**Section 611.352 Corrosion Control Treatment**

Designating Optimal Corrosion Control Treatment for Systems Optimizing or Re-Optimizing Corrosion Control Treatment. A supplier must complete the corrosion control treatment requirements in this Section as they apply to the supplier under Section 611.351.

a) System Recommendation Regarding Corrosion Control Treatment for Suppliers Not Having Lead Service Lines and Suppliers Having Lead Service Lines but Not Exceeding the Lead Action Level

1) A supplier without corrosion control that must recommend under Section 611.351(e) one or more of the corrosion control treatments in subsection (c)(1)(A) for the Agency to designate must base its recommendation on the results of lead and copper tap monitoring and water quality parameter monitoring.

A) A small CWS supplier or NTNCWS supplier exceeding the copper action level and recommending corrosion control treatment to the Agency under Section 611.363(a) must comply with this subsection (a)(1).

B) The Agency may issue a SEP requiring the supplier to conduct additional water quality parameter monitoring to assist the Agency in reviewing the supplier's recommendation.

2) A small CWS supplier or NTNCWS supplier subject to this subsection (a) not applying corrosion control treatment that chooses to pursue a small water system compliance flexibility option and is required to recommend an option in compliance with Section 611.351(f) must, based on the results of lead tap sampling and water quality parameter monitoring, recommend designation of one of the options listed in Section 611.363. A supplier not having lead service lines, exceeding the lead action level, and selecting corrosion control under Section 611.363(a)(2) must recommend that the Agency designate one or more of the corrosion control treatments in subsection (c)(1) as OCCT for that system.

3) A supplier exceeding the lead action level and selecting corrosion control treatment under Section 611.363(a)(2) must recommend that the Agency designate one or more of the corrosion control treatments in subsection (c)(1)(A) as the OCCT for its system. A small or mid-sized supplier exceeding the lead trigger level but not exceeding the lead or copper action level does not need to perform a corrosion control study under subsection (c) unless the Agency issues a SEP requiring the supplier to do so.

4) A small CWS or NTNCWS supplier applying corrosion control treatment exceeding the lead action level and selecting corrosion control under Section 611.363(a)(2) must recommend designation of one or more of the corrosion control treatments in subsection (c)(2) as OCCT for its system.

5) The Agency may issue a SEP waiving subsection (a)(4)’s OCCT-recommendation requirement for a supplier if the SEP requires the supplier to complete a corrosion control study within three months after the end of the tap sampling period during which the supplier exceeded the lead action level. In that case, the supplier must proceed directly to subsection (c) and complete a corrosion control study.

b) Agency-Required Studies to Identify Initial Optimal Corrosion Control Treatment and Re-Optimized OCCT Except for Large Suppliers and Small and Mid-Sized Suppliers Having Lead Service Lines and Exceeding the Lead Action Level. Certain suppliers must conduct corrosion control treatment studies: large suppliers exceeding the lead action level, large suppliers not applying corrosion control treatment whose 90th percentile concentration results exceed either the lead practical quantitation limit of 0.005 mg/L or the copper action level, mid-sized water system suppliers having lead service lines and exceeding the lead action level, and small suppliers having lead service lines and exceeding the lead action level and selecting the corrosion control treatment option under Section 611.363(a).

1) The Agency may issue a SEP requiring a small or mid-sized supplier not applying corrosion control treatment exceeding the lead or copper action level to perform corrosion control treatment studies under subsection (c)(1) to identify OCCT for the supplier's system.

2) The Agency may issue a SEP requiring a small or mid-sized supplier not applying corrosion control treatment and exceeding the lead trigger level but not the lead or copper action level to perform corrosion control treatment studies under subsection (c)(1) to identify OCCT for its system. The supplier must install this corrosion control treatment if the supplier subsequently exceeds the lead or copper action level.

3) The Agency may issue a SEP requiring a small or mid-sized supplier applying corrosion control treatment exceeding either the lead trigger level or copper action level to perform corrosion control treatment studies under subsection (c)(2) to identify re-optimized OCCT for its system (i.e., after evaluating re-optimized OCCT).

c) Performing Corrosion Control Studies

1) A supplier not applying corrosion control treatment that is required to conduct corrosion control studies must complete certain actions:

A) A supplier not applying corrosion control treatment must evaluate the effectiveness of each of certain treatments and combinations of those treatments if appropriate to identify the OCCT for its system:

i) Adjusting alkalinity and pH;

ii) Adding an orthophosphate- or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective corrosion inhibitor residual concentration in all test samples.

iii) Adding an orthophosphate-based corrosion inhibitor at a concentration sufficient to maintain an orthophosphate residual concentration of 1 mg/L (as PO4) in all test samples; and

iv) Adding an orthophosphate-based corrosion inhibitor at a concentration sufficient to maintain an orthophosphate residual concentration of 3 mg/L (as PO4) in all test samples.

B) The supplier must evaluate each of the corrosion control treatments using pipe rig/loop tests; metal coupon tests; partial-system tests; or analyses based on documented analogous treatments in other systems of similar size, water chemistry, and distribution system configuration. A large or mid-sized supplier or a small CWS or NTNCWS supplier selecting the corrosion control treatment option under Section 611.363 having lead service lines and exceeding the lead action level must conduct pipe rig/loop studies using harvested lead service lines from its distribution system to assess the effectiveness of corrosion control treatment options on the existing pipe scale. The supplier may use metal coupon tests as a screen to reduce the number of options the supplier evaluates using pipe rig/loop tests to the current conditions and two options.

C) The supplier must measure specific water quality parameters in any tests the supplier conducts under this subsection (c)(1)(C) before and after evaluating the corrosion control treatments in subsections (c)(1)(A) and (c)(1)(B):

i) Lead;

ii) Copper;

iii) pH;

iv) Alkalinity;

v) Orthophosphate as PO4 (when the supplier uses an orthophosphate-based inhibitor); and;

vi) Silicate (when the supplier uses an inhibitor containing a silicate compound).

D) The supplier must identify all chemical or physical constraints that limit or prohibit using any particular corrosion control treatment and document those constraints:

i) With data and documents showing that a particular corrosion control treatment adversely affected other drinking water treatment processes when that treatment was used by another supplier with water having comparable water quality characteristics. Systems using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the constraints identified in this section.

ii) With data and documents demonstrating that the supplier previously evaluated a particular corrosion control treatment, finding either that the treatment is ineffective or adversely affects other drinking water quality treatment processes. Systems using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the constraints identified in this section unless the treatment was found to be ineffective in a previous pipe loop/rig study.

E) The supplier must evaluate the effect of the evaluated corrosion control treatment chemicals on other water quality treatment processes. A supplier using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the effects the supplier identifies under this Section.

F) Based on an analysis of the data the supplier generated during each evaluation, the supplier must recommend in writing to the Agency the treatment option the corrosion control studies indicate constitutes OCCT for the supplier's system. The supplier must give a rationale for its recommendation together with all supporting documentation subsections (c)(2)(A) through (c)(2)(E) specify.

2) A supplier applying corrosion control treatment that must conduct corrosion control studies to determine re-optimized OCCT must complete specific tasks:

A) The supplier must evaluate the efficacy of certain treatments and appropriate combinations of those treatments to identify the re-optimized OCCT for its system:

i) Alkalinity or pH adjustment or re-adjustment;

ii) Adding an orthophosphate- or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective corrosion inhibitor residual concentration in all test samples if the supplier does not already use the inhibitor;

iii) Adding an orthophosphate-based corrosion inhibitor at a concentration sufficient to maintain an orthophosphate residual concentration of 1 mg/L (PO4) in all test samples unless the current inhibitor process already meets this residual; and

iv) Adding an orthophosphate-based corrosion inhibitor at a concentration sufficient to maintain an orthophosphate residual concentration of 3 mg/L (PO4) in all test samples unless the current inhibitor process already meets this residual.

B) The supplier must evaluate each of the corrosion control treatments using pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry, and distribution system configurations. If the supplier’s system has lead service lines and exceeds the lead action level, the supplier must conduct pipe rig/loop studies using harvested lead service lines from its distribution system to assess the efficacy of corrosion control treatment options on the existing pipe scale. The supplier can use metal coupon tests as a screen to reduce the number of options it evaluates using pipe rig/loops to the current conditions and two options.

C) The supplier must measure specific water quality parameters in any tests conducted under this subsection (c)(2)(C) before and after evaluating the corrosion control treatments in subsections (c)(2)(A) and (c)(2)(B):

i) Lead;

ii) Copper;

iii) pH;

iv) Alkalinity;

v) Orthophosphate as PO4 (if the supplier uses an orthophosphate-based inhibitor); and

vi) Silicate (if the supplier uses a silicate-based inhibitor).

D) The supplier must identify all chemical or physical constraints limiting or prohibiting using a particular corrosion control treatment and document those constraints with certain information:

i) Data and documents showing that a particular corrosion control treatment adversely affected other drinking water treatment processes when another supplier with comparable water quality characteristics used the treatment. A supplier using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the constraints the supplier identifies under this Section; or

ii) Data and documents demonstrating that the supplier previously evaluated a particular corrosion control treatment and found that the treatment is ineffective or adversely affects other drinking water quality treatment processes. A supplier using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the constraints the supplier identifies under this Section, unless the supplier found the treatment ineffective in a previous pipe loop/rig study.

E) The supplier must evaluate the effect of the chemicals it uses for corrosion control treatment on other drinking water quality treatment processes. A supplier using coupon studies to screen or pipe loop/rig studies to evaluate treatment options must not exclude treatment strategies from the studies based on the effects the supplier identifies under this Section.

F) Based on its analysis of the data the supplier generated during each evaluation, the supplier must recommend to the Agency in writing the treatment option that the corrosion control studies indicate constitutes OCCT for its system. The supplier must provide a rationale for its recommendation together with all supporting documentation subsections (c)(1)(A) through (c)(1)(E) specify.

d) Agency Approval of Optimized and Re-Optimized Corrosion Control Treatment. When designating OCCT, the Agency must consider the effects of additional corrosion control treatment on water quality parameters and other water quality treatment processes. The Agency must notify the supplier of the basis for designating OCCT in any SEP it issues under this subsection (d).

1) Designating OCCT for a Supplier Without Corrosion Control Treatment. Considering available information, including applicable studies conducted under subsection (c)(1) or the supplier's recommended corrosion control treatment option, the Agency must issue a SEP designating from among the supplier-recommended corrosion control treatment option, alternative corrosion control treatments from among those in subsection (c)(1)(A), or an applicable alternative small supplier compliance flexibility option under Section 611.363(a).

2) Designation of Re-Optimized OCCT for Suppliers Applying Corrosion Control Treatment. Considering available information, including applicable studies under subsection (c)(2) or the supplier's recommended corrosion control treatment option, the Agency must issue a SEP designating from among the supplier-recommended corrosion control treatment option, alternative corrosion control treatments from among those in subsection (c)(2)(A), or an applicable alternative small supplier compliance flexibility option under Section 611.363(a).

e) Installing OCCT and Re-Optimizing OCCT. A supplier must properly install and operate the OCCT throughout its distribution system that the Agency approved under subsection (d).

f) Agency Review of Treatment and Specification of Optimal Water Quality Control Parameters for OCCT and Re-Optimized OCCT. The Agency must evaluate the results of all lead and copper tap sampling and water quality parameter sampling the supplier submits and determine whether the supplier properly installs and operates the OCCT the Agency approves under subsection (d)(1) or (d)(2).

1) Upon reviewing the results of the supplier's tap water and water quality parameter monitoring, both before and after installing OCCT, the Agency must issue a SEP specifying operating parameters:

A) A minimum value or range of values for pH at each entry point to the distribution system.

B) A minimum pH value for all tap samples. This value must be equal to or greater than 7.0, unless the Agency determines that a pH 7.0 is not technologically feasible or is not necessary for the supplier to optimize corrosion control.

C) If the supplier uses a corrosion inhibitor, a minimum inhibitor concentration or range of concentrations for orthophosphate (as PO4) or silicate measured at each entry point to the distribution system.

D) If the supplier uses a corrosion inhibitor, the supplier must maintain a minimum orthophosphate or silicate concentration measured in all tap samples that is necessary to form a passivating film on the interior walls of the pipes of the distribution system, as determined by the Agency in a SEP. If the supplier uses orthophosphate, the supplier must maintain an orthophosphate concentration equal to or greater than 0.5 mg/L (as PO4) for OCCTthe Agency designates under subsection (d)(1) or 1.0 mg/L for OCCT the Agency designates under subsection (d)(2), unless the Agency determines that meeting the applicable minimum orthophosphate residual is not technologically feasible or is not necessary for OCCT*.*

E) If the supplier adjusts alkalinity as part of OCCT, a minimum concentration or a range of concentrations for alkalinity for each entry point to the distribution system and in all tap samples.

2) The values for the applicable water quality control parameters in subsection (f)(1) must be those the Agency determines reflect OCCT for the supplier.

3) The Agency must explain these determinations and give the basis for its decisions when issuing a SEP.

g) Continued Operation and Monitoring for OCCT and Re-Optimized OCCT. All suppliers optimizing or re-optimizing corrosion control must continue to operate and maintain OCCT, including maintaining water quality parameter values at or above minimum values or within ranges the Agency approved under subsection (f), under this subsection (g) for all samples the supplier collects under Section 611.357(d) through (f). This subsection (g) applies to all suppliersthat Section 611.357 does not require to monitor water quality parameters, including consecutive system suppliers distributing water that another supplier has treated applying corrosion control treatment and any suppliers applying corrosion control treatment, OCCT*,* or re-optimized OCCT. The supplier must determine whether it complies with this subsection (g) every six months, as Section 611.357(d) specifies. A supplier does not comply with this subsection (g) in any six-month period during which the supplier has excursions from any Agency-specified water quality parameter on more than nine cumulative days during the six-month 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 Agency-designated minimum value or outside the Agency-designated range. The supplier calculates daily values as subsections (g)(1) through (g)(3) provide. The Agency may exclude results from this calculation that it determines are obvious sampling errors. The supplier must record sampling errors even when not included in calculations.

1) On days when the supplier collects more than one measurement for a water quality parameter at a sampling location, the daily value is the average of all results the supplier collected during the day, regardless of whether the supplier collected the samples through continuous monitoring, grab sampling, or a combination of both.

BOARD NOTE: Corresponding 40 CFR 141.82(g)(1) further provides as follows: If USEPA approves an alternative formula under 40 CFR 142.16(d)(1)(ii) in the State's application for a program revision submitted under 40 CFR 142.12, the approved formula is used to aggregate multiple measurements at a sampling point for the water quality parameters in lieu of the formula in this subsection (g)(1).

2) On days when the supplier collects only one measurement for a water quality parameter at a sampling location, the daily value is that measurement.

3) On days when the supplier collects no measurement for a water quality parameter at a sampling location, the daily value is the daily value calculated on the most recent day on which the supplier measured the water quality parameter at the sampling location.

h) Modifying Agency Treatment Decisions for OCCT and re-optimized OCCT

1) On its own initiative or in response to a request by the supplier, the Agency may issue a SEP modifying its determination of the OCCT under subsection (d) or of the optimal water quality control parameters under subsection (f).

2) A supplier must request modification in writing, explaining the propriety of the modification and providing supporting documentation.

3) The Agency may modify its determination if it determines that a change will ensure that the supplier continues optimizing corrosion control treatment. A revised determination must give the new treatment requirements or water quality parameters, explain the basis for the Agency's decision, and provide an implementation schedule for completing the treatment modifications for re-optimized OCCT.

4) Any interested person may submit information to the Agency bearing on whether the Agency should exercise its discretion and issue a SEP modifying its determination under subsection (h)(1). An Agency determination not to act on information an interested person submits is not an Agency determination for the purposes of Sections 39 and 40 of the Act.

i) USEPA Treatment Decisions on OCCT and re-optimized OCCT. Under 40 CFR 142.19, USEPA reserves the prerogative to review Agency OCCT treatment determinations under subsections (d)(1) or (d)(2), (f), or (h) and issue federal treatment determinations consistent with 40 CFR 141.82(d)(1) or (d)(2), (f), or (h) if USEPA finds that certain conditions exist:

1) The Agency fails to issue a treatment determination by the applicable deadlines in Section 611.351 (corresponding with 40 CFR 141.81);

2) The Agency abuses its discretion in a substantial number of instances or in instances affecting a substantial population; or

3) The technical aspects of the Agency's determination would be indefensible in a federal enforcement action taken against the supplier.

j) Find-and-fix Assessment for Tap Sample Sites Exceeding the Lead Action Level. The supplier must conduct specific steps when a tap sampling site exceeds the lead action level in monitoring under Section 611.356.

1) Step 1: Corrosion Control Treatment Assessment. The supplier must sample at a new water quality parameter sampling site that is on the same-sized water main, in the same pressure zone, and located within a half mile of the sampling site that exceeded the action lead level within five days after receiving the sample results. A small supplier not applying corrosion control treatment may take up to 14 days to collect the samples. The supplier must measure certain parameters:

A) pH;

B) Alkalinity;

C) Orthophosphate (as PO4), if the supplier uses an inhibitor containing an orthophosphate compound;

D) Silica, if the supplier uses an inhibitor containing a silicate compound; and

E) A supplier having an existing water quality parameter sampling site complying with this Section may sample from that site.

F) A supplier that must meet optimal water quality control parameters but not having an existing water quality parameter sampling site complying with this Section must add new sampling sites to the minimum number of sites Section 611.357(g) requires. The supplier must add sites until it has twice the minimum number of sites Section 611.357(a)(2)(A) requires. If a supplier exceeds this upper threshold for the number of sites, the Agency may issue a SEP determining that a newer site can better assess the efficacy of the corrosion control treatment and remove existing sites during sanitary survey evaluating OCCT.

2) Step 2: Site Assessment. A supplier must collect a follow-up sample at any tap sampling site exceeding the lead action level within 30 days after receiving the sample results. The supplier may use different sample volumes or different sampling procedures collecting these follow-up samples to assess the source of elevated lead levels. The supplier must submit samples it collects under this Section to the Agency but must not include them in calculating the 90th percentile concentration under Section 611.356. If the supplier cannot collect a follow-up sample at a site, the supplier must document to the Agency why it was unable to collect a follow-up sample.

3) Step 3: Evaluating Results and Recommending OCCT or Other Actions. Within six months after the end of the tap sampling period during which a supplier exceeds the lead action level, the supplier must evaluate the results of the monitoring conducted under subsections (j)(1) and (j)(2) to determine if the supplier must either locally or centrally adjust the OCCT or other distribution system actions are necessary and submit the recommendation to the Agency. Modifying corrosion control treatment might not be necessary to address every exceedance. Other distribution system actions may include flushing to reduce water residence time in the system. If known from the site assessment, the supplier must note the cause of the elevated lead level in its recommendation to the Agency because site-specific issues can be an important factor in why the supplier does not recommend any adjustment of corrosion control treatment or other distribution system actions. A supplier in the process of optimizing or re-optimizing OCCT under subsections (a) through (f) needs not recommend a find-and-fix treatment to the Agency.

4) Step 4: Agency Action. The Agency must issue a SEP approving the supplier’s treatment recommendation or specify a different approach within six months after the supplier completes Step 3, as subsection (j)(3) describes.

5) Step 5: Implementing the Agency’s SEP. If the Agency-issued SEP requires the water system to adjust the OCCT, the supplier must modify its corrosion control treatment within 12 months after completing Step 4, as subsection (j)(4) describes. A supplier not applying corrosion control treatment and needing to install OCCT must follow the schedule in Section 611.351(e).

6) Step 6: Follow-up Sampling. A supplier adjusting its OCCT must complete follow-up sampling (Sections 611.356(d)(2) and 611.357(c)) within 12 months after completing Step 5, as subsection (j)(5) describes.

7) Step 7: Agency Review. For a supplier adjusting its OCCT*,* the Agency must review the supplier’s modified corrosion control treatment, and the Agency must designate optimal water quality control parameters (Section 611.352(f)(1)) within six months after the supplier completes Step 6, as subsection (j)(6) describes.

8) Step 8: Operating and Complying. A supplier adjusting its OCCT must comply with the Agency-designated optimal water quality control parameters (Section 611.352(g)) and continue tap sampling (Sections 611.356(d)(3) and 611.357(d)).

BOARD NOTE: This Section derives from 40 CFR 141.82.

(Source: Amended at 47 Ill. Reg. 16486, effective November 2, 2023)