location or for WQPs at its entry point sampling site.

E. Compliance period July - December 2002

Assume this system collects its two samples at this location on August 29th and October 31st and both samples are above 0.5 mg/L.

Is the system in compliance during July - December 2002?

If the system has no more than 9 days with excursions for its other WQPs or sampling points, the system is in compliance. During this monitoring period, the system has no excursions for orthophosphate at its tap sampling point. In addition, if this system has been in compliance for all its WQPs at each entry point and distribution sampling location for January - June 2002 and July - December 2002, it can collect tap WQP samples at a reduced number during the monitoring period of January - June 2003. The system may also reduce the frequency of lead and copper tap monitoring to annually with written approval from the State.

EXAMPLE 6: How To Determine Compliance For A System That Operates Seasonally

EXAMPLE DESCRIPTION

Purpose of this example: This example focuses on compliance determinations for seasonal systems. This example illustrates how to calculate excursions if the 6-month compliance period includes months when the system is not in operation. It focuses on one WQP (pH) at one sampling location (entry point).

System description: This system is in operation during January 1 through March 31 of 2000 and again in November 1 through December 31, 2000. The State has set a pH minimum of 7.0 at the system's one entry point.

MONITORING RESULTS

A. Monitoring Results for the Compliance Period of January - June 2000

Entry Point pH Results for The 6-month Monitoring Period of January - June 2000			
State-specified pH minimum = 7.0			
Collection Date	**Result = Daily Value**	**Collection Date**	**Result = Daily Value**
January 3	7.5	February 15	7.4
January 16	7.6	March 1	7.6
January 20	7.5	**March 14**	**6.6**
February 2	7.5	**March 28**	**6.8**

Is the system in compliance during January through June 2000?

The system is ***out of compliance.*** The system had excursions on 18 days (March 14 through March 31), as shown in the table below.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursion	Number of Days with Excursions	
March 14	March 14 - 31	18 days
Total Number of Days with Excursions	18 days	

For this system, do not consider the time period of April 1 through June 30 in the compliance assessment because the system closed on March 31. ***For any seasonal system, do not consider the days that the system is closed down and not delivering water when calculating the length of an excursion.***

B. Monitoring Results for the Compliance Period of July - December 2000

The table below shows the monitoring results for July through December 2000. Remember in this example, the system reopened on November 1, 2000.

Entry Point pH Results for The 6-month Monitoring Period of July - December 2000			
State-specified pH minimum = 7.0			
Collection Date	Result = Daily Value	Collection Date	**Result = Daily Value**
November 3	7.3	**December 12**	**6.8**
November 17	7.3	December 13	7.6
November 30	7.2	December 27	7.3

Is the system in compliance during July through December 2000?

During July through December 2000, the system had excursions on 3 days. The system was in operation and providing water on November 1. The system had an unresolved excursion from the previous compliance period and did not collect a sample that demonstrated that it was above the pH minimum until November 3. Therefore, the duration of the first excursion was two days (i.e., November 1 and 2). The system was again below the pH minimum on December 12. The system collected a sample on December 13 that showed it was above the pH minimum set by the State. A summary of the excursions are shown below.

Number of Days that the System Had Excursions		
Collection Date of the Sample That Began the Excursion	Number of Days with Excursions	
March 28	Nov. 1 & 2	2 days
December 12	December 12	1 day
Total Number of Days with Excursions	3 days	

This system is in compliance if during the period of July - December 2000, if it had no more than 6 additional days in the monitoring period with excursions.

EXAMPLE 7: How To Determine Compliance For A Small or Medium System with Intermittent Exceedances

EXAMPLE DESCRIPTION

Purpose of this example: This example focuses on compliance determinations for a small or medium-size system that periodically exceeds the lead or copper action level. The system is not required to monitor for WQPs during those monitoring periods in which it is at or below both action levels. This example illustrates how to calculate excursions if a system has monitoring periods in which it is not required to collect WQPs. It focuses on one WQP (pH) at one sampling location (entry point).

System description:

- System serves 25,000 people.
- It was above the lead action level during July - December 2000.
- ***It had excursions on December 29 - 31, 2000 for pH at its entry point.***
- It was below both action levels in all monitoring conducted during 2001 and 2002, and was not required to conduct WQP monitoring.
- It conducted lead and copper annual tap monitoring during September 2003, and exceeded the lead action level.
- The State set a pH minimum of 7.5 at the system's one entry point.
- The system began collecting WQP entry point samples on October 2, 2003.

MONITORING RESULTS

Monitoring Results for the Compliance Period of July - December 2003

Entry Point pH Results for The 6-month Monitoring Period of July - December 2003			
State-specified pH minimum = 7.5			
Collection Date	**Result = Daily Value**	**Collection Date**	**Result = Daily Value**
October 3	7.7	November 28	7.6
October 17	7.6	December 11	7.6
October 31	7.7	**December 24**	**7.2**
November 14	7.7	----	----

The LCRMR define the timing of a 6-month monitoring period for small and medium systems on reduced lead and copper tap monitoring that are triggered into WQP monitoring because of an action level exceedance. For these systems, the end of the 6-month period for WQP monitoring is synchronized with the end of the reduced lead and copper tap monitoring period during which an action level was exceeded. In this example, the lead and copper tap reduced monitoring period ended on December 2003; therefore, the first 6-month period for which compliance with OWQPs can be determined after the system exceeds the lead action level is July - December 2003.

Is the system in compliance for July - December 2003, assuming the system had no excursions for other OWQPs or at other sampling sites?

During the compliance period of July 1 - December 31, 2000, the system had 8 days with excursions, as shown in the table below. The system is in compliance for the compliance period of July - December 2003, if it had no more than 1 other day with excursions for at any other sampling location, or for a different WQP at this sampling location.

Number of Days that the System Had Excursions	
Collection Date of Sample that Began the Excursion	**Number of Days with Excursions**
December 24	Dec. 24 - 31 8 days
Total Number of Days with Excursions	**8 days**

Remember: An unresolved excursion from a previous monitoring period is not considered for a small or medium-size system if the 6-month period being evaluated was preceded by a 6-month OWQP compliance period in which the system was not required to conduct WQP monitoring because it was at or below the lead and copper action levels. ***This is the only instance in which you do not consider an unresolved excursion from a previous monitoring period.***

APPENDIX B

Lead and Copper Rule Minor Revisions that Relate to OWQP Compliance and Reporting Requirements

- §§141.81(b) & (b)(2)
- §141.82(g)
- §§141.86(d)(4)(vi)(A) & (B)
- §§141.87(d) & (e)(4)
- §141.90(a)(1)(viii)
- §142.16(d)(1)(ii)

Appendix B

Lead and Copper Rule Minor Revisions that Relate to OWQP Compliance and Reporting Requirements

§141.81(b): *The following section clarifies that systems that have installed corrosion control treatment, but are not required to conduct WQP monitoring must:*

1. *Properly operate and maintain corrosion control treatment at all times; and*
2. *Meet any requirements the State deems are needed to ensure this treatment is maintained.*

A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the system satisfies one of the criteria specified in paragraphs (b)(1) through (b)(3) of this section. Any such system deemed to have optimized corrosion control under this paragraph, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the State determines appropriate to ensure optimal corrosion control treatment is maintained.

§141.81(b)(2): *The following section requires systems that have been deemed by the State as having optimized treatment by meeting the requirement of §141.81(b)(2) (also known as (b)(2) systems) to:*

1. *Continue WQP and lead and copper tap monitoring after the State sets OWQPs; and*
2. *Determine compliance with OWQPs using the new procedure that is explained in §141.82(g).*

Note: *A (b)(2) system is one that has completed treatment steps that are equivalent to those described in the 1991 LCR prior to December 7, 1992.*

Any water system may be deemed by the State to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the State that it has conducted activities equivalent to the corrosion control steps applicable to such system under this section. If the State makes this determination, it shall provide the system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with §141.82(f). Water systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with the State-designated optimal water quality control parameters in accordance with §141.82(g) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with §141.86(d)(3) and §141.87(d), respectively. A system shall provide the State with the following information in order to support a determination under this paragraph:

(i) The results of all test samples collected for each of the water quality parameters in §141.82(c)(3).

(ii) A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in §141.82(c)(1), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

(iii) A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(iv) The results of tap water samples collected in accordance with §141.86 at least once every six months for one year after corrosion control has been installed.

§141.82(g): *The following section contains language that explains the new procedure for assessing compliance with OWQPs.*

Continued operation and monitoring. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the State under paragraph (f) of this section, in accordance with this paragraph for all samples collected under §§141.87(d)-(f). Compliance with the requirements of this paragraph shall be determined every six months, as specified under §141.87(d). A water system is out of compliance with the requirements of this paragraph for a six-month period if it has excursions for any State-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the State. Daily values are calculated as follows. States have discretion to delete results of obvious sampling errors from this calculation.

(1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both. If EPA has approved an alternative formula under §142.16 of this chapter in the State's application for a program revision submitted pursuant to §142.12 of this chapter, the State's formula shall be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this paragraph.

(2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

§141.86(d)(4)(vi)(A) & (B): *The following sections apply to systems that were on reduced lead and copper monitoring schedules. They clarify what a system should do if it no longer meets its OWQPs.*

(A) A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with paragraph (d)(3) of this section and collect the number of samples specified for standard monitoring under paragraph (c) of this section. Such a system shall also conduct water quality parameter monitoring in accordance with §141.87(b), (c) or (d) (as appropriate) during the monitoring period in which it exceeded the action level. Any such system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of paragraph (d)(4)(i) of this section and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(4)(iii) or (d)(4)(v) of this section.

(B) Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the State under §141.82(f) for more than nine days in any six-month period specified in §141.87(d) shall conduct tap water sampling for lead and copper at the frequency specified in paragraph (d)(3) of this section, collect the number of samples specified for standard monitoring under paragraph (c) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with §141.87(d). Such a system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

(*1*) The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (c) of this section after it has completed two subsequent six-month rounds of monitoring that meet the criteria of paragraph (d)(4)(ii) of this section and the system has received written approval from the State that it is appropriate to resume reduced monitoring on an annual frequency.

(*2*) The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (d)(4)(iii) or (d)(4)(v) of this section and the system has received written approval from the State that it is appropriate to resume triennial monitoring.

(*3*) The system may reduce the number of water quality parameter tap water samples required in accordance with §141.87(e)(1) and the frequency with which it collects such samples in accordance with §141.87(e)(2). Such a system may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of §141.87(e)(2), that it has re-qualified for triennial monitoring.

§141.87(d): *The following section requires systems to determine compliance with OWQPs using the new procedure, explains when the 6-month period for assessing compliance begins, and describes when a system that exceeds the lead or copper action level should begin WQP monitoring.*

Monitoring after State specifies water quality parameter values for optimal corrosion control. After the State specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under §141.82(f), all large systems shall measure the applicable water quality parameters in accordance with paragraph (c) of this section and determine compliance with the requirements of §141.82(g) every six months with the first six-month period to begin on the date the State specifies the optimal values under §141.82(f). Any small or medium-size system shall conduct such monitoring during each six-month period specified in this paragraph in which the system exceeds the lead or copper action level. For any such small and medium-size system that is subject to a reduced monitoring frequency pursuant to §141.86(d)(4) at the time of the action level exceedance, the end of the applicable six-month period under this paragraph shall coincide with the end of the applicable monitoring period under §141.86(d)(4). Compliance with State-designated optimal water quality parameter values shall be determined as specified under §141.82(g).

§141.87(e)(4): *The following section applies to systems that were on reduced WQP tap monitoring. It clarifies what a system should do if it is no longer in compliance with its OWQPs.*

Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the State in §141.82(f) for more than nine days in any six-month period specified in §141.82(g) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in paragraph (d) of this section. Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in paragraph (e)(1) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that paragraph and/or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (e)(2)(i) or (e)(2)(ii) of this section.

§141.90(a)(1)(viii)*: This section describes the revised reporting requirements pertaining to WQP monitoring results.*

A water system shall report the results of all water quality parameter samples collected under §141.87(c)-(f) during each six-month monitoring period specified in §141.87(d) within the first 10 days following the end of the monitoring period unless the State has specified a more frequent reporting requirement.

§142.16(d)(1)(ii)*: This section requires a State to provide in its primacy application, an explanation of how it will calculate compliance with OWQPs if it elects to use an alternative approach than averaging when multiple samples are collected per day at the same sampling location and for the same WQP.*

Section 141.82(g) -- Designating an alternative approach for aggregating multiple measurements collected during the same day for a water quality parameter at a sampling location, if the State elects to adopt a formula other than the one specified in §141.82(g)(1) of this chapter.