United States
Environmental Protection
Agency

Public Comment and Response Document for the Final Lead and Copper Rule Revisions

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List of Acronyms

μg/L	Micrograms per liter
ACS	American Community Survey
AL	Action level
ALE	Action level exceedance
ANSI	American National Standards Institute
ASDWA	Association of State Drinking Water Administrators
AWIA	America's Water Infrastructure Act
AWWA	American Water Works Association
BLL	Blood lead level
BMD	Benchmark dose
BMDL	Benchmark dose lower bound
BMR	Benchmark response
BPb	Blood lead level
CCR	Consumer Confidence Report
CCT	Corrosion control treatment
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CHAD	Consolidated Human Activity Database
CI	Confidence interval
CVD	Cardiovascular disease
CWS	Community water system
CWSS	Community Water System Survey
DEIs	Data entry instructions
DWSRF	Drinking Water State Revolving Fund
EA	Economic analysis
ECOS	Environmental Council of States
EDF	Environmental Defense Fund
EP	Entry point
EPA	United States Environmental Protection Agency
EPDS	Entry point to the distribution system
FOIA	Freedom of Information Act
FR	Federal Register
FRN	Federal Register Notice
FTE	Full-time equivalent
GAO	Government Accountability Office
GDP	Gross domestic product
GSD	Geometric standard deviation
GWR	Ground Water Rule
HBBF	Healthy Babies Bright Futures
HHS	Department of Health and Human Services
HRRCA	Health Risk Reduction Cost Analysis
HUD	United States Department of Housing and Urban Development

ICP-MS	Inductively coupled plasma mass spectrometry
ICR	Information collection request
IQ	Intelligence quotient
ISA	Integrated Science Assessment for Lead
IT	Information technology
LCCA	Lead Contamination Control Act
LCR	Lead and Copper Rule
LCRR	Lead and Copper Rule Revisions
LEA	Local educational agency
LIS	Lead Information Survey
LME	Linear mixed-effect models
LSL	Lead service line
LSLR	Lead service line replacement
MCL	Maximum contaminant level
MCLG	Maximum contaminant level goal
mg/L	Milligrams per liter
MOU	Memorandum of understanding
MRDL	Maximum disinfectant residual level
NCES	National Center for Education Statistics
NDEP	Nevada Department of Environmental Protection
NDWAC	National Drinking Water Advisory Council
NHANES	National Health and Nutrition Examination Survey
NHEXAS	National Human Exposure Assessment Survey
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulation
NRDC	Natural Resources Defense Council
NSF	NSF International
NTNCWS	Non-transient non-community water system
OCCT	Optimal corrosion control treatment
OMB	Office of Management and Budget
O&M	Operations and maintenance
OWQP	Optimal water quality parameter
PBPK	Physiologically based pharmacokinetic
PE	Public education
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic acid
PN	Public notice
POE	Point-of-entry
POU	Point-of-use
ppb	Parts per billion
PRA	Paperwork Reduction Act
PWS	Public water system
PWSS	Public Water System Supervision
RCRA	Resource Conservation and Recovery Act

RFA	Regulatory Flexibility Act
RIA	Regulatory impact assessment
SAB	Science Advisory Board
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SOP	Standard operating procedure
TL	Trigger level
TLE	Trigger level exceedance
TMF	Technical, managerial, and financial
TTAL	Treatment technique action level
UK	United Kingdom
UMRA	Unfunded Mandates Reform Act
USEPA	Unites States Environmental Protection Agency
USGS	United States Geological Survey
VDH	Virginia Department of Health
WBS	Work breakdown structure
WIFIA	Water Infrastructure Finance and Innovation Act
WIIN	Water Infrastructure Improvements for the Nation
WISC	Wechsler Intelligence Scale for Children
WLL	Water lead level
WPPSI	Wechsler Preschool and Primary Scales of Intelligence
WQP	Water quality parameter
WTP	Willingness to pay
WWTP	Wastewater treatment plant

Introduction and Overview

Background

The Environmental Protection Agency (EPA) proposed regulatory revisions to the National Primary Drinking Water Regulation (NPDWR) for lead and copper under the authority of the Safe Drinking Water Act (SDWA). The proposed regulation, "National Primary Drinking Water Regulations: Proposed Lead and Copper Rule Revisions" was published on November 13, 2019 (84 FR 61684). The purpose of the proposed rule also referred to as the proposed LCRR was to provide more effective protection of public health by reducing exposure to lead and copper in drinking water. It also strengthened procedures and requirements related to health protection and the implementation of the previous Lead and Copper Rule (LCR) in the following areas: lead tap sampling; corrosion control treatment; lead service line replacement; consumer awareness; and public education. In addition, this proposal included new requirements for community water systems to conduct lead in drinking water testing and public education in schools and child care facilities.

Following publication of the proposed LCRR, EPA accepted public comments for 90 days. EPA received comments from over 79,000 individuals and organizations representing a wide range of stakeholders, including public water systems, states, tribes, other organizations, and private citizens. Each unique comment was read and considered in determining the final rule requirements. A record of the comments received on the proposal, as well as EPA's responses to these comments are provided in this document. Copies of unique individual comments are also available as part of the public record and can be accessed through EPA's docket (EPA-HQ-OW-2017-0300 at www.regulations.gov). In addition, the materials referenced in this document are also available in the docket.

In addition to public comment, EPA's Science Advisory Board (SAB)[1] provided recommendations for the LCRR in a report issued June 12, 2020 (USEPA 2020c). The SAB and SAB Drinking Water Committee met by teleconference on March 30, 2020 and elected to review the scientific and technical basis of the proposed rule titled *National Primary Drinking Water Regulations: Proposed Lead and Copper Rule Revisions* (Proposed Rule). A work group held SAB deliberations on this topic at a public teleconference held on May 11, 2020. The SAB's advice and comments on the Proposed Rule were considered by EPA and the Agency's response is reflected in this document.

EPA's Categorization of Public Comments and Document Organization

EPA developed a list of numbered Comment Codes, organized by 19 main topics that were addressed by commenters. EPA further divided each main topic into more specific subtopics. The list of comments codes is provided in Exhibit 1.

To give each public submission a unique identifier, and to organize them in the docket for the rule, EPA assigned a unique Letter ID to each submission. The letter ID is the last four digits of the document ID,

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[1] As part of its statutory duties, the EPA Science Advisory Board (SAB) may provide advice and comments on the scientific and technical basis of certain planned EPA actions. The Environmental Research, Development, and Demonstration Authorization Act of 1978 (ERDDAA) requires the EPA to make available to the SAB proposed criteria documents, standards, limitations, or regulations provided to any other federal agency for formal review and comment, together with relevant scientific and technical information on which the proposed action is based.

assigned by the docket when the letter is received. Each public submission was read by EPA and, where appropriate, was subdivided into distinct issue areas, based on topical breaks within the submission. EPA grouped these comment sections (hereinafter referred to as "comments") and assigned each comment a unique "EPA Comment ID" Comments that were similar in topic were then grouped together into a corresponding EPA Comment Code.

Exhibit 1: EPA Comment Codes

Topic	Topic Name
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Topic	Topic Name
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Topic	Topic Name
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Topic	Topic Name
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Topic	Topic Name
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Document Organization and Cross Referencing of Responses

The remainder of this document is organized by the 19 topic codes. For example, the first section 1.0, "General Matters," includes an introductory paragraph, followed by five subsections 1.1 through 1.5. Within each subsection, EPA has included a "Summary of Comments," followed by "Agency Response" that addresses each of the comments raised in the summary of comments. In some instances a subsection may include multiple summaries and Agency responses. In addition, a reference section is provided at the end of each main section, where applicable.

In some cases, comments that addressed several distinct issues within a sentence or a paragraph could not practically be divided into individual Comment IDs. For these comments, EPA placed the comment section where it was judged to be the best fit and has cross referenced responses in other sections to provide clarity, avoid redundancy, and ensure consistency.

1 General Matters

In the proposed rule, EPA requested comments on general matters pertaining to the proposed Lead and Copper Rule revisions (LCRR), the appropriate scope and content of the rule, complexity, and implementation challenges, specifically:

"The EPA is requesting comment on the overall framework for the proposed LCR revisions. Has the EPA developed proposed revisions that address the variability in conditions among the regulated water systems that effect the levels of lead that may be present in drinking water? Do the proposed revisions to the LCR target the appropriate treatment technique actions to prevent known or anticipated adverse health effects to the extent feasible in accordance with the Safe Drinking Water Act (SDWA)?

The EPA requests comment on the complexity of the regulatory requirements that result from targeting different actions for different types of water systems and challenges States and water systems will encounter. The EPA requests comment on ways that the proposed LCR revisions could be simplified and burden, including paperwork burden, could be reduced while still assuring adverse health effects are prevented to the extent feasible.

The EPA solicits comment on ways it can improve the ability of State or Federal government to enforce this rule. The EPA solicits comment on ways it can improve the ability of State or Federal government to assist water systems with compliance."

EPA received comments on overarching issues, scope of rule and applicability, complexity of the rule, and how state and federal governments can improve assistance.

1.1 General Comments

Summary of Comments

EPA received numerous general comments pertaining to the LCRR. Most of the comments reiterated the importance of removing lead from drinking water. The public was especially concerned about lead's harmful impact on children since there is no safe level of lead. Many commenters acknowledged the difficulty of revising a regulation as complex as the Lead and Copper Rule (LCR) and commended EPA's efforts. For example, one comment stated, "Balancing regulatory flexibility and ease of implementation is always challenging in EPA's regulatory development process." The positive comments overall believed EPA was taking a step in the right direction but recognized more revisions would be needed in the future.

While EPA did receive positive comments about the LCRR, there were several dissenting comments. Some dissenting comments raised concern about the complexity of the rule and whether it is based on unrealistic expectations regarding state and local government and public water systems (PWSs). For example, one commenter stated, "…the rule as written may be problematic to implement…" Other commenters were concerned the LCRR does not do enough to protect drinking water or address the stated failures of the previous LCR. For example, a comment that was submitted stated, "As the proposal stands, it is inadequate to provide a safe reliable source of primary water" and another commenter stated "The current LCR has long-standing problems, including permitting problematic testing methods that do not accurately reflect lead exposure, and opportunities for states to avoid the actions needed to truly protect children" and added "proposed revisions do not fix these underlying issues, and will not address the national public health crisis of lead in our drinking water delivery system swiftly enough." In addition, one commenter stated "…it does not go far enough to reduce lead in drinking water. The revision fails to proactively replace system-wide lead service lines."

There were several comments regarding rule flexibilities in the proposed LCRR. Overall, the commenters encouraged flexibility to address potential local and regional needs. However, the commenters cautioned EPA against providing too much flexibility since it could create potential loopholes which would undermine rule provisions. For example, one commenter stated "…too much flexibility can create confusion, inconsistency and unintended "loopholes" and may mean that critical issues for protecting public health might not get recognized and resolved."

Agency Response

EPA agrees with commenters regarding the importance of reducing lead in drinking water. EPA acknowledges that the final rule introduces several new provisions which states, and water systems will need to learn and implement, but the Agency does not believe the rule as a whole is too complex or burdensome to implement. EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

The proposed rule structure, which has been retained for the final rule, was based on recommendations from the Association of State Drinking Water Administrators (ASDWA) that were provided to EPA during the Federalism consultation that took place in January 2018. This structure, which compels more actions by water systems to reduce lead in drinking water prior to exceeding the lead action level, addresses commenter concerns that the previous rule is not prevention oriented. For more detailed responses addressing individual rule provisions, see the corresponding comment response sections.

EPA agrees with commenters who acknowledged the balance between offering rule flexibilities to account for local or regional needs, as well as the potential for flexibilities to create additional burden and loopholes. EPA has designed the final rule to offer targeted flexibilities in key rule areas (such as flexibilities for small systems) and has avoided introducing new flexibilities where they are not necessary.

EPA disagrees that the proposed rule would undermine confidence in drinking water. The proposed rule includes improved transparency, public education, and public notification provisions regarding lead in drinking water. EPA finds that the proposed rule would strengthen confidence in drinking water, while a rule that deemphasizes transparency and public education would decrease confidence. The final rule retains these provisions.

In response to a comment about impacts of lead exposure falling disproportionally on vulnerable populations, please see response to comment Sections 6 and 18.

In response to the comment noting that the proposal did not require proactive removal of all lead service lines (LSLs), please see response to comment Section 6.

In response to comments about testing methods, see response to comment Section 9.

In response to comments about high lead levels in individual taps, please see response to comment Section 13.

In response to a comment suggesting the rule should include a health-based value for lead in drinking water, please see response to comment Section 19.

1.2 Scope of Rule and Applicability

Summary of Comments

EPA received multiple comments concerning the scope of the LCRR and its applicability.

Many comments frequently highlighted Flint, Michigan as an example of the pitfalls of failing to protect drinking water. The comments inferred that EPA should use Flint as a case study to develop the LCRR. For example, one commenter stated, "rather than learning the lessons of Flint and respecting the science of lead's neurotoxicity, the proposed Lead and Copper Rule Revisions (LCRR) are a missed opportunity to protect the public's health and to rebuild trust in our nation's drinking water."

Overall, the comments show a lack of support for how copper is addressed in the LCRR. The comments about copper were mostly negative albeit for various reasons. Some commenters claimed the LCRR should not treat copper in the same way as lead. For example, "EPA should consider every possible way to diverge pathways to address copper issues more simply as compared to lead issues." Some commenters believed copper exceedances can be remedied through individual treatments like flushing, rather than installing permanent corrosion control treatment. Commenters suggested eliminating the stringent copper rules to reduce compliance costs without encroaching on public health. Other commenters believed the LCRR does not sufficiently address copper corrosion. For example, one commenter states "copper corrosion is a problem in many water systems but the LCR treats copper as an orphaned child." The commenter believes EPA should use the LCRR as an opportunity to improve the copper corrosion issues and educate the public about copper. One commenter suggested that EPA introduce public notification requirements when high copper levels are detected. Regardless of the viewpoints, overall, the commenters agreed LCRR did not adequately address the copper issues.

Additionally, one commenter recommended EPA take a holistic regulatory approach while developing the LCRR. The commenter stated the addition of phosphate-based corrosion control treatment (CCT) could impact other EPA regulations such as the National Pollution Discharge Elimination System (NPDES), potentially causing discharge limits violations or forcing additional investment to install a nutrient removal treatment system.

Agency Response

EPA notes that the final rule improves public health protection relative to the previous rule, as described in the economic analysis and elsewhere in the record. The final rule also increases transparency, strengthens public notification and public education requirements, and introduces provisions that require water systems to inventory service line materials. More stringent tap sampling procedures and inclusion of lead service line replacement (LSLR) requirements prior to exceeding the lead action level also contribute to improvements of the final rule relative to the previous rule. In addition, in §141.82(g) of the final rule, EPA has clarified that the requirement to continue CCT applies to consecutive systems such as Flint that receive water that has been treated to control corrosion.

Regarding comments about copper, EPA finds that because the source of lead and copper in drinking water are generally the same (i.e., corrosion from fixtures or pipes containing the metal), and because the treatment technology for elevated copper levels is also the primary treatment for lead (i.e., reducing corrosion in the distribution system), it is logical to group these two contaminants into a single rule. Additionally, both lead and copper require sampling at taps, rather than at the entry point of the distribution system.

While EPA's focus in the LCRR was lead, and the Agency did not propose revisions to address copper, the rule revisions will also reduce copper levels when systems optimize or re-optimize CCTs such as pH and alkalinity adjustment and orthophosphate inhibitors because they are effective mechanisms for controlling copper corrosion as well. The re-optimization of existing corrosion control for systems above the lead trigger level of 10 µg/L will likely reduce copper levels as well due to the improved corrosion control. Additionally, the find-and-fix requirements related to lead will reveal potential distribution system issues as systems are required to take water quality parameter samples at a location on the same size main in the same pressure zone located within one half-mile of the sampling site where lead exceeds 15 µg/L. Solutions to elevated lead levels can include changes to the CCT or changes in distribution system practices, such as flushing to reduce water age or nitrification, which in turn may reduce copper levels. The rule also allows states to add other water quality parameters for monitoring that it deems necessary for corrosion control.

The final rule retains the notification requirements under the previous rule for copper action level exceedances (ALEs). The 24-hour public notification for lead is based on a statutory requirement (see Section 1414(c)(2)(C) of the SDWA), applicable to exceedances of the lead action level only, not the copper action level. It is discussed in the preamble of the final rule. EPA disagrees that the 24-hour deadline should apply for copper because exceedance of the copper action level is not a violation of the National Primary Drinking Water Regulations (NPDWR) or a lead ALE and therefore should not be treated as a Tier 1 and not subject to SDWA Section 1414(c)(2)(C). EPA intends to consider revisions for copper in the future after evaluating the effectiveness of the tools in the implementation of the revisions for lead.

One commenter suggested that the final rule should take an overarching approach that, for example, considers orthophosphate CCT's potential downstream NPDES impacts. The statutory framework for promulgation of an NPDWR requires a treatment technique rule to prevent known or anticipated adverse effects on the health of persons *to the extent feasible"* (emphasis added); EPA cannot promulgate a rule that is less stringent than required by SDWA to address surface water impacts. Additionally, because the LCR is such a multifaceted regulation, and because water systems differ so greatly in size, prevalence of LSLs, and other factors, EPA finds that variances to the entire rule or a rule component provide the most appropriate response to local or individual concerns as needed. A provision written into a national rule would fail to consider water systems on a case-by-case basis and could potentially create loopholes.

For response to comments about copper monitoring, please see the response to comment Section 9.

In response to comment about certification of lead fixtures as "lead free," EPA notes that the LCR does not include any such provisions. Please find more information at https://www.epa.gov/sdwa/use-lead-free-pipes-fittings-fixtures-solder-and-flux-drinking-water.

1.3 Complexity of Rule

Summary of Comments

EPA received many comments regarding the complexity of the proposed rule. Overall, commenters stated that the proposed rule is more complex than the previous rule and that the new requirements (e.g., trigger level, LSL inventory, school and child care lead sampling, public education and reporting requirements) introduce "confusion and uncertainty within the regulated community and unnecessary concern and anxiety for consumers." Commenters suggested that EPA simplify requirements and reconcile apparent inconsistencies between the rule preamble and regulation text, adopt clear definitions, and make editorial changes to reduce ambiguity and potential confusion. Some commenters also suggested simplifying CCT steps, removing the trigger level and lowering the action level for lead, setting a timeframe for removal of LSLs, simplifying LSL inventory requirements, and clarifying tap sampling requirements as ways to reduce rule complexity. One commenter noted that the final rule should clearly define responsibilities of water systems and customers. A few commenters also expressed concern that the lack of a health-based level for lead will lead to challenges in communicating water system actions and exceedance of the trigger level and action level to the public.

Some commenters further stated that the proposed rule is a "one size fits all approach" and argued that EPA has not considered local and regional variability across water systems. One commenter suggested that each local community is "unique in its operations and character" and that the "federal government should not 'promulgate uniform regulations'" for local communities. A few commenters noted that the tap monitoring requirements do not address communities with seasonal water use and should allow a confirmatory sampling process, while another stated that first liter sampling does not capture peak lead levels in homes with LSLs. Conversely, other commenters expressed that multiple pathways to comply with the rule based on system size, type, monitoring results, and threshold exceedances would make compliance and implementation difficult. Another commenter argued that EPA lacks appropriate data resulting in a rule with multiple tiers and trigger levels to capture "every violation scenario." They stated that increased complexity contributes to "the unreliability of the reported lead levels and widespread violations", with another commenter questioning if the additional requirements were needed to reduce lead risks. Likewise, a few commenters argue that additional complexity will lead to more widespread violations that are procedural in nature and not due to lead contamination. One commenter suggested that the rule should focus on “big picture” items and reduce paperwork and reporting burdens that are “not important for public health.”

Some commenters expressed concern that the proposed rule requires an increased level of interaction between states and water systems leading to increased regulatory burden. A few commenters also stated that increased interactions between states and water systems may create conflict. Commenters noted concerns regarding a potential increase in administrative and financial costs and stated that water systems and states lack the necessary staff expertise and/or finances to meet the proposed requirements, and that training and assistance responsibility will likely fall to states. A few commenters also noted concerns regarding the complexity of data management and the Safe Drinking Water Information System (SDWIS) and that some states may not seek primacy due to burden and lack of resources. Conversely, one commenter suggested that states be responsible for some of the new rule requirements such as school and child care sampling and public education. Finally, other commenters expressed concern that oversight requirements by primacy agencies and EPA creates the possibility that water systems, “despite significant efforts at complying with the rule’s substance and intent, would be subject to the caprices of state or Regional EPA administrators,” particularly regarding CCT and the LSL inventory.

Agency Response

EPA acknowledges that the LCR is a complicated rule. This is primarily due to the need to control the corrosivity of drinking water as it travels through water system distribution systems to consumer’s tap, coupled with the variability in water chemistry and distribution system materials, as well as other treatment processes used by the system to comply with other NPDWRs. Furthermore, additional actions by both water systems and consumers are needed to reduce lead levels due to the ubiquity of lead in aging drinking water infrastructure and premise plumbing. This includes actions such as LSLR and taking steps to reduce lead exposure through public education and water system engagement. However, EPA disagrees that the new rule requirements will introduce confusion and uncertainty for water systems. The Agency acknowledges inconsistencies between the rule text and preamble in the November 2019 Federal Register Notice (FRN) and has made revisions to clarify the requirements for many aspects of the rule (USEPA, 2019a). EPA will work with primacy agencies and water systems to assure they understand different actions that must be taken when water systems exceed the trigger level or action level . EPA also notes suggestions to simplify various aspects of the rule. Please see the response to comments sections for definitions (Section 2), CCT (Section 4), LSL inventory (Section 5), LSLR (Section 6), and lead tap monitoring (Section 9) and other relevant sections for details. In response to concerns regarding water system responsibility, EPA notes that the final rule has been revised to clearly differentiate water system requirements from voluntary consumer actions. For response to comments on reducing complexity by lowering the lead action level in lieu of the trigger level and setting a health-based level for lead, see response to comment Section 19.

EPA disagrees that the revised rule will result in “unnecessary concern and anxiety” for water system consumers. Public awareness of lead in drinking water and the steps people can take to reduce lead exposure is an important component of the revised rule and is necessary to “prevent known or anticipated adverse effects on the health of persons to the extent feasible” (SDWA 1412(b)(7)(A)). EPA anticipates that the added public education requirements in §141.85 will help to educate people about the sources and health risks of lead in drinking water and steps that both they and their water system can take to reduce exposure. For further details please see response to comment Section 8.

EPA further disagrees that the proposed rule is a "one size fits all approach." The proposed rule requires different actions to reduce lead and copper based on characteristics such as system size, system type (e.g., community water systems (CWSs), non-transient non-community water systems (NTNCWSs)), LSL status, and lead and copper levels (see Section III.A of the FRN; USEPA, 2020a). Some provisions such as LSL inventory in §141.84(a) and many of the public education requirements in §141.85 apply to all systems to increase public awareness of lead sources and risks. However, EPA has included flexibilities in the rule based on system size and type including alternatives to CCT for small systems (serving 10,000 or fewer people) and all NTNCWSs. Please see response to comment Sections 5 (LSL inventory), 7 (small system flexibilities) and 8 (public education requirements) for further detail. EPA further notes that requirements are not uniform for all systems. For example, the LSL requirements in §141.84 are targeted to the systems with higher lead levels and address weaknesses in the previous rule to achieve full LSLR in the communities where they are needed most. EPA has also increased flexibility in the process for systems optimizing and re-optimizing CCT. EPA disagrees that it has not justified differing requirements for CCT based on system size. For discussion on the framework for CCT requirements see the response to comment Section 4.

EPA also disagrees that the complexity of the rule and addition of the trigger level for lead stem from lack of data. EPA established the trigger level to allow states to focus on water systems with elevated lead before an ALE occurs. By taking a progressive set of actions, such as reevaluating CCT, initiating goal-based LSLR, and more frequent tap sampling, the trigger level ensures that systems can rapidly respond if there is an ALE. EPA found that it is both feasible for systems to take the required actions when there is a trigger level exceedance (TLE), (the lead 90th percentile level is above 10 µg/L but at or below 15 µg/L) and that they prevent known or anticipated adverse effects to the health of persons. In addition, significant benefits accrue from these actions (see the Economic Analysis; USEPA, 2020b). EPA notes that requiring a progressive set of actions based upon lead levels at the tap are appropriate to assure reduced exposure to lead (see the response to comment Section 3). EPA disagrees that these requirements will lead to unreliable lead levels and violations. EPA has revised the tap sampling requirements in §141.86 to ensure that the tap sampling criteria gives priority to highest risk lead sites and that the sampling methodology captures the highest lead levels by requiring fifth liter sampling at sites served by LSLs (see the response to comment Section 9). EPA notes that a TLE does not constitute a violation, but instead ensures systems take progressive actions to reduce lead levels and prevent future ALEs. Failure to take required actions due to a lead TLE or ALE results in the water system being in violation of the treatment technique or monitoring and reporting requirements. EPA does not believe that reporting or notification requirements are "not important to public health." For example, failure to notify the public of an ALE or presence of an LSL prevents consumers from taking individual steps to reduce their risk of exposure to lead. Please see the response to comment Sections 8 and 14 for detailed discussions on public education and water system reporting requirements, respectively.

EPA agrees with commenters that the proposed rule will increase the level of interaction between states and water systems for some systems. For example, in the final rule a TLE requires systems to take actions (e.g., increased tap sampling, CCT steps, goal-based LSLR) that require state approval and oversight. By targeting actions when a system's lead levels are high, but not exceeding the action level, systems and states can engage in a more manageable and orderly process to reduce lead levels in drinking water so that they remain below the lead action level, and to prepare for actions that would be required in the event of an ALE (see also the response to comment Section 19). EPA has determined that the benefits justify the costs of the final rule.

EPA disagrees with some commenters who expressed concerns that water systems without LSLs will be required to fulfill “onerous” requirements. EPA notes that under the final rule in §141.84, water systems that demonstrate through their inventory that they have no LSLs, would not be required to update their inventory over time or conduct LSLR after a lead TLE or ALE. Water systems with no LSLs also have a potentially greater number of tap sampling sites that can be used in accordance with §141.86, reducing burden to find and retain customer participants. EPA notes that this is not an exhaustive list of ways the final rule requires less burden for non-LSL systems. Other rule provisions, such as CCT and find-and-fix, apply regardless of a system’s LSL status because elevated lead levels can result from corrosivity of water and its interaction with other sources of lead in plumbing. For response to comments suggesting a requirement for states to conduct school and child care lead sampling in lieu of water systems please see response to comment Section 12.

EPA understands the concerns states and water systems may have about the changes to the LCR and finance and resource limitations. Please see the response to comment Section 17 for discussion of funding concerns. Furthermore, as noted above, EPA has maintained flexibilities for CWSs serving 10,000 or fewer persons that may face more significant resource challenges. The Agency determined the compliance flexibility options would be most appropriate for small water systems that serve 10,000 or fewer persons, as they are most frequently the systems that are struggling to maintain compliance with the previous LCR and/or do not have the technical, financial and managerial capacity to operate CCT in conjunction with other complex treatment technique requirements. Options such as selecting a lead reduction approach in the event of an ALE including CCT, LSLR, replacement of lead-bearing materials, and provision of point-of-use devices are offered in lieu of completing several requirements at the same time under the revised rule and will alleviate some of the financial concerns raised by commenters (see response to comment Section 7 for more details). Likewise, a process for issuing waivers for existing lead sampling programs in schools and child care facilities under §141.92(d) will reduce duplicative efforts (see the response to comment Section 12). EPA notes requests for guidance to provide additional clarity of rule requirements. EPA understands that rule guidance is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA disagrees that water systems will be held in non-compliance due to the “caprices” of the state or Regional EPA Administrator. State and EPA oversight assure that appropriate actions are taken to reduce lead levels and protect public health. One commenter specifically noted concern over state discretion on early implementation of LSL inventory requirements. For response to comments on the LSL inventory see Section 5. EPA has not changed existing provisions in Subpart I that allow EPA, using the procedures specified in §142.19, to establish certain requirements for systems related to corrosion control and monitoring, in lieu of the State determinations which allow the Regional EPA administrator oversight of state implementation of NPDWRs under the SDWA. This includes the provision in §141.82(i) which allows the EPA administrator to review CCT determinations made by a state and issue a federal treatment determination under certain specified circumstances (e.g., if a state has failed to issue a treatment determination by the applicable deadline or the state has abused its discretion in a substantial number of cases or in cases affecting a substantial population). Please see the responses to comment Section 4 for discussion of state designation of water quality parameters under CCT optimization and re-optimization.

1.4 How State and Federal Government Can Improve Assistance to PWSs Implementing the Rule

Summary of Comments

EPA received many comments related to how the LCRR could be improved for PWSs. One of the frequent suggestions cited in comments was for EPA to adopt the National Drinking Water Advisory Council's (NDWAC) recommendations. Examples of the NDWAC's recommendation that were suggested for EPA to adopt included providing incentives to water systems and creating an informational website that could be accessed by the general public. For instance, one comment stated "The NDWAC discussed the value of incentives, but the proposal does not provide incentives to promote proactive action by systems." Another comment stated, "EPA should follow through on the NDWAC recommendation to develop a comprehensive and sound website to support effective risk communication."

A major concern that was echoed throughout the comments was the concept of shared responsibility. Commenters argued that EPA did not show a meaningful effort to support the collaboration between states and local governments, water systems and customers and that EPA's lack of support fails to help water systems be successful. For example, a commenter stated, "EPA did not describe any significant new efforts by the Agency or Safe Drinking Water Act primacy agencies, or other federal agencies to support the proposed framework, so that water systems subject to the rule would be empowered to be successful." Some suggestions given to help water systems meet the LCRR's requirements include revising the plumbing code, expanding training, and supporting rate commission filings.

Commenters addressed issues of scientific basis and transparency. Some commenters were concerned EPA did not rely on sound science while developing the LCRR. One comment stated "It is clear that EPA has ignored any research published on lead solubility in the past 15 years, even that conducted by its own scientists, in the preparation of these revisions to the LCR in the area of optimal chemistry and water quality parameters. EPA must use "'the best available peer-reviewed science and supporting studies' and so must revise the ENTIRE section on optimal corrosion control treatment…" Another commenter recommended that EPA look into ways to prevent data suppression and increase transparency.

Commenters were also concerned that the three-year timeframe is inadequate for water systems to fully comply with the LCRR's requirement. The comment states, "The three-year timeframe for water systems to come into full compliance with the final rule may not be feasible as proposed… Existing EPA guidance is inadequate and new guidance will not be developed with sufficient speed and informed stakeholder input with public notice and comment to allow timely utilization." It was argued the LCRR's complexity and lack of transparency would hinder water systems to accurately comply with the rule's requirements. Another suggestion given to improve compliance was that EPA should remove the provision that allows water systems to phase out of corrosion control. It was argued that once corrosion control is established it needs to remain in place for public health and infrastructure reasons.

One commenter suggested EPA should create and provide editable templates for states. They argued states have limited resources and thus some of the LCRR's requirements will be unachievable without some additional assistance from EPA. The editable templates would help reduce the regulatory burden on states.

A couple of comments addressed lead from other sources (i.e., paint, dust, and soil). One commenter stated that lead in paint "poses a far greater risk of exposure" than lead from water, and that addressing LSL without addressing lead in paint is "not a responsible solution." Another commenter suggested that "water lead exposure" should be integrated into existing state and national lead mitigation programs, which usually focus on lead from paint, dust, and soil.

Agency Response

EPA has adopted some of the recommendations made by the NDWAC. In December 2015, the NDWAC prepared a report outlining its recommendations for the LCR (NDWAC, 2015). EPA considered these recommendations when revising the LCR. On December 4-5, 2019, EPA presented the LCRR to the NDWAC, highlighting that the revisions were developed with input from state, local and tribal partners. Some of these changes include requirements to report the following data to the state: tap sampling results, monitoring results, and LSL inventories.

Regarding comments addressing incentives to states and water systems, EPA emphasizes that the rule's structure encourages a "proactive" LSLR (thus avoiding lead ALEs) by implementing goal-based, requiring the creation of an LSLR plan, replacing lead connectors when encountered and including customer-initiated LSLR, regardless of lead levels (see the response to comment Section 6). Regarding systems with existing LSLR programs with concerns about competing or conflicting rule requirements, EPA encourages systems to continue their existing proactive LSLR programs. For instance, if a water system already has an LSLR plan, according to §141.84(b), the existing plan must be submitted to the state. With respect to lead goosenecks, pigtails, or connectors, §141.84(c)(6) takes into account states that may already include these components in their definition of LSLs (see also the response to comment Section 5). In addition, the final rule addresses other means of reducing lead in drinking water, which include CCT, public education, customer notification, etc. EPA disagrees with the concerns that the rule's implementation would discourage customer requested samples, EPA requires that results from customer-requested sampling only be considered in the 90th percentile calculations if the sample meets the requirements for compliance tap samples in §141.86.

In response to concerns that EPA did not address "shared responsibility," EPA did engage state, local and tribal partners in Federalism consultations on two occasions (November 2011 and January 2018) early in the revision proposal process. The final rule includes many opportunities for interaction with consumers to help facilitate the shared responsibility. For example, LSL customers will receive notification annually, all consumers will be notified within 24 hours of a lead ALE, tap sampling sites will receive results with 3 days if >15 µg/L or 30 days if ≤15 µg/L; a component of all of these requirements is to provide consumers with information about the health effects of lead, source of lead in drinking water and actions consumers can take to reduce lead in drinking water, including LSLR. In addition, customers will be engaged for find-and-fix activities.

EPA consider state legislative schedules to give states more time to make any necessary "legislative changes" to comply with the rule, the Agency highlights that state and local organizations were engaged throughout the LCR's revision process via Federalism consultation and a series of follow-up meetings where participants could provide input. The compliance dates in the rule are consistent with the requirements of Section 1412(b)(10) of the SDWA which requires NPDWRs to take effect three years after promulgation unless an earlier compliance date is practicable. The Administrator or, on a case-by-case basis, a state may allow a system up to two additional years to achieve compliance if the additional time is needed for capital improvements. Section 1413 of the SDWA requires states to adopt regulations no less stringent than the LCRR not later than 2 years after promulgation of the LCRR, unless the State requests, and EPA approves, an extension request for up to 2 additional years. See also §142.12(b).

In response to recommendations on how EPA could help support water systems including revising plumbing codes, public health codes and rate commission filings, EPA would point out that model plumbing codes are industry developed standards. EPA does not have control over the content of the plumbing codes. Model codes have no force or effect as a legal matter unless, and to the extent they are adopted into state or local law. Similarly, EPA cannot control whether, and to what extent, a state or local jurisdiction adopts a model code. Meanwhile, plumbing codes are generally written or adopted as part of city or state law, and adjustments to rate structures are generally under jurisdiction of a municipal government or state utilities commission. The Agency will support water systems and states with implementation in that EPA intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials (e.g., templates, website) that will help states and water systems implement the revised rule and promote greater national consistency. In response to comments concerning SDWIS (i.e., updates), please see the response to comment Section 15.

In response to concerns that three years might be insufficient time to develop an LSL inventory, EPA maintains the three-year time limit is feasible due to the flexibility water systems are given in identifying service line materials. For instance, during this time, water systems can designate service lines that may be hard to identify as "lead status unknown service lines." With respect to requests for guidance and templates, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. See Section 5 for response to comments on developing the LSL inventory.

Concerns were raised about the science underlying the LCR, with special emphasis on CCT and lead solubility. In response, the EPA highlights that in proposing the revisions, it must rely on the "best available peer-reviewed science" as stated in §1412(b)(3)(a)(i). A list of the peer-reviewed studies can be consulted in the reference section of the FRN. In addition, EPA highlights that it has engaged the Science Advisory Board (SAB) as recently as March 30, 2020. On June 12, 2020, the SAB has provided feedback confirming that the proposed CCT requirements are based on sound science (USEPA, 2020c). With respect to current knowledge on lead solubility and its relation to elevated lead levels, EPA concludes that the cases of elevated lead levels (Washington, DC; Durham, NC; Greenville, SC) that were cited in the comment were due to changes in the water treatment process. Consequently, EPA emphasizes that the 2007 LCR revisions (USEPA, 2007) require the water system to inform the state of any treatment changes prior to their application and this requirement is maintained in the current LCR (§141.90(a)(3)). In response to the additional recommendation to modify the rule that applies to ALEs in communities under 50,000 with no prior CCT, EPA revised this section of the rule to require optimal corrosion control treatment (OCCT) installation if any CWS serving more than 10,000 persons has an ALE. Further, the final rule established a trigger level which if exceeded requires systems without prior CCT to conduct a CCT study to be prepared in the event of a subsequent ALE. Also, §141.82(i) gives the EPA the authority to issue “corrosion control treatment determinations” in lieu of the state’s OCCT determination in certain circumstances.

In response to concerns over transparency (e.g., data suppression), the revisions in the LCR aim to improve the transparency of water systems and states. For instance, a tap sampling results must be made publicly available and tap sampling sites receive their lead and copper results. In addition, the LSL inventory must be available to the public, including the locations of the LSLs identified (see Section 5). Also, all CWS must compile a list of schools and child care facilities for public education outreach and sampling (see Section 12). All of these measures ensure that important information is made available to the public or those who are affected in a timely fashion.

In response to the comment on exposure to lead from other sources such as paint and dust, EPA notes that existing legislation, regulations, and proposals address other means of lead exposure. For example, in 1978, lead paint for residential and commercial use was banned (16 CFR part 1303 and 40 CFR part 141). In 1995, a ban was instituted on lead solder in food cans (21 CFR 189.240). In 2019, EPA revised the dust lead hazard standards for floors and windowsills (USEPA, 2019b), and in June 2020, EPA proposed lowering dust lead clearance levels for dust on floors and windowsills (USEPA, 2020d). On September 1, 2020, EPA published the final regulation "Use of Lead Free Pipes, Fittings, Fixtures, Solder, and Flux for Drinking Water" (USEPA, 2020e), which requires that manufacturers or importers certify that their products meet the lead free requirements as defined in Section 1417 of the SDWA. These certification requirements will ensure that only lead free plumbing products are used in repairs and new installations of potable use applications. Legislation such as Resource Conservation and Recovery Act (RCRA) and Superfund have addressed lead in soil.

1.5 Other

Summary of Comments

EPA received comments on various miscellaneous issues related to the proposed LCRR. Some of the commenters requested that EPA provide further clarification on the LCRR requirements; however, they did not have a specific question. Other comments further detailed the inadequacies and gaps of the LCRR to meet public health needs. Commenters insisted the LCRR’s complexity would create additional problems for states and local government as well as for customers and water systems. Some commenters called to further revise the sampling protocol so more accurate results could be obtained. One commenter argued that the data on violations is flawed and thus violations are being under-reported.

A commenter suggested EPA allow more flexibility to water systems so they can apply community specific solutions rather than be confined to a one size fits all approach. Furthermore, a commenter asked EPA to reconsider the LCRR timelines because states oversee a lot of water systems. The timelines in the LCRR are argued to be infeasible to abide by and are seen as a potential source of conflict between states and water systems. One commenter was concerned about the number of activities the state must conduct between the effective date of the LCRR and the first tap sampling period. Another commenter expressed concern that the extra costs water systems would face to comply with the LCRR would divert resources from public health issues other than lead.

Many commenters called EPA to do more in the way of LSLR. Commenters wanted LSLR to be more of a priority in the LCRR. There was a call for better inventory data and more education surrounding LSLs.

One commenter stated that EPA continues to remain silent on consecutive systems. Consecutive systems would like EPA to provide more guidance on how the LCRR applies to their complex situation.

A commenter suggested that the Agency remove the requirement that pitcher filters and 3 months of filter packages be provided to customers following a full or partial LSLR.

Several commenters noted errors in the proposed rule, including incomplete sentences, conflicting requirements, and improper section references. One commenter recommended that EPA review past guidance to ensure consistency with the LCRR and minimize confusion, particularly with definitions where the commenter noted redundancy and a need for greater precision.

A commenter asserted that the LCRR will detract from addressing other drinking water contaminants such as PFAS.

Agency Response

For responses to comments related to the complexity of the rule, please refer to response to comment Section 1.2. For responses to comments regarding the tap sampling protocol, see the response to comment Section 9.

One of the commenters expressed concern with the quality of state and regional program data on violations, leading to underreporting. The final rule requires compliance reporting or certification for new requirements for example the LSL inventory, LSLR plan, tap sampling plan based on new site selection tiering criteria. EPA believes the final rule revisions will enhance oversight and compliance assurance. The final rule requires greater coordination between water systems and states. For example, when water systems have a 90th percentile concentration that exceeds the lead trigger level, the actions they must take under the final rule (e.g., CCT) require review and oversight from states to assure that they are effective in reducing drinking water lead levels. Specifically, CWSs serving more than 10,000 persons that exceed the trigger level and do not have CCT in place are required to conduct a CCT study and obtain state approval for designated CCT. For more information on this new CCT requirement, see sections III.A and III.B of the final rule FRN (USEPA, 2020a). EPA also expects CWSs serving 10,000 or fewer persons to work with their state to select a compliance option to reduce drinking water lead levels. Under the final rule, CWSs serving 10,000 or fewer people and all NTNCWSs that exceed the trigger level must evaluate the LCRR's four compliance alternatives listed in the next paragraph and make a recommendation to the state within six months on which compliance alternative the water system would implement if the water system subsequently exceeds the lead action level. The state must approve the recommendation or designate an alternative compliance option within six months of submittal; see section III.E of final rule FRN for more information. The final rule also requires all water systems with LSLs or lead status unknown service lines in their inventory to submit an LSLR plan to their state; for more information see section III.D of the final rule FRN. In addition, systems that exceed the trigger level must start LSLR programs at a rate they set with their state; see section III.D of the final rule FRN for more information.

Several commenters requested greater flexibility for water systems in carrying out the various requirements of the proposed rule, particularly for small systems. EPA notes that the final rule provides many flexibilities for small water systems and NTNCWSs. For information on these flexibilities, please see § 141.93 of the final rule and response to comment Section 7. For example, CWSs serving 10,000 or fewer persons and NTNCWSs with a TLE can choose from various options, with state approval, to comply with the final rule, including CCT, LSLR, provision and maintenance of point-of-use devices, or replacing all lead-bearing plumbing materials. EPA disagrees with the comment requesting that the Agency remove the requirement that pitcher filters and 3 months of filter packages be provided to customers following a full or partial LSLR; however, the final rule extends the 3-month period to 6 months. EPA believes provision of filters is important in order to help customers reduce their risk of exposure to lead in drinking water following LSLR. In response to the comment concerned about “false reliance upon filter,” EPA notes that the final rule also requires public education informing customers of additional actions they can take to reduce their risk of lead exposure; for more information on what materials water systems are required to provide following a full or partial LSLR, please see § 141.85(f)(3) of the final rule and response to comment Section 6. For additional examples of how the final rule is not a “one size fits all” approach and the various flexibilities it allows, please see response to comment Section 1.2.

EPA considered comments on the feasibility of timelines for water systems and states in the proposed rule. In response, EPA has revised some timelines for water systems, including requiring water systems to notify customers of individual sampling results that exceed 15 µg/L lead within three business days, rather than the proposed 24 hours (see response to comment Section 8 for more information). EPA also revised the reporting date for the annual requirement for CWSs to provide public education and find-and-fix information to local and state health agencies from January 15 to July 1 to coincide with notifying health agencies of school sampling results, consistent with the Consumer Confidence Report (CCR) (see response to comments in Section 8 for more information). However, EPA believes the other timelines in the proposed rule are feasible for water systems and states to implement and has maintained them in the final rule.

EPA does not believe that the LCRR should detract from addressing other drinking water contaminants such as PFAS, as one comment expressed. EPA believes the final rule requirements are necessary to improve implementation of the LCR and better protect public health. For information on how EPA is addressing PFAS, please refer to the PFAS Action Plan at https://www.epa.gov/pfas/epas-pfas-action-plan.

For responses to comments related to the LSL inventory and public education about LSLs, please see response to comment Sections 5 and 8, respectively.

EPA received a comment requesting Agency guidance on implementation of the revised rule for consecutive systems. One commenter recommended that EPA review past guidance to ensure consistency with the LCRR and minimize confusion, particularly with definitions where the commenter noted redundancy and a need for greater precision. EPA understands this is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. For response to comments on definitions, please see response to comment Section 2.

One commenter asked for the effective dates of the requirements in § 141.91, § 141.92 and § 141.93. EPA notes that the requirements of Subpart I, including § 141.91, § 141.92 and § 141.93, are effective 60 days after the date of publication of the final rule in the Federal Register, and the compliance deadline is 3 years after publication in the Federal Register except where otherwise specified. See Section § 141.80 for more detail.

Several commenters noted errors in the proposed rule, including incomplete sentences, conflicting requirements, and improper section references. EPA acknowledges that there were errors in the proposed rule and has worked to correct them in the final rule. One commenter inquired why there was no § 141.83 in the proposed rule although it was cited in other parts of the rule; EPA notes that this section is part of the previous rule and was not included in the proposed rule since no revisions were proposed to it. For more information on revisions made to definitions between the proposed and final rule, please see section IV.C. of the preamble to the final rule FRN (USEPA, 2020a).

One commenter wrote that the intergovernmental collaborative should be incorporated into the rule to ensure public health protection. EPA notes that the Agency consulted with governmental entities affected by the rule, consistent with the intergovernmental consultation provisions of the Unfunded Mandates Reform Act (UMRA), section 204.

One commenter requested that EPA develop a centralized information warehouse on lead health risk and risk reduction, corrosion control training and guidance for state regulators and public water utilities. EPA intends to provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

One commenter took issue with the proposed LCRR not discussing climate change effects on water supply and quality, recommending that the rule revisions be examined from a climate change perspective. EPA acknowledges the impact of climate change on water resources; however, the Agency believes its discussion is beyond the scope of the rule. For information on how EPA is addressing the impact of climate change on water resources and information on initiatives to help water systems adapt to climate change and comply with NPDWRs, please visit https://www.epa.gov/climate-change-water-sector/epa-action-addressing-climate-change-impacts-water-resources.

One commenter requested clarification on a variety of topics but did not provide specific questions. For response to comments on notifying customers within 24 hours of the lead 90th percentile exceeding the action level, see response to Section 8. For clarification on whether broadcast media includes social media, see response to Section 8. For LSL definitions, see response to comment Section 2. For the LSL inventory and galvanized service line considerations, see response to comment Section 5. For LSLR, see response to comment Section 6; for costs, see response to comment Section 16. For CCT options, see response to comment Section 4. For WQP monitoring framework revisions, see response to comment Section 10; for budget effects, see response to comment Section 16. For school and child care sampling responsibilities, see response to comment Section 12; for estimated costs of the rule, see response to comment Section 16. The commenter also requested flow charts and fact sheets to better understand the rule revisions; EPA intends to develop supporting materials to facilitate understanding of the final rule.

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2 Definitions

EPA received comments on the terms and definitions defined under § 141.2. These included new terms with definitions added in the proposal, updated definitions to existing terms from the previous Lead and Copper Rule (LCR), and slight changes to the terminology itself. Commenters were concerned about the amount of detail and specificity in the definitions provided, some recommending less detail, while many asked for additional detail and information. EPA reviewed all comments thoroughly and updated the definitions accordingly to enhance clarity in terminology in § 141.2 and throughout the rule.

2.1 General Comments

Summary of Comments

One commenter asked EPA to clarify what a point-of-entry device or, "POE" means, and if this refers to the filter in a residence or at the water system. Another commenter explained that the new terminology (lead service line (LSL), trigger level, etc.) used in the proposal will need to be more clearly defined and communicated between the various stakeholders that the rule affects. Another commenter asked for more details on the definition of "lead service line" and "shut off" to avoid misinterpretation. Finally, one commenter explained that states require more clarity on some of the terms proposed including the concepts around them. Some examples of these include: "property owner," "optimized," and "re-optimized." They recommend revising these terms in the final rule or with a supplemental notice.

One commenter asked for several updates to the proposed definitions. First, the commenter states that the “first draw” definition should not only refer to § 141.86, monitoring for lead and copper at the tap, because a first draw sample is also required for school sampling. Several commenters also ask that “hydrovacing,” “potholing,” and “trenching” be removed from the rule because the commenters either do not support these methods of LSL identification or because the limited use in the rule does not warrant a definition for each. They also suggest retaining the definitions of “small water system” and “medium-size water system” to align with other drinking water regulations, thus keeping small water system as serving populations of 3,300 as below, to prevent inconsistency between different regulations which leads to errors by the regulated community. Finally, a commenter suggested several editorial changes to individual definitions in the proposal rule, including the removal of “generally” from the definition of a galvanized service line because it could be open to too much interpretation with this added

One commenter asked for clarification on the existing definition of “consecutive system” in Part 141, which was not proposed for revision in the Lead and Copper Rule Revisions (LCRR), and the applicability of the corrosion control treatment (CCT) and water quality parameter monitoring requirements to consecutive systems.

Agency Response

In response to the request for clarification of POE, EPA notes it is currently defined under § 141.2 as “a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.” A water softener is an example of a POE device. “Shut off” refers to when water to a building is turned off from a service line or main. EPA has not included a definition of “shut off” in the final rule because the action is self-explanatory. Regarding comments on additional clarification on new terms used in the rule such as the “lead trigger level” and “lead service line,” EPA has provided clarification in §§ 141.80 and 141.2 respectively. EPA has changed the term “trigger level” to “lead trigger level.” For more information about “lead trigger level” see response to comment Section 2.4 New Definitions Added**.** In addition, EPA has not included “optimized,” “re-optimized” or “property owner” in the updated definitions because optimal corrosion control treatment (OCCT) is already included in § 141.2. EPA believes that it is clear that property owner is the party or individual that owns that property referenced in the rule; thus, EPA did not include a definition for this term.

EPA has retained the reference to sampling collection methods under § 141.86 for the “first draw” definition because this refers to sampling after a stagnation period of six hours under the tap sampling methods. The protocol for sampling at schools under § 141.92 in the final rule uses the phrase “first draw” but the volumes of the first draw and stagnation periods differ depending on whether the sampling is for compliance with §§ 141.86 or 141.92. EPA chose to include a definition of “first draw” in § 141.2 that is applicable only to the sampling conducted under § 141.86 and not to expand the definition to reference the sampling conducted at schools and child-care facilities under § 141.92 in order for the sampling requirements for schools and childcare facilities to be self-contained in § 141.92 and to avoid confusion as to the sampling requirements for public water systems (PWSs), which may include schools that are regulated PWSs. This choice has no substantive impact on the requirements for sampling under either §§ 141.86 or 141.92. The terms “hydrovacing,” “potholing,” and “trenching” have been removed from the final rule because, as pointed out by commenters, they are not used in the rule.

EPA disagrees with commenters that small systems should be defined as they have been "for the purpose of Subpart I of this part only" as a "water system that serves 3,300 persons or fewer". For purposes of small system flexibility options under § 141.93, a small system is one serving 10,000 or fewer persons, and the definition of a medium-size system has been modified for subpart I only, to encompass those systems serving greater than 10,000 to less than or equal to 50,000 persons. EPA recognizes that while small systems serving between 3,301 and 10,000 persons may have greater technical, managerial and financial capacity than smaller systems, they still face financial and managerial limitations. EPA has determined that it is not feasible for systems serving 10,000 or fewer persons to implement the multiple treatment technique actions of (OCCT), public education (PE) and lead service line replacement (LSLR). Implementing such a complex program requires consequential managerial, operational, and financial investment. Please see response to comment Section 7 for a more in-depth discussion.

EPA did not define "consecutive water system" in the final rule but has clarified requirements for sampling and monitoring. See response to comment Section 4 and 10.

2.2 Lead Service Line (LSL) Definition

EPA reviewed the comments received on the proposed definition of "lead service line." Some commenters were opposed to the exclusion of goosenecks, pigtails and connectors from the definition, explaining that these connectors are a source of lead and must be included. Other commenters asked for increased clarity on how galvanized service lines fit into the definition. Some commenters disagree with including the private side of the LSL in the definition which affects implementation of various parts of the rule. Some commenters recommended increasing the clarity of the definition as they claim it is confusing as written in the proposal.

Lead Connectors in LSL Definition

Summary of Comments

Many commenters objected to the exclusion of connectors in the proposed definition of an LSL. These commenters argued that connectors are made of lead so should be included because they directly contribute to lead in drinking water, and therefore, exposure. Commenters stated that they are also a significant source of lead in drinking water because of how they flex with temperature which compromises the protective coating developed from CCT. In turn, they argued this increases the likelihood that the connectors release lead particulates into drinking water. These commenters state that excluding them from the definition is providing false information to residents who have connectors which creates a risk. These commenters asserted the proposed definition is problematic because it exempts connectors as LSLs. Therefore, the water system's inventory and customer notices will be misleading stating "non-lead" although connectors are made of lead and may be present. This will also impact the types of lines that are sampled under § 141.86. For instance, under the proposal, lead connectors would not be sampled, only if they are in a building connected to LSLs. Another commenter states if the rest of the line is non-lead and because EPA has not defined "service line," if the system is replacing only the connector, this would be equivalent to a partial LSLR. These commenters state that EPA provided no explanation for this change but obviously sees these connectors as posing a risk to lead in drinking water because they are required to be removed upon LSLR and during routine and emergency maintenance in § 141.84(c). These commenters also explain how an LSL is defined by the states of California, Michigan and the Water Infrastructure Improvements for the Nation (WIIN) Act.

One commenter asks that EPA share data to justify why connectors are excluded from the definition. Another commenter states that if a connector is a part of a service line then the service line should be considered lead until all lead is removed. Another commenter states that failure to keep connectors in the definition will result in elevated sources of lead in homes and provide inaccurate messages that a pipe or system is completely lead-free. One commenter stated that regardless of what it is connected to, a lead connector should be considered an LSL. One commenter states the exclusion of connectors from the definition is unjustified and since it is a requirement to remove them during replacement of LSLs, this should prompt their inclusion in the definition of LSL. One commenter suggests all lead fittings be included in the LSL definition, including connectors even when they are the only part of the line that contains lead.

Some commenters support including connectors in the definition for purposes of the inventory and replacement provisions in the rule. These commenters explain that their system will not be able to confirm what is or was upstream, prompting them into replacing many that may be of no risk. Another commenter supports the mandatory replacement of connectors urging them to be included in the definition.

A commenter argues EPA does not offer justification for excluding connectors from the definition and including them only when they are connected to a galvanized line requiring replacement. A commenter states that even though connectors may pose a lesser risk to lead in drinking water than a full LSL because of their size, they should be included in the definition. This commenter states that it aligns with the reasons behind the National Drinking Water Advisory Council's (NDWAC's) recommendation: "any service line where any portion, including a lead pigtail, gooseneck or other fitting, is made of lead" (NDWAC, 2015a). This commenter also states that the proposed definition goes against the WIIN Act which prohibits the exemption of connectors from the definition: "The term 'lead service line' means a pipe and its fittings, which are not lead free (as defined in section 1417(d)), that connect the drinking water main to the building inlet." A commenter questions whether the exclusion of connectors is permitted under the Safe Drinking Water Act (SDWA) for an LSL, "a pipe and its fittings which are not lead-free," given that connectors are not lead-free. They state that their exclusion is problematic, that EPA lacks legal authority to define an LSL in different way from Congress under 42 U.S.C. § 300j-19b(a)(4), and if connectors are included, they should count towards LSLR rates. Several commenters propose their own LSL definition which includes connectors. One commenter states the exclusion of these connectors from the definition is a weakening of requirements under SDWA and the 1991 Rule. They argue that there would be partial replacements if the portion inside the house is also not removed.

Two commenters request that EPA clarify why if the only part of a service line is a gooseneck, then it is not considered an LSL. One asks for data to prove it isn't lead and does not understand why they must be replaced when encountered but not included in the sampling tiering criteria under § 141.86. Two commenters do not support connectors in the LSL inventory because they do not believe they should be counted separately as LSLs unless they are the only leaded portion of the line. These commenters support their removal when found during LSLR.

One commenter stated that if any part of a service line contains lead, then it contributes to lead exposure in drinking water, including all lead connectors such as goosenecks and pigtails. Another commenter asks about the definition of an LSL in regard to LSLR notification requirements under § 141.85(f) and if the replacement of a lead connector is included under these requirements. One commenter explains that lead connectors can be a major source of lead in drinking water and should not be excluded from the LSL definition. They state, the connecters can release lead into drinking water when they move and note that EPA implicitly acknowledges that risk in the proposed requirement in § 141.84 to replace connecters when encountered during other maintenance activities. This commenter disagrees with a situation where a service line is made of unknown material or non-lead material, but contains one or multiple lead connectors, and according to the proposed definition, it would not be considered an LSL.

Agency Response

EPA agrees that clarity was needed in the definition of an LSL due to its importance related to LSL inventory, LSLR outreach, and selection of tap sample sites and has clarified this in section III.C of the final rule notice (USEPA, 2020). EPA has modified the definition to simplify it and to specify that it is for the purposes of the LCRR only, to prioritize tap sampling sites and replacement of full LSLs. EPA excluded the lead connector portion of the LSL definition and has clarified the lead connector definition itself. For purposes of this rule, lead connectors are not a part of the service line and are required to be replaced only when identified while conducting other maintenance and replacement activities. EPA has kept these connectors out of the LSL definition to ensure water systems are conducting LSLR on service lines and not counting replacement of connectors as a replaced LSL.

The Agency agrees these are sources of lead and present a risk to public health and have included appropriate rule provisions to address them. In response to notification requirements regarding the replacement of connectors, EPA has included a notification requirement after the replacement of a connector due to a disturbance under § 141.85 (f)(2).

EPA disagrees with commenters who suggested that the privately owned portion of an LSL should not be included in the definition because the LCRR requires full LSLR, not just replacement of the water system owned portion.

Galvanized Lines in LSL Definition

Summary of Comments

Many commenters sought clarification on galvanized service lines in the LSL definition. Several commenters asked for clarification on inventory requirements since they are included in the definition of an LSL. Another commenter asked EPA to explain how these lines warrant enough risk for replacement but not for tap sampling and how this provision will impact state oversight specifically with tap sample site selection. Many commenters state that all galvanized pipe should be included in the definition regardless of what it is connected to. Another commenter recommends excluding all galvanized lines from the definition of an LSL stating it will be impossible to determine what was upstream of the line and it is confusing how these are treated in different parts of the rule. This commenter explains they do not have LSLs so these lines would be their major lead concern for their system. Several commenters ask for clarification on when a galvanized service line is considered an LSL. One commenter suggests several subcategories to define LSLs based on if lead is expected or not for unknowns (lead probable or not).

One commenter suggests including all galvanized service lines in the definition of the LSL or none of them in lieu of partial inclusion of them that is proposed. The commenter explains, like many others, that it will be extremely difficult to determine if one was ever downstream of a lead source. Another commenter requested clarification as to where galvanized service lines fit in the tiering pool under § 141.86 based on the LSL definition. One commenter stated that the galvanized line downstream of an LSL will be problematic for their system, causing them to replace thousands of lines with “virtually no public health benefit.”

Many commenters state that EPA does not provide rationale for galvanized lines downstream of lead needing replacement (§ 141.84) but not monitoring at the tap (§ 141.86). They explain that because the galvanized lines are not considered an LSL for the purposes of tap sampling, but included in the LSL definition, it is unclear how water systems would manage this discrepancy when developing sampling plans. While many others express concern it will be too challenging to implement because most systems won’t have records to know what was upstream of the galvanized line. One commenter suggests defining how a galvanized line would be considered “downstream” and define it separately. Another commenter recommends a new term for these titled “lead impacted service line” and suggested providing a definition.

One commenter believes that galvanized lines should not be considered in the LSL inventory as these have not been incorporated before and they explain this would be a large burden to the PWS. They state this would involve more communication with the homeowner to determine if galvanized lines are a part of the internal plumbing system. This commenter explains that the studies EPA cited when making this decision are “bad science” and do not reasonably conclude the dissolved lead from galvanized lines is not reasonably different than that from mixed home plumbing.

One commenter suggests that galvanized lines should either be considered an LSL or not regardless of what is upstream to avoid confusion. Another commenter asks why EPA would only consider galvanized lines downstream of a lead source when there is lead risk from the zinc coating internal of the galvanized pipe. One commenter suggests that galvanized lines should not be called LSLs but should be subject to the same requirements including inventory and replacement.

One commenter suggests that after a period of time, the lead risk would decrease from galvanized lines downstream of a lead source and therefore, a time period should be included in this portion of the LSL definition. Similarly, another commenter explains that the inclusion of “ever was” in the definition is problematic without providing a definitive time frame. Another commenter suggests the definition is problematic, because many LSLRs took place voluntarily, so records do not exist for when these occurred. Therefore, determining if the line “ever was” downstream of a lead source will be almost impossible so most galvanized lines will be considered an LSL due to lack of records.

One commenter states the preamble should include information on how to prove the galvanized line is meeting the definition’s criteria. Another commenter supports the inclusion of galvanized lines as proposed in the LSL definition because of their ability to absorb then leach lead particles into drinking water. They ask EPA to clarify this part of the definition. Other commenters echo that the “ever was” would create problems, stating to include a galvanized line in the definition regardless of what is upstream for simplicity.

One commenter asserted that a galvanized service line with only a gooseneck upstream should not be considered an LSL. Several commenters ask if a galvanized service line downstream of a gooseneck, etc. not just an LSL or unknown would be considered an LSL. They state that the LCRR allows them to be counted for inventory purposes but not used for tap sample collection. Another suggested EPA provided visuals of a galvanized service line downstream of an LSL and a connector. One commenter supports the exclusion of galvanized service lines downstream of a lead gooseneck, etc. from the definition.

One commenter explains there is confusion on how galvanized lines are being addressed differently in the rule and expressed concern that a galvanized service line downstream of a connector is considered an LSL in the rule and definition. This is a concern since their system does not have LSLs and asks that galvanized service lines be separated out from the LSL definition.

Two commenters ask for clarification that galvanized lines downstream of only a lead connector would not be considered an LSL. They state that because they do not have LSLs but have galvanized lines that are potentially downstream of a connector, since they cannot confirm, most of these lines would be classified as an LSL. Therefore, this may result in low lead sampling results because these lines may not actually have a lead gooseneck. Therefore, this will not provide an accurate indication of how well CCT is working. They also suggest that for systems without LSLs, unknown service lines should not be considered LSLs. One commenter asks why EPA considers LSLs that are upstream of a galvanized line as contributors to lead in drinking water but lead connectors are not. Several commenters suggest that systems do not have records for when they replaced connectors and ask for recommendations on how to determine this.

One commenter states that it is confusing in the proposal where a galvanized line is considered an LSL for the purposes of inventory but not for sampling and they suggest these should be included as Tier 1 sampling sites and that most utilities will not have adequate records to determine upstream material so they will be deemed an LSL by default. One commenter asks that galvanized lines downstream of a connector are not considered an LSL since connectors are not defined as an LSL.

Several commenters state the proposed LSL definition is circular in nature and asks EPA to delineate if a galvanized line downstream of a lead connector is an LSL.

Agency Response

The Agency modified a couple of definitions to address commenter concerns and to improve clarity. EPA determined that a galvanized service line that is or ever was downstream from an LSL requires replacement but is not included in the LSL definition to reduce confusion and because it has its own definition. In addition, EPA included sites served by a galvanized requiring replacement in the tap sample site selection criteria (Tier 3) in the final rule. This also helps clarify that while galvanized service lines that were or are upstream of an LSL require replacement, they are not appropriate sites for tap sampling.

The Agency has also clarified the various rule requirements associated with galvanized service lines with added language in the respective rule sections, such as in § 141.84 and § 141.86(a). For example, in § 141.86 the Agency has added a new tier for tap sample selection to address galvanized lines that could be a lead source. In this final rule, Tier 3 contains "galvanized lines identified as being downstream of an LSL currently or in the past or known to be downstream of a lead connector (lead gooseneck, pigtail or connector)." With this update, those galvanized service lines that have been impacted by upstream lead sources, including connectors are now prioritized in tap sampling. In response to the public comments and to specifically address those water systems which have no LSLs or very few, Tier 3 will ensure the sites selected will contain lead-impacted galvanized service lines if the water system has these.

EPA has removed the portion of the LSL definition related to galvanized lines to avoid confusion. Instead, the Agency has retained the separate definition for "galvanized service line" and has included detail in the corresponding rule sections as necessary, like in § 141.86 described above. The treatment of galvanized lines with regard to other provisions is described in those sections, such as in § 141.84, where galvanized lines requiring replacement are handled in LSL inventory and LSLR. In addition, EPA added a new definition "full lead service line replacement" to make clarifications requested by commenters. EPA believes the modified and new definitions associated with LSLs and LSLRs will improve implementation for tap sample site selection, LSL inventories, and LSLRs.

Other Comments on LSL Definition

Summary of Comments

Many commenters expressed concern that the proposed definition of an LSL under § 141.2 is not clear and is too complicated. Several commenters state that it is difficult to understand and thereby may be misinterpreted by relevant stakeholders and needs to be clear and consistent in the entirety of the rule and at present it is not. They recommend providing a table or visual to help interpret how an LSL is defined and affects different parts of the rule. One commenter explains the confusion in how galvanized service lines downstream of lead are included in the definition but lead goosenecks, etc. are not. One is concerned that the definition is too broad as currently written. Another commenter urges that the definitions between EPA and states be consistent.

One commenter asks that EPA make the definition clearer and provides suggestions to delineate the different types of service lines from a lead pipe to an unknown service line. Another commenter states that the parts of the definition around ownership should be removed and instead included in guidance. This commenter recommended that EPA retain the current definition. Two commenters state that goosenecks, galvanized lines and lead solder should be considered an LSL for simplicity and because these are all sources of lead. One of these commenters cites the NDWAC Lead and Copper Working Group "a lead pipe, even if only a small portion, poses a sufficiently similar risk as a full lead service line" (NDWAC, 2015b). A commenter also asks EPA to remove the phrases containing "galvanized service lines" and "goosenecks" altogether because they already have definitions.

EPA also received comments on how service lines of unknown lead status are considered in the LSL definition and under various parts of the rule. One commenter asks for clarification on when an LSL is referred to in the rule and if it is referring to known LSLs only, or also unknown service lines. They refer specifically to sections §§ 141.84(a)(5)(i) and 141.84(a)(5) of the proposed LCRR (USEPA, 2019). They suggest adding another term for these unknowns and to be clear in the rule text when EPA is referring to both or either one. Another commenter asks EPA to provide criteria for what an "unknown" is since they are included in the LSLR. One commenter suggests including categories for unknowns for when lead is expected to be present or not.

Two commenters asked for clarification of "building inlet" in § 141.2, in "a service line made of lead, which connects the water main to the building inlet.*"* One states this could be interpreted as the outside wall of the building which would result in plumbing inside not being replaced. Another questioned which part of the line is included, asking if it is the premise plumbing itself, from the line to the meter or something else.

A commenter states that leaded solder is a significant source of lead and should be explained in the rule, specifically on the customer side, asking EPA to include lead solder as an LSL because it poses a lead risk. Several commenters ask EPA to disclose all leaded parts of service lines. One asks for criteria to be provided for "lead" vs "non-lead" designations.

Several commenters state that EPA has not differentiated the LSLs that are used for other services such as fire protection or irrigation, and these sites that are not used for drinking water consumption should be given a lesser priority or should not be included in the replacement and sampling plan. Another commenter asked if fire lines and other non-potable uses are considered as an LSL in the LCR.

Another commenter asks for clarification on "downstream of an LSL" in the definition, because it could be misinterpreted. They suggest that it should be clearly stated to mean lines downstream *from* the water main not downstream of the water main like in the Total Coliform Rule (Subpart Y).

One commenter asks that EPA delineate the public and private side in the rule to standardize it because currently many states use the meter as the differentiation. One commenter expresses that expanding the definition into the private side and for unknown service line increases the burden to the system to remove lead beyond its control. Another commenter asks EPA to define service line from water main to the meter and confirmed lead lines would be removed by the system. One commenter asks EPA to clarify the distinction between public and private lines and designate the responsibility of the water system. They explain that across the area there are different ways to determine this and it can create confusion during replacement activities. Another commenter explains the difficulty with access to the customer-side of the service line and asks that the customer side of the service line "be limited to the boundaries between the water meter and the customer property limit."

One commenter supports the inclusion of galvanized lines in the definition but with some alterations in the text and asks EPA to include lead connectors as an LSL and additional language in the definition of "lead goosenecks, pigtails and connectors" as it relates to the LSL definition. One commenter proposed their own definition for EPA's use in the final rule with an addition to the portion on lead goosenecks to improve clarity.

One commenter asks what EPA means by "downstream of any service line" and how water systems will prove if a galvanized line ever was downstream of a lead source/connector. They assume that it is directly connected to the service line made of lead. One commenter asks that all leaded lines and parts be disclosed and included in the definition of an LSL and provide criteria for what is "lead" and "non-lead."

Another commenter encourages EPA to use California's definition of a "Lead User Service Line." This definition only includes the pipeline between the water main and water meter, yet it does include any lead connector, which the commenter feels should be included in EPA's LSL definition. The commenter asserted differences in these definitions and thus the inventory will cause confusion and unduly burden to systems in California. The commenter also states that the LSL definition is problematic because it includes the pipe from the water main to the building inlet and there are properties that have a long setback from the property boundary, so the system may not be able to determine the material of the line.

Agency Response

The Agency recognizes the importance of clearly communicating these terms to water systems, states, and other affected parties. The proposed definition of an LSL contained many nuances with connectors, service lines that are of unknown material, and galvanized service lines. The Agency modified the LSL definition and added a definition for a "full lead service line replacement" in order to improve clarity. EPA also, revised the LSL inventory requirements, LSLR requirements, and tap sample site selection tiering criteria to further clarify how lead connectors and galvanized service lines are to be considered in the final rule. See response to comment Sections 5, 6, and 9, respectively.

EPA agrees that LSLs from "other services" as fire protection and irrigation, may be of a lesser priority than LSLs servicing sites with drinking water uses. However, EPA disagrees with including "potable" in the LSL definition because it isn't certain that these sites would not be used for drinking water and the water system may not be aware of all uses for each site.

For designations of lead and non-lead, commenters should refer to the definition of "lead-free" in Section 1417 of SDWA. The designations of service line materials for the inventory can be found in § 141.84(a)(4). To address comments on the "unknown service lines" in the proposed LSL definition, EPA has termed these "lead status unknown service line" and has defined them.

EPA is maintaining the proposed LSL definition regarding ownership ("an LSL may be owned by the water system, owned by the property owner, or both") to ensure that the customer or private side of the service line are included in rule requirements such as inventory and replacement. EPA is maintaining the requirement for full LSLR regardless of ownership.

2.3 Definition of Customer/Consumer/Owners of LSL/Residents

Summary of Comments

One commenter expressed concern about how the definitions of "customers" and "consumers" are used throughout the rule, specifically in §§ 141.84 and 141.85 and alerts EPA of the different groups of people impacted. This commenter explains that "customers," as defined, should be manageable for the water system to communicate with because they are the paying users of the water system. They discuss how those that own the service line are not included in either the "consumer" or "customer" definition but may be assumed to be the customer, and how both of these terms are used interchangeably in the preamble; whereas "resident" is not defined in the rule but the water system will need to communicate with them. This commenter explains that because the definition for "consumer" is so broad and may include residents, tenants in a building, etc. it will be difficult to contact them for purposes of §§ 141.84 and 141.85.

Several commenters stated that "consumer" and "customer" are not used as unique terms throughout the rule and ask EPA to clarify their definitions and use, such as in "consumer notification" under § 141.85. One of these commenters explains that in their water system, the "customer" refers to the owner of the property. Another commenter explains how these two terms are misused in the proposal and do not match the appropriate definition, citing several examples where there are errors in both §§ 141.84 and 141.85.

Agency Response

EPA reassessed the utility of codifying definitions for consumer and customer in § 141.2 since the definitions would apply more broadly than just to the LCRR. Other regulations that water systems must comply with, such as the Consumer Confidence Report (CCR) (USEPA, 1998) and Public Notification (PN) (USEPA, 2000) have defined these terms. EPA agrees that the preamble and regulatory text inconsistently used these terms and has made modifications to improve clarity and ensure consistency. EPA determined that these modifications within Subpart I are clear and include the appropriate population in the various sections of the rule with more detail such as "persons served by the water system at the service connection." The Agency concluded that water systems and states have implemented the previous LCR without requiring these definitions in § 141.2 and believes that more accurately specifying the intended audience for various PE and notification purposes in the final rule addresses commenter concerns about ambiguity and confusion.

2.4 New Definitions Added

Summary of Comments

EPA proposed various new definition under § 141.2 in the proposed LCRR and received many comments and questions about these new terms. Several commenters asked EPA to clarify the definition of "pitcher filter" specifically as it relates to the American National Standards Institute (ANSI) certifying body. They also commented on the wording and the inclusion of both parts of the device (pitcher and cartridge). One commenter recommended edits to the "pitcher filter" definition using the correct term to refer to the ANSI. One commenter asks the Agency to refine the "pitcher filter" definition as written because they asserted the definition in the proposal only refers to the insert and not the pitcher. A commenter recommended that the definition of a "pitcher filter" include the standard for reduction of lead. Several other commenters also stated that the standard should be included in the definition of "pitcher filter." One commenter asked for the definition of "pitcher filter" to include what is acceptable and expand beyond ANSI standards. One commenter had several suggestions for the "pitcher filter" definition. First, not including "remove" because these devices can only reduce lead. They stated that the definition as proposed only includes the insert and asked EPA to explain the appropriate lead reduction standard for use. Another commenter stated that "pitcher filter" is unclear specifically with the definition's reference to ANSI standards, and they offer a substitution that includes other certifying bodies. A commenter asked that EPA not limit the types of pitcher filters allowed for use, because some faucet filters (point-of-use or "POU" devices) are certified to remove lead.

Another commenter asked for clarification on the definition of "wide mouth bottle" which included a specification for being at least 55 mm wide. The commenter asked EPA which part of the bottle this is referring to (inside of mouth, outside, etc.). This commenter asked EPA to clarify a specific inner and outer measurement for "wide mouth bottles" and if there are bottles currently available as specified in the proposal. Several commenters suggest deleting "to optimize capturing accurate lead measurements" from the "wide mouth bottle" definition as it implies that this is the only important aspect of these bottles. Another commenter suggests including a volume in the definition of "wide mouth bottle."

Two commenters ask that the term of "find-and-fix" be changed to "sample site assessment." While another commenter requested that the name of these activities be changed to "follow-up sampling."

One commenter stated that “find-and-fix” definition should be more generic for future regulations as it is too specific to the LCR as proposed. One commenter claims that because find-and-fix is explained in § 141.82(j), the definition is unnecessary.

One commenter gave a robust explanation for the terms “compliance period,” “monitoring period,” and “sample period” and the guidance provided by EPA in the past. Others state that “sampling period” is used synonymously with “monitoring period” in the proposal and the Agency has replaced “compliance period” with “monitoring period” and replaced “monitoring period” with “sampling period,” asking EPA to clarify this confusion. They also provide a suggestion for the definition of “sampling period.” Another commenter had a similar concern with these three terms being used interchangeably. One commenter declared that both “sampling period” and “monitoring period” may not be needed because they can cause confusion.

Another commenter recommended that “sampling period” should be replaced with “collection period” to be consistent with the Safe Drinking Water Information System (SDWIS). Another commenter asked EPA to clarify the difference between “monitoring period” and “sampling period.” They also ask EPA to include “lead” in the “trigger level” definition because trigger level is used is in other National Primary Drinking Water Regulations (NPDWRs) such as the Long-term 2 Enhanced Surface Water Treatment Rule.

Commenters asked EPA to add a timeframe to the “pre-stagnation flushing” definition, which could be confused with “flushing” in the 3Ts guidance (USEPA, 2018).

Another commenter asked EPA to reword the “trigger level” definition to be consistent with the “action level” which includes a lead concentration. Another commenter requested that the definition of “trigger level” be clarified with regard to whether if an action level is exceeded, whether trigger level activities should cease. One commenter has a suggested edit for POU device and POE device.

Several commenters asked for the removal of “generally” in the definition of galvanized service line.

Agency Response

Based on public comment, the following definitions have been revised in the final rule to provide more clarity and improve understanding: “action level,” “pitcher filter,” “first draw sample,” “wide-mouth bottle,” “find-and-fix,” “pre-stagnation flushing,” “galvanized service line,” “gooseneck, pigtail and connector,” “lead service line,” “point-of-use device,” “school,” “elementary school,” “secondary school,” “tap sampling protocol,” “wide-mouth bottle,” and changing “trigger level” to “lead trigger level.” EPA has created consistency in the use of term throughout the rule where applicable and corrected any errors in definitions, terms and their application to other parts of the LCRR.

Regarding request to include the lead reduction standard in the “pitcher filter” definition, EPA has not included this because the standard may change in the future. The Agency modified the definition to ensure both the pitcher and replacement cartridges are included. While the Agency did not modify the definition to include faucet devices that reduce lead, EPA did revise the risk mitigation measures water systems must take after an LSLR or disturbances to include POU devices. See response to comment Section 6.

In addition, based on comments, EPA has reevaluated “monitoring period,” “sampling period,” and “compliance period” and has determined that clarity is needed and, thus, has modified the terms and definitions. Further, EPA revised regulatory text to ensure consistent use of the defined terms. EPA has changed these terms to “tap sampling period” for the timeframe when samples must be collected and “tap sampling monitoring period” for the frequency (i.e., semi-annual, annual or triennial). The Agency also clarified that these terms are for monitoring requirements under § 141.86 only.

EPA does not agree that find-and-fix should be referred to differently. The concept of find-and-fix and the terminology was suggested by stakeholders and EPA determined the definition and requirements are clear and understandable. The Agency did, however, clarify that the find-and-fix steps include a site assessment (at the tap sample site with results > 15 ug/L) and treatment assessment (CCT/water quality parameter evaluation). EPA also does not agree that the numerical level in the “find-and-fix” definition should be removed. EPA has retained this for clarity as this initiates the find-and-fix requirements.

EPA has also added several terms and definitions in this final rule based on feedback from commenters, including: “full lead service line replacement,” “lead status unknown service line,” “system without corrosion control treatment,” and “partial lead service line replacement.” These have been added to improve communication of replacement events in the rule (§ 141.84) and to better classify service lines if the lead status is unknown. EPA also disagrees with adding a maximum stagnation time to the definition of “pre-stagnation flushing.” See response to comment Section 9.

The definition of wide mouth 1-liter bottle has been clarified to specify that it must have an internal mouth diameter of 55 mm.

In response to the comment on the definition of the “trigger level,” if a water system has exceeded the trigger level, then subsequently exceeds the action level, the trigger level activities under the rule for that system cease and the action level activities begin.

2.5 Other Existing Definitions Revised in Proposal

Summary of Comments

One commenter suggests that certain phrases included in the “action level” definition be removed. (“lead service line replacement” and “tap sampling”). Commenters suggested EPA revise the definition of “effective corrosion inhibitor residual” instead of including the study requirement in § 141.82. Commenters noted that EPA is using the fifth liter sampling protocol then the “service line sample” definition should be removed from the definitions section. A commenter also requested clarification on “single family structure” due to receiving feedback that “Tier 1 sites” should be residences and not sites used for business. Another commenter requested changes to “find-and-fix,” “galvanized service line,” “action level” along with several others.

One commenter stated that the “first draw sample” should include a reference to samples taken for schools and child care facilities in accordance with the 3Ts guidance (USEPA, 2018) in addition to the reference to § 141.86.

One commenter expressed concern that the definition of optimal corrosion control has changed from a treatment that minimizes lead to that which reduces it to the trigger level, stating this violates SDWA and lets systems ‘off the hook’ to continuously reduce lead levels and weakens protection of public health in violation of the back-sliding provision. They reference the current definition of OCCT under § 141.2 which states it “minimizes copper and lead concentrations.” They express that systems are tasked at all times to continuously reduce lead levels through CCT, and asserted that the proposal removes the responsibility of the system to do this to the "maximum extent feasible." The commenter argues this provides a lower level of protection to public health, stating EPA should remove any provisions that include meeting a lead level to be deemed "optimized" even if it's below the 90^{th} percentile trigger level, and failing to do so would be "unlawful."

One commenter asked EPA to specify population size instead of using small, medium, and large systems in the rule, because it is confusing. They state that small systems are defined differently than in other federal safe drinking water regulations, which defines them with a population of 3,300 or fewer. Several commenters asked EPA to retain the current definitions of "small water system" and "medium-size water system" in the final rule. Another commenter states that the definitions for medium and small water systems should indicate if these also apply to non-transient non-community water systems (NTNCWS).

Agency Response

EPA has decided to retain the definitions of small and large water system from the LCRR proposal because to prevent confusion between other NPDWRs. Because of the constraints that water systems serving between 3,301 and 10,000 persons also face, small water systems in the LCRR include those systems that serve 10,000 or fewer persons, and medium-size water system has been updated in this final rule. See response to comment Section 7 for further detail.

In addition, the Agency has amended the following terms to be clearer and avoid misinterpretation: "first-draw sample" and "action level." The final rule prohibits "testing out" of LSLs to count toward LSLR, therefore, as commenters noted, the definition of "service line sample" is no longer applicable. The Agency has removed this definition.

EPA disagrees that a definition for single-family structures is warranted as it is clear it refers to residence and not a nonresidential building.

EPA disagrees with the commenter stating that the numeric value should not be included in the "action level" definition. EPA concluded that it is important that the lead action level and lead trigger level definitions include the 90^{th} percentile value that delineates an exceedance which then compels further requirements by water systems to reduce lead levels in drinking water. In agreeance with another commenter, EPA has removed the phrases about LSLR and tap sampling from the action level definition, as these descriptions are more appropriately elsewhere. EPA has not proposed a revision and to the definition of effective corrosion contributor residual and does not believe modification is needed.

EPA maintained the reference to § 141.86 in the definition of first draw sample. Although first draw samples are also collected for child care and school sampling, the protocol uses a different volume and has different stagnation time requirements. Therefore, EPA did not reference § 141.82 in the definition.

EPA did not revise the definition of optimized corrosion control. Adding requirements for a trigger level exceedance did not change the requirement for water systems to continuously reduce lead levels in drinking water. The OCCT definition still means "the treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations." The new rule provisions are an improvement to the previous rule requirements for OCCT, because now all water systems must complete corrosion control study if the trigger level is exceeded and implement OCCT if the action level is exceeded (except small systems that elect to implement a small system flexibility option). When a water system meets criteria for optimization (e.g., small or medium-size system that does not exceed the lead trigger level and copper action level for two consecutive six-month monitoring periods under § 141.86) it is "deemed" optimized or re-optimized for the purposes of the LCRR only. However, the water system must still maintain corrosion control continuously, until the State determines in writing that it is no longer necessary.

2.6 Definitions of Child Care Facility and Schools to be Covered Under Testing

Definition of Child Care Facility and Schools

Summary of Comments

Many commenters had concern that the definition included home-based childcares, including those that are unlicensed and those of any size. While others supported the inclusion of these and described how licensing will omit many others that should be required to have testing. In addition, because licensing differs between states and regions, commenters are concerned this will result in a wide variation in applicably of testing in child care facilities.

Several commenters stated that the definition of child care facilities should include those of a certain size, with suggestions of ten or more children. Several commenters are concerned that if home-based child care facilities are included, the water system would not have information on these, they could change frequently and unless there is some routine communication between these facilities and the water systems, then the system cannot identify them. One commenter is concerned if the community water system (CWS) will need to track all child care facilities and the burden associated with this. Several commenters mentioned that if the in-home child care facilities would be included in tap sampling under § 141.86, and therefore should not be included in the definition to avoid duplication of efforts.

Many commenters had concern on the inclusion of "licensed" in the definition of child care facilities. Several explain that this varies widely in states and local jurisdictions so this will create inconsistencies with the rule implementation, especially those that are "registered" not licensed. One commenter asserted that by including only licensed childcares, many facilities are left out. The commenter provided data showing that 24 percent of children in the United States are in unlicensed day cares. One commenter asks EPA to further define licensing in the definition. Another explains that there are several different types of child care facilities in their state, and that in the proposal's definition, by including only licensed facilities, EPA is including only a subset of these. One commenter asks that EPA include "licensed" before "childcare" in all parts of the rule and that this responsibility of testing be transferred to the state's department of human services. Several commenters ask EPA to provide more specificity in the definition and they question which types of facilities are included, such as private facilities.

Many commenters ask that "other location" be deleted from the definition of "school" under § 141.2, as it does not fit with EPA's intent based on cost estimations and could unintentionally include homeschools, nature centers, art and music facilities, athletic sites, museums, etc. These commenters believe the definition to be too broad and explain that it is unclear if private schools are included. One commenter suggests that only those facilities under the state department of education should be included in testing and thus the definition. Many commenters express concern that homeschools are being included in the definition as written and ask for EPA to provide clarification. One such commenter mentions how homeschools are not regulated and the difficulty with finding and tracking these locations, and another describes how the state should be responsible for this list and updating it. Some commenters ask for more clarity in the definition of schools. One commenter asks for clarification if tutoring centers, kindergartens, churches, etc. are included as schools. Another commenter asks that the schools included are only those with state-issued licenses. One commenter supports homeschools to be included in the definition of schools.

Another commenter asked for clarification if community colleges and technical schools are required to be included in school testing under the definition of "school," while another asked to clarify if other facilities like dance academies, churches, park department facilities, etc. are included. One commenter asked EPA to revise the "school" definition to more closely resemble "child care facility." Another commenter explained that schools will be considered private property while service providers manage the PWS. One commenter provided their proposed definition of school which includes a minimum number of students and number of days the facility holds classes or services. It also excludes colleges and universities. Another commenter mentions that private and charter schools may be more difficult to locate and collect samples from.

Agency Response

EPA acknowledges that requiring tap sampling at licensed child care facilities may exclude some unlicensed or in-home child care facilities. However, the Agency determined it is not feasible for water systems to find and track these undocumented child care facilities. Home-based facilities may be included in compliance tap sampling in § 141.86 if they meet site selection tiering criteria. The tap sampling protocol for the school and child care sampling differs from the compliance tap sampling protocol and for facilities located in homes the compliance tap sampling protocol (e.g., 1 liter in volume, first or fifth liter depending on the presence of an LSL) is more appropriate to identify elevated levels of lead. Therefore, EPA has maintained the proposed definition of "child care facility." The final definition of child care facility is "a location that houses a licensed provider of child care, day care or early learning services to children, as determined by the State, local, or tribal licensing agency." EPA believes this provides adequate detail to ensure the majority of child care facilities are captured and is feasible for water systems to comply.

EPA acknowledges commenter concerns and has revised the definition of "school" by removing "or other location" to reduce ambiguity. The Agency did not intend to include sites like museums, nature centers or athletic facilities in the definition and therefore in sampling requirements under § 141.92. Home-based facilities may be included in compliance tap sampling in § 141.86 if they meet site selection tiering criteria. The tap sampling protocol for the school and child care sampling differs from the compliance tap sampling protocol and for facilities located in homes the compliance tap sampling protocol (e.g., 1 liter in volume, first or fifth liter depending on the presence of an LSL) is more appropriate to identify elevated levels of lead.

EPA does not agree that only facilities under the state department of education should be included in testing and therefore excluded this specification from the definition of school, because this may exclude facilities with large student populations. Excluding certain facilities, such a private or any school without a state-issued license could lead to decreased knowledge of lead levels at these facilities and therefore exposure to students. The goal of the LCRR is to protect public health especially those most vulnerable from lead in drinking water. The testing is applicable to elementary and secondary schools and facilities, thereby technical schools, community colleges and universities are not included. To prevent further confusion on school grades to be included in the mandatory testing program in the final rule, EPA has added definitions for "elementary school" and "secondary school" as well. While EPA understands it may be more difficult to locate private or charter schools, since there are fewer in number, the Agency determined it is feasible for water systems to identify these facilities for tap sampling. See response to comment Section 6 for additional information on CWS's requirements to sample for lead in schools and child care facilities.

2.7 Other Needed Definitions

Summary of Comments

One commenter stated the "drinking water outlet" needs clarification regarding schools that no longer use these outlets. Another commenter asked EPA to clarify "metal coupon tests" by including acceptable methods for lead and copper CCT studies, citing references that have cautioned the use of coupon tests. Several commenters ask EPA to define or give guidance on what constitutes a "source change" or "significant treatment change," questioning which changes would fall into these categories.

Another commenter asks EPA to define "secondary students." One commenter urges EPA to update the definition of "optimized corrosion control treatment," because as currently written, it may be placing too much weight on the 90th percentile and median concentrations. They state that systems can still have unstable scale when achieving the lowest 90th percentile value, and that policy and guidance should be provided to allow for consideration of uncertainties that affect CCT in the field as opposed to in a controlled study.

One commenter suggests including definitions for "full lead service line replacement" and "partial lead service line replacement." Several commenters mention that definitions of "building inlet" and "water main" are not in the rule, and because they are used in the LSL definition they should be explained. One commenter asks for definitions of "orthophosphate measurement," so that systems are all using the same, and "optimization" and "re-optimization." A commenter states that it is important to define "disturbance" as it is used in the preamble. One commenter expresses that the "first-draw sample" definition is not clear with its reference and should be changed to "first liter sample." Another commenter asks that "corrective action" be defined as used in §§ 141.82 and 141.84.

One commenter requested additional detail on what constitutes "localized corrosion control treatment." Several commenters ask EPA to define "pitcher filter tracking and maintenance system" and to include what is required for this in the rule and via guidance. Another commenter asks for the definition of a "notification" for § 141.84 asking if email, voicemail, etc. suffices. Another commenter asks for clarification in the final rule on what defines a "drinking water outlet." "A pipe rig/loop test" is mentioned in § 141.82 in the proposal and a commenter asks EPA to define this.

A commenter asserted that the use of "deemed" in reference to meeting requirements for optimized corrosion control has changed and both SDWIS and the primacy agency do not identify systems as "deemed," thereby a definition is needed. Another commenter states that "lead-bearing plumbing materials" should be modified to "lead-containing plumbing materials" and the "first-draw sample" definition should include the stagnation period.

A commenter recommends the Agency redefine "re-optimization" highlighting its importance for rule requirements such as actions after a trigger level or action level exceedance and include that it must be approved by the state. Another commenter requests that the current definition of "disturbance" as it pertains to LSLs could include maintenance activities, and the definition should preclude these.

One commenter explained that the current definition of OCCT is misapplied by putting too much weight on the 90^{th} percentile concentration without considering other factors that can impact CCT. They suggested that there could be systems meeting the lowest 90^{th} percentile but still having unstable scales. They ask EPA for the water systems to be given discretion when considering uncertainties and to develop guidance for systems when evaluating factors that could affect the lead levels in drinking water.

Agency Response

In response to commenters, the Agency decided to add the following definitions to the final LCRR: "full lead service line replacement," "partial lead service line replacement," and "lead status unknown service line." It's clear that these definitions are necessary because of new rule provisions under § 141.84 regarding categorization of service lines and LSLRs. EPA has also added the term "system without corrosion control" to ensure consistent implementation of trigger level and action level exceedances for water systems without CCT and for re-optimization requirements for systems with CCT.

As requested by commenters, EPA has included definitions for "localized corrosion control" and "pipe rig/loop test." EPA has also removed "pitcher filter tracking maintenance system" and its associated provisions from the final rule as decisions on tracking systems are best made based on water system capacity. For response to comments regarding source water or treatment changes, see response to comment Section 11.

In response to first-draw sample comments, EPA modifies the definition to specify it is a "one-liter" sample for clarity. As stated, in response to commenters requesting EPA define "secondary students," new definitions of "elementary school" and "secondary school" were added to the final rule. This will clarify these terms in the definition of "school" and which facilities are applicable in § 141.92.

Several areas of the rule have been updated with improved language, such as CCT requirements under §§ 141.81 and 141.82 to address commenters requests for clarification. EPA has established new terms and definitions to categorize the type of service line with regard to its lead status, such as "lead status unknown service line," "galvanized service line," and galvanized requiring replacement under § 141.84 based on commenters recommendations.

For some of the other terms identified in the comments, the Agency added clarifying language in the rule text and preamble. The Agency believes this will resolve the issues described above and improve understanding amongst stakeholders without the need to create new definitions under § 141.2. EPA is working on guidance to address requests from commenters. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

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3 Lead Trigger Level

EPA requested comment on the proposed lead trigger level of 10 µg/L and the actions water systems must take if they exceed this trigger level but not the action level of 15 µg/L, i.e., had a trigger level exceedance (TLE). Specifically, EPA:

- Asked does this level represent an appropriate 90th percentile level at which to require systems to initiate progressive actions to reduce drinking water lead levels?
- Requested comment on other 90th percentile level thresholds that would be reasonable for water systems to initiate progressive actions to reduce drinking water lead levels.

Most commenters agreed with the incorporation of a trigger level. However, commenters identified a few issues with the proposed trigger level. A significant amount recommended either a lower value (5 µg/L and 1 µg/L were mentioned in some comments), or a health-based value. Commenters also expressed concern that the trigger level would be complex and difficult to implement and interpret.

3.1 General Comments

Summary of Comments

Over a hundred comments addressed general issues associated with the lead trigger level. Most of the commenters either expressed agreement or disagreement with the incorporation of a lead trigger level. Most commenters agreed with the addition of the trigger level. Justifications included: more time for water utilities to determine the cause of the lead exceedances; more time to evaluate corrosion control treatment (CCT); and the prevention of action level exceedances (ALEs). One commenter recommended use of a “bin approach” when dealing with action and trigger levels.

A significant number of commenters recommended lowering the trigger level. Most recommended the level be lower than 10 µg/L as proposed. Several commenters suggested lowering the trigger level to 5 µg/L. One commenter suggested having one benchmark (rather than a trigger level and action level) and setting that at 5 µg/L. One commenter suggested lowering the trigger level to 1 µg/L, mentioning that there is “no safe level of exposure” to lead and that a lower trigger level will let families make "informed decisions about what level of lead contamination they are willing to accept in the water."

Commenters that opposed the trigger level highlighted the complexity of the new rule and that it may be confusing for water systems and customers. One commenter added that the trigger level would result in increased “non-compliance.” A commenter asserted that the trigger level actions are excessive and that replacing premise plumbing or addressing poor sampling procedures are sufficient. One commenter warned that the trigger level should be carefully implemented as the new limit may be manipulated to create fear in customers and possibly be “misused by activists.” Another commenter mentioned that the trigger level is only good when considering drinking water sources of lead and no other lead sources (i.e., dust, soil). Other commenters suggested eliminating the trigger level and lowering the action level instead.

A few commenters suggested that the trigger level should be a health-based limit. A few commenters asserted that lead levels did not increase over time but may fluctuate over time across sampling locations. They questioned if there was sufficient data to suggest a system with a lead 90th percentile of 10 µg/L would exceed the action level of 15 µg/L in future tap sampling, especially if the system does not have lead service lines (LSLs).

A few commenters raised the issue of enforcement. One commenter mentioned that additional trigger level actions must be overseen, reviewed and approved by the state staff. One commenter recommended that if a TLE occurs, the water system should carry out “public education outreach,” by sending information to all customers on the issue of lead, and inform customers of ways to mitigate elevated lead. Another commenter suggested that a TLE should first prompt an “assessment” to determine the cause of the elevated lead level as opposed to evaluating CCT. A couple commenters mentioned that a TLE would not prompt sufficient action (i.e., lead service line replacement (LSLR)) to address the elevated lead level thus still leaving families “exposed to lead.” Other commenters asked for clarification that the trigger level only applies to lead and not copper and that an alternative term to “trigger level” be used.

Risk communication was another issue raised by commenters. Some commenters expressed concern that the new trigger level would make risk communication more complicated. Other commenters suggested that instead of implementing a trigger level, water systems should focus more on risk communication and continuous optimization of CCT (if the system has CCT). A couple commenters suggested that EPA develop guidance focusing on risk communication.

Agency Response

EPA disagrees with commenters suggesting the elimination of the trigger level. The use of a trigger level of 10 µg/L in the implementation of this treatment technique rule will ensure that systems have a plan in place to rapidly respond if there is an ALE. If the trigger level is exceeded, systems that currently treat for corrosion are required to re-optimize their existing treatment. Systems that do not currently treat for corrosion will be required to conduct a corrosion control study so that the system is prepared to respond quickly if necessary.

EPA disagrees that the trigger level should be eliminated, and the action level should be lowered instead. EPA established the lead action level in 1991 to require small and medium-sized systems exceeding it to install CCT and to require large systems and other systems with optimal corrosion control treatment (OCCT) to conduct LSLR. The action level was based on examination of data at 39 medium sized systems; while it was “limited as a basis for making broad-based estimates of treatment efficacy,” EPA concluded that “the data are useful as general indictors of the range of levels systems have achieved with various treatment measures in place.” (56 FR 26490; USEPA, 1991). EPA acknowledged in 1991 that the selection of the action level “is not based on a precise statistical analysis of the effectiveness of treatment” but it “reflects EPA’s assessment of a level that is generally representative of effective corrosion control treatment, and that is, therefore, useful as a tool for simplifying the implementation of the treatment technique” at those systems. (56 FR 26490). EPA decided to use the same action level as a screen to determine which systems with CCT must also replace LSLs (56 FR 26491). While EPA is not lowering the action level, the Agency is strengthening the public health protections of the treatment technique by improving the sampling procedures to better identify elevated levels of lead. This will result in more systems exceeding the action level and more actions to reduce drinking water exposure to lead.

EPA does not agree that the trigger level should be lowered. The use of a trigger level of 10 µg/L in the implementation of this treatment technique rule provides a reasonable concentration that is below the action level and above the Practical Quantitation Level of 5 µg/L at which to require water systems to take a progressive set of actions to reduce lead levels prior to an ALE and to have a plan in place to rapidly respond if there is an ALE. Requiring such actions of systems only when a trigger level 10 µg/L is exceeded, rather than all systems prioritizes actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority. The actions water systems will be required to undertake if their 90th percentile exceeds the trigger level will require review and oversight from states to assure that they are effective in reducing drinking water lead levels.

As shown in Exhibits 4-13 and 4-20 of the Economic Analysis for the Final Lead and Copper Rule Revisions,” hereafter referred to as the “Final LCRR EA” (USEPA, 2020), setting a lower trigger level would substantially increase the number of water systems required to obtain review and input from their primacy agency to comply with the CCT and LSLR requirements. EPA has concluded it is not practicable for this significant number of water systems to obtain this state review and approval. The number of systems impacted by the trigger level can be estimated by combining the breakout of systems with and without LSLs from Exhibit 4-13 of the Final LCRR EA based on Cornwell et al. (2013) and the percentage of systems projected to exceed the lead trigger level of 10 µg/L but not the action level of 15 µg/L for the previous rule and final LCRR from Exhibits 4-19 and 4-20 of the Final LCRR EA, respectively. While Exhibit 4-19 shows the percentage of systems between the TL and AL, the baseline LCR does not have a trigger level, so these systems will not be subtracted out from the LCRR to look at incremental impacts. Under the low and high estimates, 722 and 4,072 CWSs are projected to be impacted by a TLE, respectively. There are also 680 CWS in the low estimate and 2,381 CWSs in the high estimate projected to exceed the lead action level due to the LCRR after subtracting out the ALEs from the existing rule baseline (Exhibit 4-19) to get the increase in ALEs due to the LCRR. The total number of impacted systems above the trigger level that includes systems with a TLE or ALE ranges from 1,402 to 6,453 CWSs. While the system-state interactions are less extensive for TLE, setting the trigger level at 10 µg/L still more than doubles the number of systems impacted under either the low or high estimate scenario for ALEs.

In addition, EPA examined the impacts of a 5 µg/L trigger level using the subset of percent of systems with 90th percentiles between 5 and 10 µg/L in Exhibit 4-20 of the Final LCRR EA. Under the low estimate, an additional 2,069 CWSs would be projected to be impacted by the trigger level and under the high estimate, an additional 4,827 CWSs would be projected to be impacted by the trigger level. Combining these CWSs with the ones between 10 and 15 µg/L yields a total of 3,472 CWSs projected to be impacted by a trigger level of 5 µg/L in the low estimate and 11,279 CWS in the high estimate. Even though the system-state interactions are less extensive for TLEs, setting the trigger level at 5 µg/L would represent about a 5-fold increase in the number of systems impacted under either the low or high estimate scenario for ALEs. The high estimate for a 5 µg/L would mean more than 20 percent of CWS would be impacted. Setting an even lower trigger level would have required almost all water systems to obtain review and input from their primacy agencies to comply with the CCT and LSLR requirements. Therefore, EPA has concluded it is not practicable for almost every water system to obtain this state review and approval in the same timeframe.

EPA does not agree that the trigger level should be health-based. The Agency has established a health based maximum contaminant level goal (MCLG) of zero for lead. The trigger level is not a health-based level, rather it is a reasonable level at which to require systems to begin to take a progressive set of actions based upon lead levels at the tap that are appropriate to assure reduced exposure to lead. The concept of including additional thresholds to compel actions before an action level exceedance was suggested by the Association of State Drinking Water Administrators (ASDWA) as a way to focus actions towards the systems with the greatest potential concerns (USEPA, 2018). This regulatory framework is similar to other National Primary Drinking Water Regulations (NPDWRs), such as the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which requires increasing levels of remedial action based on the concentration of the contaminant (USEPA, 2006). EPA has revised the regulatory text in the final rule to improve its clarity and will work with primacy agencies and water systems to assure they understand the different actions that must be taken when systems exceed the lead trigger level or action level.

Commenters raised issues over what the “trigger level” applies to and the use of the term. EPA clarifies that the trigger level only applies to lead, not copper. Also, while EPA appreciates the concern over the terminology, the Agency has decided to maintain use of the term “trigger level” as it initiates an investigatory response as noted in the above paragraph.

EPA agrees with the commenter that raised the concern that the trigger level only addresses lead in drinking water. However, as summarized in the proposed rule federal register notice Section I (USEPA, 2019), EPA highlights the other regulations and efforts that are being carried out to address lead exposure from other sources (i.e. air, soil).

EPA agrees with the commenter suggesting the trigger level should also require water systems to carry out public education outreach. The final rule includes provisions to notify LSL customers when a TLE occurs to provide information about the goal-based LSLR program. For more information on Public Education, refer to response to comment Section 8.

EPA disagrees with commenters that the trigger level results in unnecessary complexity and regulatory burden. EPA determined that a progressive set of actions based upon lead levels at the tap are appropriate to ensure reduced exposure to lead. EPA in its Health Risk Reduction Cost Analysis (HRRCA), as documented in the Final LCRR EA (USEPA, 2020) has found that a significant number of benefits accrue from systems being required to take mitigation activities as a result of TLEs. EPA also examined the costs and found that it is feasible for systems to take the actions required when there is a TLE. It is technically possible for systems to conduct increased tap sampling, take additional steps to improve CCT, and implement a goal-based LSLR program. Requiring these actions when a system's lead levels are high, but not exceeding the action level, will help both systems and states to engage in a manageable and orderly process to reduce lead levels in drinking water so that they remain below the lead action level. Accordingly, inclusion of the trigger level in the final rule will provide for "greater protection of the health of persons" consistent with the statutory authority in Section 1412(b)(9) of the Safe Drinking Water Act (SDWA) for revising existing drinking water standards. Additionally, this proactive approach to lead contamination in response to a trigger level will reduce the likelihood that a water system will exceed the action level in the future or be faced with public health concerns about the need to implement emergency measures such as the distribution of water filters or bottled water in response to a lead crisis.

EPA disagrees with the comments that the trigger level actions are excessive and that replacing premise plumbing or addressing poor sampling procedures are sufficient. Tap sampling is conducted at a small fraction of the number of residences served by a system. Premise plumbing replacement at the sampled house, assuming the system can address it, would only reduce lead for that house. The house next door that is not being sampled may have similar premise plumbing issues that are not being detected. Systems with CCT will re-optimize their existing treatment to try to get below the trigger level.

One commenter stated that lead levels fluctuated at sites, but did not increase over time, and questioned if the system would exceed the action level in future periods, if they don't have LSLs. EPA believes that the trigger level will work well with other changes to the rule to address scenarios like systems that fluctuate above and below the action level. System will no longer be allowed to continue to fluctuate above and below the action level as the LCRR will require them to install CCT or re-optimize existing CCT. Systems without CCT will identify the CCT or small system compliance option that would be implemented if the system exceeds the action level. Fluctuations in lead levels at non-LSL sites may indicate that the existing CCT is not optimized, and the system should re-optimize the CCT to try to get below the trigger level and reduce the variations at sites. For systems without CCT, a TLE will require them to make a recommendation for CCT implemented if there is a subsequent action level exceedance. Sampling pools are not static as new sites enter the sampling pool to replace sites where the customer no longer wants to participate or where an LSL has been replaced. Addition of new sites could affect the 90th percentile as well.

EPA would like to clarify for the commenter that assumed that TLEs only trigger planning and do not require any LSLR unless the lead action level is exceeded in the future. The final rule requires water systems to conduct the goal-based full LSLR program at a LSLR rate approved by the state, and if the annual LSLR goal is not reached to conduct public outreach activities, which is an enforceable requirement of the LCRR. For more information on the LSLR requirements, see response to comment Section 6.

EPA acknowledges that risk communication is important and may be challenging for some water systems. However, EPA determined that providing public access to information related to locations of LSLs and tap sampling results will help to educate consumers about the sources of lead in drinking water, the health effects of lead, actions consumers can take and actions the water system is taking to reduce lead in drinking water. EPA received several comments requesting Agency guidance on implementation of the revised rule and in particular on risk communication. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

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4 Corrosion Control Treatment

In the proposed rule, EPA requested comment on the proposed corrosion control treatment (CCT) re-optimization requirements, specifically:

"EPA requests comment upon the potential actions water systems could take to adjust their corrosion control treatment and how they should work with the State to determine if adjustments to the treatment would better optimize corrosion control."

EPA received many comments on the proposed requirements, included in § 141.81 (Applicability of Corrosion Control Treatment Steps to Small, Medium, and Large Water Systems) and § 141.82 (Description of Corrosion Control Treatment Requirements). EPA received comments both in support of, and opposition to, the proposed requirements. The Agency received comments on CCT optimization and re-optimization timeframes and steps, corrosion control studies, designation of optimal water quality parameters, corrosion control treatment options, daily optimal water quality parameter calculations and corrosion control treatment review during sanitary surveys.

4.1 General Comments

EPA received general comments on the corrosion control treatment (CCT) optimization and re-optimization requirements proposed in § § 141.81 and 82. EPA also received comments on the deemed criteria proposed in § 141.81(b) for corrosion control optimization or re-optimization. CCT-related comments were also received on the proposed find-and-fix assessment requirement in § 141.82(j) and the small system compliance flexibility options in § 141.93. Finally, EPA received general comments pertaining to the State review of long-term treatment changes or new source additions; consecutive system-related considerations; and other provisions applicable to water systems with optimized and re-optimized corrosion control.

Proposed Corrosion Control Treatment Optimization/Re-Optimization Requirements

Summary of Comments

In the preamble to the proposed rule EPA requested comment on "the overall framework for the proposed LCR revisions," including whether the Agency has "developed proposed revisions that address the variability in conditions among the regulated water systems that affect the levels of lead that may be present in drinking water." In response to these considerations, one commenter believed there would be "a significant number of water systems, particularly community water systems, for which the § 141.81 provisions will not work well," including those with "multiple sources of water supply entering their distribution system, existing corrosion control treatment, more complex source water quality, aged infrastructure also requiring replacement, multiple consecutive water systems with varying distribution system and service line materials, and systems only needing to make minor adjustments to corrosion control treatment."

One commenter expressed general support for the proposed corrosion control treatment requirements and stated that the approach "should help reduce current [environmental justice] disparities." The commenter also suggested that "Because water treatment is consistent across an entire community, stronger requirements that reduce the ability of lead to leach into water from LSLs, leaded solder, and other sources should mitigate, but not eliminate, the disproportionate burden in homes with LSLs."

A second commenter also expressed general support and requested that EPA expand "emphasis on corrosion control programs." The commenter found that the proposal "is likely to be a more economical solution than accelerated and total lead material abatement" and that "a multiple barrier solution through a micro-depositing corrosion control program is also an effective strategy to ensure safety, as has been proven broadly."

Two commenters raised concerns over the variability of conditions from state to state. One commenter asserted that "EPA has disregarded specific concerns for each state" and that "[w]hen using the word 'optimal' corrosion control, it restricts a state to force PWSs to implement corrosion control that could have environmentally detrimental impacts and is not the appropriate approach for that state." The second commenter stated, "EPA has assigned several requirements to the States without facilitating the ability to make good decisions for the specific concerns each state may have." The commenter also believed that "use of the wording 'optimal' corrosion control restricts any consideration for a state to implement corrosion control that could be more 'appropriate' in controlling corrosion" and suggested "chang[ing] the word optimal to adequate to solve this issue."

A commenter believed the proposed revisions "implicitly establish the addition of high-dose orthophosphate addition optimized for minimizing soluble lead release as a 'gold standard' for corrosion control treatment," and that the approach "is inappropriate because it (1) limits systems' ability to make timely changes in treatment and sources of supply, (2) limits water systems' ability to respond rapidly to degraded corrosion control performance, and (3) prioritizes performance on a single criterion over all other regulatory and operational considerations."

A commenter raised concerns over the proposed rule because it maintains "the compliance mechanism for corrosion control treatment" that was promulgated under the original Lead and Copper Rule. The commenter believed "water system maintenance of 'optimized' water quality parameters does not directly correspond to actual lead levels at consumer taps" and that "such a framework 'rewards' water systems for success in maintaining their water quality parameters within 'optimal' ranges, even when lead-in-water contamination in their service area is severe." The commenter suggested revising the rule to "replace the LCR's current compliance mechanism for corrosion control treatment with a mechanism that corresponds to lead levels at the tap" and to incorporate "[a] scheme that triggers a violation following a LCR lead action level exceedance." The commenter also suggested EPA "[r]eview all available technologies that would allow water system compliance with non-lead-related national primary drinking water regulations, while also achieving the lowest possible levels of lead at consumer taps." Finally, the commenter requested that, "[s]hould EPA leave [the existing] mechanism in place, it must provide peer-reviewed science showing that: [1] Optimized water quality parameter levels… are reliable predictors of lead-in-water-drinking levels at consumer taps; and [2] Water system maintenance of State-designated "optimal" water quality parameter ranges has prevented large-scale lead-in-water contamination in cities like Washington, DC; Flint, MI; Portland, OR; Newark, NJ; Pittsburgh, PA; and Sebring, OH."

One commenter characterized the proposed corrosion control framework as "marginal improvements to the corrosion control provisions of the LCR." The commenter asserted that "improving corrosion control requirements will only go so far in reducing lead exposure" since it "only serves to limit, not eliminate, exposure to lead." The commenter believed that through a proactive lead service line replacement program, a "constant need to monitor and reoptimize corrosion control would be avoided altogether." Another commenter indicated similar support and rationale for prioritizing the removal of lead service lines over optimization of corrosion control treatment.

A commenter did not support the proposed revisions to the corrosion control treatment requirements based on the belief that it "places the highest emphasis in the water treatment and water quality on protection of lead service lines without regard to the effectiveness of the water system's corrosion control;" "creates a higher cost to provide service to properties with lead service lines;" and "requires all treatment to favor lead service lines which may adversely affect other types of service lines."

With regard to small and medium systems, one commenter believed the proposed rule did not "address legacy issues with current rule related to OCCT," claiming that "[s]mall and medium systems tend to 'guess' the right treatment to use with very little data and little to no scientific backing." Another commenter did not believe the "framework for corrosion control will be implemented as presented," claiming that "[s]tates may default to requiring treatment changes because the rule construct creates the impression that action is warranted." The commenter also noted the "proposed rule presents a different administrative structure based on system size," and that "EPA [did] not articulate a basis for the administrative breakpoint in either its benefit-cost analysis or its preamble description of the basis for the rule corrosion control treatment requirements." A third commenter recommended EPA provide justification in the final rule of any "fundamental difference[s] in study or treatment installation requirements for large versus medium-sized systems."

Other commenters broadly suggested states and water systems provide "detailed engineering information about all treatment techniques used by a CWS or NTNCWS to treat their water;" raised concerns over potential public perceptions associated with "prescriptively add[ing] extra chemicals" to drinking water; and suggested a general need for "more research in corrosion control as it relates to all metals, products for use, chemicals, and alternate metal or plastics."

EPA also requested comment on "the complexity of the regulatory requirements that result from targeting different actions for different types of water systems and challenges States and water systems will encounter" and on "ways that the proposed LCR revisions could be simplified and burden, including paperwork burden, could be reduced while still assuring adverse health effects are prevented to the extent feasible." Overall, commenters found the proposed requirements for corrosion control treatment to be complex and suggested EPA simplify the language in the final rule. One of the commenters generally suggested that "EPA more thoughtfully consider the revisions to this rule language, especially with regards to implementation." Several commenters also provided specific suggestions on how § § 141.80, 81 and 82 could be simplified or noted typographical inconsistences in the proposed language.

Commenters also raised general burden concerns over the amount of time it would take system or state staff to understand the proposed requirements and determine system compliance, particularly with regard to § 141.81(a), § 141.81(d) and (e). Another commenter raised a similar concern for "small and medium sized water systems that may not have the personnel or resources to devote to fully understanding the Rule." Commenters also noted terminology and usage as contributing factors to the complexity of the proposed rule. Some did not find a sufficiently clear distinction between 'optimization' and 're-optimization.' One of the commenters noted usage of "'optimal' and 'optimized' throughout the [proposed rule], sometimes interchangeably" and suggested that "different types of efforts be designated as such: initial CCT or existing CCT, and re-optimized CCT."

Another commenter was concerned the overall optimization/re-optimization proposal introduced the practical quantitation level, as an implicit "treatment objective." The commenter asserted that "[t]he proposed regulatory text draws a connection between the practical quantitation limit and optimized corrosion control;" that "[t]his connection is substantially different than existed under the current LCR, but the Economic Analysis does not take the effect of § 141.81(b)(3) into account;" that "EPA has not attempted to demonstrate whether it is feasible for a sufficient cross-section of water systems in the U.S. to reliably maintain 90th percentile lead levels below the current practical quantitation limit of 5 µg/L so as to consider it 'feasible';" and that "[t]he proposed revision also take place [sic] in the context of a proposed rule where primacy agencies have considerable latitude." In light of these concerns, the commenter suggested that "[t]he final rule and associated preamble must be clear that 90th percentile lead levels below the practical quantitation limit is a means of dispensing with additional regulatory burdens not a treatment objective," and that "[w]ater systems of all sizes and descriptions need a clear path forward to compliance and a reliable expectation that if they perform within the parameters of the rule construct they will not be subject to the impulses of regulatory agencies."

Other commenters raised a similar concern with the overall optimization/re-optimization proposal "effectively mak[ing] the trigger level the new standard at which a water system would have to take further action related to corrosion control – leaving the action level somewhat less relevant," or otherwise making the trigger level "the de facto action level." The commenters requested that EPA "more fully explain its reasoning for having corrosion control changes contingent upon a trigger level exceedance rather than an action level exceedance."

Commenters also noted the complexity of adjusting corrosion control treatment and the technical expertise required on the part of water systems and states. In light of this, commenters requested the provision of technical training and development of guidance materials to aid water systems and states with the implementation of the proposed corrosion control treatment requirements. Another commenter noted that "[s]imultaneous compliance considerations can be challenging for water systems and States" and requested that "EPA update and maintain the online Decision Tool to Help Utilities Develop Simultaneous Compliance Strategies," which was developed by the Water Research Foundation.

Agency Response

EPA does not agree with the assertion that the provisions in § 141.81 will not work well for community water systems. The Agency recognizes there are many factors to consider when installing or re-optimizing corrosion control treatment (CCT). However, the regulation of lead and copper is complicated by the fact that the presence of these factors and extent to which they may affect CCT effectiveness is unique to each system. Because of their specificity, EPA believes it is not possible to create a national standard that more directly accommodates or addresses each of these factors for the types of systems described in the public comment. Such an approach would result in a regulation that is overly prescriptive and burdensome to implement; the Agency believes a more effective strategy for reducing the presence of lead and copper in drinking water is through strengthening the CCT provisions in § 141.81 and incorporating a trigger level approach that enables systems to address lead and copper corrosion more proactively than under the current rule.

Regarding how the optimal corrosion control treatment (OCCT) provisions intersect with state-specific concerns, EPA notes the goal of the rule is to provide maximum public health protection by reducing lead and copper levels at consumers' taps as close to the MCLGs as is feasible. To accomplish this, EPA established under the 1991 Lead and Copper Rule a treatment technique requirement for systems to install OCCT. Section 1412(b)(7)(A) of the Safe Drinking Water Act (SDWA) requires that such a treatment technique "prevent known or anticipated adverse effects on the health of persons to the extent feasible." For these reasons, the OCCT provisions are not intended to give equal weight to other, non-health-related factors. Doing so would be inconsistent with this statutory provision and could result in systems implementing an OCCT that is less than optimal in its protection of public health. With regard to the terminology suggestion, EPA believes the term 'adequate corrosion control' would not accurately capture these considerations and thus has retained the term 'optimal corrosion control' in the final rule.

Regarding the assertion that the proposed CCT requirements will limit a system's ability to make timely changes in source or treatment, or to respond rapidly to degraded corrosion control performance, EPA notes the rule requires consultation with the state regarding such changes because of the potential for unintended consequences that may degrade CCT optimization and put the public at risk. The Agency believes evaluating source and treatment changes – in coordination with the state and prior to the system implementing those changes – is a critical and necessary component in ensuring the continued protection of public health. Regarding degraded CCT performance, EPA recognizes the need for addressing such issues on a timely basis and has modified provisions in the final rule to address this concern. Systems of any size whose 90th percentiles are between the trigger and action levels may, as specified in final rule § 141.81(d)(1), make state-approved CCT modifications without being required to conduct a CCT study first. Small and medium systems exceeding the lead trigger level or copper action level also may make treatment modifications without being required to conduct a CCT study [§ 141.81(d)(2)(ii)]. For large systems and systems of any size with lead service lines (LSLs) exceeding the lead action level, the Agency believes a CCT study is necessary to ensure continued protection of public health after implementing any necessary CCT changes. In these cases, the final rule does not allow systems to make CCT modifications without first evaluating its impacts through a study. Finally, EPA disagrees with the assertion that the rule prioritizes a performance on single criterion over all other regulatory and operational considerations. Under proposed and final rule § 141.82(c)(1)(i), systems without CCT are required to evaluate the effectiveness of alkalinity and pH adjustment, orthophosphate- or silicate-based corrosion inhibitors, and if appropriate, combinations of the treatments to identify the OCCT for the system. Systems are not required to install orthophosphate-based treatment where such evaluations identify another CCT option (e.g., alkalinity and pH adjustment) as the OCCT. This evaluation process also accounts for the regulatory and operational considerations that were raised as a concern. Under § 141.81(c)(1)(iv), systems must identify chemical or physical constraints limiting or prohibiting the use of a particular CCT. Systems also must evaluate the effect that CCT may have on other drinking water quality treatment processes [§ 141.81(c)(1)(v)]. Systems with CCT also must conduct these activities as specified in § 141.82(c)(2).

Regarding the suggestion for a regulatory scheme that uses action levels as a basis for triggering a compliance violation, EPA notes such a scheme would implicitly establish maximum contaminant levels (MCLs) for lead and copper. As discussed in the preamble to the 1991 Lead and Copper Rule [56 FR 26476], the regulation of lead and copper is complicated by the fact that a major contributor to tap lead levels is the corrosion of lead-bearing materials that are present within consumers' private premises. Since these are not owned or controlled by a public water system (PWS), EPA determined the statutory definition of "public water system," as defined in section 1401(4) of the Safe Drinking Water Act (SDWA), precludes the Agency from promulgating a drinking water regulation that holds a PWS liable for conditions that are beyond their control. This interpretation also is consistent with the plain language of the statute and with the reasonable approach of requiring systems to address only those problems over which they exercise sufficient control for remedial action. See comment response section 19.2.

Peer-reviewed science relating to the use of WQPs within the LCR framework are documented extensively in the preamble to the 1991 Lead and Copper Rule [50 FR 26466].

Regarding the cited cases of large-scale, lead-in-drinking-water contamination, EPA notes that nearly all resulted from long-term treatment changes that were implemented by consecutive systems without fully evaluating its corrosion control implications or determining the new OWQPs that would be necessary for the system to maintain an optimized CCT. The Agency also notes that, to address consecutive system-related concerns associated with large-scale treatment changes, EPA finalized the change to § 141.82(g) on continued operation and maintenance of optimal corrosion control treatment (OCCT) to apply to consecutive systems receiving water supplied by another system.

EPA disagrees with assertions that improving the corrosion control requirements will only go so far in reducing exposures to lead in drinking water, or that corrosion control treatment constitutes a lesser priority than LSL removal. The Agency notes that even where systems prioritize the removal of all LSLs, it will not sufficiently allow for the discontinuation of CCT because of the presence of other lead sources that will remain in the plumbing of consumers' homes and other buildings. These sources could include interior household pipes; lead solders and fluxes used to connect copper pipes; and alloys containing lead, including some faucets made of brass or bronze. In light of the persistence of these other, non-LSL sources of lead, the use of optimized CCT and related monitoring will continue to be necessary. The Agency thus considers the CCT requirements to be a critical and meaningful component of the rule's framework for reducing public exposure to lead, even for water systems who either do not have LSLs or have successfully removed of all LSLs from the distribution system.

EPA does not agree with the broad claim that the CCT requirements place an emphasis on LSLs over other sources of lead in drinking water. Under the proposed rule, water systems must install or operate optimal corrosion control treatment, which is defined in § 141.2 as the treatment that "minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations." The CCT provisions in § § 141.81 and 82 direct systems to install optimized or re-optimized treatment meeting this definition. The specifics of how individual systems shall tailor their CCT to meet this definition is left to the individual discretion of that system and its state. EPA has retained this approach in the final rule. The Agency also believes the assertions about the proposal 'favoring' LSLs over other considerations – e.g., higher cost to properties with LSLs or adverse impacts on other types of service lines – do not account for the extent to which LSLs can be a prevalent source of lead contamination. Numerous studies have evaluated the contribution of lead in drinking water from different sources (e.g., service lines, faucets, meters). A study published by American Water Works Association (AWWA) Water Research Foundation (2008) "Contributions of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues" (Sandvig et al., 2008) estimates that 50 percent to 75 percent of lead in drinking water comes from LSLs. Given that systems are required to install optimized corrosion control treatment that minimizes lead and copper concentrations at users' taps and the extent to which LSLs are a significant source of lead, EPA does not believe it would be in the interest of public health for the rule to allow systems to ignore LSL sources since it may result in the installation of a less-than-optimal CCT.

The claim that small and medium systems 'guess' the right OCCT using little data or scientific backing appears to assume the rule leaves OCCT designation to the sole discretion of the system. However, the provisions in §§ 141.81 and 141.82 of the existing rule specify that OCCT must be designated by the state. Per § 141.82(d), this designation must be based on the state's consideration of available information, any CCT studies conducted by the system, and the system's OCCT recommendation. Section 141.82(d) also requires systems to provide additional information where it is requested by the state to aid its review, thus providing a mechanism for ensuring that OCCT designations are based on data that is scientifically sound. EPA has retained these existing provisions in the final rule and update them to reflect designation steps and corresponding rule citations for optimized vs. re-optimized OCCT.

Regarding state implementation of the corrosion control treatment framework, the Agency believes action *is* warranted when a system triggers the CCT re-optimization requirements. EPA has revised provisions in § 141.81(d) to clarify that such an action may include modifications to the existing CCT rather than an outright CCT change. Systems have the opportunity to evaluate whether re-optimization can be achieved through modification of the existing CCT when making its re-optimization treatment recommendation to the state in accordance with § 141.82(a). Upon its review of the recommendation, the state may approve the modification when designating re-optimized OCCT as specified in § 141.82(d)(2) unless the state believes a CCT change is necessary for the system to achieve re-optimization.

With regard to the structure of the CCT requirements, their relation to system size, and whether there are any fundamental differences, EPA notes the matter has been discussed extensively in the preamble to the original rule [56 FR 26492]. Summarizing briefly, the rule does not establish different treatment requirements based on system size; all sizes are uniformly required to optimize CCT. EPA's approach simply establishes a presumption, supported by available data, that certain systems – e.g., small and medium systems – have optimized CCT if they meet certain levels. Large systems must make a more detailed technical showing of meeting the optimized CCT requirement by leveraging their greater technical sophistication and operational expertise. EPA proposed 10 µg/L trigger level as a reasonable concentration that is below the action level and above the PQL of 5 µg/L at which to require water systems to take a progressive set of actions to reduce lead levels prior to an action level exceedance, and to have a plan in place to rapidly respond if there is an action level exceedance. Requiring these actions when a system's lead levels are high, but not exceeding the action level, will help both systems and states to engage in a manageable and orderly process to reduce lead levels in drinking water so that they remain below the lead action level. Accordingly, inclusion of the trigger level in the final rule will provide for "greater protection of the health of persons" consistent with the statutory authority in Section 1412(b)(9) of the Safe Drinking Water Act (SDWA) for revising existing drinking water standards. Additionally, this proactive approach to lead contamination in response to a trigger level exceedance will allow systems to quickly take action if there is a ALE, while reducing the likelihood that a water system will exceed the action level in the future. Also see trigger level response to comment in Section 3.

Regarding costs and benefits, EPA's Health Risk Reduction Cost Analysis found that a significant number of benefits accrue from systems being required to take mitigation activities as a result of trigger level exceedances. In examining the costs, EPA also found that it is feasible for systems to take the actions required when there is a trigger level exceedance. Small community water systems and non-transient non-community water systems have the added flexibility to select a non-CCT option – LSL replacement, installation and maintenance of point-of-use devices, or replacement of lead-bearing plumbing materials – where the system finds such a flexibility option to be the most feasible, affordable, and effective compliance alternative compared to CCT.

EPA recognizes some consumers may have specific concerns about the chemicals that are used to mitigate the potential for lead exposures in their drinking water. EPA notes that the corrosion control treatment options remaining in the final rule have been shown to be effective at minimizing lead and copper levels at taps and provide a high level of public health protection in public water supplies. EPA notes that the corrosion control treatment option recommended by a public water system must be approved by the state.

EPA recognizes the general burden concerns raised and has made a number of modifications in the final rule that address many of the general concerns raised by commenters about the burden to systems and states, complexity and effectiveness of the proposed CCT provisions, as well as its successful implementation. EPA has reorganized optimization and re-optimization study requirements based on 'bins' the Agency has identified. These 'bins' are based on system characteristics such as CCT status, the presence of LSLs and lead 90th percentile value. See the response in section 4.5.1 for a detailed discussion of each optimization/re-optimization 'bin' and its applicable study requirements. EPA also has added a definition of "systems without corrosion control treatment" in the final rule to clarify the instances under which systems would use the optimization or re-optimization pathway. Language throughout § 141.81, particularly § § 141.81(a), (d) and (e), has also been revised to make the specific requirements easier to follow. The Agency believes these modifications will address concerns by simplifying rule requirements and terminology, making it easier for states and systems of all sizes to determine compliance, offer greater clarity on which systems would proceed along a given pathway and more clearly identifying the distinctions between trigger and action level exceedances. The added clarity from these changes also address concerns related to how optimization-related terminology are distinct, particularly as it pertains to installation vs. re-optimization of CCT.

EPA recognizes the concerns raised over the implementation of the practical quantitation level (PQL) as an implicit treatment objective and has revised § 141.81(a) for greater clarity and consistency on the intended path forward to compliance. Large systems without CCT are explicitly required under § 141.81(a)(1)(ii) to complete the treatment installation steps in § 141.81(e) if they exceed the lead PQL. EPA had initially proposed the lead trigger level; however, the Agency believes requiring such action when the lead PQL is exceeded allows states to work proactively with these systems that are a higher priority by virtue of the larger populations they serve and the lack of existing CCT. EPA also has modified § 141.81(a)(1)(iii) to clarify under what circumstances large systems with CCT that exceed the lead PQL, but do not exceed the lead trigger level or the copper action level, may be required by the state to complete the CCT re-optimization steps in § 141.81(d). Because of the general magnitude of the population served by large water systems, EPA believes it is important for states to have the flexibility under § 141.81(a)(1)(iii) to require system re-optimization where it determines further lead reductions are achievable by these systems. EPA concludes these modifications will make the rule more protective of public health while also addressing the concern with states potentially implementing the rule in a manner that uses sub-PQL concentrations as a basis for triggering the optimization/re-optimization requirements.

EPA disagrees with the characterization that the trigger level would effectively be a new standard that makes the action level less relevant, or that it would otherwise be a de facto action level. As discussed above, EPA proposed the trigger level as a reasonable concentration that is below the action level and above the PQL at which to require water systems to take a progressive set of actions to reduce lead levels prior to an action level exceedance, and to have a plan in place to rapidly respond if there is an action level exceedance. See response to comment Section 3.

Finally, EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials to help states and water systems implement the revised rule and promote greater national consistency. Additionally, the Water Research Foundation Tool described was developed jointly and maintained by WRF on its website. However, WRF no longer supports that tool.

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Deemed Criteria for Corrosion Control Optimization or Re-Optimization

Summary of Comments

EPA received several comments specifically related to the proposed provisions in § 141.81(b), which specifies the criteria under which systems are deemed to have optimized or re-optimized corrosion control.

One commenter stated that "implementation for [§ 141.81](b)] provisions are very complex, and the proposed revisions further complicate the concept of what it means to be deemed," and that "the trigger level adds unnecessary complexity in the revisions to § 141.81(b)(1) and the new (b)(2)." The commenter disagreed that "a PWS can be 're-optimized' and deemed using (b)(3);" and suggested EPA "remove the provision for any size PWS to be considered optimized under (b)(3), or at minimum, require (b)(3) systems to be re-evaluated for the optimization criteria with each round of compliance monitoring." The same commenter also suggested EPA "abandon the 'deem' compliance mechanism. Instead, EPA and primacy agencies should simply track which systems have CCT installed or small system flexibilities implemented, and which systems do not." The commenter provided specific implementation suggestions related to the review of systems with a 'deemed' milestone status and to subsequent state reporting of system milestones. Finally, the commenter requested "clear guidance from US EPA as to if and when a primacy agency should change the designation (deem) status of a PWS that installs OCCT."

Commenters also sought clarification on several specific aspects related to § 141.81(b). One commenter sought clarity on whether systems previously deemed to have optimized corrosion control treatment that later exceed the lead trigger level, but not the lead action level, would still be considered optimized while undergoing re-optimization steps. One commenter found § 141.81(b)](2)(i) to be "unclear when a State could not require a water system to meet optimal water quality parameters" and provided specific language suggestions. This commenter also raised a more general question on how, under the proposed rule, "a large system [is] deemed optimized if it does not meet (b)(3) of this section."

Another commenter believed the proposed requirements established a "new, unspoken trigger" where large systems "may be required to evaluate for and install corrosion control treatment" if their 90th percentile exceeds 5 µg/L. Two other commenters raised a similar observation and suggested that EPA clarify "under what circumstances large, non (b)(3) water systems without [trigger level exceedances] or copper [action level exceedances] are not optimized and are therefore candidates for re-optimization" and that states require "each of these systems to complete corrosion control treatment steps" in § § 141.81(d) or (e). They also suggested EPA clarify in § 141.81(b)(3) that small and medium water systems, with a corrosion control treatment that has not been designated as optimal by the state, may be required to perform corrosion control treatment studies under § 141.82. One of the commenters also suggested revising the proposed rule to state that "systems with CCT, even when treatment has not been designated cannot turn off the treatment process without state approval."

Two commenters sought to understand the specific circumstances in § 141.81(b)(3)(iii) that qualify as a 'new source.' One suggested EPA "[s]pecify by rule (or in guidance, at a minimum) what constitutes a change in source or treatment;" the other requested EPA revise § 141.81(b)(3)(iii) so that it would "not trigger a re-optimization of corrosion control." Commenters also requested general clarification on § 141.81 (b)(3)(iv); whether § 141.81 (b)(3)(iv) should include a reference to the lead action level; and whether the term 'date' in § 141.81(b)(3)(v) "refers to the date the sampling was conducted or the date that the results of the sampling are finalized." For the latter, the commenter suggested specifying in the final rule "that the exceedance begins at the end of the sample period once all samples have been collected, properly entered into the compliance calculation, and the state has determined and notified the system an exceedance occurred in the preceding monitoring period."

Finally, commenters provided suggested language for the final rule and noted typographical inconsistences within the proposed language of § 141.81(b).

Agency Response

EPA has revised § 141.81(b) to provide more clarity on which systems can be deemed optimized and how these systems can continue to be deemed optimized under this section. Language also was added to clarify the circumstances under which systems deemed optimized or re-optimized under § 141.81(b) must continue to demonstrate that they qualify in all subsequent rounds of monitoring. EPA has also clarified that where the state has set optimal water quality parameters, small and medium systems that meet the action level but exceed the trigger level cannot be deemed optimized under § 141.81(b)(2). EPA also notes that, as part of the streamlining process, § 141.81(b)(3) was extensively revised to provide greater clarity with subparts (i), (iii),(iv) and (v) deleted and replaced with "RESERVED" in the final rule. Large non-(b)(3) systems are optimized by meeting the optimal water quality parameters specified by the state for optimal corrosion control treatment.

EPA disagrees with the suggestion to abandon the deemed optimized provisions in § 141.81(b). The Agency concludes these provisions continue to serve the purpose of prioritizing optimization actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority by virtue of these elevated levels. Removing the provision would substantially increase the number of water systems required to obtain state review. EPA has concluded it is not practicable for such a significant number of water systems to obtain these reviews/approvals from their states. Additionally, such an approach would be overly prescriptive for systems with lower lead 90ths since they may not be able to achieve further reductions. In such cases, the suggested requirements would not provide meaningful opportunities to protect public health. EPA has thus retained the provision in the final rule for administrative ease.

EPA acknowledges the concerns raised over the implementation of the practical quantitation level (PQL) as an implicit trigger. EPA has revised provisions in § 141.81(a) that the Agency believes simultaneously addresses the expressed concerns about the deemed optimized provisions in § 141.81(b). Large systems without corrosion control treatment (CCT) are explicitly required under § 141.81(a)(1)(ii) to complete the treatment installation steps in § 141.81(e) if they exceed the lead PQL. EPA believes requiring such action when the lead PQL is exceeded allows states to work proactively with these systems that are a higher priority by virtue of the larger populations they serve and the lack of existing CCT. EPA also has modified § 141.81(a)(1)(iii) to clarify under what circumstances large systems with CCT that exceed the lead PQL, but do not exceed lead trigger level or the copper action level, may be required by the state to complete the CCT re-optimization steps in § 141.81(d). Because of the general magnitude of the population served by large water systems, EPA believes it is important for states to have the flexibility under § 141.81(a)(1)(iii) to require system re-optimization where it determines further lead reductions are achievable by these systems. EPA has also included revisions in § 141.81(a) that address the concerns related to systems of any size with a non-state-designated CCT. These revisions direct a system without corrosion control treatment to complete the applicable CCT steps prescribed in § 141.81 (d) or (e). EPA also has included a definition in the final rule for the term *"system without corrosion control treatment"* that specifically identifies these non-state-designated-CCT-systems as fitting the definition of the term.

Corrosion Control Treatment-Related Comments on Proposed Requirement for Find-and-Fix Assessments at Tap Sample Sites Exceeding the Lead Action Level

Summary of Comments

EPA received several CCT-related comments on the proposed requirement for a find-and-fix assessment in accordance with § 141.82(j). (See response to comment section 13 for summaries and responses to other, non-CCT related comments on the proposed find-and-fix provision.) The assessment steps proposed in § 141.82(j) would be triggered "when a tap sample site exceeds the lead action level under monitoring conducted under § 141.86." As stated in the preamble to the proposed rule, "the water system would be required to determine if problems with the CCT are leading to elevated levels of lead in the tap samples and then implement a mitigation strategy if necessary." In addition, the preamble noted that "CCT adjustment may not be necessary to address every exceedance."

One commenter found the proposal to be protective, but stated that "[t]he provision that creates a CCT study is unwarranted and inappropriate for instances when a single compliance sample is >15 ug/L."

Numerous other commenters did not support the proposal, raising concerns over a single, elevated tap sample result potentially triggering the need for a corrosion control study or a system-wide CCT re-evaluation. One of the commenters urged "clarify[ing] the rule to better show that a new corrosion control study is not warranted based on one localized set of sample results." Another stated, "elevated lead levels at individual homes point to the need to investigate local issues such as water use patterns or building plumbing, or localized water quality issues. These isolated instances may do not inform [sic] the effectiveness of CCT, and reevaluation and adjustment of system-wide CCT based on localized issues may lead to adverse impacts on other water quality parameters." A third commenter suggested that "[i]f a distribution system… has documentation that it contains no LSLs, then any trigger level or action level exceedances at a home should be treated as an isolated event and the system should be exempt from corrosion control requirements." A final commenter, similarly echoing concerns about the potential for CCT optimization to be triggered by a single find-and-fix result, stated their position that the proposal "sets rigid timelines for compliance and does not sufficiently allow public water systems to investigate and evaluate both current available CCT measures or future options."

EPA received several requests for clarification on CCT-related aspects of the find-and-fix provisions proposed under § 141.82(j). One commenter requested general clarification on "how systems that have already exceeded an AL or TL are impacted by 'find and fix', when they are already in the process of installing, optimizing, or re-optimizing treatment." Another commenter requested clarification on whether proposed § 141.82(j)(1) was intended to apply to all systems or "only systems with optimal corrosion control treatment installed." Another commenter raised concerns over the proposed requirement in § 141.82(j)(3) for water systems to "determine if either localized or centralized adjustment of the optimal corrosion control treatment (initial, modified, or re-optimized) is necessary and submit the recommendation to the State." The commenter sought "greater clarity on what EPA means when it refers to 'localize corrosion control treatment.'" The commenter also recommended "that the proposed rule should focus on evaluations of possible system wide corrosion control adjustments," noting that "[w]hile in theory a water system could potentially add small chemical feed stations in various locations throughout its distribution system to supplement phosphate levels in certain neighborhoods, in practice this would be extremely challenging to plan, implement, operate, and maintain." One of the commenters also noted a specific provision of proposed § 141.82(j)(5) – "[s]ystems without corrosion control treatment required to install optimal corrosion control treatment shall follow the schedule in § 141.81(e)" – and raised the following questions: "Is the EPA suggesting one sample site over 15 ug/L could trigger a water system into the corrosion control steps? If this is the case, why are corrosion control treatment requirements based on the lead and copper 90th percentile of tap samples?"

Agency Response

Many commenters interpreted the proposed rule to require CCT modifications as the typical response to address a site that exceeded a lead concentration of 15 µg/L. EPA has modified final rule § 141.81(j)(3) to further clarify that CCT modification may not be necessary to address every exceedance, and that other distribution system actions may include flushing to reduce water age. . For those instances where the find-and-fix corrosion control assessment monitoring finds that optimal water quality parameters are not being maintained in a portion of the distribution system, systems may need to implement localized or centralized adjustment of corrosion control treatment. A system that does not have existing corrosion control treatment is not required to conduct a corrosion control study or to install treatment as a result of find-and-fix unless the state determines it is necessary. See section 13 for responses to non-CCT-related considerations on find-and-fix requirements.

Corrosion Control Treatment-Related Comments Pertaining to Systems Using the Small System Compliance Flexibility Options Under § 141.93

Summary of Comments

EPA received several comments on corrosion control-related matters that relate to the small system compliance flexibility provisions proposed in § 141.81(f). The proposed revisions prescribe the specific steps and deadlines applicable to small community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) using the small system compliance flexibility options under § 141.93. (Note: For a complete discussion of non-CCT-related comments, see the corresponding section on comments pertaining to the small system flexibility provisions proposed in § 141.93.)

As proposed in § 141.80(d)(3),"[a]ny small water system that complies with the applicable small system compliance flexibility requirements specified by the State under § 141.81 and § 141.93 shall be deemed in compliance with the treatment requirement in paragraph (d)(1) of [§ 141.80]." One commenter sought clarification on how an action level exceedance would affect system compliance with the treatment requirement and whether it would trigger a continuation of the corrosion control steps.

One commenter generally suggested "integrat[ing] these [small system flexibility] options into § 141.81 as methods of CCT." One commenter suggested revising the rule to include "language emphasizing that small systems with CCT already in place cannot stop treatment without prior approval from their primacy agency."

Under § 141.81(f)(3), EPA proposed the specific requirements and time periods for each of the compliance flexibility options. One commenter recommended revising the paragraph to more clearly delineate which of the provisions would be applicable to small CWSs vs. NTNCWSs.

Agency Response

EPA has revised 141.81(a)(3) to clarify that the CCT steps in § 141.81 (d) or (e) apply when the system has selected CCT as the small system option under § 141.93. EPA has also added a requirement that systems with CCT that select a different small system compliance flexibility option must maintain their existing CCT until the state determines it is no longer necessary. Systems that select one of the other compliance flexibility options follow the schedule in § 141.81(f).

The rule requires that systems implement the compliance flexibility option after the first action level exceedance. EPA disagrees with comments that suggested including the small system flexibilities in the regulatory text of § 141.81. The Agency deemed it appropriate to keep small system compliance flexibility requirements together in § 141.93 because they are intended as equivalent options in lieu of CCT.

Under the final rule, all of the compliance flexibility options are available to small and non-transient, non-community water systems as discussed in the responses to comments on § 141.93. As such the schedule in § 141.81 (f)(3) will apply to either type of system using that compliance option.

Corrosion Control Treatment-Related Comments Pertaining to State Review of Long-Term Treatment Changes or New Source Additions

Summary of Comments

As stated in the preamble to the proposed rule, EPA proposed requiring that “all water systems that change their source water or make significant treatment changes obtain approval from their primacy agency prior to making the change.” Under the proposed provisions, “any water system deemed to have optimized or re-optimized corrosion control” under § 141.81(b)(3)(iii), or “any water system subject to a reduced monitoring frequency under [§ 141.86(d)(4)],” would be required to notify the State in writing “of any upcoming long-term change in treatment or addition of a new source.” EPA expects states will review the proposal and “evaluat[e] and mitigat[e] the impacts of the source water change or treatment change on corrosion control.”

Two commenters agreed with the above proposal and for states to approve all source and treatment changes. The commenters further suggested that “the proposed rule should specifically state that systems with CCT, even treatment that has not been designated, cannot turn off the treatment process without State approval” and that final rule “must strictly prohibit changes to water source or water chemistry without a comprehensive and scientifically robust study of the impact of these changes on lead-in-water levels at the tap and the corrosion control treatment in place (if any).”

Three commenters suggested requiring a CCT study prior to implementing any source water or treatment change. The commenters believed that such an approach would assist water systems in “identify[ing] simultaneous compliance and corrosion control issues prior to any such changes” and prevent unintended impacts that would result in elevated lead and copper levels system-wide. One of the commenters also provided suggested language for EPA consideration.

Commenters also raised concerns over how the review of source water and treatment changes would be implemented by water systems and states, and expressed their position that “[t]here is not enough detailed information in the proposed rule or guidance to help water systems and primacy agencies to understand the potential corrosion impacts of design changes and the required activities for various design projects.” Another commenter stated a similar position, that “[w]hile US EPA is proposing that all PWSs notify their primacy agency prior to making a source or treatment change, the onus will remain on the states to determine the impact of potential changes and any required actions for the PWS.” The commenter suggested EPA “include more detailed and specific information in the rule or guidance” and noted that their state program has “developed guidance to determine what constitutes a significant change to source or treatment.” The commenter provided a detailed list of potential considerations that could be included in the suggested rule or guidance. Briefly, the list identified considerations relating to the level of review that would be required by the state; the need for corrosion control treatment installation or re-optimization, formal treatment studies, and additional water quality parameter monitoring; and impacts to consecutive systems.

With specific regard to treatment changes, one commenter suggested that the final rule “should differentiate between significant treatment changes and minor treatment changes requiring OCCT re-evaluation.” The commenter considered alum- to ferric-based coagulant changes to be significant. The commenter considered minor treatment changes to be “powder activated carbon and potassium permanganate addition” and changes in “orthophosphate percent purity or an ortho-polyphosphate blend percentage." Another commenter similarly suggested clarifying, in the final rule or guidance, "what constitutes a change in source or treatment" and whether "a new well installed near an existing well, at the same depth, in the same aquifer, [is] considered a new source." The commenter also suggested providing additional clarity with regard to "[w]hat actions are expected of the customer supply if the seller makes changes to their source or treatment? A third commenter suggested that "[t]he proposed rules or guidance to the State should specifically allow demonstration of no change in treated water quality when implementing a long-term change." As an example, the commenter indicated they had implemented a long-term treatment change to address zebra mussel concerns in the system's raw water infrastructure and were able to demonstrate that no changes in treated water quality had occurred. A fourth commenter noted their state drinking water program "require[s] construction permits for changes in treatment" and certified professional engineers "to complete the design for the improvements/substantive changes" and concluded that this approach had "proven to be helpful should there be large changes."

Agency Response

EPA understands there may be instances where an upcoming long-term change in treatment or addition of a new source may merit CCT re-evaluation to safeguard against potential deterioration in water quality or unintended consequences. EPA also acknowledges commenters' concerns with water systems potentially modifying their existing treatment practices without first informing the State or conducting supporting evaluations or studies demonstrating the need for such a change. In the final rule, the general corrosion control requirements in § § 141.80(d)(4) specify that water systems must notify, and receive approval from, the State pursuant to § 141.90(a)(3) of any upcoming long-term change in treatment or addition of a new source. The State may require additional monitoring or other actions the State deems appropriate to ensure the water system maintains minimal levels of corrosion in its distribution system. The final rule includes an additional monitoring requirement in § 141.86(d)(2)(iv) further specifying that systems adding a new source or making a long-term treatment change shall monitor every six months at the standard number of sites listed under § 141.86(c) until the system meets the lead and copper action levels for two consecutive six-month monitoring periods, unless the State determines that the addition of the new source or long-term change in treatment is not significant and, therefore, does not warrant more frequent monitoring. Systems that do not exceed the lead and copper action levels, and/or the lead trigger level for two consecutive six-month monitoring periods may reduce monitoring in accordance with paragraph § 141.86(d)(4) of this section. If a new source or treatment change is deemed significant by the State, the water system may be required to take appropriate steps such as increased lead, copper, and water quality parameter (WQP) monitoring or the re-evaluation of CCT given the potentially different water quality conditions of the source or treatment change.

Commenters generally supported state review of long-term treatment changes or new source additions; some were concerned with systems shutting off treatment processes where CCT was in place but had not been designated as OCCT. EPA notes that under § 142.10(a)(4) states are required to maintain a program to ensure the design and construction of new or substantially modified public water system facilities will be capable of complying with State primary drinking water regulations. One state commenter noted that its permit review process was helpful in identifying large changes. Several commenters suggested requiring a CCT study for any treatment or source changes. EPA agrees the CCT studies have significant value in evaluating the impacts of potential changes. However, there may be existing sources of information such as previous CCT studies, source water quality, other treatment evaluations or state or system experience that allow for the evaluation of impacts without initiating a new CCT study. That information would be part of the state's review.

Many commenters were concerned with the requirements for state evaluation of treatment or new source additions without some criteria that identify what constitutes such a change or addition. Several commenters offered what considerations would identify a treatment changes or what types of treatment changes would be considered minor. Given the complexity of corrosion chemistry, the wide variability in source water quality and distribution systems materials and EPA's and State's experiences in LCR compliance problems with systems making source or treatment changes or adding new sources, EPA does not believe it is feasible to establish such national criteria that can be used to evaluate treatment or source changes or new source additions.

Finally, with regard to the requirement that systems on reduced tap monitoring must notify the state of any long-term changes in treatment or addition of a new source, EPA notes the provision was added in the 2007 short-term revisions to the Lead and Copper Rule. The examples on long-term treatment changes in § 141.90(a)(3) have been retained in the Revised Lead and Copper Rule. The state must review and approve a change before it is implemented by the system. EPA believes that guidance is the best pathway to provide additional information on long-term treatment changes and addition of new sources. See response to comment section 4.1.1 for further discussion of implementation guidance.

Consecutive System Considerations

Summary of Comments

EPA received comments relating to proposed § 141.82(g). The provisions proposed would require water systems to ensure continued operation and monitoring for optimal corrosion control treatment and re-optimized corrosion control treatment. In § 141.82(g)(1), EPA also proposed these provisions would "apply to all systems, including consecutive systems that distribute water that has been treated to control corrosion by another system." One commenter requested that EPA clarify "the information that will be required from the consecutive system in order to ensure it is in compliance" and "the implications for a wholesale system if the consecutive system does not maintain compliance." The commenter also stated that "[f]or consecutive systems, it is unclear if the wholesale water system is responsible for any exceedances in the consecutive system" and suggested that "[a]ny exceedances, monitoring requirements, and outreach should be the responsibility of the consecutive system and failure to perform any action required by this regulation by a consecutive system should not impact the compliance standing of the wholesale system." A second commenter did not agree with inclusion of this provision but did not provide any additional information or supporting rationale. If maintained in the final rule, the commenter suggested that the provision "be outlined much more clearly, as it is easily missed as currently proposed."

EPA also received comments that suggested revising the proposed corrosion control treatment (CCT) requirements to include further consideration of consecutive water systems. Commenters claimed there to be variability in how states and local regulatory authorities address compliance concerns for these systems and that the revised rule would significantly impact how consecutive systems would comply moving forward, particularly with regard to the optimization/re-optimization and find-and-fix assessment requirements. Commenters also suggested clarifying what would be the regulatory expectations for both the consecutive system as well as the wholesaler and how a trigger level exceedance would factor into those expectations.

One commenter suggested providing clarity on what would be required of consecutive water systems without CCT that exceed the trigger or action level; what impacts it would have on the supplying system; and how exceedances would be addressed "for a consecutive system that receives water from two or more supplying systems." Another commenter suggested adding clarity on "[w]hat actions are expected of the customer supply if the seller makes changes to their source or treatment" and "[w]hat actions are expected of the seller if a customer exceeds a trigger or action level."

Another commenter suggested "clarifying in the rule the expectation for consecutive systems that purchase all of their water from systems that have optimized corrosion control in place" and that "water parameters should not differ significantly from the primary system." A third commenter sought clarity on whether a trigger level exceedance would be "aggregated" among its "member communities" or whether "a single exceedance of either the trigger level or find-and-fix sample" would trigger the proposed rule's optimization requirements. A fourth commenter suggested clarifying "who is the responsible party (wholesale or consecutive system) for the consecutive PWS to achieve compliance of § 141.82(g) to operate and maintain optimal corrosion control treatment (OCCT), including maintaining water quality parameters at or above minimum values or within ranges designated by the State, when the consecutive PWS has no control over the operation and maintenance of the CCT." A fifth commenter suggested clarifying requirements pertaining to "[c]orrosion control designation and re-optimization for consecutive systems." A sixth commenter requested clarification for "when consecutive system monitoring requirements should apply." In light of the interconnected nature of water systems in the commenter's state, the commenter questioned whether the rule would pose a requirement "to have consecutive systems install corrosion control treatment when they do not already have facilities" and claimed that such an approach would be costly for consecutive systems. The commenter recommended EPA clarify the requirements for "consecutive systems that do not have currently constructed treatment facilities and clarify any options that may be available including those requiring cooperation with the wholesale provider."

Finally, one of the commenters recommended that "the rule or guidance be clear that treatment decisions for wholesale or regional systems will continue to be made based on regional data, not the results from a single consecutive system."

Agency Response

EPA recognizes the need for addressing how the optimization and re-optimization requirements intersect with consecutive systems. EPA notes both the proposed and final rules specifically calls out consecutive systems as being subject to the § 141.82(g) requirement for continued operation and monitoring for optimal CCT and re-optimized CCT. The Safe Drinking Water Act (SDWA) requires compliance with all National Primary Drinking Water Regulations (NPDWRs) by all public water systems subject to coverage under the Act. The exceptions to coverage under Section 1411 of the SDWA would not apply to the typical consecutive water system. A consecutive public water system subject to coverage under SDWA is fully responsible for meeting all requirements of the NPDWRs. Therefore, a consecutive system – and not its wholesaler, unless they are treated as a single system under a modified monitoring requirement set forth by the State and concurred by EPA (discussed below) – would be required to take action to address a trigger/action level exceedance or failure to comply with the continued operation and monitoring for OCCT and re-optimized OCCT requirements under § 141.82(g). Any source water additions or treatment changes on the part of a wholesaler that may impact a consecutive system's ability to maintain optimized or re-optimized CCT would similarly require a consecutive system to take action to ensure it remains in compliance with all rule requirements.

Alternatively, under 40 CFR 141.29, EPA allows states to "modify the monitoring requirements under Part 141 to the extent that the interconnection of the system justifies treating them as a single system for monitoring purposes." However, any monitoring must be conducted pursuant to a schedule specified by the State and concurred by EPA. In that case, any compliance determinations would be based on the data collected under the modified monitoring requirements set forth in the State-approved schedule with which EPA must concur. For the purpose of compliance with the LCRR, these modified monitoring requirements would need to ensure that monitoring locations for both tap samples and distribution water quality parameter samples are representative of taps sampled at sites served by a LSL and water quality parameters throughout the combined distribution system. These representative samples would be used to determine the need for the combined system to optimize/re-optimization treatment, where the lead 90th exceeds a trigger or action level, as well as to determine the combined system's compliance with the provisions of § 141.82(g).

Other Provisions Applicable to Water Systems with Optimized and Re-Optimized Corrosion Control

Summary of Comments

EPA received several comments on other proposed requirements applicable to water systems with optimized or re-optimized corrosion control. First, with regard to designation of optimal corrosion control treatment (OCCT) and optimal water quality parameters, commenters noted language throughout § § 141.81 and 82 of the proposal that reflected state "designation" of OCCT, re-optimized corrosion control treatment, and optimal water quality control parameters (OWQP). The commenters stated that under a typical state process, a water system would submit a proposed recommendation or design and the state would approve it as the OCCT or OWQP. For consistency, commenters suggested revising the language in the final rule to reflect "the State will review and approve."

A second set of provisions for which EPA received comment relates to § 141.82(h), under which the state may modify treatment decisions for optimal corrosion control and re-optimized corrosion control. A commenter requested that EPA clarify the following portion of proposed § 141.82(h): "The State may modify its determination… to ensure that the water system continues to optimize corrosion control treatment re-optimized corrosion control treatment."

EPA received comment on the proposed § 141.82(i), under which EPA "may review optimal corrosion control treatment determinations made by a State." Two commenters supported maintaining this provision in the final rule. One also requested that "more CCT training with appropriate levels of corrosion control lessons to improve staff's technical knowledge on this complex subject, as well as, more funding to hire additional staff."

Agency Response

Regarding terminology relating to designation of OCCT and optimal water quality parameters, EPA disagrees with the suggestion to change the regulatory text relating to a State "designation" of OCCT, re-optimized corrosion control treatment, and optimal water quality control parameters (OWQPs) because the processes for determining the treatment and OWQPs does not consist only of review and approval of the system's recommendations. The State must designate either the system's recommended treatment, or another treatment from a list of treatments provided in the regulations. The State also must determine and subsequently designate the appropriate OWQPs. Therefore a "designation" or specification by the State more accurately describes the process required by the regulations. In addition, the Agency has made the determination to maintain the existing terminology and provisions to avoid confusion and for administrative ease.

EPA has revised § 141.82(h) to address the typographical error pointed out by the requested clarification on this provision.

With regard to the requested Agency implementation guidance relating to § 141.82(i), see the response to comment section 4.1.1.

4.2 Timeframes for CCT Optimization and Re-Optimization

Summary of Comments

EPA requested comment on the proposed corrosion control treatment re-optimization requirements and received several comments on the matter as it relates to the proposed timeframes associated with the re-optimization steps in § 141.81(d). Many of the comments are also applicable to the timeframes associated with the proposed optimal corrosion control treatment installation steps in § 141.81(e).

Under § § 141.81(d)(3) and (e)(3), EPA proposed that water systems would be required to complete corrosion control treatment studies within 18 months. One commenter generally noted that the timeframe required for conducting corrosion control studies would depend on the type of study performed by the water system. According to the commenter, timing could range from three months, for a lead solubility study, to as long as one to two years for a pipe loop/rig study. Other commenters generally stated that they did not believe the proposed timeframe of 18 months for completion of corrosion control studies would be sufficient; that the proposal "sets rigid timelines for compliance and does not sufficiently allow public water systems to investigate and evaluate both current available CCT measures or future options;" and that the timing would be "impossible to meet under most public budgeting and procurement processes." A third commenter claimed that "[p]lanning for, budgeting, designing and conducting the corrosion control study for CCT re-optimization can be time-consuming and costly, it could take up to three years to plan for and complete the corrosion control study" and suggested revising the rule to provide for "a phased approach to establishing deadlines for CCT re-optimization" that "will give the CWSs an opportunity to conduct an in-depth study and take any corrective actions as needed." A fourth commenter suggested EPA evaluate the timeframes associated with CCT studies and treatment recommendations, "to see if the amount of time can be shortened when possible." Commenters also suggested EPA "ensure that the final rule is structured so that water systems are able to make timely decisions on corrosion control treatment that is appropriate for their specific situation as shown by the information available" and allow a "re-optimization timeline of up to three years." To ensure that the final rule is structured so that water systems are able to make timely decisions on corrosion control treatment that is appropriate for their specific situation as shown by the information available" and allow a "re-optimization timeline of up to three years."

With regard to pipe loop/rig studies, one commenter asserted that "the time required to do a harvested pipe flow through study is not compatible with the proposal requirement that the study be completed and reported to the Primacy Agency in 18 months" and suggested that "[a] more realistic time frame is 30 months." The commenter also stated, "EPA's most recent corrosion control guidance notes that pipe loops can require years of operation to provide useful data" and observed that "[a]s a specific example, in 2017 [EPA] Region 5 issued a letter to Flint noting that pipe loops must be run for a minimum of a year to provide appropriate data on each test condition." The commenter estimated "a best-case scenario of 17 months and a more realistic time frame of 2 + years," based on scientific literature and field experience, and provided a breakout of the timing required for performing each phase of such a study. The commenter estimated at least 3 months would be required for planning, design, and construction of a pipe loop/rig; 3 to 9 months would be required for pipe loop/rig stabilization; 2 months would be required for transition periods to/from different corrosion control treatments; 6 to 12 months would be required for stabilization periods to/from different corrosion control treatments; and 3 months would be required for final data analysis and report development.

A second commenter similarly concluded that "18 months is insufficient" and recommended that "providing states greater flexibility to adjust the 18-month time period if good cause is shown that additional time is needed to complete a corrosion control treatment study, perhaps with a maximum time limit of 45 months." Based on first-hand experience in performing a pipe loop/rig study, the commenter stated requiring 50 months, of which the "pipe rig study itself consumed about 42 months." The commenter noted the following factors that they believe "influenced the need for more than 18 months to complete the pipe rig study:" multiple water sources, LSL harvesting, and pipe loop/rig conditioning. Since the commenter's water system utilized multiple water sources, it was necessary to harvest LSLs for more than one pipe loop/rig and subsequently operate these rigs for the corrosion control study. The commenter stated, "[t]o harvest 32 usable LSLs, [water system] crews excavated over 100 service lines. Many of these service lines proved to be unsuitable for the study because they had been previously repaired, were insufficient in length or were damaged during excavation." Once the pipe loop/rig had been constructed, the commenter noted that "it took approximately eight months to adequately condition the lines." Finally, the commenter stated that "due to regulatory timing under the current rule, [the commenter] began testing the different corrosion control treatments before the lines were adequately conditioned, and as a result experienced challenges, including mechanical issues, which required a temporary cessation of operation, affecting the data collected."

A third commenter stated that pipe loop/rig stabilization can "last for several months before the evaluation of the various conditions can even begin." According to the commenter, "the time required to set up, allow the scales to become stable from both the physical disturbance and then the changing test conditions could easily exceed the total 18 months allowed in the proposed rule for performing pipe loop experiments." Instead, the commenter recommended that the proposal allow systems to "develop a timeline with the state and engage the state more often during any study. In that case the system can provide the data to the state in the event that the pipe loops may take longer than expected to reach a baseline or there is a problem performing the study."

A fourth commenter estimated the necessary timeframe for completing corrosion control studies utilizing pipe loops/rigs is "easily likely to exceed the 18 months mandated in the proposal." The commenter indicated that "[b]udgeting for, selecting, and hiring an engineering firm to assist a water system in evaluating its treatment can take months to over a year;" that "[i]f use of a pipe loop test rig is appropriate for that evaluation, assembling it and acclimating the harvested lead pipe until it is stable enough for statistically useful results can take 6 to 12 months;" and that "[t]esting alternatives may require evaluation of performance over different seasonal water quality conditions."

A commenter suggested that corrosion control studies utilizing pipe loops/rigs "should include water testing for a minimum of 1 full year to evaluate seasonal effects" and "should account for at least 3 years in their time to comply with any study requiring a pipe loop." According to the commenter, "study design and construction will require 6 months minimum, but often longer for construction if space and lead service lines are not readily available." The commenter also noted that LSL excavation "cannot be done during freezing temperature months or rain" and that "[p]ipe loop scales need to acclimate for after at least 1 year of routine operation to provide meaningful results."

A commenter believed that "[p]ipe loop/rigs require significant technical, managerial, and financial capacity which makes them difficult for systems to execute within the proposed rule deadlines." The commenter also shared anecdotal observations related to the performance of these studies by a large system: "lead service line pipe loops took 2.5 years to set up due to substantial challenges with harvesting lead service lines. Then, after the pipe loops were constructed, conditioning, testing, data analysis and report preparation took an additional 2 years."

Other commenters stated their general belief that an 18-month timeframe would be insufficient for performing a corrosion control study that utilized a pipe loop/rig and indicated the time needed to harvest LSLs, stabilize pipe loop/rig conditions, and generate data representative of seasonal water quality fluctuations as general constraints.

EPA proposed requiring water systems to install re-optimized corrosion control treatment, or complete the necessary treatment modifications to achieve re-optimized corrosion control, within 12 months in accordance with proposed § 141.81(d)(5). Water systems installing optimal corrosion control treatment in accordance with proposed § 141.81(e)(5) would be required to do so within 24 months. One commenter generally suggested that EPA revise the proposed rule to "allow primacy states to designate a shorter time frame."

One commenter stated that, "in some instances, it may be possible to take steps more quickly using available information and less time-consuming analyses." However, the commenter believed that "complex cases or situations where significant capital construction" would require more than 12 months to procure funding, contract for design and construction services, and complete construction. The commenter also asserted that the "expectations, oversight, financing, and logistics associated with significant capital improvements to drinking water treatment facilities are such that the [Safe Drinking Water Act] provides a three – five-year window for treatment changes." The commenter did not believe "all changes that occur following an evaluation of corrosion control practice will require such an extended timeline," but suggested the rule should not "be constructed in a manner that requires water systems and states to seek variances in order to accomplish required improvements."

Other commenters similarly believed that the proposed timeframe of 12 months would be insufficient. One commenter claimed it would be insufficient "to implement any agreed upon changes to corrosion control treatment;" that "[o]nce the final treatment is agreed upon, significant time is needed to design, permit, and build the appropriate facility;" and that "[m]any systems also have complex situations such as several sources of water entering a system, consecutive system considerations, public communications, and wastewater treatment issues that must be addressed prior to a change in the water chemistry." Another commenter generally stated that the timeline for treatment implementation is "impossible to meet under most public budgeting and procurement processes."

One commenter stated that "[t]he 12-month construction timeline for CCT re-optimization (141.81(d)(1)) is not achievable for large treatment modification projects" and noted that "[m]any times a supplier needs to install a new treatment building or chemical room and therefore go through the design, approval and construction process." The commenter also identified "state revolving funding or a short construction season" as additional constraining factors and suggested that "the deadline be dependent on the treatment change or modification scope. Minor treatment changes using existing equipment (e.g., orthophosphate dose change) should take place as soon as possible and within a maximum time limit to protect public health. However, if the treatment change is significant then up to two years should be granted."

Other commenters generally stated that "if construction of significant changes to treatment processes is required, the 12-month implementation deadline in the proposal is inadequate" and that "design and construction of corrosion control-related capital upgrades can take much longer than twelve months to complete." These commenters suggested revising the prescribed timeframe and allowing it to be extended on a case-by-case basis.

One commenter suggested EPA revise § 141.81(e)(5) to require installation of optimal corrosion control treatment within 6 months instead of 24 months on the basis that "the preceding [treatment] steps allow enough time for bidding, budgeting, etc." and that the commenter's state also had done so. Another commenter similarly suggested EPA evaluate the installation timeframe "to see if the amount of time can be shortened when possible."

Under § § 141.81(d)(6) and (e)(6), EPA proposed to require water systems to complete follow-up sampling within 12 months of completion of modifications to corrosion control treatment or installation of optimized or re-optimized corrosion control treatment. One commenter stated that "[t]he requirement to have follow-up monitoring completed within 12 months may be impractical in instances when the beginning of the next six-month monitoring period is months away from the treatment approval date." The commenter instead recommended requiring "water systems complete follow-up sampling for two consecutive six-month monitoring periods and within 18 months after initial installation or re-optimization."

Finally, a commenter sought general clarification on whether the optimization steps were intended to take "up to 4.5-5 years based on timelines given." With regard to the proposed treatment steps for systems that are re-optimizing their corrosion control treatment, a second commenter asked, "[h]ow can a large water system recommend optimal corrosion control treatment within six months after the end of the monitoring period during which it exceeds either the lead trigger level or copper action level before it conducts the corrosion control studies required under § 141.81(d)(2)" and noted that § 141.81(d)(2) "calls for completing the corrosion control studies within 18 months of the exceedance pursuant to § 141.81(d)(3)." The commenter noted the same question for the proposed requirements in § § 141.81(e)(1), (2), and (3) for systems installing optimal corrosion control treatment.

A final commenter suggested that "[t]he noncompliance time period that triggers replacement of all lead service lines needs to be lengthened by 12-18 months to allow adjustments to corrosion control to actually be seen in the distribution system." For more information on LSLR see response comment Section 6.

Agency Response

EPA agrees the amount of time needed to complete a corrosion control study will depend on the type of study conducted and recognizes that budgeting, planning and procurement for certain studies, those using pipe loops/rigs, will require significantly more time. EPA also agrees with the importance of providing a final rule that better enables systems to make timely treatment decisions appropriate to the specifics of their situation. As discussed in the next paragraph, EPA has included modifications in the final rule to provide additional time to those systems that must conduct pipe loop/rig studies. For other types of studies – e.g., metal coupon tests, partial-system tests or analyses based on documented analogous treatments with other systems of similar size – the final rule retains the 18-month timeframe. EPA does not believe the scope and logistical complexity of these other types of studies are sufficient to justify delaying the installation of optimized/re-optimized treatment. With regard to the shorter timeframe suggested for OCCT recommendations, systems will need sufficient time to gather and analyze data, identify technical constraints and articulate a basis for which treatment option(s) the system is recommending as its OCCT. EPA does not believe it would be practical or feasible, based on the Agency's experience with implementing the current rule, for systems to do so in fewer than the six months prescribed in the final rule. With regard to the shorter timeframe suggested for CCT studies, the Agency similarly believes that the majority of systems will need 18 months not only to conduct the studies, but to complete a variety of activities related to the planning, analysis of study results and subsequent summarization of findings and conclusions when preparing the study report for the state. For those systems that are able to submit their treatment recommendations or CCT studies sooner than the timeframes prescribed in the final rule – 6 and 18 months, respectively – the Agency notes that the final rule would not preclude them from doing so. Finally, the Agency disagrees with comments suggesting the proposed timeframe does not sufficiently allow systems to evaluate current or future treatment measures or options, or that it warrants a phased deadline approach for conducting in-depth studies or taking corrective actions. Prior to the start of the 18-month study period, systems that are not conducting pipe loop/rig studies are provided an additional 6 months to initiate their evaluations as they develop treatment recommendations for initial or re-optimized corrosion control in accordance with § § 141.81(d)(1)(i) or (e)(1)(i), respectively. As identified above, and discussed in the next paragraph, systems conducting pipe loop/rig studies would have up to 30 months.

With regard to the comments that more specifically suggested the proposed rule's 18-month timeframe for corrosion control studies would not be sufficient for the subset of systems required to conduct pipe loop/rig evaluations because of the additional time required to harvest, construct and stabilize the pipe loop/rig prior to commencing the study, EPA acknowledges the logistical considerations raised by commenters and agrees a longer timeframe is warranted for pipe loop/rig studies. For the subset of systems who must conduct such studies – those with lead service lines that exceed the lead action level – EPA has removed the requirement for submitting an optimal corrosion control treatment (OCCT) recommendation within six months from the end of the monitoring period in which the exceedance occurred. Instead, these systems must construct pipe loops/rigs and operate them with finished water within one year from the end of the tap sampling period during which the action level was exceeded [§ § 141.81(d)(1)(ii) and (e)(1)(ii)]. Following this period, systems will have 18 months to complete their corrosion control studies [§ § 141.81(d)(3)(i) and (e)(3)]. EPA believes that, by removing the OCCT recommendation requirement, systems will be able to concentrate resources more immediately on the harvesting, building and conditioning of pipe loops/rigs. The one-year 'build' period provided under § § 141.81(d)(1)(ii) and (e)(1)(ii) will yield an overall timeframe of 30 months to build conditioned pipe loops/rigs and complete subsequent corrosion control studies. This timeframe is consistent with comments EPA received on the proposed rule, the majority of which anticipated needing an overall timeframe of 30 months, and for which 6 to 12 months would be needed specifically for the construction and conditioning of pipe loops/rigs. EPA does not believe it will be necessary for systems to develop, in coordination with their states, individual timelines for the completion of harvested flow-through pipe loop studies. Under the final rule, systems completing such studies in accordance with either the optimization or re-optimization steps are now provided up to 30 months to harvest lead pipes from the distribution system, construct flow-through pipe loops, and perform the corrosion control study. In the event of any unanticipated delays or problems in performing the study, EPA does not believe the provision of study data, as suggested by commenters, would sufficiently inform state decision-making on water quality conditions, or the corresponding water quality parameter values that would constitute optimized or re-optimized treatment.

In response to comments regarding the proposed rule's 12-month timeframe for installing re-optimized corrosion control, EPA acknowledges the logistical considerations raised by commenters and agrees the scope of the treatment change would warrant a shorter or longer timeframe. EPA has made modifications to § § 141.81(d) and (e) to reflect these considerations accordingly. Those systems that must complete a corrosion control study would have up to 36 months prior to the 12-month installation period to plan for the upcoming treatment modification. Small and medium systems for which the State determines a study is not required would have 12 to 18 months. For systems that exceed the lead trigger level, but not the lead or copper action level, the State may approve modification of the existing CCT without requiring a study. In these instances, water systems would have 6 months to make the modifications in accordance with § 141.81(d)(1).

With specific regard to the ability for states to designate shorter timeframes for the installation of optimized or re-optimized CCT, EPA encourages systems and states to work together to install optimized or re-optimized CCT on a shorter timeframe, where feasible, than the maximums identified in the final rule. States may, if they choose, adopt timeframes that are more stringent than the revised Lead and Copper Rule.

The proposed step requirements for optimized and re-optimized CCT would require some systems to recommend OCCT to the State 12 months before the corrosion control study would be required to be completed. As discussed above, EPA has included modifications in the final rule that address this consideration. EPA has removed the requirement for initial OCCT recommendations for systems conducting pipe loop studies. This applies to systems installing optimized CCT in accordance with § 141.81(e) as well as to systems that are re-optimizing CCT in accordance with § 141.81(d). Those systems that are not required to conduct corrosion control studies would recommend the optimal treatment based on the results of lead and copper tap sampling and water quality parameter monitoring in accordance with § 141.82(a)(1) within six months after the end of the tap sampling period during which it exceeds either the lead trigger level or copper action level [§ 141.81 (d)(1)(i) and (e)(1)(i)].

EPA disagrees with comments suggesting shorter timeframes for OCCT installation under proposed § 141.81(e)(5), and for follow-up sampling under proposed § § 141.81 (d)(6) and (e)(6). Based on the

Agency's experience with implementing the current rule, the vast majority of water systems will need up to 24 months to install the treatment and make any necessary operational adjustments to ensure the treatment is operating as intended. EPA recognizes some systems may be able to install OCCT on a shorter timeframe and notes that these systems would not be precluded from doing so under the final rule. With regard to the follow-up sampling provisions, the purpose of the follow-up monitoring is to demonstrate the newly installed or modified corrosion control treatment has stabilized and is functioning as intended. In the event that it's not, it is in the public's interest for this determination to be made sooner rather than later. Allowing systems to postpone follow-up monitoring would be less protective of public health. For these reasons, EPA is not revising the existing timeframes for treatment installation and follow-up sampling in the final rule. Finally, it was suggested that "[t]he noncompliance time period that triggers replacement of all lead service lines needs to be lengthened by 12-18 months to allow adjustments to corrosion control to actually be seen in the distribution system." It is not clear which time period the comment is referencing. While reductions from treatment modifications are not immediately observable, EPA does not believe the completion of other complementary actions to reduce lead concentrations should be precluded or delayed by it.

4.3 Process for CCT Steps (Initial Optimization)

EPA received comments on the proposed requirements in § § 141.81 and 82 for initial optimization of corrosion control based on lead 90th percentile and corrosion control treatment status. EPA also received comments on the proposed optimization steps that systems would be required to complete under § § 141.81 and 82.

Initial Optimization Requirements Based on Lead 90th Percentile and Corrosion Control Treatment Status

Summary of Comments

EPA received several comments on the proposal to base corrosion control treatment (CCT) optimization requirements on the lead 90th percentile and CCT status of the system. This section summarizes comments relating to water systems without existing CCT. For systems with CCT, see the separate discussion in section 4.4.1.

Some commenters expressed general support for the proposed approach. One commenter stated "[a]ll water systems should be treating for corrosion control regardless of their sampling results or 90th percentile readings." Two commenters expressed specific support for the proposed requirement in § 141.81(a)(1)(ii) for large systems without corrosion control treatment to complete the treatment installation steps after exceeding either the lead trigger level or the copper action level. A third commenter supported "extending the requirements for CCT to systems servicing > 10,000."

One commenter supported the overall approach proposed but suggested using a reduced lead action level as the basis for triggering initial optimization under § 141.81(a)(1) – (4). The commenter also made a general suggestion for EPA to "require all water systems to complete a corrosion control study to identify optimal corrosion control treatment" and, as an alternative for small and medium systems, for EPA to "conduct systematic corrosion control studies in typical representative source waters across the country that states could use to extrapolate to treatment requirements."

Some commenters did not support the proposed initial optimization requirements. One of the commenters disagreed with “EPA’s proposal to allow states to determine whether a CCT study is warranted for community water systems” and recommended revising the proposal to require “all community water systems, regardless of size and status of CCT, to conduct a study following a Trigger Level or action level exceedance.” Another disagreed with the initial optimization requirements “be[ing] solely based on 90th percentile values” and recommended EPA “require all water systems to determine if they are optimized, regardless of their 90th percentile values” and “require all water systems with [lead service lines] or service lines of unknown material, regardless of their 90th percentile, to conduct a CCT evaluation within 12 months of the rule becoming effective.” A third commenter stated they “disagree[d] that small or medium systems who exceed the copper AL shouldn’t be held to the same standard as for lead.” The commenter suggested that “exceedance of either AL trigger the requirement to install CCT or implement applicable small system flexibilities.”

A commenter raised concerns over the added burden that the implementation of this re-optimization approach would place on states. The commenter stated that “these additional requirements will have to be reviewed and approved by the state staff;” would result in a “significant increase in the amount of technical assistance;” and that training would be “necessary to prepare state staff, consultants, engineers, and system operators to conduct proper CCT evaluation and recommend appropriate treatment.”

In addition to the general comments on the proposed initial optimization requirements summarized above, EPA received several comments specific to the requirements proposed in § 141.81(a). Three commenters suggested adding language to the rule specifically addressing “large water systems without corrosion control treatment that are deemed to have optimized corrosion control.” Some generally noted several provisions within § 141.81(a) direct large systems to follow treatment steps and deadlines in § 141.81(e) – “Treatment steps and deadlines for small and medium-size systems…” – and suggested further clarifying these provisions in the final rule. (See corresponding discussion of § 141.81(e)-related comments further below.) Others provided comment on proposed § 141.81(a)(1)(iv), under which large systems without CCT “that do not exceed the lead trigger level and copper action level but are not deemed to have optimized corrosion control under paragraph (b)(3)” of § 141.81 “may be required by the State to complete the corrosion control treatment steps in [§ 141.81](e).” One commenter supported the proposed approach; others raised a general concern that the proposed approach would “not be as protective as the current rule for large systems” and seemed to create “a new subset of large systems that may not currently be optimized,” for which “the revised rule does not appear to explicitly require additional action” and for which “states may not have the authority to require additional action.” Instead of the approach proposed in § 141.81(a)(1)(iv), some commenters suggested that “all large systems be required to implement [optimal corrosion control treatment] or be deemed optimized using [§ 141.81](b)(3).” Other commenters noted the proposed language “does not address large water systems without corrosion control treatment that are deemed to have optimized corrosion control” and requested that “large systems without corrosion control treatment be considered optimized and not required to install treatment.” Another commenter suggested the final rule explicitly state “[i]f these systems are exempted from corrosion control treatment.”

Other commenters expressed a general concern over how the provision in § 141.81(a)(1)(iv) – that a state "may require" large systems without CCT that do not exceed the lead trigger level and copper action level to complete the CCT steps – could be implemented by States. One of the commenters believed the proposed approach "sets a third regulatory level" and suggested revising § 141.81(a)(1)(iv) "to remove the possibility of regulators having the authority of arbitrarily requiring large water systems to review their approach to corrosion control based on their 90th percentile lead levels not being below the Practical Quantitation Level (currently 5 ppb)." Another commenter similarly stated, "[i]n the situation where a large water system without corrosion control has a 90th percentile tap water lead level that is between the practical quantitation and trigger levels of 5–10 ppb year after year, a large water system could be ordered by the State to perform corrosion control studies pursuant to § 141.81(e)(2) every year, despite the 90th percentile lead level being consistently below the trigger level." The commenter suggested that "the rule should contain a safe harbor that would protect a large system from conducting needless additional corrosion control studies if it has already carried out the required corrosion control studies, except in instances where there has been a significant change to the large water system or in corrosion control technology." Another commenter stated, "the proposed rule could require us to perform lengthy and costly pipe loop corrosion control studies (§ 141.81 (a)(iv)) to prove what we already know and can demonstrate by the scale on our pipes and our water chemistry." The commenter suggested "EPA should revise the rule to allow the flexibility of demonstrating optimized corrosion control in these instances by showing existing distribution system conditions rather than require additional studies by the water system. EPA should also pass that flexibility on to the State regulatory programs."

EPA also received comments on the proposed provisions in § § 141.81(a)(2) & (3) for medium and small systems, respectively. One commenter recommended that "the steps required of a public water system following a lead trigger level exceedance be clarified," stating "the rule language in § 141.81(a)(2)(ii) and (a)(3)(iii) regarding the requirements for small and medium systems to conduct corrosion control treatment steps is confusing and seemingly inconsistent with § 141.81(c)(2)."

Agency Response

EPA agrees with commenters who support a requirement for water systems to optimize their corrosion control treatment (CCT) based on the lead 90th percentile level and CCT status. The strengthened treatment optimization procedures resulting from this approach will promote greater protection of public health by requiring water systems to take more progressive actions to optimize their treatment and, in turn, reduce lead levels at the tap. The final rule includes, in § 141.81(a), a requirement for any system without CCT to conduct the optimization steps in § 141.81(e) upon exceeding the lead trigger or lead and copper action levels. EPA has revised the regulatory text in § 141.81(a) of the final rule to improve its clarity and will work with primacy agencies and water systems to ensure they understand the different actions that must be taken when systems exceed a trigger or action level.

EPA disagrees with the comments suggesting all systems complete a CCT study or determine if they are optimized regardless of their 90th percentile. The Agency believes the use of a trigger-level approach prioritizes optimization actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority. Both of the suggested alternatives would substantially increase the number of water systems required to obtain state review. EPA has concluded it is not practicable for such a significant number of water systems to obtain these reviews/approvals from their states. Additionally, such an approach would be overly prescriptive for systems with low lead 90th percentiles since they may not be able to achieve further reductions. In such cases, the suggested requirements would not provide meaningful opportunities to protect public health.

EPA also received comment suggesting the Agency conduct corrosion control studies that would be representative of source waters nationally. These studies could, in turn, be used by systems to extrapolate treatment needs for corrosion control. Source water and distribution systems are highly case-specific in their nature and vary over time; EPA does not believe the development of such a tool would be functional. Agency guidance on the implementation of the CCT step requirements was also requested by commenters. See response to comment section 4.1.1 for further discussion of implementation guidance.

Regarding the assertion that the proposal does not hold small and medium systems exceeding the copper action level to the same standard as for lead, and for which it was suggested exceedance of either action level should serve as the trigger for taking action, EPA notes that both the proposed and final rules include provisions that are consistent with the suggested approach. Under the final rule, medium and small systems that exceed either the lead or copper action level are required under § § 141.81(a)(2)(ii) and 141.81(a)(3)(iii) and (iv), respectively, to complete the CCT steps specified in § 141.81(e). For medium systems, EPA believes the suggestion for triggering actions solely on the basis of action level exceedances would hinder these systems' ability to proactively prepare for, and quickly take action if, there is a subsequent action level exceedance. For this reason, the final rule includes a requirement under § 141.81(a)(2)(iii) for medium systems above the trigger level (but below both action levels) to complete the treatment recommendation step specified in § 141.81(e)(1). These systems would then complete the remaining steps in § 141.81(e) if they subsequently exceed either action level. For small systems, as well as non-transient, non-community water systems, EPA instead believes it is important to provide greater flexibility in selecting the treatment action that makes sense for protecting the health of their community. For this reason, the final rule includes a requirement under § 141.93(a) for such systems above the trigger level (but below both action levels) to evaluate the four compliance options prescribed in that section and make a recommendation to the state. The compliance options include CCT installation as well as lead service line replacement, point-of-use devices, and replacement of lead-bearing plumbing.

EPA acknowledges concerns with the added burden the proposed re-optimization approach would place on states and systems. To ease the burden and offer greater flexibility, the Agency has identified 'bins' reflecting certain system characteristics that would elevate the potential risk for drinking water lead exposures and thus warrant more rigorous CCT study requirements. These characteristics include CCT status, system size, the presence of lead service lines and lead 90th percentile. The final rule includes modifications that target requirements according to these 'bins.' EPA believes this 'bin' approach will reduce the overall burden of the rule by more precisely identifying the subset of systems whose conditions would not necessitate a more rigorous CCT study, such as a pipe rig/loop study, to protect public health. See the response in section 4.5.1 for a detailed discussion of these characteristics and how they form the basis for the CCT study requirements and any associated burden reductions.

Per commenters' suggestions, EPA also modified § 141.81(a) to clarify under what circumstances large systems without CCT must complete the CCT optimization requirements. The modification, which is included under § 141.81(a)(1)(ii) of the final rule, requires large systems without CCT to complete the treatment installation steps in § 141.81(e) if they exceed the lead practical quantitation level (PQL), rather than the lead trigger level EPA initially proposed, or the copper action level. EPA believes that requiring such action when the lead PQL is exceeded allows states to work proactively with these systems that are a higher priority by virtue of the larger populations they serve and their lack of existing CCT. EPA also has removed proposed § 141.81(a)(1)(iv) from the final rule since these systems would be required to install CCT in accordance with final rule § 141.81(a)(1)(ii). EPA believes these modifications will make the rule more protective of public health and address concerns by eliminating the potential creation of a subset of large systems for which states may not have the authority to require additional action; eliminating the potential for States to implement the proposed provisions in a manner that sets arbitrary lead 90th concentrations as the basis for requiring the CCT installation; and more directly addressing/clarifying which large systems would be exempted from installing corrosion control treatment (i.e., those whose distribution system conditions demonstrate eligibility for being deemed optimized under § 141.81(b)(3)). This modification also addresses 'safe harbor' concerns since final rule § 141.81(a)(1)(ii) contains an explicit CCT installation requirement for the subset of systems whose lead 90ths are between the PQL and trigger level, eliminating the CCT installation 'gray area' that was raised as a concern. EPA also has revised § 141.81(b) to provide more clarity on which systems can be deemed optimized and how these systems can continue to be deemed optimized. Language also was added to clarify that all systems optimized under § 141.81(b) must continue to demonstrate that they qualify for the deemed status in all subsequent rounds of monitoring.

Modifications also have been made to the final rule as they relate to the comments seeking clarity on proposed § § 141.81(a)(2) & (3) and suggesting inconsistencies between these provisions and § 141.81(c)(2). EPA believes the following modifications will provide greater clarity and resolve the perceived inconsistency with § 141.81(c). Final rule § 141.81(a)(2)(iii) includes language clarifying that the provision applies to medium systems without CCT that exceed the trigger level, but not the lead or copper action levels. Final rule § § 141.81(a)(3)(iii) and (iv) include language clarifying that small community water systems choosing the corrosion control option pursuant to § 141.93, as well as non-transient, non-community water systems, must complete the CCT steps in § 141.81(e) if they exceed the lead or copper action level; references to the trigger level in the proposal have not been retained in the final rule. Finally, § 141.81(c) has been modified to provide greater clarity on the circumstances under which systems subject to this paragraph may cease completing CCT steps. Systems may cease completing steps if they do not exceed either action level during each of two consecutive six-month monitoring periods prior to the start of Step 3 (§ 141.81(e)(3)) or Step 5 (§ 141.81(e)(5)). The proposal's separate provision in § 141.81(c)(2) that dealt specifically with systems exceeding the trigger level has been removed.

EPA received comments opposing the provisions proposed in § 141.81(c) that would allow small and medium water systems that meet both action levels for two consecutive six-month monitoring periods to cease completing certain initial optimization steps in proposed § 141.81(e). EPA disagrees that any action level exceedance should trigger CCT. The Agency believes it is necessary for the final rule to retain the flexibility provided by § 141.81(c), and the subsequent burden reductions it offers small and medium systems. The Agency also notes, per § 141.81(b)(1) of the previous and proposed/final rules, that small and medium systems who meet both action levels for two consecutive six-month monitoring periods are deemed optimized with regard to their corrosion control. EPA recognizes, however, that there may be circumstances where the increased risk to public health warrants requiring follow-through on a CCT study completion regardless of a system's ability to meet both action levels in subsequent monitoring periods. The Agency believes the presence of LSLs is such a circumstance and has revised the final rule to reflect this consideration. Under § 141.81(c) of the final rule, medium systems with LSLs and small systems with LSLs that choose the corrosion control option pursuant to § 141.93 must complete a CCT study in accordance with § 141.81(e), Step 3. Systems without LSLs are not required to complete CCT studies or installation of OCCT – Steps 3 or 5 of § 141.81(e) – if they do not exceed either action level for two consecutive six-month monitoring periods prior to the start of Step 3. The final rule has been revised for added clarity and to specify that systems are not permitted to cease the optimization steps a second time. Any systems initiating Step 5 (installation of OCCT) must also complete the other three remaining steps (i.e. follow-up sampling, State designation of optimal water quality parameters (OWQPs), and operating in compliance with OWQPs).

Proposed Initial Optimization Steps and Requirements

Summary of Comments

EPA received comment on the required treatment steps proposed in § 141.81(e) for systems without corrosion control treatment. Commenters expressed general agreement with the proposal; however, one commenter disagreed with the specific approach for initial sampling requirements proposed in § 141.81(e)(1), claiming it would not "account for water systems that exceed the [trigger or action level] after the initial monitoring periods following promulgation of the rule," and provided specific suggestions on how initial sampling provisions could be revised on the matter.

Other commenters provided suggested revisions to proposed § 141.81(e). One commenter suggested the inclusion of language explicitly stating when "a small/medium supply that exceeded the trigger level can stop the treatment steps in (e) unless/until they subsequently exceed the action level" and "including specific criteria for justifying any requiring optimized corrosion control." Another commenter recommended revising § 141.81(e)(1) to require small and medium systems to base their optimal corrosion control treatment recommendation on "initial water quality parameters within six months of the trigger level exceedance instead of requiring a corrosion control study." A third commenter suggested revising § 141.81(e)(2) to require medium systems to complete corrosion control studies. A fourth commenter stated generally that they could not "imagine a scenario involving waterworks serving 500 or fewer persons where CCT, preceded by corrosion control studies, or lead service line replacement would cost less than point of use treatment and maintenance."

Commenters noted portions of § 141.81(a) as proposed direct large systems to follow treatment steps and deadlines in § 141.81(e) – "Treatment steps and deadlines for small and medium-size systems…" Commenters requested clarification on the requirements being proposed for large systems without corrosion control; suggested revising § 141.81(e) to more clearly identify the applicable treatment steps for large systems; and provided several specific suggestions. Other commenters noted the proposed § 141.81(e) does not appear to address medium systems who grow to become large systems due to population increases and suggested adding language to address these types of systems or provide separate guidance on the matter. A final commenter provided specific suggestions on how the proposed language in § 141.81(a) could be clarified further. In addition to comments on § 141.81(e), EPA received comment on the proposed provisions in § 141.82(a)(1) – (4) specifying the conditions under which water systems without corrosion control treatment would be required to make an optimal corrosion control treatment recommendation to the state. Under the proposed approach, water systems would make the recommendation in response to a trigger level exceedance and install the treatment if the lead or copper action level were subsequently exceeded. Commenters noted general concerns with the possibility of "an evaluation [prepared after a trigger level exceedance] may be several years old before the subsequent trigger occurs" and that "states will likely require more recent data, which will require the completion of redundant corrosion control activities." One of the commenters recommended providing clarification "for acceptable timelines and system characteristics which would allow the use of a previously completed study or when an entirely new study would be warranted" and on whether "systems are required to repeat corrosion control activities if they continue to exceed the trigger level but not the action level." In relation to the latter, the commenter recommended that "small and medium systems not be required to repeat corrosion control activities unless there is a change in source or treatment."

Commenters suggested "requir[ing] all decisions about and assessments of a water system's corrosion control treatment to be examined and certified by an independent, certified professional engineer with expertise in corrosion control" and that "[a]ll documentation involved in this process must be publicly available." A third commenter suggested adding revisions that would "address the impacts of climate change on the water supply and water quality."

Agency Response

EPA has modified the provision in proposed § 141.81(e)(1) in a manner that addresses the concern that it would not account for systems exceeding the trigger or action levels after initial monitoring periods following promulgation of the final rule. The final rule provision omits the references to 'initial tap sampling' that were suggested to be problematic.

EPA received a comment suggesting that § 141.81(e) include language explicitly stating when small or medium systems may be allowed to cease optimization steps. The Agency notes the requested criteria are available in § 141.81(c) of the proposed and final rules. This paragraph specifies the specific criteria under which small or medium systems may be eligible to cease completing optimization steps. Final rule § 141.81(c) includes additional modifications to improve the paragraph's overall clarity. EPA has not incorporated these provisions into § 141.81(e) as the Agency does not believe it would meaningfully enhance or improve their clarity.

Commenters suggested requiring in § 141.81(e)(1) the use of initial water quality parameters (WQPs) as a basis for optimal corrosion control treatment (OCCT) and, in § 141.81(e)(2), requiring all medium systems to complete CCT studies, respectively. As discussed in the response to the previous subsection, 4.3.1, EPA has revised the optimization requirements in § 141.81(e) to prioritize actions according to certain system characteristics that would elevate the potential risk for drinking water lead exposures and thus warrant more rigorous requirements. These characteristics include CCT status, system size, the presence of lead service lines and lead 90th percentile. The Agency believes this approach eases the burden and offers greater flexibility to systems and states. In light of these modifications, the suggestion to use WQPs as an OCCT basis is limited to systems that exceed the lead trigger or copper action level [§ 141.82(a)(1)] or to small community water systems or non-transient, non-community water system that exceed the lead trigger or copper action level and choose to pursue a small water system compliance flexibility option and are required to recommend an option in accordance with § 141.81(f) [§ 141.82(a)(1)]. Medium systems are required to conduct pipe rig/loop studies if they exceed the lead action level and lead service lines (LSLs) are present in the distribution system [§141.81(e)(1)(ii)].

Medium systems without LSLs that exceed the lead trigger or either of the action levels may be required by the state to conduct corrosion control studies [§ 141.81(e)(2)].

Although EPA does not believe the majority of very small systems are likely to opt for CCT, the Agency believes it is important to provide water systems greater flexibility in selecting the treatment action that makes sense for protecting the health of their community. For this reason, the provision in § 141.93(a) that requires small systems above the trigger level (but below both action levels) to evaluate their compliance options and make a recommendation to the state includes CCT installation as an option. Those small systems that select CCT installation as their flexibility option are directed in final rule § 141.81(e) to complete each of the treatment optimization steps prescribed in that paragraph.

Several commenters expressed confusion over how proposed § 141.81(a) directs large systems to conduct optimization steps that were labeled in § 141.81(e) as applying to small and medium systems only. Comments also sought clarification on how large systems without corrosion control or medium systems who grow to become large systems are intended to comply with the proposed initial optimization requirements. To address these comments and suggested clarifications, EPA has modified the paragraph title in § 141.81(e) to "Treatment steps and deadlines for systems without corrosion control treatment." EPA believes this modification better reflects the paragraph's intended applicability to the subset of systems that do not have corrosion control treatment in place and alleviates the points of confusion noted in the comments.

Some comments expressed concerns with the possibility of proposed § 141.81(e) and related provisions in § 141.82(a) yielding OCCT recommendations that are several years old by the time the system is triggered into implementing them. EPA recognizes the potential for such circumstances to arise and notes that § 141.81(c) of the proposed and final rules include a provision that directly addresses this concern. Under this provision, water systems are required to repeat treatment steps they have previously completed when the State determines it is necessary to implement the treatment requirements of the rule. The Agency believes this will eliminate the potential for systems to implement the treatment optimization steps using outdated information. EPA disagrees with commenters who suggested the final rule prescribe timelines and system characteristics under which previous optimization activities, including CCT studies, would be acceptable or necessary to repeat. The Agency also disagrees with the suggestion to limit the need for new studies only when source water or treatment changes have occurred. Because of the highly specific nature of such considerations, EPA believes it is important to provide states the flexibility to determine the need for such actions in accordance with § 141.81(c) on a case-by-case basis.

Commenters suggested requiring treatment decisions to be independently certified by corrosion control experts, promote greater public access to documentation of treatment decisions, and address potential climate impacts. EPA encourages water systems to communicate with their customers and raise awareness of any potential treatment changes the system may be contemplating; however, EPA does not believe such requirements would provide a sufficiently meaningful opportunity to protect public health given the potential for delays it may pose on the optimization process and the added burden to water systems and states. Agency guidance on the implementation of the CCT step requirements was also requested by commenters. See response to comment section 4.1.1 for further discussion of implementation guidance.

4.4 Process for CCT Steps (Re-Optimization)

EPA received comments on the proposed requirements in § § 141.81 and 82 for re-optimization of corrosion control based on lead 90th percentile and corrosion control treatment status. EPA also received comments on the proposed re-optimization steps that systems would be required to complete under § § 141.81 and 82, as well as the proposed provisions in § 141.82(b)(3) that relate to a State decision for requiring small or medium sized system corrosion control studies to identify re-optimized treatment.

Re-Optimization Requirements Based on Lead 90th Percentile and Corrosion Control Treatment Status

Summary of Comments

EPA requested comment on the proposed corrosion control treatment (CCT) re-optimization requirements and on "potential actions water systems could take to adjust their corrosion control treatment and how they should work with the state to determine if adjustments to the treatment would better optimize corrosion control." This section summarizes comments relating to water systems with existing CCT. For systems without CCT, see the separate discussion in section 4.3.1.

In response to the proposed CCT re-optimization requirements, several commenters expressed general support for EPA's proposal "to mandate additional CCT requirements based on the water system's lead 90th percentile level and CCT status." One commenter stated "[a]ll water systems should be treating for corrosion control regardless of their sampling results or 90th percentile readings;" another was "excited to have a proposed rule that sees corrosion control treatment optimization as a constant process," but suggested EPA "be more transparent of this proposed regulatory change;" and a third supported "extending the requirements for CCT to systems servicing > 10,000." One commenter supported the overall concept, but suggested using a reduced lead action level as the basis for triggering re-optimization under § 141.81(a)(5) – (7). Another commenter also supported "evaluating and re-optimizing CCT when sample results show existing CCT is not optimized," but recommended that EPA "clarify in the regulations how this re-evaluation differs from an initial treatment study" and requested "detailed guidance relating to this re-evaluation."

Three commenters supported the proposed requirement for large and medium systems with a trigger or action level exceedance to re-optimize their corrosion control treatment. One of the commenters noted that this approach would be consistent with that of their state drinking water program, which "require[s] both to conduct CCT studies in the event of an ALE." Another commenter supported "the requirement for PWSs with CCT installed to ensure continued optimization of their CCT, including re-optimization as necessary;" however, they did not believe "implementation of the [lead trigger level] is the most effective way to ensure this." The commenter suggested, "[i]nstead US EPA should take a proactive approach and require PWSs to evaluate CCT when they propose a source or treatment change, in addition to the population (>50,000) and 90th percentile triggers (based on an exceedance of the AL or TL)." A fourth commenter agreed "that large and medium systems with an ALE or a TLE should be required to evaluate the effectiveness of their existing CCT" but noted that in their experience "[m]any states see issues not with systems making an incorrect original CCT choice, but with maintaining CCT throughout the system once it's implemented."

Several commenters did not support EPA's proposed re-optimization approach for systems that exceed the lead trigger level of 10 ug/L. One commenter recommended revising the proposal to require "all community water systems, regardless of size and status of CCT, to conduct a study following a Trigger Level or action level exceedance." Others were concerned the proposed approach would base CCT re-optimization requirements on a "single" or "handful" of lead tap samples. One commenter stated "[s]ingle results can be influenced by a number of site specific factors" and that "[t]here are many other factors to be considered in determining why a particular sample result showed a lead level of concern, especially if past monitoring results showed levels at that locations were not a concern." Another commenter expressed concern over instances where re-optimization requirements are triggered "even if a repeat sample at the same location is a non-detect, the sample result is below the regulated action level of 15 ppb and other water quality parameters in the distribution system are meeting acceptance criteria," and stated their position that such an approach would be "based upon a statistically insignificant and unrepresentative subset of the distribution system." Another commenter claimed the proposed re-optimization approach is "entirely inconsistent with established approaches of data collection and improving corrosion control over time," and that it "discounts the fact that there might be a site specific issue that can be resolved by other means in lieu of expending resources for system-wide evaluations." A commenter was concerned that "once CCT has been optimized, water systems may not find much room to further mitigate lead risks by CCT alone."

A commenter claimed "[t]he 90th percentile is limited in the useful information it provides" and suggested that "determination of when a water system needs to be re-evaluated for CCT should not only look at the water system's latest 90th percentile, but at the historical trends in the system's data and should conduct a more detailed data analysis." The commenter also suggested EPA develop "data analysis tools" to help states "evaluate WQPs and lead data to determine whether CCT is performing well and whether it should be re-evaluated" and for "use during a Sanitary Survey to help States evaluate CCT performance."

Some commenters raised concerns over how the proposed CCT requirements on lead 90th percentile level and CCT status would be implemented. One commenter was concerned with the potential for large water systems and states to "have deemed corrosion control treatment 'optimized' simply when 90th percentile values have met the LCR lead action level, irrespective of the system's ability to achieve further systemwide lead-in-water reductions." In light of this concern, the commenter suggested requiring any large water systems that exceed the trigger level to "[c]onduct a comprehensive study of all the factors that contributed to the exceedance" and achieve "the lowest possible 90th percentile value, even if other water treatments must be adjusted." Another commenter was concerned that § 141.82(h) "would allow a primacy agency to… modify its determination of optimal CCT without bounding this to provide a level of certainty to the [water system]." The commenter, and others, suggested that the rule prescribe a threshold 90th percentile, such as 5 µg/L, where system optimization "can be considered equivalent or acceptable."

A commenter raised concerns over the added burden that the implementation of this approach would place on states. The commenter stated that "these additional requirements will have to be reviewed and approved by the state staff;" would result in a "significant increase in the amount of technical assistance;" and that training would be "necessary to prepare state staff, consultants, engineers, and system operators to conduct proper CCT evaluation and recommend appropriate treatment."

In addition to the general comments on the proposed re-optimization requirements summarized above, EPA received several comments on specific provisions within § 141.81(a). Commenters suggested clarifying under what circumstances large systems without lead trigger level exceedances or copper action level exceedances should be required to complete re-optimization" and claimed the proposal "leaves a gray area of a 90th percentile between 5 and 10 ppb where a system is no longer optimized but is not required to re-optimize." A commenter also provided specific suggestions on how the proposed language in § 141.81(a) could be clarified further.

Other commenters expressed a general concern over how the authority provided in § 141.81(a)(1)(iii) – that a state "may require" large systems with CCT that do not exceed the lead trigger level and copper action level to complete the CCT steps – could be implemented by States. Commenters raised a general concern that the proposed approach would "not be as protective as the current rule for large systems" and seemed to create "a new subset of large systems that may not currently be optimized" for which "the revised rule does not appear to explicitly require additional action" and for which "states may not have the authority to require additional action." Instead of the approach proposed in § 141.81(a)(1)(iii), some commenters suggested that "all large systems be required to implement [optimal corrosion control treatment] or be deemed optimized using [§ 141.81](b)(3).One of the commenters believed the proposed approach "sets a third regulatory level" and suggested revising § 141.81(a)(1)(iii) "to remove the possibility of regulators having the authority of arbitrarily requiring large water systems to review their approach to corrosion control based on their 90th percentile lead levels not being below the Practical Quantitation Level (currently 5 ppb)." Another commenter expressed a similar concern but suggested removing proposed § 141.81(a)(1)(iii) altogether.

Agency Response

EPA agrees with commenters who support a requirement for water systems to re-optimize their corrosion control treatment (CCT) based on the lead 90th percentile level and CCT status. The strengthened treatment optimization procedures for systems with existing CCT will promote greater protection of public health by requiring water systems to take more progressive actions to re-optimize their treatment and, in turn, reduce lead levels at the tap. The final rule includes, in § 141.81(a), a requirement for any system with CCT to conduct the re-optimization steps in § 141.81(d) upon exceeding the lead trigger or lead and copper action levels. EPA has revised the regulatory text in § 141.81(a) of the final rule to improve its clarity and will work with primacy agencies and water systems to ensure they understand the different re-optimization actions that must be taken when systems exceed a trigger or action level.

EPA disagrees with the comments suggesting all systems complete a CCT study or determine if they are optimized regardless of their 90th percentile. The Agency similarly disagrees with the suggested requirement for all systems to evaluate CCT when they propose a source or treatment change. The use of a trigger-level approach prioritizes re-optimization actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority. Each of the suggested alternatives would substantially increase the number of water systems required to obtain state review. EPA has concluded it is not practicable for such a significant number of water systems to obtain these reviews/approvals from their states. Additionally, such an approach would be overly prescriptive for systems with low lead 90ths since they may not be able to achieve further reductions. In such cases, the suggested requirements would not provide meaningful opportunities to protect public health. EPA has instead revised the re-optimization requirements to account for certain system characteristics that may elevate the potential risk for drinking water lead exposures and thus would warrant more rigorous CCT study/evaluation requirements. These characteristics include CCT status, system size, the presence of lead service lines and lead 90th percentile. To ease the burden and offer greater flexibility, the final rule includes modifications that target requirements according to these characteristics (i.e., 'bins'). EPA believes this 'bin' approach will reduce the overall burden of the rule by more precisely identifying the subset of systems whose conditions necessitate a more rigorous CCT study, such as a pipe rig/loop study, to protect public health. See the response in section 4.5.1 for a detailed discussion of these characteristics and how they form the basis for the CCT study requirements and any associated burden reductions.

Other commenters were concerned the proposal would base CCT re-optimization requirements on a "single" or "handful" of tap samples that are not statistically significant or representative of the distribution system. EPA disagrees with comments suggesting the proposal failed to account for alternatives that could be used to address such site-specific issues in lieu of CCT re-optimization. Under the proposal as well as the final rule, a water system would be required to determine if problems with the CCT itself are contributing to elevated lead levels at individual sites, then implement a mitigation strategy if necessary. In addition to follow-up sampling, the water system could review distribution system operations or other factors to determine the cause of the elevated lead level. CCT re-optimization may not always be necessary to address an exceedance.

With regard to the concern that systems may not find room to further mitigate lead risks by CCT alone once the system has been optimized, the Agency notes that, in addition to LSLs, lead may leach into drinking water from household sources such as leaded brass fixtures and lead solder. A study published by American Water Works Association (AWWA) Water Research Foundation (2008) "Contributions of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues" (Sandvig et al., 2008) estimates that 50 to 75 percent of lead in drinking water comes from LSLs, while the remainder comes from leaded solder, brass/bronze fittings, galvanized piping, faucets, and water meters. Therefore, EPA believes use of CCT over the long-term would continue to provide public health protection from these sources. While there may be instances where systems are fully optimized, EPA notes that the final rule includes a suite of actions, in addition to CCT, that taken together will further reduce lead exposure in drinking water.

The Agency encourages systems to be proactive in identifying opportunities to improve CCT effectiveness and recognizes that evaluating historical trends/detailed data analyses can be helpful in achieving such improvements. However, the Agency believes the development and subsequent review of such analyses for re-optimization purposes would add considerable burden to systems and states, and that a regulatory requirement for such analyses would be overly prescriptive given the extent to which such analyses and interpretation of results would be highly case-specific. As discussed earlier in this sub-section's response, EPA believes the process to re-optimize CCT should be determined based on system characteristics such as system size, the presence of LSLs and 90th percentile value. Re-optimization requirements in the final rule have been modified to reflect this approach. With regard to EPA development of analytical tools that states could use to evaluate CCT performance, the Agency similarly believes the factors that must be considered during such evaluations – e.g., water quality conditions, distribution system patterns, historical data trends – are highly case-specific in nature; therefore, the development of such analytical tools at the national level by EPA would not be functional for system-specific evaluations.

EPA disagrees with the suggestion to require all large systems to conduct a CCT study if they exceed the trigger level. The Agency believes it is important for the final rule to provide states the flexibility to determine whether slight modifications of the existing CCT would more quickly address the underlying cause of the exceedance. In the final rule, states are allowed to approve existing corrosion control modifications without a corrosion control study for systems that exceed the lead trigger level, but not the lead or copper action levels [§ 141.81(d)(1)(i)].

With regard to the suggestion to modify proposed § 141.82(h) – modification of State treatment decisions for optimal corrosion control and re-optimized corrosion control – to reference a threshold 90th percentile upon which such modifications could be considered acceptable. EPA notes that such threshold exists in § 141.81(b)(3). In accordance with the provision, any water system demonstrating that the lead 90th percentile is less than or equal to the practical quantitation level for lead would be deemed to have optimized or re-optimized corrosion control. Therefore, EPA does not believe the suggested modification to §141.82(h) is necessary.

EPA acknowledges concerns with the added burden the proposed re-optimization approach would place on states and systems and has identified a 'bin' approach that will reduce the burden and add greater flexibility under the final rule. See above, 2nd paragraph of this response section, for more complete information about the 'bin' approach and how it will reduce the overall burden on states and systems.

Per commenters' suggestions, EPA has modified § 141.81(a)(1)(iii) to clarify that large systems with CCT that do not exceed the lead trigger or action levels, but do exceed the lead PQL, may be required by the state to complete the corrosion control treatment steps in § 141.81(d).

With regard to the implementation concerns with proposed § 141.81(a)(1)(iii), EPA disagrees with the assertions that the proposal would be less protective than the previous rule for large systems with existing CCT, or that it would create a new subset of large systems that may not currently be optimized. The Agency notes the suggested approach of requiring all large systems to implement optimized corrosion control treatment or to be deemed optimized in accordance with § 141.81(b)(3) is consistent with provisions in the previous rule as well as the proposal (see proposed § 141.81(a)(1)(i)). The Agency believes the use of a trigger level of 10 µg/L, as proposed in § 141.81(a)(1)(i), provides a reasonable concentration that is below the action level and above the practical quantitation level of 5 µg/L at which to require water systems to take a progressive set of actions to reduce lead levels prior to an action level exceedance and to have a plan in place to rapidly respond if there is an action level exceedance. Requiring such actions of systems when a trigger level 10 µg/L is exceeded prioritizes actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority. EPA has retained this provision in the final rule. For the proposed provision in § 141.81(a)(1)(iii), the Agency believes it is necessary to provide states the flexibility to assess the need for re-optimization on a case-by-case basis for the subset of systems whose 90ths are above the PQL but below the lead trigger and copper action levels. Universally requiring large systems to re-optimize regardless of whether they are below the lead trigger or copper action level would substantially increase the number of water systems required to obtain state review. EPA has concluded it is not practicable for such a significant number of water systems to obtain these reviews/approvals from their states and has thus retained the provision in the final rule. As discussed in the previous paragraph, the final rule provision includes modified language clarifying how it applies to systems with CCT whose 90th percentiles are above the lead PQL but below the lead trigger or copper action level. EPA disagrees with the suggested elimination of proposed § 141.81(a)(1)(iii) or revision to preclude states from having the authority to require these systems to re-optimize. Because of the general magnitude of the population served by large water systems, EPA believes it is important for states to have the flexibility to require system re-optimization where it determines further lead reductions are achievable by these systems.

Proposed Re-Optimization Steps and Requirements

Summary of Comments

EPA requested comment on the proposed corrosion control treatment (CCT) re-optimization requirements and on “potential actions water systems could take to adjust their corrosion control treatment and how they should work with the state to determine if adjustments to the treatment would better optimize corrosion control.” The steps by which a water system exceeding the lead trigger level or copper action level would be required to re-optimize their corrosion control treatment are prescribed in § 141.81(d). Additional requirements associated with these steps are further described throughout § 141.82.

One commenter generally stated they “support[ed] the addition of re-optimization steps which provide a clear path for improving treatment at supplies with existing treatment in place” and “support[ed] progressive action for supplies with higher lead action levels or exposure risk.”

One commenter stated generally that “[t]he proposed rule does not present a clear distinction between ‘optimization’ and ‘re-optimization’ and claimed, “most readers view the proposal as (1) requiring the same level of analysis as initial optimization (subject to modification by the state), (2) requiring an evaluation of potential treatment efficacy using a single determinative test, pipe loop studies, and (3) constraining the required evaluation to treatment practice.” The commenter suggested a “more appropriate description of re-optimization would reflect: evaluation of the existing corrosion control process control; evaluation of whether current operations are achieving targeted conditions in the distribution system; identifying actions to correct shortcomings found in process control and achieving target conditions in distributed water; and, if current practice is operating as intended and the trigger level or action level is being exceeded then, the system should initiate a review of corrosion control.” Another commenter suggested that “information is necessary to define what re-optimization under the Revised LCR requires” and stated that “[i]t is unclear as to whether water systems are required to engage in a new CCT Study following a second (or more) trigger or action level exceedance, or whether the re-optimization steps are permitted to be situation specific and are able to be adjusted accordingly.” Another commenter believed “EPA is proposing essentially the same steps for re-optimization of CCT as the steps for originally designating CCT” and stated their disagreement with such an approach. This commenter, and many others, instead suggested requiring that water systems first evaluate their existing treatment before ‘restarting’ the OCCT steps. (See discussion under section 4.9 – Comments on CCT Study vs. Re-Optimization.) Several comments expressed concerns over the proposed procedures potentially triggering a ‘restart’ of OCCT designation and subsequent installation of a new OCCT. In response to these concerns, the commenters suggested separate analysis or evaluation under which systems would first review how effectively they are implementing their existing CCT and identify potential modifications prior to considering, evaluating, or conducting CCT studies for an alternate OCCT that is not already installed. One of the commenters suggested revising § 141.82(a) to include the requirement for such an approach. (See discussion under section 4.9 – Comments on CCT Study vs. Re-Optimization.) Another commenter provided detailed suggestions on how the proposed language for each of the re-optimization steps in § 141.81(d) could be clarified. The commenter expressed a concern over potential confusion with the terms ‘initial’ vs. ‘standard’ monitoring in § 141.81(d)(1); found references to other sections in § 141.81(d)(2) to be confusing and inconsistent; suggested combining § § 141.81(d)(3), (4) and (5); and suggested § 141.81(d)(6) require follow-up monitoring on ‘January 1 or July 1, whichever is sooner,’ rather than 'within 12 months from completion of Step 5.’ Another commenter suggested clarifying the proposed language in § 141.81(d)(1) and (d)(3)(i) on the basis that they “seem similar but stipulate different timeframes,” and suggested that “changes to corrosion control treatment be implemented on a reasonable timeframe following discussions with the state primacy agency.” EPA also received comments more specifically related to the proposed re-optimization step proposed under § 141.81(d)(1), where water systems exceeding the lead trigger level or copper action level would be required to make an optimal corrosion control treatment (OCCT) recommendation to the state; this recommendation would be made in accordance with the procedures prescribed in proposed § § 141.82(a)(5) – (7). (See discussion under section 4.9 – Comments on CCT Study vs. Re-Optimization.)

One commenter did not support the proposed re-optimization requirements and claimed, without providing any additional information or supporting rationale, that "[p]roof of optimization of CCT should not be required of water utilities by the EPA, it is unconstitutional and unnecessary.”

Some commenters provided other general suggestions on potential revisions that could be made to the proposed re-optimization requirements. One commenter recommended adding flexibility “to deal with systems that have more complicated configurations” and for states to “require additional information such as water quality parameters, a follow-up corrosion control study and report, changing treatment, additional monitoring, and any other applicable requirements, to be determined by the state.” The commenter believed that “[s]ince many states do not have the flexibility to be more stringent than the federal rule it is important for those states that the rule is clear on what the states are allowed to require.” Additionally, the commenter recommended a proactive water management planning approach to “help water systems manage distribution water quality issues that may affect corrosion (such as nitrification, iron, manganese, distribution flushing programs, and managing biological activity within the distribution system).” Another commenter suggested adding “flexibility in what constitutes ‘re-optimization’ and stated “[s]ometimes it is simply a treatment process issue that causes a system to exceed when they have CCT.” The commenter suggested that “[s]ubmitting plans on how to prevent these process issues from happening in the future should be adequate – a system shouldn’t have to go through a study or re-evaluation of various treatment options to be considered ‘re-optimized.’” Another commenter made a similar suggestion for flexibility, suggesting that “allow[ing] flexibility in determining what, if any, changes should be made to [a system’s] corrosion control approach.”

Two commenters suggested revising the re-optimization requirements to include three levels of corrosion control evaluations that would be triggered based on sample results collected from individual locations as well as systemwide. Under this approach, elevated results at a given location would “trigger action at the individual location” while system-wide levels exceeding the trigger or action level would respectively “require planning and preparation for changes to corrosion control treatment” or “trigger the requirement for implementing changes to treatment if determined to be necessary.” Other commenters provided more specific suggestions on potential provisions that could be added to the final rule. Four commenters suggested clarifying “whether partial corrosion control treatment (ie –corrosion control of some but not all sources of treated water) is viewed as no corrosion control, or should be treated in some other manner not currently specified." Another commenter suggested requiring "more oversight and transparency for CCT" and stated their position that "[t]he lack of CCT or WQP review results in systems with no baseline knowledge of why an TL or AL exceedance might occur and with no plan to address it," and that it "puts residents at risk of long-term exposure to lead… as systems determine the problem and develop a plan to address the problem." Another commenter suggested that "corrosion control should be considered a short-term solution while [lead service line] replacement activities are occurring" and that, "[b]ecause of competing priorities, the corrosion control should not be required to be 'optimized' but 'improved' if the 90th percentile level is above 10 ug/L." Another commenter claimed "[t]he regulation does not consider the source of elevated lead, which can be from a localized source due to household plumbing… that the rule's prescribed treatment techniques are not designed to control or reduce." In light of these concerns, the commenter suggested "[t]he option for a corrosion control study at these lower levels should be determined by the water system as they have many other competing treatment and infrastructure needs to balance" and recommended "including data review and source assessment prior to initiating a re-optimization study." One commenter noted that water systems "routinely add several new wells to their water systems in any given year" and was concerned that systems may be required to "perform re-optimization evaluations at such regular frequencies" that "would be infeasible and unwarranted." The commenter, and one other, requested including language that would exempt "new groundwater wells drawing from the same aquifer as existing approved ground water wells, demonstrated to have comparable pH and alkalinity as existing wells" from triggering re-optimization requirements. One commenter suggested "require[ing] all decisions about and assessments of a water system's corrosion control treatment to be examined and certified by an independent, certified professional engineer with expertise in corrosion control" and that "[a]ll documentation involved in this process must be publicly available." Another suggested adding revisions that would "address the impacts of climate change on the water supply and water quality."

EPA also received comments more specifically related to the proposed re-optimization step proposed under § 141.81(d)(1), where water systems exceeding the lead trigger level or copper action level would be required to make an optimal corrosion control treatment (OCCT) recommendation to the state; this recommendation would be made in accordance with the procedures prescribed in proposed § § 141.82(a)(5) – (7). EPA received several comments expressing concern over the proposed procedures potentially triggering a 'restart' of OCCT designation and subsequent installation of a new OCCT. In response to these concerns, the commenters suggested separate analysis or evaluation under which systems would first review how effectively they are implementing their existing CCT and identify potential modifications prior to considering, evaluating, or conducting CCT studies for an alternate OCCT that is not already installed. One of the commenters suggested revising § 141.82(a) to include the requirement for such an approach. (See discussion under section 4.9 – Comments on CCT Study vs. Re-Optimization.)

Another commenter suggested clarifying the proposed language in § 141.81(d)(1) and (d)(3)(i) on the basis that they "seem similar but stipulate different timeframes," and suggested that "changes to corrosion control treatment be implemented on a reasonable timeframe following discussions with the state primacy agency."

EPA also received comments related to the proposed requirement in § 141.82(a)(5) for systems with CCT to "conduct a re-optimization evaluation of the existing corrosion control treatment," after a lead trigger level exceedance, and to "make a recommendation to the State for modification (if any) of the designation of optimal corrosion control treatment." One of the commenters indicated they did not support the § 141.82(a)(5) re-optimization proposal. The commenter believed "systems should approach changes in corrosion control practice as a long-term and continuous improvement process rather than rapid responses to exceeding regulatory triggers," and that "[r]e-optimization should focus on whether corrosion control is being effectively implemented rather than re-evaluating the state-approved optimization strategy." The commenter believed the "proposal over-emphasizes changing corrosion control over maintaining effective process control for existing corrosion control practice;" "discourage[s] water systems from collecting additional water quality and treatment performance data for actively managing and improving corrosion control treatment;" and that "[t]he proposal does not address the considerations relevant to best professional judgement that go into determining if a corrosion control change should actually be made." The commenter stated "[t]he final rule should recognize that any decision to make a change is complex and must consider an array of factors. For example, if a corrosion control study shows that a new corrosion control treatment approach slightly lowers lead compared to the existing approach—they must determine whether the reduction justifies the change." The commenter noted that under certain circumstances, changes can entail complexities "where the transition period result[s] in elevated lead release, significant turbidity, and red water" and that "[t]he potential for unintended impacts and undesirable elevation in lead release." In light of these concerns, the commenter suggested incorporating into the final rule a "find-and-fix" evaluation – distinct from the find-and-fix EPA proposed in § 141.82(j) – that would be initiated "when the 90th percentile of samples exceeds a threshold" and could include consideration of distribution system conditions, treatment operations, and any other factors that may have contributed to the exceedance; "temporal and spatial trend analyses;" and desktop corrosion control evaluations. The evaluation would also assess "current water quality conditions and trends as well as current treatment regardless of system size or type." According to the commenter, the purpose of such an evaluation would be to "focus on better implementation of the current corrosion control strategy or initiation of an optimization study to potentially change the current corrosion control strategy." The commenter also stated their position that "[t]his distinction is significant. It is possible to take immediate steps to correct implementation of an appropriate corrosion control strategy. Changing that underlying strategy is a much more significant undertaking."

One commenter indicated they were very concerned "about systems adjusting their CCT without State discussion and/or agreement" and believed "all OCCT adjustments should be done in coordination with the States." Another commenter raised a similar concern with regard to potential "risks associated with the transition from one form of corrosion control to another" and the perceived potential for "systems to be forced into making changes of marginal longer-term benefit and uncertain intermediate risk." The commenter recommended that EPA "provide explicit flexibility within regulatory language, and develop guidance to assist states in appropriately reviewing system data to avoid this potential public health risk."§ 141.82(a)(5), noting that "re-optimization under proposed § 141.82(a)(5) can be applicable only to [a system with] CCT that has been designated as optimal." The re-optimization requirements therefore would not apply to other types of systems that "may have CCT installed but are deemed optimized because they haven't exceeded an [action level]." One of the commenters noted that "small systems currently using CCT should not discontinue their techniques without state approval." One commenter suggested revising § § 141.82(a)(5) – (7) to reference applicable requirements in § 141.82(c)(3) for systems with an inhibitor-based corrosion control treatment process.

Agency Response

EPA recognizes the suggested need for greater clarity on whether the re-optimization steps require evaluating treatment practices under the existing, state-designated optimal corrosion control treatment (OCCT) or 'restarting' the steps for a new OCCT designation. EPA also agrees that some systems may be able to achieve lead reductions more quickly by modifying the existing CCT. Final rule § 141.81(d) includes modifications that provide greater clarity on the matter. Under § 141.81(d)(1), for systems without lead service lines (LSLs) that exceed the lead trigger level, but do not exceed the lead or copper action level, states may approve modifications to the existing corrosion control treatment (CCT) without requiring a CCT study. These systems must then complete the treatment modifications within 6 months of state approval. For systems with LSLs, the Agency believes the elevated risk posed by their presence warrants more rigorous CCT study/evaluation requirements to be triggered by a lead action level exceedance. These systems are required under § 141.81(d)(1)(ii) to commence the initial steps for a pipe rig/loop study for subsequent submission and review by the state. These modifications also eliminate the potential confusion surrounding the terms 'initial' vs. 'standard' monitoring that was raised as concern in proposed § 141.81(d)(1) and add consistency to the references in § 141.81(d)(2). EPA has not incorporated the suggested revisions for § § 141.81(d)(3) – (6). The Agency believes these suggested language revisions do not add clarity to an extent that is significant or meaningfully different.

EPA received several suggestions on how the proposed rule could be revised to address other considerations that related to CCT re-optimization. One commenter noted many states do not have the flexibility to be more stringent than the federal rule and suggested including provisions that would allow states to require additional information related to water quality parameters, corrosion control studies, treatment changes and additional monitoring. The final rule includes an additional provision under § 141.80(d)(4) giving states the authority to require additional monitoring or other actions the State deems appropriate prior to a system's implementation of any upcoming long-term change in treatment or addition of a new source, to ensure the water system maintains minimal levels of corrosion in its distribution system. The final rule also modifies an existing provision in § 141.82(d) to address systems that are installing initial CCT vs. re-optimized CCT. Under this provision in the final rule, both types of systems must provide any additional information the state requests to aid its review during the designation of OCCT or re-optimized OCCT. EPA also notes a provision in the previous rule, which has been retained in the final, gives states the authority to require any additional information the state requests to aid its review of source water treatment recommendations. The Agency believes the added provisions, together with the existing provision, sufficiently address the matter.

A proactive water management planning approach intended to help systems manage water quality in the distribution system was also suggested. EPA recognizes the importance of managing other water quality issues that may impede a water system's ability to deliver drinking water safely and effectively. EPA notes that under § 141.82(f) of the final rule, the State may designate values for additional water quality parameters, beyond those specified in the rule, as determined necessary by the State to reflect optimal corrosion control for the water system.

The modifications to final rule § 141.81(d)(1), described in the first paragraph above, offer the suggested flexibility in what constitutes re-optimization, and whether any changes should be made to a system's corrosion control approach. As discussed above, systems without LSLs that exceed the lead trigger level, but not the lead or copper action levels, may, with state approval, modify their existing CCT without requiring a CCT study. As suggested, this will allow systems to address treatment process issues if it is found to be the root cause of elevated 90th percentiles. For systems with LSLs, the Agency believes the elevated risk posed by their presence warrants more rigorous CCT study/evaluation requirements to be triggered by a lead action level exceedance. These systems are required under § 141.81(d)(1)(ii) to commence the initial steps for a pipe rig/loop study for subsequent submission and review by the state.

Commenters also suggested revising the re-optimization requirements that would compel water systems to conduct corrosion control evaluations system-wide and at individual sites. EPA believes the proposal's trigger/action level approach and find-and-fix assessment, which have been incorporated under the final rule, are consistent with these suggestions. For elevated levels system-wide, the comments suggested requiring planning and preparation for CCT changes or implementing those changes. Under the proposal, systems whose 90th percentiles exceed the trigger level are required to conduct the planning and preparatory steps in a manner that is consistent with what the comments suggested. Similarly, systems whose 90th percentiles exceed an action level are required to implement those treatment changes. Finally, the comments suggest corrosion control evaluations that would be triggered based on sample results collected from individual locations. EPA notes the find-and-fix provisions are based on individual locations and are triggered when those samples exceed the lead action level. Systems are then compelled to evaluate whether localized or system-wide corrosion control adjustment is necessary based on the system's review of monitoring results collected at individual sites.

With regard to comments suggesting a need for clarity on what constitutes CCT (or a lack thereof), the final rule revisions add a definition for "*systems without corrosion control treatment."* This term is defined in § 141.2 as being a public water system that does not have or purchases all of its water from a system that does not have: 1) an optimal corrosion control treatment approved by the State; or 2) any pH adjustment, alkalinity adjustment, and or corrosion inhibitor addition resulting from other water quality adjustments as part of its treatment train infrastructure. The Agency believes this definition will address the suggested need for greater clarity on the matter and will ensure consistent implementation for LCRR requirements for conducting CCT studies.

Regarding the suggestion for greater oversight and transparency of CCT and a periodic review of CCT and water quality parameters (WQPs) the final rule includes a provision under § 141.401(c)(2) that requires the review of CCT and WQP data against most recent CCT guidance issued by EPA during sanitary surveys. The Agency believes this provision achieves the aims sought by the suggestion for greater oversight and transparency of CCT, as well as the periodic review of that CCT and the monitored WQPs. This provision will provide a recurring opportunity annually or every three years, for surface and ground water systems, respectively to engage with states on the matter, and to assess the need for improving the effectiveness of the system's corrosion control.

Regarding the suggestion that CCT should be considered a short-term solution while lead service line (LSL) replacement activities are occurring, or that it does not consider localized sources of lead, EPA notes that a study published by American Water Works Association (AWWA) Water Research Foundation (2008) "Contributions of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues" (Sandvig et al., 2008) estimates that 50 to 75 percent of lead in drinking water comes from LSLs, while the remainder comes from leaded solder, brass/bronze fittings, galvanized piping, faucets, and water meters. Therefore, EPA believes use of CCT over the long-term would continue to protect the public from these sources. EPA also believes that merely requiring CCT improvements when a system exceeds the lead trigger level, rather than requiring re-optimization, would be insufficiently protective of public health given the known risks associated with drinking water lead exposures. Finally, regarding the suggestion for flexibility in determining when a re-optimization study is needed, final rule § 141.81(d) includes modifications that provide the requested flexibility. See the first response paragraph above for additional information about these modifications.

With regard to the suggestion that the rule include language exempting certain groundwater wells from triggering re-optimization requirements. EPA has not included such a modification in the final rule as the Agency believes site-specific considerations warrant State decision-making on a case-by-case basis to ensure water systems maintain optimal levels of corrosion control in their distribution system .

Commenters suggested requiring treatment decisions to be independently certified by corrosion control experts, promote greater public access to documentation of treatment decisions, and address potential climate impacts. EPA encourages water systems to communicate with their customers and raise awareness of any potential treatment changes the system may be contemplating; however, EPA does not believe such requirements would provide a sufficiently meaningful opportunity to protect public health given the potential for delays it may pose on the optimization process and the added burden to water systems and states. Agency guidance on the implementation of the CCT step requirements was also requested by commenters. See response to comment section 4.1.1 for further discussion of implementation guidance.

It was suggested that systems should approach changes in CCT as a long-term and continuous improvement process and that re-optimization should focus on whether the CCT is being implemented effectively. To achieve these aims, a “find-and-fix” treatment evaluation approach was suggested that would be triggered after exceeding an unspecified 90th percentile. This additional approach would be distinct from the find-and-fix assessment requirement EPA proposed in § 141.82(j) and would direct systems to conduct a robust analysis using a variety of tools to fully assess the underlying cause of an exceedance and inform the subsequent actions needed to re-optimize the existing treatment. EPA has not incorporated the suggested approach because it would add complexity to the rule such that it would not be feasible in conjunction with the other re-optimization requirements.

Concerns were raised over how the re-optimization requirements in § 141.82(a) could affect systems that have installed an OCCT that has not been designated as such by the State. Health risks were also raised as a concern if a state OCCT designation would require the system to switch OCCTs because of the possibility for unintended consequences resulting from potentially drastic changes that could occur under such a scenario. As noted earlier above, EPA has added a definition for “*systems without corrosion control treatment.*” Under the definition, systems with any pH adjustment, alkalinity adjustment, and or corrosion inhibitor addition resulting from other water quality adjustments as part of its treatment train infrastructure would be considered to have CCT. Systems operating a non-state-designated OCCT would meet this definition and thus would be subject to the re-optimization steps of § 141.81(d). EPA also notes that each of the final rule provisions in § 141.81(a) direct systems with CCT to complete the corrosion control steps specified in § 141.81 (d). The initial step systems would take under § 141.81(d) requires coordination with the state since these systems would be required to either make a re-optimized optimal corrosion control treatment recommendation to the state [§ 141.81(d)(1)(i)] or commence the initial steps for a pipe rig/loop study for subsequent submission and review by the state [§ 141.81(d)(1)(ii)]. Additionally, large systems with CCT that exceed the lead PQL, but not the lead trigger or copper action levels, would be directed to complete the corrosion control treatment steps in § 141.81(d) at the state's direction and thus in coordination with the state. The Agency believes this approach addresses the concerns noted above by eliminating the potential for OCCT switches to occur without first evaluating the technical merits of such a change.

Proposed State Decision Provisions for Requiring Studies to Identify Re-Optimized Corrosion Control Treatment

Summary of Comments

EPA received comment on the proposed provision in § 141.82(b)(3), under which states may require "any small or medium-size water systems with corrosion control treatment exceeding either the lead trigger level or copper action level to perform corrosion control treatment studies" in accordance with § 141.82(c)(3). Three commenters suggested EPA "clarify in § 141.82(b)(3) that the study required under this proposed provision for re-optimization applies only to systems with designated OCCT, not all systems with CCT." Additionally, to ensure systems would not discontinue, without state approval, the treatment in place at the time of the lead trigger or copper action level exceedance, commenters suggested EPA clarify that "the state may require small and medium systems with CCT to perform CCT studies under § 141.82" and explicitly state in the rule that "systems with CCT, when treatment has not been designated cannot turn off the treatment process without state approval."

Commenters also noted that language in § 141.82(b)(3) did not appear to include reference to § 141.82(c)(2), applicable to systems with a pH and alkalinity corrosion control treatment process that are conducting re-optimization corrosion control studies.

Agency Response

In consideration of the comments above, EPA has added a definition to § 141.2 for *"systems without corrosion control treatment."* Under the definition, systems with any pH adjustment, alkalinity adjustment, and or corrosion inhibitor addition resulting from other water quality adjustments as part of its treatment train infrastructure would be considered to have CCT. Because these systems are considered to have CCT, they would be subject to § 141.82(b)(3). Additionally, they would be required under §141.82(g) to continue operating and maintaining their OCCT. The provision in § 141.82(g) has been modified in the final rule to more clearly reflect its applicability to these types of systems. The provision specifies that any water system with CCT, OCCT or re-optimized OCCT that is not required to monitor water quality parameters under § 141.87 are required to continue operating and maintaining their OCCT. The Agency believes this modification is sufficient to address the concerns noted above and therefore has not added an explicit 'cannot turn off' provision to the final rule.

EPA has also modified language in the final rule to specify the corrosion control study-related requirements in § 141.82(c) that would be applicable to systems with corrosion-inhibitor based treatment.

4.5 Corrosion Control Treatment Studies

EPA received general comments on the corrosion control study requirements proposed in §141.82(c). EPA also received comments on specific requirements proposed in §141.82(c) that relate to evaluating orthophosphate addition at residual concentrations of 1 and 3 mg/L and performing pipe rig/loop testing and coupon studies.

Proposed Corrosion Control Study Requirements

Summary of Comments

EPA received numerous comments on the proposed treatment recommendation requirement in § 141.82(a), corrosion control study requirements in § 141.82(c), and other related provisions throughout § 141.82. By and large, the majority of commenters expressed concerns with these requirements in general and believed them to be overly prescriptive; may not provide sufficient flexibility for water systems or primacy agencies to consider case-specific needs, factors, constraints or lead sources; may be impractical or impose a significant burden to water systems and states; may delay system efforts to implement treatment modifications that would reduce lead levels; may provide limited lead concentration reduction benefits; and may prevent approval of other, "more rapid, less expensive studies that can be tailored to system-specific issues" or other treatment options, "such as when a water system can provide established optimum control treatment strategies with effective supporting data."

With regard to the proposed methods by which systems would be required to perform the corrosion control studies prescribed in § 141.82(c), two commenters suggested that, for any pH adjustment alternative, the revised rule "specifically state that removal of [disinfection byproduct] precursors should be considered in conjunction with increased pH in the distribution system so that utilities are less likely to disregard increased pH as a realistic alternative for corrosion control." Several commenters suggested that the rule incorporate a "toolbox" or "bin" approach for corrosion control studies. This approach would establish study requirements for a given "bin;" clarify pertinent criteria for water systems to consider when balancing objectives and constraints during the selection of appropriate corrosion control strategies; and identify which types of studies (e.g., desktop solubility studies, coupon testing, pipe rig/loop testing, scale analyses) and points of consideration would most appropriately tailor corrosion control studies to the specific circumstances of individual systems.

Commenters also offered numerous additional suggestions and perspectives on how the proposed requirements could be revised in the final rule. Commenters generally suggested EPA consider including additional evaluation options (e.g., desktop studies, bench-scale testing, coupon studies, jar testing). One commenter believed "[a]ll study options should remain acceptable." Another stated that "[e]valuating options for improving treatment in a system that is already doing CCT is a substantially different technical challenge" and that the "tools available, including pipe loops, are often not sensitive enough to provide a clear distinction between [corrosion control treatment] options." This commenter recommended "that EPA's regulatory and guidance language reflect this concern." Commenters also generally suggested adding flexibility on the contents and methods that would constitute an acceptable study and "allowing states to limit the scope of the study and/or allow alternate study techniques." Other commenters suggested a "separate option for evaluation of CCT to include 'other, as approved by the State'" and requiring all corrosion studies to be designed by consulting engineers, or under the supervision of a registered professional engineer, and subsequently reviewed by a third party prior to primacy agency approval. One commenter recommended including corrosion control study requirements for "systems with LSLs or service lines of unknown material to conduct pipe scale analysis and sequential monitoring as part of the proposed CCT study requirements." A final commenter recommended "allowing water systems with similar source and treated water to share and use the results from the corrosion control study."

Another commenter raised a concern that “[i]f the final rule includes a requirement to remove all the lead pipes and provide POU treatment at the highest risk homes, water systems can optimize corrosion control treatment to address household plumbing sources of lead and provide more health protection to all consumers because water systems will no longer have to design corrosion control treatment for lead service lines. In this way, the existence of lead service lines may have the unintended consequence of increasing the risk of lead exposure in homes that have other sources of lead in solder and brass fittings and fixtures but no lead service lines.”

Commenters also provided additional, more specific suggestions on how the proposed evaluation requirements and procedures could be revised in the final rule. One commenter suggested that “minor treatment changes might require a simple desktop evaluation be done, but in no way should require pipe loops and a re-evaluation of the OCCT or OWQCP designations.” Another believed “[s]mall and NTNC systems may have an easier time conducting CCT studies which are less time consuming and costly compared to options such as pipe loop or coupon studies.” A third commenter claimed they “[did] not anticipate many [small] systems will be required to evaluate the 1 mg/L or 3 mg/L orthophosphate requirement, as they will likely not be required to conduct CCT studies.” A fourth commenter suggested requiring large systems to “[c]onduct a comprehensive study of all the factors that contributed to the exceedance,” in addition to the “list of water quality parameters in the current LCR” and provided peer-reviewed literature for other potential water quality parameters for consideration towards the final rule. A fifth commenter suggested requiring “mak[ing] the corrosion control study available to the public and hold at least one public meeting during the study process.” A commenter similarly suggested “includ[ing] a requirement to hold a public meeting to discuss treatment changes and make corrosion control studies and recommendations available for public review.” A seventh commenter suggested “evaluat[ing] a scenario that drops the polyphosphate dose to 10% or less (i.e., 90% orthophosphate).” A commenter suggested water systems “rely on historical data for technologies that have been used and proven to be effective” to inform corrosion control treatment modifications.

Commenters also questioned the need to evaluate all of the treatment options prescribed in proposed § 141.82(c), even if chemical or physical constraints have been identified that would limit or prohibit the use of a particular treatment. Two commenters suggested “a system should only be required to evaluate all options by demonstration if they are unable to implement the best option from the [EPA] Optimal Corrosion Control Treatment Guidance due to simultaneous compliance issues or other similar impacts.” Another commenter suggested “if a system adds orthophosphate for corrosion control, a re-optimization study should not concentrate on pH/alkalinity adjustment in lieu of orthophosphate treatment. The re-optimization study should focus on finding the optimal orthophosphate dosage.” Another commenter believed the evaluation of the four treatment options as proposed in § 141.82(c) may lead to systems “missing [other] causes of increased lead solubility in their system” that may arise from switching from free chlorine to chloramine disinfection or from sulfate-based to chloride-based coagulants.

With regard to the revision proposed in § 141.82(c), to clarify that water systems must evaluate “the addition of an orthophosphate-based [emphasis added] corrosion inhibitor,” one commenter expressed their general support for the clarification, stating they “agree[d] with the proposed requirement” “since orthophosphate products are more effective at inhibiting corrosion than blended phosphate products.” Another commenter claimed the specification of an orthophosphate-based corrosion inhibitor “severely limits CCT options. Phosphate inhibitor options other than orthophosphate have a record of successful corrosion control to maintain compliance with the LCR" and suggested that non-orthophosphate options "should be permitted if they allow a system to meet Pb and Cu compliance levels." One commenter suggested adding requirements "for systems that currently use a polyphosphate or a polyphosphate blend to conduct a re-optimization study" and "[e]valuate a scenario that drops the polyphosphate dose to 10% or less (i.e., 90% orthophosphate)." The commenter also suggested adding a requirement for chlorinating systems to "evaluate effectiveness of chlorination to maintain [a tetravalent lead] scale before switching to orthophosphate."

Another commenter suggested clarifying, whether in the final rule or subsequent implementation guidance, "how to handle polyphosphate/orthophosphate changes or blends and how the rule expects to address simultaneous compliance and efficacy of other treatment methods." The commenter claimed that "[t]he proposed rule handles polyphosphate and orthophosphate differently which could mean systems transitioning" and stated needing "consistent ways to deal w/ Fe & Mn sequestration moving to oxidation & filtration." In light of the proposed specification of orthophosphate-based corrosion inhibitors, one commenter sought to "confirm that a blended polyorthophosphate, which many systems use, will still be acceptable" and questioned whether "a system that has a history of complying with the action level, while optimized at a lower orthophosphate target, [would] be required to raise targets to 1 mg/L." Another sought clarity on whether a "ortho-/poly-phosphate blend [would] be considered an orthophosphate-based inhibitor" and whether orthophosphate "residual concentrations need to be evaluated if the PWS has a copper ALE and is required to complete a study." Finally, one commenter provided specific language suggestions relating to blend phosphates for consideration towards the final rule.

EPA also received comments on the requirements specifically proposed in § § 141.82(c)(1)(ii), (c)(2)(ii), and (c)(3)(ii), where water systems would be required to "evaluate each of the corrosion control treatments using either pipe rig/loop tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry, and distribution system configurations," and under which "[c]oupon tests can be used as a screen to reduce the number of options that are evaluated." Numerous commenters provided specific suggestions on the use of pipe rig/loop and coupon studies; these are summarized and discussed separately in their own respective section. One commenter suggested revising the provisions to allow the use of coupon studies when systems evaluate modifications to existing corrosion control treatments. Two commenters also suggested revising these provisions to allow the use of desktop studies. One of the commenters further suggested that a "water system may conclude from the desktop study that a coupon or full pipe loop study is needed to evaluate changes in treatment and specify the time period for the plan, design, construction, operation, and analyses of the coupons or pipe loops." With regard to partial-system testing, one commenter supported the proposal to evaluate treatments using partial-system tests. Another did not oppose the proposed use of this evaluation approach, but suggested requiring systems with lead service lines to "evaluate corrosion control effectiveness using sequential samples that measure water collected from lead service lines," and that the final rule "prevent water systems from making new decisions based on old studies that do not meet the revised requirements" and clarify that if a system "rel[ies] upon a previous analysis, it must include evaluation of the currently mandated study options and cannot rely solely on coupon studies." With regard to analyses based on documented analogous treatments with other systems of similar size, water chemistry, and distribution system configurations, one commenter supported the proposal and another did not. Finally, one commenter claimed “[i]t may be very difficult for a system to perform a partial system study or leverage data from an analogous system.”

Commenters also provided comment on the proposed requirements in § § 141.82(c)(1)(iii), (c)(2)(iii), and (c)(3)(iii) for systems to measure certain “water quality parameters in any tests conducted under [§ § 141.82(c)(1), (2) or (3)] before and after evaluating the corrosion control treatments listed above].” One commenter suggested that the final rule “should not remove any of the required parameters from the list of required sampling to justify OCCT selection and perhaps should expand the list to ensure that a sufficient water quality panel is obtained for accurate modeling.” The commenter also suggested expanding the list to include “chloride, sulfate, total phosphorus, iron, and manganese, at a minimum.” Another commenter suggested adding calcium as “an important parameter to consider when completing a corrosion control study or recommendation report” so that systems may “determine the upper limit pH that would cause calcium carbonate to precipitate in the distribution system.” A third commenter stated their position that “the chloride to sulfate mass ratio (CSMR) is a valuable tool in evaluating potential corrosivity.” The commenter provided anecdotal information about an analysis they conducted on 11 water systems that exceed the lead action level. Of these, the commenter stated “10 had a CSMR value over 0.57,” thus “saturation indices can be used for risk categorization” and “CSMR can be an important indicator of corrosion in certain public water systems.” A fourth commenter suggested including “the water quality factors that affect release of lead and copper as listed in the EPA Optimal Corrosion Control Guidance Manual.”

One commenter disagreed with the data and documentation sources proposed in § § 141.82(c)(1)(iv), (c)(2)(iv), and (c)(3)(iv) when identifying chemical or physical constraints that would limit or prohibit the use of a particular corrosion control treatment. The commenter suggested replacing proposed subparagraphs A and B in each of these sections with the following language: “with applicable references to the peer reviewed literature, EPA guidance, recognized standards of practice, or site-specific studies.”

For systems without corrosion control treatment, one commenter raised technical, managerial, and financial capacity concerns and suggested addressing them by revising § 141.82(c)(1) to require primacy agencies to determine the optimal corrosion control treatment on the behalf of small and medium water systems. Another commenter suggested revising § 141.82(c)(1)(iv)(B) to allow the use of “previous coupon study data that found a specific treatment to be ineffective or detrimental to other processes” when demonstrating a previous attempt to evaluate a particular corrosion control treatment.

For systems with existing corrosion control treatment in place, commenters suggested requiring an initial assessment of whether the treatment is already optimized and being implemented effectively, prior to conducting a subsequent assessment of each of the treatments identified in § § 141.82(c)(2) & (3) (i.e., alkalinity and pH adjustment, addition of orthophosphate- or silicate-based corrosion inhibitors, or addition of orthophosphate-based corrosion inhibitors at residual concentrations of 1 and 3 mg/L).

EPA also received numerous comments requesting clarification in the final rule on various aspects of the corrosion control study and evaluation procedures proposed in § 141.82(c), including when corrosion control treatment recommendations or studies would be required; what evaluation procedures specifically would be required as part of corrosion control studies; and whether a single study would suffice for systems triggered into the requirement but that are “expect[ing] one or more source changes in 5-10 years." One commenter sought clarity on what constituted alkalinity adjustment and under what circumstances a water system would be required to monitor alkalinity, noting that "[a]ny adjustment in pH has an effect on the alkalinity." Additional commenters requested clarification on whether orthophosphate residual concentrations prescribed in § § 141.82(c) are to be measured as mg/L of phosphate or as mg/L of phosphorus; what specific circumstances under § 141.82(c) would permit the use of desktop studies or require corrosion control studies, pipe rig/loop tests, or orthophosphate residual treatment option evaluations; what specific types of source water or treatment changes would trigger the requirement for such a study; whether specific study requirements would vary based upon system size, initial optimization versus re-optimization, or other circumstances; and how the required corrosion treatment evaluation requirements would apply to water suppliers and their consecutive systems. Where such system-specific differences in study requirements may exist, one commenter requested EPA "discuss the degree of analysis and why this level of analysis is protective for these systems." Commenters also requested clarification on "definitions regarding corrosion testing techniques" and whether "bench-scale methods would be considered 'metal coupon tests' or 'pipe rig/loop tests';" the intended regulatory approach for scenarios "when a public water system adds an additional new source or changes in source while in the process of doing a corrosion control study or after completing the corrosion control study;" and whether the rule would permit systems to substitute other treatment options by evaluating the same or similar treatments at different concentration doses instead of the four prescribed in § 141.82(c) (i.e., alkalinity and pH adjustment, addition of orthophosphate- or silicate-based corrosion inhibitors, or addition of orthophosphate-based corrosion inhibitors at residual concentrations of 1 and 3 mg/L). Other commenters also provided suggested language and typographical revisions for the final rule.

Several commenters also requested EPA guidance, training and tools that would provide technical assistance to water systems and states in completing corrosion control studies. One commenter also recommended "EPA substantially simplify the regulatory language and develop (and plan to regularly update) guidance with effective and flexible recommendations for study designs" in accordance with the recommendations of the National Drinking Water Advisory Council. Commenters also requested additional guidance that would address the following, more specific topics: "choos[ing] the correct tool for commonly occurring treatment considerations;" "how to perform corrosion studies;" determining the appropriate [study] options and when to use other types of stud[ies];" and on "geochemical modeling tools" to "reduce the burden on water systems and promote expedient installation." Once commenter additionally requested EPA "provide a corrosion testing design standard."

In addition to the guidance requests summarized above, one commenter suggested "a minimum funding of $10 million of corrosion control research" that would "support PWS decision making."

Agency Response

EPA agrees that more clarity is needed on which systems proceed down the optimization or re-optimization pathways. EPA agrees that optimization and re-optimization processes should provide more flexibility. EPA added a definition of systems without corrosion control treatment to define 'bins' for optimization or re-optimization. *System without corrosion control treatment* means a public water system that does not have, or purchases all of its water from a system that does not have: 1) an optimal corrosion control treatment approved by the State; or 2) any pH adjustment, alkalinity adjustment, and/ or corrosion inhibitor addition resulting from other water quality adjustments as part of its treatment train infrastructure. One of the key ‘bin’ factors is the presence or absence of corrosion control treatment and whether the system will proceed down the optimization or re-optimization pathway. In the final rule, systems that do not meet these criteria will utilize the re-optimization pathway. EPA agrees that for some systems, lead reductions can be achieved quickly with slight modifications of the existing CCT and should not be delayed potentially by two years for the results of the corrosion control study. EPA agrees it is appropriate for states to approve modifications of the system’s existing corrosion control treatment for systems that are between the trigger level and action level without a corrosion control treatment study. In the final rule, states are allowed to approve existing corrosion control treatment modifications without a corrosion control study for systems with lead levels between the trigger level and the action level.

EPA agrees that a ‘bin’ approach based on system characteristics such as system size, the presence of lead service lines and 90th percentile value can provide more flexibility for some systems doing corrosion control studies. EPA agrees that requirements for harvested pipe loops and coupon studies are best delineated through such a ‘bin’ approach. Harvested pipe loops are only required for systems with lead service lines that exceed the lead action level. To the extent that there are any large systems without corrosion control treatment that have lead service lines and exceed the lead practical quantitation level of 5 µg/L, those systems would also need to conduct a harvested pipe loop study. EPA believes that the corrosion control treatment changes needed for systems above the action level merit a thorough investigation of the impacts of the options on the existing pipe scale. Another cost implication of the pipe loop study for small systems is that the study costs will be front-loaded with nearly $300,000 that would have to be paid within a few years of the action level exceedance. However, if a small system with lead service lines selects the corrosion control treatment option, a harvested pipe loop study would have to be conducted to ensure optimized corrosion control treatment is implemented. For large and medium systems, coupon studies can serve as a screen to reduce the number of options for the harvested pipe loop study. Commenters noted that the construction of harvested flow-through pipe loops and the stabilization of those loops can take six months to one year before options can be evaluated. EPA agrees that more time is needed to construct pipe loops from harvested pipes; therefore the Agency is removing the requirement for initial treatment recommendations in the final rule for these systems. For these systems, the final rule directs them to start constructing and operating the flow-through pipe loops after the action level exceedance in place of the initial treatment recommendation step, since the pipe loop study will be the basis for their treatment recommendation. For these systems, Step 1 of the optimization or re-optimization process is the construction and operation of the flow-through pipe loops after the action level exceedance, which must be completed within one year of the exceedance. EPA retained the requirement that coupon studies can only be used as a screening tool for these systems. Commenters indicated that for some systems, coupon studies rather than pipe loop studies may be an appropriate treatment recommendation tool. EPA agrees that coupon studies can be used for systems that do not have lead service lines because existing scale impacts are not as significant and it would be very difficult to harvest internal plumbing fixtures and soldered copper pipes and re-install them in a pipe loop/rig. The final rule includes requirements to allow coupon studies to be the basis for treatment recommendation for other systems that do not have a lead action level exceedance and lead service lines. The following table lists the ‘bins’ for the final rule based on systems size, presence/absence of lead service lines, corrosion control treatment status, and lead 90th percentile:

‘Bins’ based on status of corrosion control treatment, lead service lines, and 90th percentiles

Bin	Large System (>50,000)	Medium System (10,001 – 50,000)	Small System (<=10,000), if select CCT compliance option
No CCT w/ LSLs > Pb AL	Mandatory pipe loop	Mandatory pipe loop	Mandatory pipe loop[1]
No CCT w/ LSLs	Mandatory pipe loop unless ≤ PQL[2]	CCT recommendation if ALE in future, State decision on CCT study[3]	CCT recommendation if ALE in future, State decision on CCT study[3]
No CCT w/o LSLs > Pb or Cu AL	CCT study – coupons	CCT recommendation, State decision on CCT study[4]	CCT recommendation, State decision on CCT study[4]
No CCT w/o LSLs > TL, < ALs	CCT study – coupons	CCT recommendation if ALE in future, State decision on CCT study[3]	CCT recommendation if ALE in future, State decision on CCT study[3]
CCT w/ LSLs > Pb AL	Mandatory pipe loop	Mandatory pipe loop	Mandatory pipe loop[1]
CCT w/ LSLs > TL, <ALs	Can modify existing CCT w/o study – State[5]	Can modify existing CCT w/o study – State[5]	Can modify existing CCT w/o study – State[5]
CCT w/o LSLs > Pb or Cu AL	CCT study – coupons	CCT Rec., State decision on CCT study[4]	CCT Rec., State decision on CCT study[4]
CCT w/o LSLs > TL, < ALs	Can modify existing CCT w/o study – State[5]	Can modify existing CCT w/o study – State[5]	Can modify existing CCT w/o study – State[5]

Notes:

[1] Small lead service line systems are recommended to select lead service line replacement if they exceed lead action level due to cost and complexity of studies – pipe loop study cost ≈ replacement of 55 lead service lines

[2] It is unlikely that there are large lead service line systems without corrosion control treatment that meet the new definition for systems without corrosion control treatment, but this scenario will be covered in rule. One possibility might be medium system that grew to become a large system. Since a large system must have optimized corrosion control, these systems would have to conduct a pipe loop study.

[3] The intent for systems without corrosion control between the trigger level and action level is to proactively determine what they will do if they ever exceed the action level, so they can react quickly. This can be based on treatment recommendation or after a State required corrosion control treatment study.

[4] Desk-top studies are an option if States require a study.

[5] Systems with existing corrosion control treatment between the trigger level and action level can have existing treatment modifications approved by the State without a study – tweaks of the existing corrosion control treatment, which will save time and money as systems will likely try to enhance the performance of their current treatment process to lower lead levels. These modifications have a faster approval and implementation time frame, since the treatment is already installed.

EPA disagrees with comments about polyphosphate inhibitors being an effective treatment for lead corrosion control and believes that an orthophosphate-based inhibitor is the appropriate approach as it covers both orthophosphate and blends of ortho- and polyphosphate while emphasizing that the orthophosphate is the key control parameter. The Science Advisory Board report (EPA-SAB-20-007) supported the requirement that the phosphate inhibitor be orthophosphate-based. The report noted that research by Hozalski et al. (2005) and others (e.g., Holm and Schock, 1991) has shown that polyphosphate, as a metal chelator, can result in much higher lead levels than when using orthophosphate alone. EPA has finalized the revision to note that the key parameter is orthophosphate measured as PO_4 as the residual from orthophosphate-based inhibitors, which can include blends of ortho- and polyphosphate or just inhibitors containing orthophosphate.

EPA disagrees with the comment about requiring chlorinating systems to evaluate the effectiveness of chlorination to maintain a tetravalent lead scale before switching to orthophosphate. EPA does not have a record basis for concluding that many chlorinating systems have the conditions to produce a consistent tetravalent lead scale throughout the distribution system. Two of the best examples for a tetravalent lead scale are the Washington, DC system in the early 2000s with very high chlorine doses that created problems with disinfection by-products and Cincinnati, OH where the system uses granular activated carbon to remove disinfection by-product precursors. Systems that are triggered into a study will be using their existing treatment as a control and can compare the results with the orthophosphate results to compare the two approaches.

Several commenters did not think it was necessary to evaluate all of the options and some, in particular, thought it was unnecessary to evaluate the pH/alkalinity option if they were adding orthophosphate. The final rule allows states to approve treatment modifications without a study for systems between the trigger level and action level. Systems with lead service lines with an action level exceedance are required to do a study and medium and small systems without lead service lines may be required to conduct a study, since more extensive revisions to the corrosion control treatment may be necessary and that these systems need to investigate all options. . There were also several comments that deal with the impact of long-term treatment changes, which were addressed by the upfront notification and State approval that was added to the lead and copper rule in 2007. Systems conducting a study to evaluate the impact of a long-term treatment change prior to making it would want to include parameters that can affect the corrosivity of the water to see if corrosion control treatment adjustments would be necessary in conjunction with the approved long-term treatment change.

EPA received several comments about water quality parameters that should be monitored as part of the corrosion control treatment study. The water quality parameters that must be monitored in the corrosion control treatment study are the critical parameters associated with that treatment strategy. EPA agrees that systems may want to add other parameters based on their system-specific water quality considerations. However, EPA disagrees with mandating that all systems conducting studies add all of these parameters as it would significantly increase the cost of the study and many of the parameters may be unnecessary for defining the optimal corrosion control treatment. Parameters such as chloride and sulfate may be useful in evaluating if a long-term treatment change of coagulants could affect the chloride to sulfate mass ratio, which can affect the corrosivity of the water. These parameters are not critical to a corrosion control treatment strategy. As noted above, systems that have been required to conduct a corrosion control study prior to making such a long-term treatment change should include chloride and sulfate along with the critical corrosion control parameters. EPA has provided costs for harvested pipe loops in the Economic Analysis with a default set that includes some of the additional parameters. The following is intended to show the impact of additional parameters on the cost of the study. EPA used the default for costing purposes. The baseline cost for a pipe loop for systems serving greater than 50,000 people is $304,617 that includes monitoring for lead, pH, alkalinity and orthophosphate. The default cost for a pipe loop study is $342,476 and includes monitoring for calcium, iron, free and total chlorine, ammonia, heterotrophic plate count, total coliform, and total dissolved solids. The addition of chloride and sulfate to the default would result in a pipe loop study cost of $367,643.

The language related to identifying constraints is existing language from the rule and was not new in the proposal. The rationale for using data and documentation from previous studies performed by the system or from a system with comparable water quality characteristics is transferability. In those instances, the constraints were identified based on water that is the same or very similar in water quality characteristics. Other sources of information may identify constraints that don't apply to the system's water quality characteristics. Some constraints might not be actual constraints and can be overcome with additional treatment for simultaneous compliance with the LCRR and other regulations. For example, a system should consider organic precursor removal to reduce disinfection by-products which could allow elevated pH adjustment options, if the system has limitations on orthophosphate discharge to wastewater.

Alkalinity is a required measurement parameter in the corrosion control treatment studies and would be a critical control parameter for systems using pH and alkalinity adjustment as their corrosion control treatment process.

EPA chose to not impose requirements in the rule to dictate who is doing the studies or to require outside reviews of the results because they would delay implementation of the optimal corrosion control treatment. Similarly, public review would delay implementation and is unlikely to provide much input as the results from the pipe loop and coupon studies are complex and require a good degree of technical knowledge. Even mandating third-party review with some degree of expertise may not add substantially to the review of the study results and would delay implementation of the optimized or re-optimized corrosion control treatment.

The final rule requires small and non-transient, non-community water systems with existing corrosion control treatment to maintain it until the State determines it is no longer necessary if they select a compliance option other than corrosion control treatment under § 141.93.

Agency guidance on the implementation of the CCT step requirements was also requested by commenters. See response to comment section 4.1.1 for further discussion of implementation guidance.

Requirement to Evaluate Orthophosphate Addition at Residual Concentrations of 1 and 3 mg/L

Summary of Comments

Two commenters expressed their general support for the inclusion of 1- and 3-mg/L orthophosphate residual evaluations as proposed for CCT studies in § 141.82(c). However, one recommended requiring systems to "sustain a minimum PO_4 residual concentration in the distribution system of 1 mg/L." The other believed "greater definition on the minimum study requirements (e.g. water quality parameters, test duration, etc.) and an explanation of how to demonstrate what is a compliant testing device (e.g. pipe rig/loop tests with harvested vs. new lead pipe material) is necessary." A third commenter supported EPA's proposal that "water systems conducting corrosion control studies would not be able to rule out orthophosphate simply based on the increase in loading to wastewater treatment facilities." While this commenter agreed "phosphorous loading at wastewater treatment plants should not be used to eliminate consideration of orthophosphate for CCT," they suggested "discharge limits for wastewater should nonetheless be included in overall assessment of an optimal CCT design."

Commenters generally did not support including the evaluations of orthophosphate addition at 1 and 3 mg/L as proposed in § 141.82(c) and many disagreed with EPA's proposal that "water systems conducting corrosion control studies would not be able to rule out orthophosphate simply based on the increase in loading to wastewater treatment facilities." One commenter stated "[o]rthophosphate addition is not a one-size-fits-all treatment solution" and claimed the effective pH range for orthophosphate "likely precludes most of the Midwest where source waters are high in hardness, water softening is required, and pH/alkalinity adjustment is likely to result in optimized corrosion control." For such communities, the commenter stated that "evaluation or implementation of orthophosphate would not be an effective use of time and resources." Commenters also were concerned the proposed approach may result in broader adoption of orthophosphate-based inhibitors, claiming "[t]he net effect of EPA's definition of a corrosion control study effectively limits corrosion control treatment solutions to one option, high-dose orthophosphate addition;" that "the final rule must allow consideration of the full range of orthophosphate concentrations;" and that "[t]he final rule must recognize wastewater treatment impacts as a serious factor in decision-making." Another commenter was similarly concerned that "in the absence of clear guidance from EPA, regulators may push water systems to change their CCT to orthophosphate, which may not be optimum and may have unintended consequences." A third commenter was concerned with how the potential for broader orthophosphate adoption could adversely impact consecutive systems. The commenter claimed that "the proposed rule does not address the problem of consecutive systems" and that "[i]f one retail PWS exceeds a regulatory threshold but others do not, there is little reason for the PWS supplying the water to convert their entire system to zinc orthophosphate. This makes for a very complex situation." Other commenters expressed support for "a regional approach to the identification of optimal corrosion control treatment that allows for creative solutions while avoiding the use of the chemical orthophosphate" and suggested EPA "consider regional differences when recommending adding orthophosphate for CCT." One commenter indicated that "[f]or systems blending different water sources in the distribution system with different corrosion control treatment techniques applied to each source, maintaining a consistent orthophosphate concentration of 1.0 mg/L as P04 throughout the distribution system is not achievable." Another commenter characterized a 3-mg/L orthophosphate residual concentration as being "problematic and extremely difficult to obtain" and suggested instead that "[t]he required residual should be based on the specifics of each water system and part of their individual corrosion control treatment plan." A second commenter expressed a separate concern with a 3-mg/L residual, stating that it "potentially puts some PWSs into an undesirable position of being a contributor to Harmful Algal Bloom formation." The commenter recommended "letting the science dictate the appropriate orthophosphate levels needed for OCCT and having that level take into account local constraints as appropriate." A final commenter suggested adding greater specificity to the evaluation of pH/alkalinity-based options to prevent "inappropriately prioritize[ing] the selection of corrosion control treatment towards phosphate based options," "when a properly designed pH/alkalinity method may have been equivalent or superior," and to "ensure all [treatment] options are evaluated with an appropriate degree of rigor and that a fair comparison can be made."

Commenters also urged EPA to consider public health impacts as well as economic and environmental impacts to wastewater treatment plants, receiving water bodies and downstream drinking water sources. Other commenters noted the potential for negative consequences to distribution system pipe scales or coatings, one of whom suggested adding a scale analysis to determine "the presence of amorphous oxides and hydroxides" as these "would be a strong indicator that orthophosphate use may not be appropriate." The commenter also suggested allowing "water systems to select orthophosphate for corrosion control studies applying the minimum dose necessary to effectively reduce lead levels."

One commenter claimed other drawbacks to the use of orthophosphate that could impact public health, stating that "[i]f a system has a disruption in their chemical feed system and they do not catch it, they will be solubilizing lead into consumers taps unknowingly. Another drawback to orthophosphate is the difficulty and concern that utilities will stop feeding orthophosphate once lead service line are removed, which could result in elevated releases of lead from premise plumbing." One commenter suggested EPA include "technologies that may be available now or developed in the future for corrosion control treatment by adding a statement that other treatment options may be approved by the state primacy agency or EPA." Another requested "EPA provide relief to POTWs receiving drinking water where orthophosphate is used as a CCT in order to offset the impacts of removing excess phosphorous."

Commenters also indicated general concerns with the potential for unintended impacts to drinking water systems (e.g., increased operating costs, long-term stability of market supply or affordability challenges due to surges in orthophosphate demand/pricing); the extent to which downstream orthophosphate removal could also lead to unintended impacts and burdens to wastewater treatment plants, particularly those in arid or semi-arid areas; and the extent to which orthophosphate would be less beneficial to systems whose elevated lead levels are primarily attributed to brass corrosion.

One commenter claimed, "EPA's analysis [of phosphorus loading to surface waters] underestimates the scope of the problem" and "failed to consider regional or watershed impacts." The commenter suggested EPA expand "its analysis to examine more closely the impacts… on water quality in different regions of the country" and "consider not just the potential cost of phosphorus removal for wastewater utilities, but also the potential loss of revenue for recreation, fisheries, and tourism industries from HABs." Another commenter believed the "proposed rule does not address the importance of scale analysis," which could serve as an "indicator that orthophosphate use may not be appropriate."

Commenters suggested revising the rule to provide systems and primacy agencies greater, site-specific flexibility in the selection of corrosion control treatment and consideration of downstream impacts to public health and the environment, noting a need for "flexibility to determine which CCT options are feasible in [the water system's] area and include only those options in their CCT studies" and that "[n]ot having flexibility in determining the proper dose will limit [the system's] ability to adequately address differing conditions within the system." Commenters also suggested revising the rule to "make it explicit that CCT evaluations can and should examine the full range of possible environmental impacts and costs;" expanding water quality parameters to receiving wastewater streams; enabling state regulatory agencies to consider downstream impacts; and providing clarification on the ability for water systems to use alternatives to orthophosphate-based inhibitors. In addition to phosphorus-related impacts, one commenter recommended EPA "take a holistic approach that focuses on simultaneous compliance [and] guards against unintended consequences within water systems." Another suggested allowing "more flexibility to revise standards and permits, promote wastewater reuse, or implement variances when orthophosphate is used." A third commenter suggested providing clean water utilities with regulatory flexibility, "such as considering the development of a variance or conducting a use attainability analysis (UAA) to account for increased phosphorus concentrations associated with the LCR." A fourth commenter suggested that the final rule "be clear that water systems must analyze straight orthophosphate at doses of 1 and 3 mg/L and not polyphosphate blends." Other commenters supported "a regional approach to address lead that will remove the majority of lead service lines in [the] community while avoiding the use of the chemical orthophosphate."

One commenter requested EPA clarify "when the provisions of § 141.82 can be applied to the primacy agency," stating that "[c]larification is needed to indicate if the primary agency shall be required to update WQP ranges… upon promulgation of the final rule, or if these minimum WQP standards are intended to be designated only during a corrosion control study in response to a Trigger Level or Action Level exceedance" and that "it is not clear if these minimum WQP standards would be required during these annual reviews."

Commenters noted the use of elevated orthophosphate residual concentrations may, for certain systems, have detrimental impacts on water quality and existing pipe scales in the distribution system (e.g., water discoloration, biofilm growth, cloudy water, or the formation of very small lead particulates). One commenter noted that, for these systems "making the decision to replace existing scales in order to successfully add orthophosphate is not a trivial decision. If that is the course pursued then the transition process would need to be carefully monitored." The commenter also identified small groundwater systems or systems with unlined iron pipes, where "[t]ransitioning from a sequestration strategy to a high-dose orthophosphate strategy will require also addressing iron and manganese treatment." Another recommended "removing the specified orthophosphate dose levels [1 and 3 mg/L] from the rule."

One commenter suggested "wastewater treatment facilities receive notification from the public water system prior to the system beginning the corrosion control study so wastewater treatment facilities can have input on potential impacts which can then be considered as part of the corrosion control study design." The commenter also believed "owners and operators of wastewater treatment facilities should be notified [of increases in orthophosphate residual in drinking water] so that wastewater treatment adjustments… can be planned and funded."

Commenters requested EPA provide guidance on evaluating CCT environmental impacts and costs; "address the unintended consequences of contributing more nutrient pollution to water bodies;" "guide coordination between public water utilities and downstream wastewater treatment plants when an upstream utility re-optimizes its CCT and begins adding orthophosphate;" and "support research into innovative approaches to phosphorous management and continue to support advanced understanding of corrosion control practices."

Agency Response

The final rule requires monitoring of the key water quality parameter for orthophosphate-based inhibitors as orthophosphate measured as PO_4 as the residual. Orthophosphate-based inhibitors can include blends of ortho- and polyphosphate or just inhibitors containing orthophosphate, but the residual measurement will only count the orthophosphate. The Science Advisory Board report (EPA-SAB-20-007) supported the requirement that the phosphate inhibitor be orthophosphate-based. The report noted that research by Hozalski et al. (2005) and others (e.g., Holm and Schock, 1991) has shown that polyphosphate, as a metal chelator, can result in much higher lead levels than when using orthophosphate alone. EPA has finalized the revision to note that the key parameter is orthophosphate measured as PO_4 as the residual from orthophosphate-based inhibitors, which can include blends of ortho- and polyphosphate or just inhibitors containing orthophosphate.

The use of orthophosphate for corrosion control can increase the phosphorus loading to wastewater treatment facilities. However, water systems conducting corrosion control studies cannot rule out orthophosphate simply based on the increase in loading to wastewater treatment facilities. The definition of optimal corrosion control treatment means the corrosion control treatment that minimizes lead and copper concentrations at users' taps while ensuring that the system does not violate any national primary drinking water regulations. The definition of optimal corrosion control treatment means the corrosion control treatment that minimizes lead and copper concentrations at users' taps while ensuring that the system does not violate any national primary drinking water regulations. SDWA Section 1412(b)(7)(A) requires that a treatment technique prevent known or anticipated adverse effects on the health of persons to the extent feasible. EPA has determined that orthophosphate treatment is a feasible corrosion control treatment technology in accordance with SDWA Section 1412(b)(4)(E). Therefore, eliminating orthophosphate as an option because of concerns unrelated to compliance with national primary drinking water regulations may prevent a system from installing the treatment technique that reduces to the extent feasible the risks of adverse health effects from lead in drinking water. In designing the CCT studies, water systems should evaluate the orthophosphate treatment options in the coupon screening and/or pipe loop/rig studies. EPA has examined the potential costs of additional phosphorus usage on wastewater treatment systems and has included this in the Economic Analysis for the final rule. Many commenters objected to the required evaluations of orthophosphate addition at 1 and 3 mg/L. Some commenters characterized these as high orthophosphate doses. EPA disagrees that these orthophosphate doses are too high to be considered in the corrosion control study. The commenters may have assumed that the dose was measured as P which would be three times greater than the dose measured as PO_4. EPA is clarifying that the orthophosphate doses to be studied are measured as PO_4. The high-end dose in the corrosion control study of 3 mg/L as PO_4 is at the low end of the typical range used in the United Kingdom where 95% of public water supplies are dosed with orthophosphate (Hayes and Hydes, 2010), and in a manner that has not resulted in detrimental impacts (e.g., water discoloration, biofilm growth) commenters raised as a broad concern. EPA also notes that the 2018 edition of Recommended Standards for Water Works published by the Great Lakes – Upper Mississippi Board of State and Provincial Public Health and Environmental Managers, commonly referred to as the 10 States Standards, has a requirement that the total phosphate applied shall not exceed 10 mg/L as PO_4 when sequestering iron and manganese, which are aesthetic concerns and not a health concern. There are also standards in the document for orthophosphate and blended phosphates for corrosion control. Under the design of phosphate system in Section 4.9.5c, the second note states that the system shall have a chemical feed system capable of maintaining an orthophosphate residual of at least 1.0 mg/L as P (3.0 mg/L as PO_4) throughout the distribution system. The member States for this document are Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, and Wisconsin.

There are several comments about the benchmarks for orthophosphate included in the treatment studies and that pH/alkalinity options can be superior. That is why the study should evaluate all the options and the system should recommend pH/alkalinity adjustment if that is the superior treatment in the study. In the situation where the wholesaler does not want to adjust its treatment, then the affected purchasing system will need to implement the treatment change. EPA disagrees with the comment that the effective pH range for orthophosphate would preclude its use throughout much of the mid-West. While the pH range where orthophosphate works best is between 7.2 and 7.8, it can be effective at higher pH options. If the study shows that pH/alkalinity is more effective than orthophosphate for systems with high natural pH, then the system should recommend it.

As noted in section 4.5.1 of the response to comment document, EPA has created 'bins' for the corrosion control studies. Scale analysis can be a useful tool in conjunction with the harvested pipe loop study. Systems with lead service lines that exceed the action level are required to do a harvested pipe loop study where the impact of orthophosphate on the existing scale can be directly assessed and the treatment performance compared against other options. See the main response in section 4.5.1 for more details on the corrosion control treatment studies.

With regard to systems turning off corrosion control treatment, Section 141.82(g) requires systems that have optimal corrosion control treatment to continue to operate and maintain it. Even for the small system compliance flexibility option where a system selects lead service line replacement or other options besides corrosion control, the system must continue to operate and maintain its existing corrosion control treatment until the State determines that it is no longer necessary.

Also, see response on the proposed corrosion control study requirements (section 4.5.1).

Proposed Requirements Related to Pipe Rig/Loop Testing and Coupon Studies

Summary of Comments

EPA received several comments relating to the pipe rig/loop-related requirements proposed in § § 141.82(c)(1)(ii), (c)(2)(ii), and (c)(3)(ii), under which systems may opt to use a pipe rig/loop when evaluating each of the corrosion control treatments prescribed in the proposed rule. EPA also received comments related to the proposal to clarify that "metal coupon tests can only be used as a screen to reduce the number of options that are evaluated using pipe rig/loops. Metal coupon tests would no longer be able to be used as the basis for determining the optimal corrosion control treatment."

Overall, two commenters generally supported the use of pipe loop/rig tests for CCT optimization studies. One of the commenters additionally suggested "the use of real-time, high frequency of monitoring" of the "produced water (at the water treatment plant) and its corrosive impact on range of lead coupons/pipe loops/solders/brass fittings." A third commenter also supported the approach, but only for "medium to large systems," noting that "pipe rig/loop studies may help systems identify not only OCCT, but potential harmful impacts related to corrosion control treatment changes."

Several commenters, however, interpreted the proposed provisions to exclusively require pipe rig/loop testing and raised concerns over eliminating other types of studies. One commenter stated that "[w]ater systems will not be able to implement the proposed rule's requirements without insights from other analyses being given comparable weight in decision-making" and that "[p]ipe loop studies can also have misleading results when completed absent other tools." Commenters also believed the exclusive use of pipe rig/loop tests would not allow for system-specific considerations;" would not be practicable, feasible, or implementable; would result in a significant burden to systems; would require significant technical support for systems to implement; may delay system efforts to implement treatment modifications that would reduce lead levels; and that many systems, particularly small or medium systems, would not be likely to have the technical, managerial, and financial capacity to conduct them. Another commenter raised concerns over the potential for lead service line harvesting activities, which are needed for pipe rig/loop studies, to pose a "risk to the customer as the disturbance could cause high lead in that home." Commenters suggested incorporating into the final rule additional state flexibilities for determining what corrosion control treatment evaluation and selection methods would be most suitable for the system, and to "account for variability in system size and available resources." Other commenters suggested “historical water quality data be an allowable alternative” to pipe rig/loop studies and revising the rule to limit pipe rig/loop testing to systems with lead service lines. Another commenter requested “reserving pilot-scale testing requirements for large systems, systems with [lead service lines], and studies performed in response to an Action Level exceedance.”

Commenters also noted pipe loops/rig studies may yield results that are not representative of distribution system conditions and thus may not accurately inform treatment selection. One commenter acknowledged that pipe rig/loop studies “can be an important part of an overall assessment of corrosion control treatment,” but cautioned that their results “are highly influenced by a multitude of factors;” that “several pipe loop studies in succession may be required;” and that “pipe loop experiments performed in a relatively short period of time is problematic and will, in many cases, lead to erroneous conclusions if they are rushed and the selection of a corrosion control practice is based on these results. Another commenter also asserted that pipe loop study “test results… often have a high degree of variability” that would render limitations with the approach and make it “difficult to extrapolate [study results] to full-scale application.” Instead, the commenter suggested “the final rule and preamble should acknowledge the limitations of relying on a single evaluation technique and promote the use of a robust weight-of-evidence approach to making corrosion control treatment decisions.” To support their position, the commenter provided “flow through harvested pipe data from several water systems,” to “illustrate the challenges of interpreting highly variable data where the mean lead concentrations observed [in pipe loop studies] are well over concentrations that will be acceptable at full-scale implementation.”

EPA proposed to clarify that “metal coupon tests can only be used as a screen to reduce the number of options that are evaluated using pipe rig/loops; that metal coupon tests would no longer be able to be used as the basis for determining the optimal corrosion control treatment.” Four commenters expressed general support for such an approach.

Several commenters did not support the inability to use coupon studies as a basis for determining the optimal corrosion control treatment and many requested allowing it in the final rule. One commenter asserted that “[c]oupon studies are an essential tool for corrosion control studies” that are “needed to support cost effective, timely, and sound corrosion control treatment decisions.” The commenter suggested “the final rule and preamble should not discount the use of coupon studies in making corrosion control decisions.” A second commenter provided anecdotal information supporting their position that “[c]oupon studies and pipe loop studies typically obtain the same results unless the lead pipe scale changes” and that ““copper corrosion control can be predicted by coupon studies.” According to the commenter, results from a coupon study yielded “nearly the same removal percentages” and “predicted similar removal percentages for the corrosion control treatments” as a pipe rig/loop study that was conducted by the same water system. The commenter additionally stated that they “would prefer some coupon data to inform the decision rather than no empirical data at all, which could be a result of the proposed rule language.” The commenter believed that “small and medium systems selecting a treatment option based on experimental data is better than implementing multiple system-wide corrosion treatments to attempt to find the optimal treatment” and claimed that “[m]ost systems will make treatment recommendations with very little data and follow EPA OCCT guidance without a pipe loop study.” A third commenter stated a coupon testing protocol has been developed that “has been proven to be as representative as pipe loop testing in side-by-side comparisons.”

One commenter suggested allowing the use of corrosion coupons when used within in-line (i.e., closed loop) systems.

One commenter requested clarification on the terms “pipe rig/loop test” and “metal coupon test,” noting there to be a lack of generally accepted industry terminology surrounding these.

Finally, commenters requested EPA provide guidance on “acceptable protocols for and the length of [pipe rig/loop] studies” and that “to successfully implement the revised LCR, additional technical and financial resources must be made available to smaller systems to adequately implement pipe rig/loop studies under the revised rule.” Commenters also requested EPA guidance on the use of coupon tests as a screening method in accordance with the provisions in § 141.82(c).

Agency Response

In Section 4.5.1, EPA provided a bin structure to describe the appropriate type of study by system size, lead concentration, presence of lead service lines and existing CCT treatment. EPA disagrees with the broad assertion that pipe loops do not yield representative results. A properly designed pipe loop allows systems to closely simulate actual distribution system and premise plumbing conditions. It also allows systems to conduct a direct comparison of corrosion control options, offering a more robust basis for decision-making on the specific conditions that would reflect optimized corrosion control treatment. Commenters also noted that some small systems may not have the technical capacity to construct and operate a harvested pipe loop study. EPA notes that in these cases the final rule provides flexibility to these small systems to implement a lead service line replacement or point-of-use program. See response in section 4.5.1 for clarification on which systems need to use pipe loops and when coupon studies can be used.

Commenters indicated that, for some systems, coupon studies rather than pipe loop/rig studies may be an appropriate treatment recommendation tool. EPA agrees that coupon studies can be used for systems that do not have lead service lines. The final rule includes requirements to allow coupon studies to be the basis for treatment recommendation for systems that do not have a lead action level exceedance and lead service lines. For systems with lead service lines, EPA believes that the corrosion control treatment changes needed for systems above the action level merit more thorough investigation. EPA has retained the requirement that coupon studies can only be used as a screening tool for these systems because of the Agency’s concern that metal coupons, in these cases, would not be representative of existing scale conditions in lead service lines or leaded plumbing materials. For these systems, coupon studies can serve as a screen to reduce the number of options for the harvested pipe loop study, but they may not to be used as the basis for determining the optimal treatment.

EPA acknowledges “pipe rig/loop test” and “metal coupon test” are terms that do not have a universally accepted definition in the drinking water industry, there are widely understood meanings based on the years of experience water systems have had with the current LCR that uses these terms. The Agency believes it would be best to address this consideration through implementation guidance, rather than developing formal regulatory definitions. The development of regulatory definitions may be too prescriptive and may prevent states from making individual determinations as to the type and nature of pipe loop/rig or coupon test that would best address state concerns and system-specific conditions. EPA also notes there is existing Agency implementation guidance that offers additional information describing the nature of pipe loop/rig and metal coupon tests. EPA will work to develop or update guidance on the matter as industry practices or terminology evolve over time. See related discussion on implementation guidance in the section 4.1.1 response.

4.6 State Designation of OWQPs (Initial Optimization & Re-Optimization)

Summary of Comments

EPA received several comments on both the procedures proposed in § 141.82(d) for state designation of optimal corrosion control treatment and re-optimized corrosion control treatment and the procedures proposed in § 141.82(f) for states to designate optimal water quality parameters (OWQPs) after "reviewing the results of tap water and water quality parameter monitoring by the water system, both before and after the water system installs optimal corrosion control treatment."

One commenter suggested adding a paragraph to § 141.82(d) that would specifically describe "designation of initial OCCT for large systems." Two commenters indicated that large systems installing, rather than re-optimizing, corrosion control treatment did not appear to be addressed in § 141.82(d) and suggested adding a paragraph specifically describing designation of initial optimal corrosion control treatment for these systems. Another commenter was concerned with proposed § 141.82(d)(3), under which a state may designate alternative corrosion control treatment(s) from what has been recommended by the water system. The commenter was concerned that the provision may be implemented in such a manner that "may allow the State agency to redefine [the water system's] optimized status and dictate increased ortho-phosphate dosages, regardless of study findings."

Under the proposal, states would be required to designate values for the specific OWQPs prescribed in § 141.82(f) – namely pH, corrosion inhibitor concentration (if a corrosion inhibitor is used), and alkalinity (if alkalinity is adjusted as part of the system's optimal corrosion control treatment). In addition, states may "designate values for additional water quality control parameters determined by the State to reflect optimal corrosion control for the water system." One commenter provided a general suggestion for EPA to "tighten acceptable WQP limits, including allowing online continuous instrumentation." The commenter stated that "[v]ariability in chemistry can significantly affect corrosion and release from lead sources" and that continuous monitoring is "necessary to optimize corrosion control" and "particularly important to ensure that treatment dosages and water chemistry remain stable within the distribution system."

With regard to the prescribed manner in which states would designate OWQPs under proposed § 141.82(f) – at each entry point to the distribution system and in all tap samples – some commenters suggested EPA consider including provisions that also would allow states to set WQPs for certain zones within the distribution system. One commenter noted circumstances where, "[f]or systems blending different water sources in the distribution system with different corrosion control treatment techniques applied to each source, maintaining a consistent orthophosphate concentration of 1.0 mg/L as PO_4 throughout the distribution system is not achievable." In light of such circumstances, the commenter requested that "EPA include provisions to allow representative WQP sample sites of each zone with different WQP targets to be identified." Another commenter raised a separate consideration for which they supported such an approach. The commenter stated their concern that water corrosivity "in different geographical areas can vary significantly" and asserted that "[i]f the challenge of water quality zones is left unaddressed, assessments of lead release in any given system can be erroneous." As such, the commenter recommended revising the rule to ensure that "water quality parameters and corrosion control treatment are properly adjusted to address actual worst-case conditions." Finally, the commenter requested that, "[s]hould EPA decide against addressing this problem, it must provide its rationale and the peer-reviewed science that supports it."

Commenters also provided suggestions on specific provisions within proposed § 141.82(f). With regard to the proposed requirement in §§ 141.82 (f)(1)(ii) and (2)(ii) – for systems optimizing or re-optimizing CCT, the state would be required to designate an OWQP using for a minimum pH value "equal to or greater than 7.0, unless the State determines that meeting a pH level of 7.0 is not technologically feasible or not necessary for the system to achieve OOCT" – one commenter indicated that they did not interpret the provision as a requirement for a minimum pH and thus suggested removing the "unless the State determines" clause. Another noted that systems "adjust[ing] pH to meet or exceed 9.2… creates a potential to exceed the Secondary Treatment for effluent requirement at 40 CFR 133.102(c) (i.e. pH values be maintained between 6.0 and 9.0)." A third raised a similar point and suggested EPA include guidance language "pertaining to the secondary MCLs and why pH values outside this range might be appropriate." A final commenter expressed their support of proposed § 141.82(f)(1)(iv), where, for all tap samples, the state would designate a minimum orthophosphate concentration "equal to or greater than 0.5 mg/L as orthophosphate, unless the State determines that meeting an orthophosphate residual of 0.5 mg/L is not technologically feasible or is not necessary for the system to optimize corrosion control."

One commenter supported the proposed requirement in § 141.82(f)(1)(iv), applicable to systems installing optimized corrosion control treatment with an orthophosphate-based corrosion inhibitor, to maintain an orthophosphate concentration "equal to or greater than 0.5 mg/L" in all tap samples. For a similar provision in § 141.82(f)(2)(iv), which would apply to systems re-optimizing corrosion control treatment with an orthophosphate-based corrosion inhibitor, the commenter suggested removing the proposed requirement for an orthophosphate concentration "equal to or greater than 1.0 mg/L" in all tap samples.

EPA also received some comments that were specific to the proposal to "remove calcium carbonate stabilization as a potential CCT technique and thus calcium as a regulated WQP." One commenter expressed their support for the removal of calcium as a regulated WQP but requested that "EPA make a clarification to continue to allow the use of [calcium-based] lime for pH and alkalinity adjustment." Another commenter supported elimination of the CCT technique but did not support the subsequent removal of calcium as a regulated WQP, claiming that "[c]alcium is also an important water quality parameter because it affects the level to which pH and alkalinity treatments can be implemented without scaling, and calcium can bind orthophosphate at higher pHs." Other commenters similarly supported maintaining calcium as a regulated WQP (see discussion further below).

In addition, EPA received comment on additional parameters that could be included as regulated WQPs in the final rule. One commenter suggested that "water quality parameters need not be limited to direct measures of a specific corrosion control strategy but could include leading indicators" and identified "oxidation reduction potential, other metals such as iron, and hardness" as possible parameters for consideration. Two commenters were concerned that if "[water systems] focus only on pH, alkalinity and orthophosphate levels, they may be missing the cause or causes of increased lead solubility in their system" and suggested revising the proposed rule to provide consideration of other water quality parameters that may serve as indicators for potential lead solubility issues, such as disinfectant type and oxidation reduction. A fourth commenter suggested including water quality parameters listed in the EPA Optimal Corrosion Control Guidance Manual.

Other commenters provided more specific suggestions for additional WQPs to consider including in the final rule. One suggested including water temperature, conductivity, and calcium concentrations based on the commenter's position that "[w]ater temperature affects ALL chemical reactions and solubilities, including pH, alkalinity, calcium, orthophosphates, disinfectant residual decay, nitrification, etc." The commenter also suggested conductivity as "a general water chemistry parameter that accounts for the soluble anions and cations and is thereby applicable under all corrosion control treatment options." Another suggested including calcium and temperature as regulated water quality parameters in the final rule since they "can still provide important information about the nature and condition of protective lead scales in service lines." The commenter also urged "expanding[ing] the proposed water quality parameter list to all the factors known to significantly impact lead corrosion and lead release" and suggested including "chlorides, sulfates, manganese, iron, aluminum, and the formation/dissolution of protective scales in lead service line," based on the commenter's position that they are "known to have potentially significant impacts on lead corrosion and lead release" and "play a significant role in inhibiting or exacerbating lead corrosion in different distribution systems." The commenter also requested "a scientifically defensible justification" if "EPA leaves its proposed list unchanged."

In addition, several commenters requested EPA guidance, training and tools that would provide technical assistance to states in reviewing corrosion control study results and implementing subsequent rule requirements in proposed § § 141.82(d) and (f) (i.e., state designation of optimal corrosion control treatment and re-optimized corrosion control treatment, review of treatment installation, and specification of optimal water quality control parameters). A final commenter generally suggested that "States should be provided with adequate resources to review, capture, and improve water quality parameters with a short turn-around."

Agency Response

EPA has revised § 141.82 so that large systems without corrosion control treatment are covered under the optimization pathway and will have optimal corrosion control treatment. This will address medium systems that grow to be large systems, which meet the definition in the final rule of a system without corrosion control treatment. EPA has retained the requirement to allow States to either approve the system's recommended treatment or designate an alternative corrosion control treatment and to notify the system in writing and explain the basis for its decision. States will need to document why they have selected an alternative and other than the larger systems, State personnel will likely be more knowledgeable about corrosion control treatment than the system's personnel.

While EPA did not propose changes to the frequency of water quality parameter monitoring, it agrees that continuous monitoring can be an effective way of measuring some of the key water quality parameters such as pH to ensure better process control and avoid long excursions and violations. Setting the minimum or range for an optimal water quality parameter would involve more factors than monitoring frequency, such as seasonal water source variability, mixing zones within the distribution system, and water demand throughout the distribution system. The structure of the rule encourages more frequent monitoring with the excursion calculations discussed in § 141.82(g) that details how water quality parameter excursions are calculated when there are multiple samples on the same day, one sample per day, or on days when no samples are taken. Systems sampling less frequently than daily are more likely to have multiple day excursions because the daily value from the most recent day that a water quality parameter was measured at the sampling location will apply on days when no measurement was conducted. Systems with more than nine days of excursions in a six-month period are in violation of the treatment technique. Systems with expertise to use continuous monitoring are much less likely to have long excursions because treatment adjustments can be made during the day when the parameter goes outside its optimal range.

There is sufficient flexibility in the rule to address water variability in different zones. The cited example indicated concerns with a minimum orthophosphate residual of 1.0 mg/L, which is set by the State after review of follow-up monitoring following re-optimization. If the State determines that it is not technologically feasible or necessary for the system to meet this residual in a particular monitoring location, it can set a lower value for it. EPA is requiring that the water quality parameter sites in the distribution system be included in the site sampling plan along with the lead and copper tap sampling sites. In addition, the find-and-fix requirements can provide better zone coverage by requiring the addition of new water quality parameter locations if one is not located within the same pressure zone and on the same size water main within a half mile of the tap monitoring site with a lead action level exceedance. These sites will be added to the minimum number of sample sites for systems required to meet optimal water quality parameters. These sites can be added until the system has twice the minimum number of sites listed in Table 1 of § 141.87(a)(2). When a system exceeds this upper threshold for the number of sites, the state has discretion to switch out sites that have been added if the newer site can better assess the effectiveness of corrosion control treatment.

The minimum pH of 7.0 in the distribution system samples (in the absence of a state determination that it is not technologically feasible or necessary for the system to optimize CCT) was in the 1991 lead and copper rule. EPA is not changing the requirement for this minimum pH value because waters with a pH below 7.0 are corrosive towards lead and copper materials and a pH below 7.0 is below the optimal range for orthophosphate if it is being added. EPA will update the optimal corrosion control treatment guidance to emphasize that pH values above the upper bound of the secondary MCL range (> pH 8.5) would be appropriate.

EPA agrees with commenters that supported the proposed minimum orthophosphate residual concentration of 0.5 mg/L (as PO_4) and has retained it in the final rule for systems installing orthophosphate. States can set a lower minimum when it is determined that it is not technologically feasible or necessary for optimal corrosion control. EPA disagrees with the comment about the minimum orthophosphate concentration of 1.0 mg/L as PO_4 in all distribution system tap samples. Such systems that are triggered into re-optimization have an existing, orthophosphate-based corrosion control treatment and still exceeded the trigger or action level. EPA believes that a higher residual concentration is necessary to control lead and copper concentrations since the existing corrosion control treatment did not keep the systems below the trigger or action levels. However, EPA notes that the final rule provides states the flexibility to determine, on a case-by-case basis, that meeting an orthophosphate residual of 1.0 mg/L is not technologically feasible or is not necessary for a system to optimize corrosion control.

Optimal corrosion control treatment is defined as the corrosion control treatment that minimizes lead and copper at users' taps while ensuring that the treatment does not cause the system to violate any national primary drinking water regulations. The LCRR retains the pH/alkalinity adjustment and inhibitor addition approaches that must be evaluated by systems in assessing corrosion control treatments. While EPA removed the calcium carbonate stabilization approach as a mandatory approach that must be evaluated to identify optimal corrosion control treatment, systems and States may find that it is the optimal corrosion control treatment for some systems. For systems conducting optimization or re-optimization studies, alternatives other than pH/alkalinity adjustment or use of corrosion inhibitors can be compared against these corrosion control treatments in the study to demonstrate that the alternative is as effective or more effective than the listed corrosion control treatments to demonstrate that it is the optimal corrosion control treatment. In the final rule, § 141.82(f)(1)(vi) provides that the State may designate values for additional water quality control parameters determined by the State to reflect optimal corrosion control for the water system. Thus, for systems where the state is retaining calcium carbonate precipitation as the optimal corrosion control treatment for the system, it can has designate calcium, conductivity and temperature as optimal water quality parameters along with pH and alkalinity for the system unless the system exceeds the lead trigger or action level. If the trigger or action level is exceeded, the system will need to demonstrate through the re-optimization process that adjustments to the calcium carbonate precipitation process is the optimal corrosion control treatment process for the system. Similarly, if a system can demonstrate that a lead oxide scale (PbO_2) is the optimal corrosion control treatment and it is approved by the State, the State could designate oxidation-reduction potential or free chlorine as optimal water quality parameters along with pH. The key parameters would be identified from the corrosion control study and the range from the follow-up monitoring. There are also parameters that can impact the effectiveness of corrosion control treatments, such as iron and manganese. In systems where the levels could interfere with corrosion control treatment, States may want systems to monitor these parameters as optimal water quality parameters. Several of the parameters listed by commenters would be important in evaluating long-term treatment changes, such as chloride and sulfate, if a system is considering switching coagulants, but may not be key parameters in assessing the effectiveness of the corrosion control treatment. EPA believes that additional water quality parameters can best be identified through this system-state interaction.

Agency guidance on the implementation of the CCT step requirements was also requested by commenters. See response to comment section 4.1.1 for further discussion of implementation guidance.

4.7 Corrosion Control Treatment Options

EPA received comments on the corrosion control treatment (CCT) options listed in the proposed rule, including comments on the proposal to remove calcium carbonate stabilization as a CCT method. EPA also received comments on other CCT options that were not listed in the proposed rule.

Corrosion Control Treatment Options Listed in the Proposed Rule

Summary of Comments

EPA received one comment relating to the corrosion control treatment (CCT) options listed in the proposed rule. The commenter suggested EPA “consider removing silica-based inhibitor adjustment as a CCT method,” based on the commenter’s position of there being a “lack of research demonstrating its effectiveness in minimizing lead and copper levels.”

Agency Response

EPA's review of available literature did not support removing silica-based inhibitors as a corrosion control treatment option. EPA notes that systems using silica-based inhibitors, upon finding they are no longer optimized because of trigger or action level exceedances, would be required to re-optimize their corrosion control treatment. That process would require a comparison of the system's existing usage of a silica-based inhibitor against other corrosion control treatment alternatives. Where alternative, non-silica-based treatments are found to reflect optimal corrosion control, the system would be required to install it in accordance with the rule's provisions for optimized treatment.

Proposed Removal of Calcium Carbonate Stabilization as a Corrosion Control Treatment Method

Summary of Comments

As indicated in the preamble to the proposed rule, EPA proposed to "eliminate the option of calcium carbonate stabilization as a CCT because literature indicates that calcium carbonate does not form a film on lead and copper pipes to a level that makes it effective as a CCT option." EPA received comments expressing support for the proposed elimination. One of the commenters also affirmed EPA's finding that calcium carbonate stabilization is less effective as a CCT option, stating that "[b]ased on [the commenter's] knowledge, there is little or no research that supports corrosion control effectiveness of calcium carbonate stabilization." Another expressed that they "[did] not object to the removal of calcium carbonate precipitation as a corrosion control treatment option."

An equivalent number of commenters were not supportive of the proposed removal. Most favored maintaining the CCT method for the sake of providing systems with a broader array of treatment options. A smaller subset of commenters did not agree with EPA's basis for the removal and claimed that "[c]alcium carbonate as a water chemistry method to control corrosion has been shown to be an effective CC technique" and that "buffered water treatment method needs to remain a cornerstone of CCT as it is often the most system effective and cost effective method available to many systems." Another final commenter claimed that "[s]everal large water systems in Missouri have successfully use [sic] calcium carbonate for their CCT for decades with no compliance issues in meeting the action level."

Many commenters noted the cascading impact of the proposal on systems currently using calcium carbonate stabilization as their designated optimal corrosion control treatment and sought clarity on how those systems would proceed under the revised rule. Commenters claimed the proposal "significantly modifies what constitutes optimized corrosion control" for these systems and recommended clarifying in the final rule that they would not be required to "change current corrosion control practice unless studies pertaining to a trigger or action level exceedance indicate a change is necessary." One commenter asserted that "[r]equiring these water systems to modify their CCT without any indication that they exceed either the Action Level or Trigger Level is unnecessary, cost-prohibitive, and unreasonably burdensome on these water systems" and suggested that "EPA should review the economic impacts of the elimination of calcium carbonate for these water systems." Another commenter stated that "[w]ithout guidance as to how a water system using calcium carbonate for corrosion control is to proceed, it could be argued that the water system is operating without an approved corrosion control technology as of the promulgation date of this rule." The majority of these commenters recommended revising the rule to allow these systems to continue operating the treatment so long as they do not exceed the trigger or action levels. Upon such an exceedance, these systems would then be triggered into evaluating other CCT methods and subsequently implementing the treatment transition. Alternatively, one of the commenters suggested EPA "provide further guidance as to what will be required of such water systems, which should at least include a reasonable sunset period that will allow enough time for sufficient studies to be concluded to ensure the safe transition to an approved corrosion control treatment option." A final commenter suggested that "EPA provide guidance and training for state regulatory agencies to prevent unnecessary and/or unwise changes to water systems' CCT" and state in such guidance that "stable systems (e.g., water systems that have been successfully and reliably operating the same way for many years in the absence of detections of elevated lead) should not be required to change their CCT."

One of the commenters indicated they had installed calcium carbonate stabilization as their state-designated optimal corrosion control treatment based on corrosion control studies they had previously completed in accordance with the Lead and Copper Rule. The commenter also noted that lead and copper samples were "non-detectable" at dedicated sampling stations and that "all triennial at-the-tap samples were below the actions levels" for nearly two decades. In light of the proposed revisions, the commenter sought clarity on how to proceed in complying with the revised rule, stating that "it is unclear, based on the proposed revisions, whether [the commenter] should continue monitoring the WQPs determined from the results of our corrosion control study, or a new corrosion control study needs to be conducted to meet the requirement of proposed LCR."

Agency Response

EPA agrees with commenters that calcium carbonate stabilization has not been shown to be an effective corrosion control treatment strategy. EPA believes the lack of support in the available literature for the use of calcium carbonate stabilization in reducing tap lead levels justifies removing it from the list of treatments required to be evaluated in a corrosion control study. The treatment options that will remain continue to offer a range of options for systems to provide OCCT.

With regard to comments and concerns regarding calcium carbonate stabilization processes currently in place, system will not be required to replace calcium carbonate treatment and that treatment may continue to operate provided the system continues to meet the lead trigger level.. Systems that have had water quality parameters designated will continue to comply with those parameters including monitoring and reporting requirements. A new corrosion control study will not be required for such systems that continue to operate calcium carbonate treatment and continue to not exceed the lead trigger level. If a water system using calcium carbonate stabilization exceeds the lead trigger level or the lead action level, it would no longer have the option to continue its use. See related discussion in section 4.6 regarding the final rule's inclusion of language that allows these systems to maintain calcium carbonate stabilization as their optimal corrosion control treatment and gives the state the authority to set the appropriate water quality parameters associated with that treatment. If a system no longer had the option to continue the use of calcium carbonate stabilization then that system would proceed with a corrosion treatment study if required based on system size monitoring of water quality parameters before and after installation of corrosion control treatment based on the applicable schedule of the LCRR

Other Corrosion Control Treatment Options Not Listed in the Proposed Rule

Summary of Comments

EPA received comment on potential corrosion control treatment options beyond those listed in § 141.82(c) of the proposed rule (i.e., alkalinity and pH adjustment, addition of an orthophosphate-based corrosion inhibitor, or addition of a silicate-based corrosion inhibitor). Four commenters suggested a potential option for certain systems, those using chlorine for secondary disinfection, to develop or maintain insoluble, tetravalent lead scales as a corrosion control treatment method. The commenters also suggested that these systems could achieve or maintain the scales by adjusting pH and adding treatment for disinfection byproduct pre-cursor removal.

Another commenter suggested including "methods to minimize iron corrosion" and claimed that it "can impact particulate lead levels;" that "optimizing corrosion control involves managing both dissolved and particulate lead;" and that "[h]istorical guidance has focused on optimization of water chemistry to minimize dissolved lead levels."

One commenter suggested that "[o]ther corrosion control treatments should be made available if proven effective" and claimed that "[m]anganese sulfate, which has not been studied extensively, has been successful in some studies as a corrosion inhibitor."

A commenter suggested EPA develop, approve, and implement a "new system of tiered products" that water systems could utilize directly, and without need for prior corrosion control evaluations or studies. According to the commenter, the tiered products would consist of "[p]roducts/technologies that have a proven track record of putting systems into compliance 99% of the time."

Agency Response

With regard to comments suggesting potential options for corrosion control treatment, EPA agrees with comments suggesting that treatment strategies to meet other NPDWRs could complement OCCT in reducing tap levels and facilitate simultaneous compliance with the NPDWRs. . Under the LCRR, states are required to set optimal water quality parameter ranges or minimums and have the discretion to set additional optimal water quality parameters. Any corrosion control strategy would need to be evaluated, including the minimum required elements, in a corrosion control study that identifies the corrosion control treatment that minimizes lead and copper levels at consumers' taps.

EPA agrees that overall control of corrosion in water systems would have a positive impact on reducing lead levels at taps. The use of OCCT would contribute to that control. EPA also agrees that considering particulate lead levels and the presence of metal scales in corrosion control treatment is important in reducing lead exposure. EPA concludes that consistent distribution system operational practices and consistent use of corrosion control based on corrosion control treatment studies that evaluate all aspects of source water chemistry and corrosion control treatment strategies can reduce exposure from all forms of lead in the distribution system.

In response to the comment regarding other corrosion control being available, based on the information reviewed in developing the LCRR, EPA believes that the corrosion control treatment methods identified represent the most practical and effective means of minimizing tap lead levels. EPA does not have information regarding the applicability or efficacy of manganese sulfate in public water system in reducing tap levels for it to be considered a corrosion control treatment to satisfy the requirement for OCCT under the LCRR.

With regard to the comment suggested that EPA develop a tiered criteria for corrosion control treatment, implementation of the previous LCR including corrosion studies conducted and investigation into exceedances of the current lead AL in multiple systems clearly indicate that are a number of unique circumstances in individual water systems including source water quality, treatment methods and distribution system construction and operation that effect tap lead levels and LCR compliance. Therefore, EPA does not believe that any tiered criteria could fully account for all these variables and allow for a conclusion as to OCCT for a given water system..

4.8 Daily Optimal Water Quality Parameter Calculation Requirements

Summary of Comments

EPA received comments on the proposed requirement in § 141.82(g) for calculating the daily values for State-specified water quality parameters used to determine corrosion control treatment compliance. Some commenters recommended that EPA consider calculating separate daily values for each distribution system entry point rather than a single, system-wide daily value calculated using the procedures prescribed in § § 141.82(g)(1) and (2). The commenters believed requiring a single, system-wide daily value would cause systems with multiple sources to incur violations more frequently than those with a single source. One commenter recommended that daily values "should be based upon a sampling plan with guidance pertaining to when and where a system should sample," and that the "sampling plan should address multiple sources, including how seasonal source are used."

Agency Response

EPA disagrees with the recommendation to calculate daily values at each entry point to the distribution system. This approach would not ensure a consistent level of corrosion control treatment and minimized lead and copper levels for all consumers served by the distribution system. EPA notes that states have considerable flexibility in setting optimal water quality parameters and adjusting them as needed over time. Water quality tap sample monitoring must take into account different sources, treatment methods and seasonal variability. EPA agrees that a sampling plan would have considerable value in water quality parameter monitoring both in ensuring representative monitoring and consistent operation of corrosion control treatment.

4.9 CCT Study vs Re-Optimization

Summary of Comments

EPA requested comment on "potential actions water systems could take to adjust their corrosion control treatment and how they should work with the state to determine if adjustments to the treatment would better optimize corrosion control." The proposed steps by which a water system exceeding the lead trigger level or copper action level would be required to re-optimize their corrosion control treatment are prescribed in § 141.81(d). Additional requirements associated with these steps are further described throughout § 141.82.

EPA received several comments suggesting that the final rule incorporate a separate 'trend analysis' or a 'find-and-fix evaluation' where systems first would review how effectively they are implementing their existing CCT and identify potential modifications prior to considering, evaluating, or conducting CCT studies for an alternate OCCT that is not already installed. Commenters suggested this approach to address concerns over the proposed procedures in § 141.81(d) potentially triggering a 'restart' of OCCT designation and subsequent installation of a new OCCT. One commenter suggested that "[e]valuation of existing treatment modification can be done using desk-top, coupon, analogous system, or partial system or full-scale trials." Another commenter suggested that "a desk-top evaluation be conducted by the system to determine optimal corrosion control treatment;" that the "need for, and requirements of, a pipe loop study be determined through discussions with the state primacy agency," and that "changes to corrosion control treatment be implemented on a reasonable timeframe following discussions with the state primacy agency." A third commenter suggested the final rule "[e]xplicitly encourage the routine collection and trend analysis of water quality parameters."

One commenter generally suggested that "[r]e-optimization should focus on making improvements to existing treatment when appropriate and require additional studies when that is insufficient." Another commenter suggested adding "flexibility in what constitutes 're-optimization.' Sometimes it is simply a treatment process issue that causes a system to exceed when they have CCT. Submitting plans on how to prevent these process issues from happening in the future should be adequate- a system shouldn't have to go through a study or re-evaluation of various treatment options to be considered "re-optimized.'"

In addition to conducting trend analyses/evaluations in responses to trigger or action level exceedances, some commenters suggested requiring systems to perform them when considering new sources or treatment changes, or to inform long-term CCT improvement measures. A final commenter also suggested including a trend analysis during sanitary survey reviews.

Agency Response

EPA agrees with commenters who suggested there should be more flexibility allowed in the re-optimization process and that a 'bin' approach can provide more flexibility and ease the cost and burden for some systems performing corrosion control studies. The bin approach is based on system size, presence of lead service lines and the 90th percentile tap lead levels. EPA agrees it may be appropriate for systems that are between the trigger level and action level to install optimized treatment without the need for a corrosion control study unless deemed necessary by the State to ensure the system will achieve optimal levels of corrosion control in its distribution system. The bin approach requires pipe loop studies only for systems with lead service lines that exceed the lead action level. Desktop studies as recommended by commenters are an option under the bin approach. Also as recommended by commenters, systems can have treatment modifications approved by the state without the need for additional studies. See the rsponses to subsections 4.3 and 4.4 for a summary of how EPA has modified requirements for the optimization and re-optimization pathways, respectively, in the final rule. See also the response in section 4.5 detailing the 'bin' approach for determining CCT study requirements based on a system's status of CCT, lead service lines, and 90th percentiles.

EPA has not incorporated the suggested requirement for completing trend analyses in response to trigger or action level exceedances, new sources, treatment changes or CCT improvement or during sanitary survey reviews. EPA agrees with comments that such analyses may have considerable value for evaluating corrosion control treatment in certain circumstances. However, the Agency believes that the need for such analyses would be best determined by states on an individual system basis. (See additional discussion on sanitary surveys in section 4.10.)

4.10 CCT Review During Sanitary Surveys

Summary of Comments

Four commenters supported the requirement to review corrosion control treatment and water quality parameter data during sanitary surveys as proposed. Another commenter supported the proposal, but suggested “the review during a Sanitary Survey should go farther and evaluate WQPs relative to Pb corrosion for all systems.”

Several commenters supported the periodic review of corrosion control treatment and water quality parameter data but did not believe the review should be completed as a part of the sanitary survey process; “believe[d] the States should be able to exempt Corrosion Control Surveys and associated treatment based off historical lead results and the information gained during Sanitary Surveys;” or would “not support the requirement… beyond a simple checklist.” One of the commenters suggested “instead that US EPA requires a minimum frequency of 3 to 5 years for primacy agencies to conduct a review of CCT and WQP data and allow the primacy agency to determine how and when this review is conducted.” Another commenter suggested “provid[ing] flexibility to states on how to accomplish reviewing corrosion control and water-quality parameters at water systems,” and that EPA “could provide flexibility in the rule by not linking the review directly to the sanitary survey and instead establish the review on a three-year frequency giving states the ability to perform the review as part of the sanitary survey or by having a special site visit to perform the review.”

One commenter did not support the proposed review during sanitary surveys, stating their belief that it would “not [be] the appropriate format to evaluate whether or not the process being used is providing optimal CCT” and that “[t]he system should be responsible for completing a review of their CCT process, and submitting documentation of such to the State.”

One commenter suggested that EPA “develop or at least allow states to use a different mechanism for periodic OCCT reviews rather than limiting that method to sanitary surveys” and claimed it “would be another opportunity to gain efficiencies and reduce costs.” The commenter also suggested mandating the review only “for systems with 90th percentile lead levels above 5 ppb.” Another also supported mandating reviews based on 90th percentiles but instead suggested using the trigger level.

Some commenters raised the additional burden to primacy agencies as a concern and a challenge, noting that the proposed sanitary survey reviews would require additional training and staffing. Another commenter suggested EPA provide guidance to states on sanitary survey requirements.

One commenter noted the proposal to require consideration of any “updated EPA guidance on CCT during the sanitary survey” and believed it to be “impracticable and likely unenforceable.” The commenter suggested “EPA reconsider and clarify its position in EPA’s response to comments, including an indication of whether and when amendments to the sanitary survey requirements in § 141 will include requirements specific to the LCR or the LCRR.” The commenter also stated their position that the proposed “evaluation is more appropriate as an in-house engineering review” and that “requiring an in-depth review of corrosion control treatment and optimal water quality parameters as part of a sanitary survey could be duplicative for states that utilize investigation staff for conducting sanitary surveys and engineering staff to evaluate corrosion control treatment performance."

A final commenter noted "acceptable methods and instrument calibration" as implementation challenges that may arise during the evaluation of corrosion control during sanitary surveys and suggested that "[v]ery clear regulation needs to be established as to acceptable methods of pH monitoring for process control." The commenter claimed that "many systems use field-based equipment to monitor and control [optimal corrosion control treatment]" and that most small systems encountered by the commenter "do not properly monitor pH." The commenter also sought clarity on whether any deficiencies observed during a sanitary survey evaluation would be considered a treatment technique violation or a monitoring violation.

Agency Response

EPA agrees that an evaluation of CCT processes and WQPs should be included in the sanitary survey as part of the overall review of all treatment processes in use and the monitoring of those processes. EPA notes that large systems will continue to be required to report WQ parameters to the state. EPA disagrees with comments that such a CCT evaluation should not be part of sanitary surveys . As with all other chemical application processes in a public water system, a sanitary survey would determine if the approved or designated treatment is still operational and adequately maintained and monitored. EPA agrees with commenters that this review could be conducted separately on a recurring schedule provided that the review in the results of sanitary survey and completed with the required frequency for sanitary surveys . EPA notes that the current requirements for sanitary surveys allow for a phased approach to completion of each of the required eight elements. There is considerable flexibility for states in organizing and implementing a sanitary survey program including how and when to evaluate OCCT and compliance with WQPs within the required survey frequency time period. In response to comment regarding different primacy agency staff or programs reviewing CCT , EPA again notes that the requirements for sanitary surveys allow for considerable flexibility in completing the required eight elements and different elements or components of those elements could be reviewed by more than one state program component to satisfy sanitary surveys requirements.

The sanitary survey program requirements for states allow for flexibility in completing the required eight elements including a phased approach to completing the required eight elements. As suggested by commenters, the requirement for an evaluation of treatment processes and compliance with water quality parameters could be satisfied as part of other state oversight processes.

EPA agrees with commenters that a full review of OCCT including adjustment of WQPs could necessitate a more focused review. As noted above, the sanitary survey requirement adds the designated CCT process to the review of all other treatment processes. EPA notes that the state may review and modify its OCCT determination and WQPs when it concludes that such a change is necessary to ensure the system continues to optimize corrosion control treatment

With regard to the comments regarding using a different mechanism than a sanitary survey to evaluate EPA does not agree with comments that reviews by states should be limited based on trigger levels or 90th percentile lead levels. LCRR requires systems to continuously maintain OCCT where applicable and routine oversight for that requirement is appropriate and consistent with the requirements for sanitary surveys.

EPA acknowledges the challenges for states in implementing the LCRR. EPA plans to continue its training efforts for states including the elements of the LCRR and sanitary surveys. EPA has initiated planning for development of implementation support documents.

EPA does not agree with the comment that a consideration of EPA guidance in LCRR oversight by states is impractical. EPA routinely updates guidance documents to assist states in implementing the NPDWRs. Th referenced language references consideration and does not set any other requirements. Given that is only requirement and that guidance documents do not set any requirements, EPA does believe the issues on enforceability is applicable. With regard to the comment for a need for revision to existing regulatory language for sanitary surveys to address LCRR, EPA has made necessary revisions to ensure OCCT is evaluated. Review of LCRR compliance including OCCT, is within the scope of the required eight elements of a sanitary survey. EPA believes including the review of the required elements of the LCRR in a sanitary survey program is feasible. With regard to the comment regarding deficiencies found related to LCRR, if a water system was found to be not providing OCCT as designated by the state at any time it would be in violation of the treatment technique requirements of the LCRR and if the system failed to complete required monitor at any time it would be in violation of the monitoring requirements of the LCRR.

The same commenter noted the importance of accurate pH measurement as part of LCRR compliance and OCCT. EPA notes that there are approved EPA methods(EPA 150.1, EPA 150.2) for the measurement of pH. Feld measurements of pH are allowed in performed by water system personnel as approved by the state. A review compliance measurements and instrumentation calibration would be a part of a comprehensive sanitary survey.

References

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U.S. Environmental Protection Agency. Revised Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water systems. Office of Water, EPA 816-B-16-003, May 2019.

5 Lead Service Line (LSL) Inventory

In the proposed rule, EPA requested comments on the lead service line (LSL) inventory in § 141.84(a), specifically, EPA requested comment on:

- The feasibility of creating initial LSL inventories by the compliance date, which is three years after publication of the final rule, and if a different frequency (other than annual) would be more appropriate for inventory updates.
- Additional requirements or guidance are needed relating to the content or format of inventories.

- The actions that systems with limited records can take to improve their understanding of the number and location of LSLs in their water system.
- Galvanized pipe in LSL inventories and in goal-based and mandatory lead service line replacement (LSLR) rates under the proposed Lead and Copper Rule revisions (LCRR) as well as on the treatment of unknown service lines in the inventory.
- Requiring systems with LSLs to make publicly available the exact address of the LSL in the inventory instead of a location identifier (street, intersection, landmark) as proposed.

Commenters provided a range of perspectives regarding the inventory requirements, such as which systems should create an inventory and how prescriptive the requirements should be. EPA received many comments regarding the requirements and limitations on the information sources that may form the basis for the LSL inventory. Commenters also gave their perspective on the deadline to submit the initial inventory, the frequency of inventory updates, and whether the rule should include a final deadline by which all lead status unknown service lines must be verified. Commenters also had comments regarding the overall burden to create an inventory. Finally, commenters gave recommendations regarding making the inventory publicly accessible as well as whether to include addresses in the inventory.

5.1 General Comments

Summary of Comments

Many commenters offered overall support for the inventory requirements, noting that creating inventories is an essential step towards reducing lead in drinking water. Commenters stated they affirm EPA's proposal to require water systems to prepare and maintain an inventory to identify locations where LSLs are present. One commenter representing a water system stated support for the requirement for a publicly available inventory, stating that the commenter's customers expect this information is known and made available to them. Many other commenters also noted the importance of public access for providing transparency and building customer trust. One commenter stated that a public facing LSL inventory will likely enhance public engagement and potentially lead to customer willingness to replace LSLs. One commenter supports requirements for public water systems (PWSs) to develop complete inventories of their distribution system, including both the private and public side for all service lines no matter the material. One commenter strongly supports LCRR provisions that would encourage community water supplies to expedite the completion of their inventories where states have already established this requirement. One commenter stated that knowing where LSLs exist, a utility can set priorities, better coordinate system upgrade work and provide notice to customers should they choose to replace their LSL during the utility's planned projects. Providing advance notice and communicating to the public, the commenter said, would be one tool to help reduce the potential need to perform partial replacements during routine or planned utility work. A commenter expressed support for all water systems to create an inventory of all water system-owned and customer-owned LSLs in its distribution system and noted "This conforms to provisions Congress included in Section 2015 of the America's Water Infrastructure Act of 2018 directing EPA to develop an assessment of LSLs on public and private property in the next round of the 2020 Drinking Water Infrastructure Needs Survey." A commenter expressed support for requiring "unknown" service lines to be considered as lead, and to provide customers with information stating that they might have an LSL and with the requirement to continuously update the inventory as additional information becomes available. Two commenters said that schools should be required to create an inventory.

Many commenters agreed with the need for LSL inventories, but suggested modifications to the proposed requirements. For example, EPA should require that the water system categorize each service line and explicitly include “unknown” lines in inventory, given that the proposed rule considered unknowns to be LSLs. Another commenter, however, expressed concern that providing customers with an annual notification that they may have an LSL when its material is unknown has the potential to cause unnecessary anxiety and distrust of PWSs. This commenter recommended that the notification process to customers of unknown service lines be delayed until fewer unknowns are in the inventory. One commenter urged EPA to require an LSL inventory, that acknowledges the multiple lead-bearing components that can lie between a service line and a home’s internal plumbing and transparency for access to LSL information including where lead lines exist in their communities.

Several commenters recommended that the rule waive the LSL inventory requirements under certain conditions. One commenter suggested that small systems with reasonable knowledge that they have no LSLs based on date of construction and historical monitoring data with 90th percentiles below 5 ppb (i.e., µg/L) should not be required to develop an LSL inventory. Commenters suggested that PWSs with no LSLs or that have replaced all their LSL should be able to certify to the primacy agency that they have no LSLs, and would notify the primacy agency if an LSL is found during main replacement or maintenance (if the LSL was previously reported as non-lead). One commenter asserted that a waiver process that requires the system to submit an application is burdensome on the system and state, especially if the system was constructed past the ban of lead piping but has no records or an easy way to confirm the service line materials for the inventory.

Other commenters recommended that the final rule continue to emphasize that the LSL inventory is to be based on available information and improved over time in the course of routine system activities. Commenters state that the rule must recognize that there will be uncertainty in which pipe materials are present but make clear that water systems should be transparent as to the basis for the inventory when presenting it to the public.

A commenter suggested that generally lead was not used for larger-diameter service lines and suggested the final rule limit inventories to certain diameter service lines and to exclude irrigation, fire lines, and other non-potable service lines. One commenter supported the proposed requirements for small water systems to develop the LSL inventory and plan but noted funding like the Drinking Water State Revolving Fund (DWSRF) may be needed. One commenter supported LSL inventory development for medium and large water systems, but not for small systems as they do not have adequate resources.

While many commenters acknowledged the importance of identifying the areas in the distribution system that contain lead, several highlighted the burden associated with creating an inventory. One commenter representing a water system estimated the cost to conduct service line inventories on the system-owned portion would range from $1.1 to $1.3 million, while identifying the customer-owned portion would cost between $19 to $21 million and be highly disruptive to customers. Another commenter noted that inventory requirements will also burden the states, who would likely provide technical assistance and trainings, as well as additional funding. Many commenters noted the significant cost and burden associated with developing an LSL inventory might require that resources from other PWS work be redirected.

Some commenters expressed concern that the proposal was overly prescriptive, forcing a "one-size-fits-all" approach for systems that vary greatly (e.g., in terms of size, infrastructure age, and materials used). One commenter said that the proposal lacked a mechanism for addressing erroneous service line composition assignments.

Some commenters raised concerns about LSL inventories given that the customer owns their side of the service line and the PWS must gain permission for access to these lines to complete the inventory. Other commenters expressed concern with the ability of PWSs to obtain customer cooperation, asserting that EPA must address and clarify how utilities contact customers and building owners that are non-responsive to notification and request for access or investigation.

One commenter suggested that "centralized state databases should also show the location of water systems that are not covered by the Safe Drinking Water Act." The commenter said that "water systems not regulated under the Safe Drinking Water Act (SDWA), and therefore not subject to the regulations of the LCR, include water systems serving an estimated 98,000 schools and 500,000 childcare providers nationwide." The commenter also suggested that "states may also make information available regarding any local regulations that exist for these water systems."

Some commenters requested clarification for what requirements apply to systems with no LSLs as well as how customer ownership of LSLs affects the inventory requirements. Other commenters requested guidance from EPA on inventory development. A commenter suggested that EPA define what is expected of the inventory in terms of documentation and acceptable methods of determining whether pipes and other plumbing components contain lead.

Agency Response

For the final rule, EPA is requiring that all community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs) create an inventory, regardless of water system size, characteristics, service line ownership, or historical tap sampling results. EPA acknowledges there is burden associated with creating and updating service line inventories. An inventory, however, is the foundation of the final LCRR as many provisions rely on an awareness and an accounting of LSL locations. For example, identifying the locations of all known and potential LSLs is needed for compliance with the requirement to notify persons served by LSLs in § 141.85(e) and to calculate how many service lines must be replaced under a goal or mandatory LSLR program under § 141.84(a). One key aspect of this treatment technique rule is public education (PE), including PE about the sources of lead in drinking water. Even when a system is at or below the lead action level based on tap sampling, there can be very high lead levels in water delivered to specific locations within the system, particularly locations served by LSLs. The requirement to notify those persons served by an LSL will give those customers information critical to their decision-making with respect to mitigating their risk of exposure to water that may contain high amounts of lead, especially in light of the fact that the rule does not require widespread tap sampling in any system. Even very small water systems, which some commenters suggested be exempt due to the burden of creating an inventory, must rely on an inventory to comply with numerous rule provisions that require knowledge of known or potential LSL locations. EPA disagrees with the commenters that said water systems with low historical lead levels should be exempt from inventory requirements because they claim there is less risk of lead exposure from their systems. As mentioned above, individual service lines may show higher lead levels even when systemwide lead levels appear low. In addition, these systems are still subject to provisions requiring an accounting of LSLs that apply regardless of system-wide calculations of lead levels, namely the requirement discussed above to notify persons served by LSLs in § 141.85(e). Water systems that state they have no LSLs must also create an inventory in order to provide documented evidence to support their claim. It is therefore essential that all regulated PWSs create an inventory and that no water systems have inventory requirements waived.

EPA determined it is practicable and feasible for water systems to prepare the initial inventory by the rule compliance date, three years after rule promulgation as not every service line composition need be determined and may be identified as lead status unknown. It is important that water systems complete the initial LSL inventory within three years of publication of the final rule to facilitate selection of tap sampling sites under new tiering criteria and informing consumers about the presence of an LSL by the compliance date for those provisions, which is based on Section 1412(b)(10) of the SDWA. The inventory is critical to determining the number of LSLs to be applied to the LSLR rate under a lead trigger level exceedance and action level exceedance.

Initial LSL inventories will be updated and submitted to states annually or triennially, in sync with the systems tap sample monitoring period but no more frequently than annually. EPA recognizes that service line material classifications may change as new records are discovered, through normal water system operations, or as physical inspections or replacements are conducted, and therefore allows water systems to update the inventory over time. EPA recommends a disclaimer stating that the inventory content is subject to change with new information, so inventory users understand how to interpret the information. There is no deadline for a water system to compile a complete inventory (i.e., one that does not include any service lines of unknown materials). This means that the water system can comply with the inventory requirements in the final rule even if service line materials remain unverified, for example due to customers who are non-responsive or unwilling to allow system personnel to inspect the service line (if an in-home inspection is even needed).

EPA disagrees that the final rule requirements are overly prescriptive or that they force a “one-size-fits-all” approach for all systems. The final rule establishes minimum requirements for the inventory, including the sources that must be reviewed under § 141.84(a)(3) and the classifications under § 141.84(a)(4). The final rule does not prescribe material identification techniques used to develop the inventory over time, inventory format, or the specific type of location identifier the system chooses to use in its publicly available inventory. See response to comment Section 5.4 for a discussion of the minimum requirements for making the inventory publicly available.

Many commenters requested guidance on how to create an inventory. EPA understands that rule guidance is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

One commenter asked EPA to clarify how to inventory service lines which split or branch from a single system-owned portion into multiple buildings. Each split or branched service connection from the system-owned portion would be considered a service line and should be included in the inventory.

In response to the commenter that recommended that schools should be required to have LSL inventories, EPA notes that schools that are regulated PWSs will be subject to the inventory requirements under the final rule. SDWA authorizes EPA to regulate PWSs as defined in Section 1401(4). Water systems will list all service lines in their inventory, which includes those which serve schools that are not PWSs. EPA notes that LSLs were generally used to serve single family homes, while schools are often larger structures whose service line is likely made of a non-lead material.

5.2 Timeframe to Submit Initial Inventory/Update Inventory

Initial Inventory Deadline of Three Years After Rule Publication

Summary of Comments

Several commenters thought that it was feasible to create an initial inventory in three years, mentioning examples of water systems and states that were successful in doing so. A commenter noted that any system that has been required to replace LSLs in the past as a result of a lead action level exceedance should already have initial inventory information, due to the previous rule requirement for systems to replace 7 percent of their LSLs. In addition, the commenter noted the February 2016 memo from EPA Assistant Administrator for Water to state SDWA primacy agency directors requested that materials inventories required under the original Lead and Copper Rule (LCR)—as well as updated information on LSLs—be posted on water system or state agency website, with a priority for large systems (USEPA, 2016).

A few commenters suggested EPA should consider a shorter timeframe for initial inventory completion, such as one or two years after rule promulgation, because they claim it is feasible for a majority of systems, would benefit the public by being made available sooner, and is needed to ensure the initial inventory is complete if LSLR is triggered at the rule effective date. One commenter argued that "[c]onducting an inventory within one year is "feasible" within the meaning of the SDWA" because "EPA's own regulations and state laws demonstrate that it is "feasible" for water systems to conduct a full LSL inventory with one year of initial rule promulgation." The commenter claims that § 141.84(b)(1) of "[t]he current rule requires water systems with existing corrosion control treatment to identify the full number of lead service lines in their distribution systems within one year of an action level exceedance" and, as a practical matter, it requires systems "to complete a full lead service line inventory within a few months in order to meet the rule's requirement to replace seven percent of the "initial number" of lead service lines in the distribution within one year of exceeding the action level." Therefore, according to the commenter, the three-year timeframe in the LCRR "is insufficiently protective of public health" and "EPA must require water systems to complete lead service line inventories within one year of the final rule's publication, to ensure that the agency's final standards protect the public against "adverse health impacts . . . to the extent feasible" [42 U.S.C. § 300g-1(b)(7)(A).] This commenter also argued that EPA violates Section 706(2)(A)and (C) of the Administrative Procedure Act because EPA did not explain why the LCRR provides systems three years to complete an initial inventory given that "[a]ll systems are currently required, in certain circumstances, to count the full number of lead service lines in their distribution systems within a year under the Lead and Copper Rule and have done so in the past. [See 40 C.F.R. § 141.84(b)(1).] Several states require water systems to perform full lead service line inventories within one year or less."

One commenter suggested that the initial LSL inventory should be developed and submitted to the primacy agency in a staggered time frame from small, medium, to large water systems, recommending the following timeframes: small one year, medium two years, and large three years.

Other commenters claimed the three-year deadline is not feasible. A commenter suggested the initial inventory should be submitted five years after final rule publication, while other commenters suggested six, seven, and ten years. A commenter noted that its water system has been developing an accurate inventory for two years; however, the customer side is only 37 percent complete. A commenter noted that requiring an initial inventory within three years may force most systems with limited budgets and personnel to create inventory lists with large numbers of unknown lines and will most likely not be very accurate. Commenters noted the significant effort required to create an inventory and conduct a thorough records search where records may be missing or inaccessible, or in a paper format which makes information time-consuming to compile. Some commenters noted that small systems that often lack capacity and are financially constrained will have difficulty producing an inventory and replacement plan within the proposed three-year timeline, and that these systems should be granted additional time to comply with the inventory requirements. Another commenter said that large systems should be granted more time as they have more service connections and potentially more records to investigate. Another commenter suggested that all water systems should have the ability to receive an extension for initial inventory submission. Some commenters suggested requiring initial LSL inventory for the public side of the distribution system within three years, while allowing five years or more for the private side, depending on system size. Staggering the submittal timeframes for LSL inventories, another commenter noted, will stagger initial tap sampling, alleviating a capacity crisis at laboratories that could otherwise occur as a result of large numbers of samples being submitted for laboratory analysis all at once. Some commenters appeared to judge feasibility of creating an initial inventory as equal to completing an inventory with all service line materials verified, although the proposed rule did not require this.

One commenter stated that three years was sufficient time to create the initial inventory, however recommended that states should be allowed one year to review the inventories before water systems submit updated compliance sampling location plans based on these inventories. The commenter noted that early implementation of the inventory creates issues by preventing the “development of appropriate inventory guidance and the development of a functional data management system for inventories.” One commenter noted that water systems will be compiling inventories while states are operating under early implementation agreements or the rule will be directly implemented by EPA. To complicate matters further, the commenter said, EPA does not typically release implementation guidance until six months or even years after a rule is promulgated. If EPA guidance or state actions after promulgation revise expectations for how inventories will be prepared or presented, a commenter stated, then systems will be unable to meet the required deadline. One commenter suggested that EPA should develop and provide guidelines for systems concurrently with the posting of the new rule, most importantly, with stakeholder input. Another commenter noted that guidance should provide detailed information to assist water systems in addressing issues such as customer engagement and how the inventory is updated. Yet another commenter recommended EPA delay implementation of the mapping and inventory compliance obligations until primacy is attained to ensure consistent application of requirements in a unilateral direction for a given state. If EPA does not allow state-driven flexibility, the commenter said, then inventory compliance deadlines should be postponed until three years after the date of EPA guidance documents for this effort are finalized.

Some commenters suggested staggering the timeframes to submit the initial inventory to reduce state burden to review all initial inventories simultaneously. This burden could also stagger tap sampling for water systems, alleviating a purported "capacity crisis" at laboratories responding to a large number of samples. Commenters asked for the final rule to allow states to grant an extension to water systems that require additional time for inventory completion. Another commenter proposed that if a system can demonstrate a "B3" status[2] to the state prior to final promulgation of the LCRR, the system may be eligible for a state-approved extension to complete the materials inventory (e.g., longer than three years, but within six years).

Agency Response

While EPA acknowledges that a review of existing records specified in § 141.84(a)(3) may require significant effort for some water systems, the Agency disagrees that three years is not feasible. The previous rule requires a service line materials inventory, meaning water systems will have already begun to compile information to populate inventory contents, and all water systems who have exceeded the lead AL under the previous LCR would have collected service line material information within one year after exceeding the lead AL so it could remove at least 7 percent of the LSLs in its distribution system. As EPA noted in the preamble to the proposed rule (USEPA, 2019), several states have already required water systems, including small systems, to create LSL inventories. For example, Michigan required an initial inventory in one and a half years and Ohio required initial inventory completion in as little as six months. EPA also disagrees that water systems should be allowed to receive an extension to comply with the initial inventory requirements because it is feasible to conduct a review of records and make the results publicly accessible within three years. The records which need be searched are explicitly stated in the final rule. These records include information on lead and galvanized iron or steel that may have been identified to comply with the requirement under § 141.42(d), as well as construction and plumbing codes, permits and records that indicate service line materials, water system records (i.e., distribution system maps and drawings, historical records on each service connection, meter installation records, historical capital improvement or master plans, and standard operating procedures), inspections and records of the distribution system that indicate service line material composition, as well as any resource, information, or identification method as provided or required by the state to assess service line materials. Furthermore, stakeholder collaboratives have compiled resources and techniques for creating an inventory which may quicken inventory development. As noted above, many water systems have already created inventories, through proactive efforts or via the previous LCR or state laws.

Timely creation of the initial inventory is critical to other aspects of the final LCRR, providing the foundation for compliance with tap sampling, PE, LSLR, and other provisions. Therefore, EPA determined that initial inventory completion within three years is not only feasible but also critical to comply with the final LCR, regardless of a whether a system has very low lead 90^{th} percentile levels (i.e., is a B3 system). Thus, the Agency has retained this requirement from the proposed rule for the final rule.

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[2] A B3 system meets the requirements in § 141.81(b)(3) by demonstrating that its lead 90^{th} percentile tap water level is less than or equal to the lead practical quantitation level of 0.005 mg/L and does not exceed the copper action level for two consecutive 6-month tap sampling monitoring periods, and does not have optimal water quality parameters set by the primacy agency.

To support water systems' ability to achieve a three-year deadline to create the initial inventory, the rule provides flexibility in terms of the inventory format. Water systems can choose an inventory format, such as a simple list or table, that will minimize burden (for more information about inventory format, see EPA's response to comment Section 5.6) except that § 141.84(a)(8) provides that water systems serving over 50,000 people must make the inventory available online. While EPA recommends that inventories be user-friendly, water systems may continue to develop and enhance the inventory format over time after creating a simpler, compliant initial inventory within three years.

EPA noticed that some commenters incorrectly interpreted the proposed rule requirements, believing verification of all lead status unknown service lines was required within three years. Neither the proposed nor final rules require any deadline to verify all unknowns. Systems conducting LSLR will have an incentive to verify the material of all unknown lines because they will be treated as LSLs in calculating the number of lines that must be replaced, but the rule will not require that verification by a set date.

EPA disagrees with commenters who suggested that the final rule require submission of the initial or a complete inventory in less than three years after publication of the final rule. First, EPA notes that the existing LCR remains applicable in the 3-year period between this final rule's publication date and the requirement to comply with the new inventory requirements in the LCRR. This means that the requirements in § 141.84(b)(1) and § 141.90(e)(1) will apply during that interim period and therefore, systems triggered into LSLR after an action level exceedance will need to identify the initial number of LSLs in their distribution system at the time the system exceeds the lead action level. Second, the new inventory requirements are different than the existing inventory requirements: they apply to all systems, not just those that are conducting LSLR in response to an action level exceedance and they call for an inventory that is different and broader than the inventory needed to implement the LSLR program in the previous rule. EPA expects that many systems will need more than one year to compile an inventory that meets the requirements of the final rule and to prepare the inventory to be made available to the public. Further, water systems will need to inventory full service lines – the portion owned by the system and the portion owned by the customer, not just the system-owned portion of the line. In addition, the final rule's initial inventory requires "galvanized requiring replacement" service lines to be classified as such if they are or ever were downstream of an LSL, which is different from the previous rule. The final rule's inventory requirements may be more complicated than it would have been when the LCR was first promulgated in 1991 (USEPA, 1991) now that many systems have conducted partial LSLRs. (If a service line has been partially replaced, the inventory under the LCRR will need to cover two parts of the service line for that address.) EPA further notes that the relevant records may be difficult for some water systems to obtain as these records may not be centrally maintained and may require further investigation to assure their accuracy. Finally, prior to the initial inventory deadline, systems will be engaged in both maintaining compliance with the previous LCR and working towards compliance with several deadlines in the revisions to the rule.

EPA also disagrees with the commenter's suggestion that EPA has changed its determination regarding the feasibility of the inventory requirement without providing a rationale. Section 1412(b)(10) of the SDWA provides that a National Primary Drinking Water Regulation (NPDWR) – and any amendment of an NPDWR – "shall take effect on the date that is three years after the date on which the regulation is promulgated unless the Administrator determines that an earlier date is practicable." This three-year time frame provides states with time needed to update their regulations and submit primacy revisions to EPA. Consistent with that provision of SDWA, EPA's proposed rule included a compliance deadline that is three years after promulgation of the regulation, which is the date of publication. EPA has considered the comments advocating an earlier compliance deadline for the inventory, but for the reasons described above, EPA finds that it would not be practicable for systems to comply with the amended inventory requirements earlier than the standard three-year time frame provided in Section 1412(b)(10) of the SDWA.

EPA disagrees that states should have one year to review the initial inventories. An added year for inventory review would create significant delays in final rule implementation.

One commenter suggested that rather than submitting the entire LSL inventory to the state, a state may request water systems provide an indication where changes have occurred from the previous inventory submitted, as this may ease their review, for example when few changes have occurred at a system with a large number of service lines. EPA agrees this would be acceptable in the regulatory text of the final rule. For EPA's response to comments about data management systems, please see response to comment Section 15.

Inventory Update Frequency

Summary of Comments

Commenters noted that because knowledge about LSL locations evolves over time, inventories must be regularly updated to reflect any changes. One commenter viewed annual inventory updates as essential. One commenter advocated for the mandatory update of the LSL inventory every five years if systems have LSLs and that more frequent updates should be voluntary. Another commenter believed that the inventory updates should be submitted to the primacy agency every three years and more frequently than annually on the water systems website. Yet another commenter suggested that the inventory should be updated every three years with the sanitary survey. One commenter suggested that the LSL inventory should be updated as replacements occur.

Some commenters suggested that the final rule align state inventory update submissions with the water system's tap sampling monitoring period, but not more frequently than annually. This submission schedule would be more efficient, commenters argued, because water systems would not be required to provide an update when there haven't been a significant number of LSLRs, such as when the system is on reduced monitoring not conducting an LSLR program.

Commenters also suggested clarification of the inventory update requirements for water systems that do not have LSLs. One commenter noted that many NTNCWSs are buildings with internal plumbing only. Some commenters suggested waiving LSL inventory updates when the inventory shows no remaining LSLs or lead status unknown service lines, and to update the inventory only if a service line originally thought to be non-lead is discovered to be an LSL, and is not subsequently replaced. According to these commenters, this type of update requirement could prevent unnecessary burden for the water system to submit and the state to review an inventory which has not changed due to complete LSLR.

Some commenters also requested that states have the flexibility to require submission of a complete inventory that includes updates or just a submission identifying revisions to the initial inventory. This would reduce the burden for the state reviewing the inventory to target their review solely on the aspects of the inventory that have changed since the previous review.

A commenter noted that enforcement workload could increase with frequent inventory update requirements due to water systems failing to submit their inventory updates.

Agency Response

EPA agrees with commenters' suggestions to align inventory update submission frequency with the tap sampling monitoring period and revised the regulatory text accordingly in the final rule. EPA agrees with this approach as it will reduce burden yet at the same time ensure that the inventory is updated more frequently in cases where there are likely to be more revisions, such as when a system is conducting LSLR and therefore monitoring more frequently. Inventories will likely undergo more change as a result of LSLR requirements that water systems are subject to after exceeding the lead trigger level (TL) and AL. This approach is efficient and reduces burden to both the water system submitting the inventory and to the state reviewing it. Water systems on 6-month monitoring are only required to submit an update annually, given that LSLR rates apply based upon a 2 year rolling average. Water systems on triennial tap sampling monitoring periods would submit inventory updates every three years.

In addition to the updates to the state, water systems must also update the public-facing LSL inventory in the final rule no less frequently than when required to be submitted to the state. This change from the proposed rule ensures that the public also has access to the most up-to-date version of the inventory. The update schedule for the publicly available inventory is identical to the system's monitoring period for the same reasons as described in the paragraph above for the updated schedule for reporting to the state. In addition, it would be unnecessarily complicated and confusing for a system to update the inventory provided to the state and the inventory provided to the public on two different schedules. EPA encourages but does not require the public-facing inventories to be updated more frequently than required in the rule so the public is kept up-to-date about the water system's progress to identify and replace LSLs.

For the final rule, EPA incorporated commenter suggestions to allow water systems to cease providing inventory updates to the state and public should the inventory show only non-LSLs. This change will eliminate unnecessary burden for the water system to submit and the state to review inventory updates for a distribution system which has been confirmed to contain no LSLs. Should an LSL be discovered in the future, the water system is required to notify the state of the discovery.

Deadline to Verify All Lead Status Unknown Service Lines

Summary of Comments

Some commenters stated that the final rule should include a deadline for the water system to achieve 100 percent verification of all service line materials. Such a deadline, commenters argued, would ensure that lead status unknown service lines would undergo materials composition verification in a timely manner, providing verification results to consumers potentially served by an LSL. Commenters noted that other states require a verification deadline, such as Michigan water systems by 2025.

A commenter suggested the final inventory identifying all unknown service lines should be required to be completed two years after the initial inventory submission. Another commenter suggested a deadline of five years after the initial inventory submission. Another commenter wrote that primacy agencies should be given the ability to impose deadlines for water systems to verify service line materials based on system-specific situations and system capacity. One commenter indicated that the rule should include a provision that states may require a verification deadline within the rule.

Agency Response

The final rule acknowledges that the inventory is an ongoing effort and does not set an affirmative deadline for complete verification of service line material composition for all service lines. Due to the widely different circumstances facing water systems, EPA is unable to set an inventory development deadline in the final rule. For systems with limited records, individual service lines may rely on more burdensome visual investigation techniques, such as hydrovacing or viewing the service line in the meter pit. For these systems, a deadline set at the federal level would likely be infeasible. For other systems with very few lead status unknown service lines, a federal deadline would likely not reflect the ability of the water system to identify its remaining unknowns in a much shorter timeframe, which may discourage or unnecessarily prolong the water system's inventorying efforts. EPA determined that a more appropriate approach to ensuring continued inventory development progress is to provide incentives in the final rule for verifying unknowns as well as by requiring that service line materials be tracked in the inventory when the water system encounters service lines, such as during existing water system activities. The rule incentives allow water systems to cease sending PE to consumers whose lead status unknown service lines are non-lead pursuant to § 141.85(e), to stop issuing risk mitigation notification to unknowns that are non-lead pursuant to § 141.85(f), and to subtract unknowns that are non-lead from the calculation of annual goal or mandatory LSLR rate pursuant to § 141.84(a)(7). This approach has the benefit of incentivizing consistent inventory development progress while accounting for the different circumstances that water systems face.

Inventories will be continually updated over time because the final rule requires that systems identify and track service line materials as they are encountered. In addition, the final rule includes a new requirement in the LSLR plan that mandates that water systems outline their strategy for determining the material composition of lead status unknown service lines. For more explanation about the LSLR plan requirements in the final rule, please see response to comment Section 6.

EPA notes that individual states may establish verification deadlines in their own LCR, such as the State of Michigan. Also, states may establish LCRR requirements that are more stringent than the NPDWR.

5.3 Inventory Scope

Summary of Comments

Commenters had many perspectives regarding which types of service lines and other lead sources should be included in the inventory. Some commenters suggested that the final rule's inventory include only service lines used for potable purposes. Commenters noted that an LSL used for non-potable purposes poses no exposure risk to humans. Commenters highlighted service lines intended for fire suppression or agricultural uses as examples of service lines that should not be included in the inventory.

Some commenters believed that focus on any service lines that are not known LSLs, such as unknowns and galvanized service lines, could detract from efforts to inventory and replace known LSLs.

Many commenters supported the inclusion of customer-owned service lines in the inventory. One commenter requested that EPA provide guidance related to inventorying customer-owned service lines.

Some commenters agreed that the water system should prepare an inventory but thought the water system should not be required to investigate or inventory the customer-owned portion of the service line, noting they are often not under the system's control. One commenter said that their water system lacks records for the customer-side and that building permit issuing agencies are more likely to have the pipe material information on the customer side and are in a better position to identify the material on that portion of the service line. Commenters noted that classification of the customer-owned service line may require customer cooperation or engagement, which could prevent the water system from learning its material if, for example, the customer is non-responsive, refuses to allow the system access to private property, or does not alert the system if they replace their portion. A commenter said that water systems should be able to document refusals or non-responses by customers to investigate the customer-owned portion. One commenter stated that their water system lacks the authority to enter customer property other than to check the meter. One commenter said that inventorying customer-owned LSLs would be a multi-year effort with no public health benefit. Another customer suggested EPA conduct a cost-benefit analysis of including the customer-owned service lines versus excluding them from the inventory. Another commenter said including customer-owned service lines in the inventory is not an appropriate use of rate payers' money because it benefits an individual and not the system. Many commenters believed that identifying and disclosing lead plumbing inside or serving a home should be left to real estate agencies, and home buyers and sellers. One commenter suggested a waiver option for agencies without lead or unknown service lines to complete inventory of private customer service lateral material of construction. The commenter went on to say at a maximum, the requirement should allow customer self-reporting as compliance with inventory development when the agency's inventory does not contain LSLs. One commenter said that the state should create a customer self-reporting or self-monitoring system for customer-owned service lines.

Many commenters generally supported EPA's decision to include lead status unknown service lines in the inventory until determined to be otherwise so that a water system may have a "complete" initial inventory, even if it lacks material composition records for every service line in its distribution system. One commenter expressed concern that allowing "unknowns" in the inventory would disincentivize water systems from completing the inventory.

Some commenters said that lead status unknown service lines should not be included in the inventory. They claimed that a high number of lead status unknown service lines, especially on the customer side, could raise alarm among members of the public. Commenters also mentioned that water systems often lack authority to enter private property, which could make service line material investigations more challenging to conduct. A commenter suggested that unknowns be excluded from the inventory because it may not be possible to investigate their material where a customer is unwilling. One commenter said that investigation of the customer-side could expose a system to customer claims and litigation over alleged liability and property damage. A commenter stated that if the customer refuses to allow the water system to investigate a customer service line whose material is unknown, the line should not be used to calculate LSLR rates, as other unknowns are.

Some commenters noted that although they have large numbers of unknowns in their distribution system, they know that LSLs are not widespread. One commenter asked for tiered inventory criteria, with less stringent requirements for systems that are unlikely to have LSLs. Commenters recommended that additional classifications for unknowns be introduced, such as "unknown—not lead," disagreeing that because a service line material is "unknown" it should automatically be presumed to be a potential

LSL. Some commenters suggested that unknowns should not be labeled as a “lead service line” in the inventory as it could cause confusion. Some commenters expressed support for statistical models that have been used by some water systems to determine the probability that an unknown is actually an LSL. One commenter suggested that unknowns be included on a case-by-case basis dependent on the water system’s history. A commenter recommended that unknowns that consistently test low for lead levels should not be considered LSLs. One commenter suggested that unknowns be tracked separately with a goal rate that unknowns are investigated. Another commenter suggested a cutoff to the number of unknowns that are considered LSLs.

Although not included in the proposal, some commenters stated they did not see the need to identify the specific material of the service line if it could be proven to be non-lead (e.g., copper or plastic pipe). Another commenter said that the final rule and subsequent guidance should encourage water systems to work to identify the material of all service lines on both the public and private sides, even if it is not an LSL.

Some commenters requested that lead goosenecks, pigtails, and connectors (connectors) should be considered as LSLs in the inventory because they are a source of lead in drinking water infrastructure. Some commenters supported their inclusion but called for them to be included separately from LSLs. Others thought that these connectors should not be included in the inventory given the burden to identify their material composition and that the inventory should focus on LSLs.

Some commenters thought that galvanized service lines should not be included in the inventory, even if they are or were downstream of an LSL, saying the requirement is unnecessary and burdensome. This requirement, a commenter said, would force water systems to start over on their inventory development and require an additional customer contact and potential customer confusion. One commenter noted that their water system lacks the records of galvanized service lines on the customer side. A few commenters questioned the science of lead adsorption on downstream galvanized service lines. One commenter suggested that due to the challenge of demonstrating a galvanized line “never was” downstream of an LSL, the replacement requirements for galvanized lines be limited to those which are currently downstream of an LSL. The commenter went on to say these lines should be subject to inventory requirements but not called “LSLs” in the inventory. One commenter said that separating the definition of galvanized from LSLs could allow water systems to prioritize LSLR over replacement of galvanized lines. One commenter suggested EPA allow the water system to come to a reasonable conclusion about the history of a given service line upstream of a galvanized line, determining if it was an LSL or not without requiring the installation record of the original service line. Another commenter suggested that systems with well-run optimal corrosion control treatment (OCCT) and low historical lead levels should not have to inventory galvanized lines. One commenter requested that all galvanized service lines should be considered LSLs, not just those that are or were downstream of lead, because a galvanized zinc coating can contain lead. Another commenter suggested all galvanized should be identified as requiring replacement to avoid the burden of determining whether or not there is or was an LSL upstream. One commenter sought clarification if galvanized downstream of a lead connector would be considered “galvanized requiring replacement,” while another commenter believed that these lines should not require replacement.

Some commenters requested that water systems include additional information in the inventory, such as installation date, pipe diameter, premise plumbing materials, populations served (i.e., schools, daycares) to assist with replacement prioritization, health risks of LSLs, and the precise methods used to determine each service line's material. One commenter requested guidance about how to inventory service lines that serve multi-family homes.

A commenter suggested the inventory include the type of population served at each service line. One commenter suggested that the inventory scope be expanded to include all materials used to construct the distribution system, including piping, solder, caulking, interior lining of the distribution system mains, interior plumbing, and service lines. A commenter requested that EPA consider including only service lines of unknown lead content, rather than unknown material in the LSL inventory. Another commenter said that it would be a missed opportunity not to identify all service line materials during inventory development.

Agency Response

EPA agrees that LSLs that are never used for human consumption do not present a risk for human exposure to lead in drinking water, but disagrees that the inventory requirement in the final rule should be limited to only those service lines used for human consumption (to the extent that a system has any such service lines). Water systems do not have adequate knowledge to determine that an individual LSL will never be used for potable purposes, given that uses could change from non-potable to potable uses, making such a limitation on the inventory impractical to implement. Therefore, the final rule does not limit the scope of the inventory to only service lines for potable use. EPA also notes that the definition of "public water system" in Section 1401 of the SDWA is "a system for provision of water for human consumption . …" In "Definition of a Public Water System in SDWA Section 1401(4) as Amended by the 1996 SDWA Amendments" (63 FR 41940, Aug. 5, 1998), EPA explained that "human consumption" as that term is used the definition of PWS means drinking, bathing, showering, cooking, dishwashing, or maintaining oral hygiene besides drinking. That document also provides guidance on the definition of PWSs and exclusions from the definition that may be useful. See also EPA's the definition of "service connection" as that term is used in "public water system" at 40 CFR 141.2.

EPA disagrees with comments suggesting that customer-owned LSLs should be excluded from the inventory. The existing rule has required an accounting of LSLs regardless of ownership status. See §§ 141.84(b)(1) and 141.90(e)(1). The customer-owned service line is connected to some system-owned components of the water system, and therefore, the water system has access to that connection point to determine the material of a customer-owned portion of the service line. System actions can impact lead release from customer-owned service lines. For example, partial LSLR of the system-owned portion can result in a lead spike on the customer-owned portion from physical disturbance and galvanic corrosion. Accounting for locations of customer-owned LSLs increases public health protection and is critical to several components of the rule such as sampling, LSLR, and execution of customer risk mitigation post-disturbance. Furthermore, customers are unlikely to possess records of service line materials if the water system originally installed the service line and maintains the original installation record. For these reasons, EPA disagrees a cost-benefit analysis of including the customer-owned service lines versus excluding them from the inventory is necessary. EPA also disagrees that including customer-owned service lines in the inventory is not an appropriate use of rate payers' money because as some commenters claimed it benefits an individual and not the system. EPA again highlights the direct effect system actions can have on individual service lines, regardless of ownership. EPA notes that the water system is not required to bear the cost of replacement of any customer-owned service line. EPA also disagrees that systems should have requirements to inventory customer-owned LSLs if they have no LSLs or unknowns on the system side. Water systems must still comply with other rule requirements, such as PE, risk mitigation, and tap sampling, regardless of LSL ownership. EPA agrees with the commenter that customer self-reporting or self-monitoring could be used for customer-owned service lines, however, disagrees that the state should require this given that many water systems may not need to rely on customer participation (i.e., the entire service line is system-owned, or customer cooperation is not needed to determine service line material).

EPA agrees that customer cooperation may be helpful in some circumstances, but it is not expected to be needed to identify the material of the customer-owned portion in most cases. As discussed above, the non-system-owned service line is connected to a system-owned component such that a water system should be able to visually inspect the material of the customer-owned portion without accessing customer property, for example when viewing or replacing the water meter. Additionally, as there is no deadline to verify all service line materials, the water system can remain in compliance despite potential customer noncooperation or nonresponse, where such cooperation is needed. In response to the customer who suggested that water systems be able to document where a customer refusal or non-response to investigate a service line material, EPA agrees that a system may document this in the inventory as an additional field; however, this would not change the service line material classification from lead status unknown.

EPA encourages but does not require water systems to partner with customers, local home inspectors, local building permitting agencies, real estate agencies, and other relevant parties to contribute to the verification of service lines on the customer-side. NPDWRs are applicable to water systems, they do not extend to those parties; therefore, it would not be appropriate for EPA to require water systems to partner with other entities. Moreover, a requirement for water systems to partner with other entities is not necessary for systems that want to do so. For information about disclosing customer-owned service line materials, including on sale or transfer of property, please see response to comment Section 5.4.

EPA received a request for guidance for inventorying service lines on private property. EPA understands guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

The proposed rule required water systems to identify LSLs, service lines of unknown material, and non-LSLs in the inventory. For the final rule, EPA adjusted the terminology based on a commenter's suggestion. Service lines of unknown materials, as referred in the proposed rule, are now identified as "Lead Status Unknown." This change is intended to reflect scenarios where the exact service line material might be unknown, but the water system can demonstrate it is not an LSL. For example, the water system may have records showing the service line was installed after a federal or state lead ban but does not know if the material is copper or plastic. In this case, the water system may categorize the service line as a non-LSL even though the actual material is "unknown." The final rule's inclusion of the term "lead status unknown" will add clarity and prevent duplication of effort for water systems that have already started inventory efforts without tracking the actual material of non-lead lines. Additionally, the final rule provides flexibility for "Non-lead" service lines to alternatively be classified in the inventory by their specific material, for example plastic or copper, if the water system chooses. EPA recommends that water systems do track service line materials for asset management purposes.

EPA disagrees that lead status unknown service lines should be excluded from the inventory or that EPA should require the inclusion of unknown service lines in certain circumstances (e.g., using tiered criteria, or on a case-by-case basis). It is necessary to inventory unknowns to comply with the PE requirement to inform customers who are served by an unknown that their service line may be an LSL. Additionally, the LSLR rate includes unknowns. Finally, including unknowns in the inventory allows the public to view the progress of LSLR as well as inventory development progress. Listing unknowns in the inventory also presents an opportunity for customer engagement and the identification of unknown materials. Rather than customer concern and distrust resulting from their inclusion, as some commenters claimed, EPA finds that exclusion of large swaths of homes with lead status unknown service lines from the inventory would likely cause significantly more confusion and alarm among the general public. While some commenters asked that multiple classifications be introduced for unknowns, for example "unknown but likely non-lead," "suspected lead," or "unknown—not lead," or that EPA require the inclusion of unknown lines only in certain circumstances, EPA finds that this would be too complicated to regulate in this way, be more burdensome for water systems, and cause more confusion to customers who may not understand how the water system distinguishes among multiple unknown classifications. EPA is requiring just one classification for unknowns, "lead status unknown" or alternatively just "unknown." While a water system may not classify a lead status unknown service line under a different label, it may include additional information associated with each service line to convey, for example, the basis for the classification or, if the water system is using a statistical approach to populate its inventory, the likelihood that the service line is an LSL. EPA disagrees that unknowns should be tracked separately with a goal rate of unknown investigation. Systems outline a strategy for identifying unknowns in their LSLR plan. Water systems have the flexibility to actively identify service line materials, or to perform them in tandem with other water system activities. Given the variability of water system work that occurs each year (for example, main replacement), as well as the possibility that in a given year infrastructure work may not occur in areas with a high number of unknowns, EPA does not find it appropriate to prescribe that a numerical goal investigation rate be assigned to systems. EPA also disagrees there should be a cutoff to the number of unknowns that are considered LSLs. EPA clarified in the final rule the that unknowns are not considered LSLs for the purposes of tap sample tiering, inventory or PE, but they must be considered LSLs for determining the LSLR rate. For more information about the LSLR rate, please see response to comment Section 6.

Please see response to comment Section 6 regarding how unknowns apply towards the LSLR rate. For information about verifying unknowns over time, please see response to comment Section 5. For information about the strategy to verify unknowns within the LSLR plan, please see response to comment Section 6. For information about incentives to verify unknowns, please see response to comment Section 6.

EPA agrees that lead connectors can contribute lead to drinking water but does not agree they should be included in the LSL inventory. There is significant burden associated with the investigation of a connector's material, given they are primarily located beneath the street. Since records on connector material are often extremely limited, investigation of connector material composition would likely require partial road demolition and subsequent repair upon completion of the investigation. While EPA agrees that it is beneficial to know the location of all lead sources in the drinking water infrastructure, it would be overly burdensome for a water system to be required to inventory connector materials given the great difficulty accessing them. In addition, the final rule retains the proposed requirement to remove connectors owned by the water system as they are encountered during any water system activity. These activities could include, but are not limited to, main replacement and emergency repairs, as well as LSLR.

For more information about lead connectors in the final rule, please review response to comment Section 6.

EPA disagrees that inventorying galvanized service lines that are or were downstream of an LSL is unnecessary. Galvanized service lines that are or were downstream of an LSL can contribute to lead in drinking water and resulting lead exposure, and therefore must be identified in the inventory and replaced in LSLR programs in the final rule. EPA agrees that the proposed requirement to list galvanized lines as "LSLs" may introduce confusion, therefore the final rule requires they be labeled "galvanized requiring replacement" if they are or ever were downstream of an LSL and "non-LSL" if they aren't or never were downstream of an LSL. Where records don't exist to prove that a galvanized service line never was downstream of an LSL, the water system must presume it was downstream of an LSL and label it "galvanized requiring replacement." This approach ensures that all galvanized service lines that may have been downstream of an LSL will be treated as an LSL and counted towards replacement under LSLR programs, ridding this source of lead from distribution systems. EPA does not agree that the burden for water systems to demonstrate the galvanized line was never downstream of a lead line is excessive or unnecessary. Water systems are not required to conduct investigations beyond checking their records to determine if an LSL may have been upstream. If historical records do not exist, water systems would simply classify the lines as galvanized requiring replacement. This approach minimizes the burden to classify these lines while allowing water system with records demonstrating these lines are truly "non-lead" to avoid the burden of replacing them. EPA disagrees with the commenter who stated this requirement would force systems to "start over" if they have already created an inventory, noting that while some additional work might be required, this burden is necessary to identify these galvanized lines in the inventory because they can be a significant source of lead in drinking water if they were ever downstream from an LSL (HDR, 2009). EPA disagrees that in the absence of records water systems should be allowed to come to a conclusion whether the galvanized line had an upstream LSL, as without evidence this judgement would be subjective and potentially leave in place a high number of galvanized lines that were downstream of an LSL. EPA also disagrees that galvanized lines should be excluded from systems with historically low lead levels and well-run OCCT, as these lines may still episodically contribute particulate lead release. EPA agrees that some galvanized lines may have a zinc coating that contains trace amounts of lead. EPA disagrees that this fact makes it appropriate for the final rule to consider all galvanized lines eligible for replacement. The lead contribution from the zinc coating is expected to be lower compared to LSLs or galvanized lines that are or were downstream of an LSL that have adsorbed particulate lead. Including these lines as eligible for replacement would dilute a water system's progress to replace the highest risk service lines, which could result in LSLs remaining in service for a much longer period of time. For more detail, please see response to comment Section 5.

EPA agrees that galvanized service lines downstream of a lead connector may contribute lead into drinking water but does not believe it is appropriate to classify these galvanized lines as "galvanized requiring replacement" if there is not or never was an upstream LSL. As mentioned above, it is not feasible to include a requirement for all systems to inventory lead connectors; therefore, they cannot be used to classify a galvanized line as needing to be replaced under the final LCRR. In addition, replacement of LSLs and galvanized service lines downstream of an LSL are expected to contribute more lead into drinking water than galvanized service lines downstream of a lead connector, so requiring these galvanized lines to be replaced as part of the LSLR program could slow the replacement progress of these potentially higher-risk service lines. EPA encourages but does not require water systems that do have lead connector records to replace downstream galvanized service lines where feasible.

EPA disagrees with commenters who do not believe the scientific evidence is strong enough to show that upstream lead can adsorb on downstream galvanized service lines. There is ample and well-documented evidence that lead risk is frequently magnified or made more permanent by the accumulation of lead in the iron oxyhydroxide corrosion byproduct deposits in old corroded galvanized steel pipes. The citations by the commenters represents only a very small fraction of the body of evidence upon which EPA basis its recommendation. The amount of lead accumulated in galvanized pipe scales is highly variable. The variability results from a variety of factors, such as the background water chemistry, the lengths and types of the upstream lead sources, the exact nature of the corrosion scale on the galvanized pipe, and the water usage, as well as others. However, the chemistry principles of the phenomenon have been well-established for decades. Galvanized coatings on steel pipes, sometimes containing small percentages of lead, corrode non-uniformly into mixtures of ferrous and ferric iron rusts (Trussell et al., 1996). Listed below is a small subset of the numerous articles EPA has evaluated, documenting sorption and accumulation of divalent lead and other heavy and trace metals on iron oxyhydroxides in soils, the geosciences, and natural water systems. Pipe scale analyses done by EPA and others have shown that these hydrous ferric oxyhydroxides are accurate analogies for the corrosion byproduct rusts that form on steel and galvanized steel water pipes. The generalized phenomenon of lead and other trace contaminant was reviewed by Schock (2005), also pointing to natural water system analogues and principles described in aquatic chemistry texts such as Dzombak and Morel (1990) and Stumm and Morgan (1996), as well as referencing a history of drinking water studies of contaminant accumulation. In addition to the McFadden et al. (2011) and HDR (2009) studies cited by the commenters, there are other studies that have directly and indirectly observed the lead accumulation in iron/steel rust scales phenomenon in drinking water systems. For example, Del Toral et al. (2013) and Batterman et al. (2019) noted the evidence of lead accumulation from service lines in premise plumbing, associated with interior galvanized pipes in the Chicago system. Deshommes et al. (2010) and Camara et al. (2013) have observed lead accumulation in downstream galvanized pipes in Canadian water systems. Dolan (2016), Goovaerts (2017), and Lytle et al. (2019) have reported observing it in Flint, Michigan. Maynard and Wasserstrom (2017) directly observed it in galvanized pipes from three cities. Therefore, EPA believes the concern with lead accumulation within downstream service line or interior premise plumbing being a potentially important source of waterborne lead exposure is soundly based on a broad and extensive body of water chemistry research. For more information, see Coughlin and Stone, 1995; Dyer et. al., 2003a; Dyer et. al., 2003b; Gunneriusson et. al., 1994; Hua et. al., 2012; Komárek et. al., 2018; Peng et. al., 2013; Potter and Young, 1999; Rahimi et. al., 2015; Tiberg et. al., 2013; Trivedi et. al., 2003; Xu et. al., 2006a; Xu et. al., 2006b.

EPA does not agree that additional distribution system details, such as installation date, pipe diameter, premise plumbing materials, must be required in the inventory. Although EPA encourages water system efforts to include more detailed information in the inventory, the main purposes of the LSL inventory are to provide the water system with a record of their service line materials to guide rule requirements such as tap sampling, PE, and LSLR, as well as to help inform the public at large about the presence of LSLs in the distribution system. Depending on the situation, too much additional information could confuse the public by diluting the key information with less relevant details. EPA recommends tracking distribution system details for asset management purposes, even if a water system does not include this additional information in the publicly accessible inventory. EPA does not agree that premise plumbing, such as fixtures, should be tracked by the water system as a final rule requirement, as there may be several fixtures associated with each service line, customers may lack the original product documentation for the fixtures, and most customers would likely replace the fixtures without informing the water system.

EPA does not agree that water systems should be required to include the precise methods used to determine each service line's materials in the inventory. For more information, see response to comment Section 5.

EPA does not believe it is appropriate to include health information in the publicly available inventory, as this information is already provided in PE materials, the Consumer Confidence Report (CCR), and Public Notification requirements of the final rule.

EPA determined it is not appropriate to require water systems to include information on the type of population served at each service line in the inventory. The population served at each service line is highly likely to change over time (i.e., new occupancy, births, deaths) and systems would need to regularly contact the occupants of each service connection to determine the composition of the population at that site. This may be viewed as invasive and intrusive by consumers and adds significant burden for water systems. Although EPA recommends water systems use this type of information for its LSLR prioritization strategy, EPA is not requiring water systems to collect additional data in the service line inventory for that purpose. The water system may also choose include this information in the LSLR plan. For more information, please see response to comment Section 6.

It is not feasible for water systems to inventory the materials of all components of the distribution system, as one commenter suggested "piping, solder, caulking, interior lining of the distribution system mains, alloys, interior plumbing, and service lines." The investigation of these other possible lead sources would require enormous disruption, customer cooperation, represents a significant burden for water systems and states, and would likely disturb lead plumbing and cause lead spikes in drinking water.

In response to EPA's request for guidance about inventory scope or contents, a commenter requested clarification for how to inventory service lines that serve multifamily homes, such as high-rise buildings. EPA understands guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. EPA also notes that due to the typical diameter of LSLs, which generally do not exceed two inches, it is unlikely that LSLs will serve high rise buildings.

5.4 Inventory Information Sources

Burden Associated with Certain Methods

Summary of Comments

Many commenters believed EPA identified appropriate records that must be used for the creation of the initial inventory. Some commenters noted that they do not have records, e.g., where the system is made of several systems that consolidated. Some commenters noted that even where historical records do exist, they can be outdated or unreliable. Including unreliable data in the inventory, those commenters said, could cause the public to regard the data with higher confidence than warranted, leading to customer disputes or liability where the initial material designation turns out to be incorrect. Commenters noted that records of customer-owned service connections are notoriously incomplete or missing.

Some commenters noted the significant burden associated with investigating service line material compositions, especially regarding methods such as potholing and trenching which require exposing and visually inspecting the underground service line. Older water systems often lack robust records and will rely more on these more burdensome techniques, commenters noted, and face a daunting challenge to achieve complete material composition identification of all service lines. One commenter stated that certain inventory techniques may disrupt an LSL and cause lead release into drinking water. A commenter requested that EPA identify funding sources for inventory development. Some commenters requested that water systems be allowed to self-certify that the distribution system has no LSLs, based on previous experience and general familiarity with the distribution system.

One commenter analyzed the burden to inventory its distribution system. The commenter stated that based on the 2,032 inlet service lines researched, an estimate of 7 minutes of labor per service line was expended and 25 percent of the accounts did not even have paper records to review (thus, the identity of the inlet services remained unknown). To research all 170,000+ accounts would occupy a full time staff member over 2 years, with the likelihood that over 42,000 accounts will remain undetermined in service line material identification due to a lack of records.

Agency Response

EPA agrees that identifying service line martials can be burden-intensive, especially where records do not exist or are unreliable, and visual inspection techniques, such as potholing, are used. Nevertheless, for reasons discussed here and elsewhere, the final rule requires an inventory regardless of these challenges. Like the proposal, the final rule does not include a deadline to identify all service line materials, allowing the burden of certain service line identification methods techniques to be eased by investigating service line materials over time and by coupling inventory development with existing water system activities. For example, if water system personnel are deployed on a street for other infrastructure work, they may use that opportunity to visually inspect service lines and engage with the customer to determine the customer-owned service line material if needed.

While EPA agrees with commenters who said that identification of customer-owned LSLs could potentially shift focus, funding and staff from LSLR, EPA highlights the importance of having an inventory that includes both portions of the service line, noting that knowledge of LSL locations is necessary to ensure sampling locations are tiered correctly, to conduct risk mitigation after a partial LSLR or LSL disturbance, as well as to ensure that goal and mandatory LSLR rates are calculated pursuant § 141.84(a)(7). The LSLR plan in the final rule adds a requirement for water systems to develop a strategy for verifying the materials of lead status unknown service lines over time, which could include how to fund the effort. EPA also notes that many funding sources exist for LSLR and related activities, such as inventorying LSLs. For more information, please see response to comment Section 6.

Which Service Line Material Investigation Methods and Techniques are Acceptable

Summary of Comments

Some commenters appreciated the rule's flexibility to allow water systems and states to determine acceptable service line verification methods. Other commenters requested EPA be more prescriptive and identify what constitutes acceptable evidence for service line materials verification. Some commenters requested EPA specifically approve the use of certain inventorying methods, such as tap sampling. Another commenter noted that when corrosion control treatment performs well, tap sampling can produce false negative results when used for determining service line composition. One commenter found that scratch tests did not provide accurate results. A commenter noted that customer self-reporting can be unreliable; however, accuracy can be improved when customers submit a photo with their self-identification for water system personnel to double check. The commenter noted that potholing is the only way to access lines which may not enter the home or the meter pit. Some commenters note that potholing can cause LSL disturbance and result in lead release into drinking water. Many commenters requested that water systems be able to presume service lines are lead-free after a certain year of installation. Many commenters suggested EPA approve use of a statistical method to verify service lines, with some commenters suggesting a confidence level of 90 percent or 95 percent is appropriate for classifying service line materials. Commenters noted that EPA has more technical expertise and would be better suited to prescribe acceptable and unacceptable methods than states. Some commenters requested EPA provide guidance regarding LSL verification methods.

Commenters were especially interested in how water systems could prove a galvanized service line "never was" downstream of an LSL, which must be replaced under the goal and mandatory LSLR programs. Many commenters wanted clarification regarding the burden of proof required to prove that there never was an LSL upstream of a galvanized line when one is not currently there.

Commenters sought clarification about proposed regulatory text that states may require water systems to use certain inventorying techniques for the development of the initial inventory. States would not, commenters noted, have primacy before the rule compliance date of three years after rule publication. Commenters also noted that effort could potentially be duplicated if the water system created the initial inventory and had to revisit the inventory after the rule compliance date to exclude certain inventory identification methods prohibited by the state, or add new ones using new methods determined by the state. One commenter believed that the regulatory text should require water systems to investigate resources "as required or provided" by the state.

Some commenters thought that the rule should require the inventory to include information to note the method used to identify the material composition of each service line (i.e., records search, potholing, inspection of the service line entering the home). Commenters believed that this would provide transparency surrounding the basis of the inventory to the public and primacy agency, increasing the confidence in the inventory contents.

A commenter suggested that the LSLR plan include a description of resources and methods used to designate service lines as lead or non-lead.

A commenter noted that § 141.84(a)(2) of the proposed rule (corresponds to § 141.84(a)(3) of the final LCRR) requires water systems to use the information collected in accordance with § 141.42(d) (of the previous rule) when conducting the new inventory data, but those requirements are vague and not quantitative. The commenter asked EPA to specify how EPA anticipates water providers will use the previously collected information in the new inventory data collection effort.

Agency Response

EPA recognizes that some water systems have very robust records; whereas, other water systems' records may be outdated, incomplete, conflicting, or inaccurate due to poor recordkeeping or other circumstances. While the final rule requires water systems to review the records listed in § 141.84(a)(3), if they exist, the system can decide not to use those records to populate the inventory if it finds the records are unreliable or are not the best data source available. Note that the final rule requires service line materials to be tracked over time as service lines are encountered, LSLR is performed, or inspections are conducted. Given the variability of water systems' records, the rule requires the review of certain records but does not specify a national standard regarding which records are appropriate to include in the inventory.

EPA recommends water systems judge which records provide the most accurate information and consider including a disclaimer in their inventory stating that material identification of individual service connections are subject to change over time as additional data becomes available, such as from visual inspections. The rule by design acknowledges potential uncertainty in the data, requiring the inventory to be updated over time. Through inventory updates, water systems will have the opportunity to correct where the original material designation was wrong and verify the material of lead status unknown service lines as they are investigated.

Some commenters thought that EPA should prescribe which service line material identification techniques are acceptable because they claimed the Agency has more technical expertise in this regard than states. EPA notes that by avoiding explicitly approving or prohibiting any identification methods in the final rule, EPA allows for the advancement of such methods, as new technologies may become available or existing methods may be developed and improve over time. In addition, the appropriateness of some identification methods may vary geographically. Other methods will vary depending on different water system practices. This includes visual inspection of service line materials at the meter box, which may be possible for some systems with, for example, inline service lines; whereas, other water systems may only be able to view the pipe material of the water meter setter from the meter box. There are many instances where an identification method may be appropriate for one water system but not another and EPA cannot capture every possible variation in a national regulation. Allowing the state to require or provide a resource, information, or identification method will allow for regional or system-specific conditions to be considered, as well as to account for new or improved methods.

EPA disagrees that water systems should be allowed to self-certify that the distribution system, in whole or by individual service lines, has no LSLs without supporting records or other evidence that demonstrate their claim. Because the presence of an LSL is household-specific, § 141.84(a)(2) of the final

LCRR requires that the inventory "include all service lines connected to the public water distribution system" and § 141.84 (a)(4) requires that "[e]ach service line, or portion of the service line where ownership is split, must be categorized…" as either lead, galvanized requiring replacement, non-lead, or lead status unknown. The Agency does not agree that general familiarity of the distribution system provides an adequate basis for making judgments about the material of individual service lines. Such experience and familiarity may be used, for example, as part of the LSLR plan's strategy for targeting service line investigations where the water system personnel believe LSLs are most likely present. The final rule includes the new text in § 141.84(a)(4)(iii) and (iv) which ensures that evidence is required to support material classifications to ensure that subjective judgments of those familiar with the distribution system as a whole do not assign material classifications to individual service lines without evidence of the material of the individual service line. Additionally, the final rule states that water systems may use other sources of information not listed in § 141.84(a)(3) if approved by the state.

The final rule includes a new option in § 141.84(a)(9) allowing a water system whose inventory shows no lead, galvanized requiring replacement, or lead status unknown service lines (regardless of ownership) in its inventory to make a written statement publicly available, in lieu of the inventory, declaring that the distribution system has no LSLs or galvanized requiring replacement service lines. The statement must also include a general description of the methods used to make this determination. This requirement does not allow water systems to avoid creating an inventory because an inventory is required to demonstrate the system has only non-LSLs, but allows a written statement certifying this information would demonstrate a similar message as an inventory of only non-LSLs.

Regarding statistical-based methods of service line materials identification, the final rule does not preclude their use for inventory development purposes, so long as the system has state approval. In response to commenters who believed that EPA should explicitly incorporate the use of statistical models into the final rule's inventory requirements, EPA notes that a statistical model may not be appropriate for all water systems, as there could be a variety of statistical models with different input parameters, as well as varying existence and reliability of input data from system to system based on the availability and robustness of records to populate model inputs. EPA cannot expect any level of consistency that would warrant these models to be required for use nationally in the final LCRR, or a national criteria be set to determine what level of confidence must be used as a threshold for making service line material classifications. EPA notes that statistical models can be used without state approval for planning purposes, such as estimating the locations where LSLs may be most prevalent. Water systems using a statistical approach for classifying service line materials may consider but are not required to provide additional information in the inventory, such as the statistical likelihood that an individual lead status unknown service line is made of lead as well as what probability thresholds are used to make material determinations.

EPA added text to require water systems to use resources "provided" by the state so the state (or EPA where the program is directly implemented) has flexibility to identify service line material identification techniques in the future and would not have to specify all methods and resources in their primacy revisions for the LCRR.

EPA agrees with commenters that recommended that water systems should be able to determine service lines are lead free based on the year of installation, noting that this information source would apply under the information sources listed in § 141.84(a)(3). Use of LSLs was prohibited at the federal level in 1986; however, some states had banned their use earlier. Other water systems may have records of local plumbing codes which show when LSLs were no longer used in the distribution system. These are all examples of benchmarks that water systems could potentially use to classify service line materials. The proposed requirements to search water system construction records and plumbing codes allowed for this information to be used and is being retained for the final rule. EPA removed the text allowing the state to require systems review “[a]ny resource required by the State to asses service line materials for structures built prior to 1989” from § 141.84(a)(2)(iv) of the proposal to acknowledge that some states may have banned lead in drinking water infrastructure before 1989. This change was not meant to prohibit installation year records from beings used for inventory development.

In the final rule, EPA clarified the criteria required to classify if a galvanized service line where no records exist to demonstrate if an LSL was ever upstream. The final regulatory text states that “if the water system is unable to demonstrate that the galvanized service line was never downstream of an upstream a lead service line, it must presume there was an upstream lead service line.” This new text provides eases implementation by providing clarification on how water systems must classify galvanized lines where no historical records on upstream service lines exist. EPA acknowledges that in some cases, water systems will likely replace some galvanized service lines that were never downstream of an LSL. EPA has determined, however, that a high burden of proof is warranted because it ensures that the rule addresses lead from a galvanized service line previously downstream of an LSL by ensuring it will be replaced under the system’s LSLR program. For additional information about how galvanized lines that are or were downstream of an LSL can contribute lead to drinking water, please see response to comment Section 5. Although not a factor in EPA’s decision-making with respect to the requirements of this rule, EPA notes that there are additional benefits to replacing galvanized service lines, which are often old and prone to leaking.

Although not required in the final rule, EPA encourages water systems to include additional information in the inventory beyond the minimum required in the rule. For example, listing the basis of material verification for each individual service line could be useful to inventory users and the state. EPA disagrees, however, that this is necessary for the national regulation, as the final rule states that material classifications must be “evidence-based,” and records or methods not specified in the final rule must have state approval. In addition, if required to state the exact method used to make a classification, the many proactive water systems who have already created inventories and may not be tracking their methods used on an individual service line basis would have been required to go back and potentially duplicate their efforts. Additionally, while the final rule does not require the verification method to be associated with each individual service line, a new requirement in the LSLR plan requires water systems to describe their strategy to verify lead status unknown service lines. This could include a description of the resources and methods that will be used, as well as when they will be used (for example, during main replacement or meter replacement). For more information about the LSLR plan, please see response to comment Section 6. In addition, when a water system has demonstrated it has no LSLs, galvanized requiring replacement, or unknowns, a new provision in the final rule allows them to issue a publicly available statement and language in the Consumer Confidence Report that they have no LSLs and include the methods used to reach that determination. These requirements will allow the water system to be transparent about the methods used to populate the inventory contents without the added burden of listing a method for each service line.

One commenter expressed concern that water systems are incentivized to undercount the number of LSLs in their inventory by listing them as non-lead. EPA notes that unless determined to be non-lead through an evidence-based record, method, or technique, water systems are required by the final rule to classify those service lines as unknown, per § 141.84(a)(4)(iv).

EPA added text to the final rule requiring water systems to develop their initial inventory using any resource, information, or identification method "as provided" or required by the state. While the proposal already required systems to use any resource, information, or identification method required by the state for the initial inventory, the text "as provided" allows states to utilize this text without adding a new requirement into their state LCR. This addition was applied to inventory updates as well. This will give states the ability to require water systems to utilize, for example, newly identified or updated techniques or methods that were not available for the initial inventory.

In the final rule, EPA maintained the requirement to identify construction materials in § 141.42(d), but the wording of this requirement was changed to better reflect the requirements in that section.

EPA agrees that some identification methods can potentially disturb LSLs. EPA notes that the final rule includes provisions require water systems to issue PE, flushing instructions, and filters in some instances when an LSL undergoes various types of disturbances. EPA recommends that water systems attempt to minimize disruption to service lines when investigating their material and recommends that water systems provide risk mitigation measures to consumers when the line has been disturbed but does not meet the disturbance criteria under § 141.85(f). EPA notes that in many cases, water systems will investigate service line materials in tandem with existing infrastructure activities that will disturb the LSL, meaning that risk mitigation measures will be provided as a result of the work.

Some commenters requested that EPA provide guidance regarding LSL verification methods. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

5.5 Public Availability of Lead Service Line (LSL) Inventory Information

Requirement for Water Systems to Make its Inventory Publicly Accessible

Summary of Comments

Several commenters signaled broad support for requiring systems to make the LSL inventory publicly accessible because transparency is a critical step for building trust, informing and educating consumers about the sources of lead in drinking water, and reducing risk. Commenters also noted that making the inventory publicly accessible helps to prioritize replacements across the country. Commenters indicated that LSLs and galvanized lines that are or were downstream of an LSL pose a known and significant public health hazard that makes it difficult to justify a water system's failure to disclose their location. One commenter also noted that making this type of information publicly available is consistent with the treatment of other types of property information that is made public through various real estate listing services, which make available detailed information on most homes, and therefore "it is difficult to see how the composition of the service line would be considered sensitive information."

Commenters that did not support a requirement to make the inventory publicly accessible raised concerns that such a requirement could infringe on customer privacy, add to confusion, cause panic, anxiety, and distrust of the water system, especially if the inventory identifies a high number of LSLs or service lines where the lead status is unknown. A commenter suggested the final rule should require utilities make the inventory "available to customers through open records requests so utilities can provide the proper background and explanation."

Commenters also raised concerns that the requirement to make the inventory publicly available could result in unintended impacts to economic development for a community and property values for individual locations with LSLs or lead status unknown service lines. A commenter noted that for the majority of Americans, their homes are their largest investment and LCRR requirements should be cautious in inadvertently causing loss of property values, noting that home prices can be adversely affected by stigmatization of neighborhoods or because individual homes may test positively for lead or copper. Commenters claim that the requirement would burden a PWS with potential conflicts in real estate transactions and open the system to legal liability associated with the release of this type of information. Similarly, a commenter was concerned that a "utility placing this type of information in the public domain lends a certain amount of validity and credibility to the information that may not be justified given the potential uncertainty of the data." Commenters indicated that the inventory disclosure would be burdensome and result in increased sampling and inspection efforts that may be necessary to address customer concerns.

Some commenters also raised concerns with the requirement because there are alternatives to allowing open access to the general public (e.g., the requirement for the PWS to provide annual disclosure to customers with LSLs; a requirement to release the information after account verification; or other non-binding measures such as pre-purchase residential inspections). Finally, there was a comment questioning, without any supporting rationale or detail, whether EPA has the authority to require systems to make this information publicly available.

Some commenters requested clarification as to whether the requirement to make the inventory publicly accessible applies to systems that do not have any unknown service lines or LSLs, pointing out that the opening sentence in § 141.84(a) of the proposal states, "[a]ll water systems must develop and maintain a publicly accessible inventory" whereas § 141.84(a)(7) of the proposal suggests that only systems with an LSL must make their inventory publicly accessible. One of these commenters expressed concern that "community members will likely not know that an absence of an online inventory means there are no LSLs in the system."

Finally, one commenter suggested that rather than making the information publicly accessible, the rule should require systems to make the information available upon request.

Agency Response

EPA agrees with commenters who support a requirement for water systems to make the inventory publicly accessible. A publicly accessible inventory will inform customers about the presence of lead in the distribution system as well as build transparency of water systems' inventory development and LSLR progress. Informed customers are better able to take actions to limit exposure to lead in drinking water and could potentially increase customer engagement, allowing for more rapid verification of lead status unknown service lines and increased participation in LSLR programs. EPA disagrees with commenters who expressed concern that a publicly available inventory would cause confusion, panic, and distrust of the water system. Many states and water systems currently make inventory information available to the public; EPA has not encountered any evidence from these localities indicating higher levels of confusion, panic or distrust of the system. The final rule includes requirements for PE and notification of customers with LSLs that will act as a countermeasure against the potential for confusion and panic. Because transparency generally increases trust, EPA expects that if water systems were to withhold information in the inventory, it would increase -- not decrease – the public's distrust of the water system. Although not addressed in the final rule itself, systems that are concerned about the validity or certainty of their data may choose to include disclaimers appropriate for their inventory.

EPA also disagrees with a commenter who believed inventories should not be disclosed due to increased sampling and inspection efforts that may be necessary to address customer concerns. While EPA acknowledges that the water system may receive increased sampling or inspection requests, or inquiries about LSLs and LSLR, many states have already promulgated requirements that water systems must create an inventory, and EPA is not aware of water systems in these states receiving an unmanageable level of requests as a result of their inventory publication. Therefore, the final rule includes the requirement in to make the inventory publicly accessible.

In response to comments requesting clarification as to the applicability of the public accessibility requirement, EPA has clarified that all water systems must make their inventory publicly accessible. In response to concerns expressed in comments about the perception of validity or credibility of the information, EPA is also requiring all systems, those with and without LSLs, to make publicly accessible the methods used to determine the presence or absence of LSLs. Together, these requirements ensure that the public has a more complete understanding of service line materials used in their distribution system, while also providing necessary context for the public to assess the reliability of the information provided in the inventory. This information is valuable in informing and educating consumers about the potential sources of lead in drinking water, helps to prioritize replacements across the country, and provides enough detail of the process used to draw the conclusions about LSL presence or absence to ensure the inventory is not given more or less weight than is appropriate. In addition, providing the public with information about the system's methodology for developing the inventory is expected to improve public confidence in the inventory where warranted and to protect water systems from becoming involved in real estate transactions.

One commenter suggested that the inventory be made available upon request. EPA notes that the final rule does not specify how systems serving 50,000 or fewer people must make the inventory publicly accessible, and therefore a system may be able to meet the public accessibility requirement by providing it upon request or, as described in the preamble to the proposal, by making the inventory available for review at the water system's headquarters. To ensure public accessibility, in the final rule, EPA added a requirement for the CCR to include instructions on how to access the LSL inventory.

Requirement of Water Systems to Include a Location Identifier, but Not Specific Street Address, in the Publicly Accessible Inventory

Summary of Comments

EPA proposed that a locational identifier be provided for each LSL (defined at proposal to also include galvanized lines that is or ever was downstream of an LSL line or a service line of unknown material) in the publicly available inventory. The location identifier requirement is only applicable to the publicly available inventory, not the water system's internal inventory which would necessarily include a specific address for each service line in order for the system to comply with other requirements in the rule such as the requirements in § 141.85(e) for known or potential lead service lines. EPA sought comments on whether to require the publicly available inventory to include a specific address for each LSL.

EPA received comments expressing support and opposition to the inclusion of specific addresses in the publicly available inventory. One commenter in support of including specific addresses in the inventory stated that it would "help water users better assess the risks of tap water in homes and buildings that may not be their own but that they frequent, and to alert residents at these homes (who might be family members, friends, or neighbors) and/or school/childcare facility managers about a [lead] hazard they may be unaware of." One commenter supported making "specific address information with appropriate disclaimers regarding accuracy and completeness … to support private transactions." One commenter thought that the specific addresses should be included so that the general public as well as potential property buyers know the locations of the LSLs." One commenter stated that that in order for individuals (property owners and tenants) to take actions based on the inventory information (e.g., actions to mitigate risk and meet due diligence responsibilities in selling or renting out the property), address specific information would need to be provided. One commenter questioned whether there would be any benefit to the users, customers, or homeowners in a rural state where the "landmarks will either be more difficult to assign or will be so broad that they will not be useful." Another commenter expressed similar concerns:

> *A primary purpose of the publicly available inventory is to inform both current and potential homeowners and tenants about the risks associated with having a lead service line, and omitting specific addresses from this dataset would leave potential homeowners and tenants unable to make fully informed decisions about whether to reside in that property. Conversely, including the specific address data in the publicly available information would encourage homeowners and landlords to take action to address their privately owned lead service line, particularly before putting their home up for rent or sale. Over time, this will prod progress toward the larger objective of replacing lead service lines nationwide*.

The same commenter also stated that "we do not believe that the sale or rental of a home – particularly to a new owner or tenant who may have small children – should be facilitated through the suppression of information that could affect the health of the new owner or tenant." This commenter recognized that there may be situations in which the disclosure of specific street addresses could violate state or local laws, such as the Colorado Open Records Act, and therefore, "the rule should give the state agency the option to waive the street address publication requirement and allow water systems to use location identifiers as an alternative."

Similarly, other commenters suggested that the rule require exact addresses in the publicly available inventories, unless expressly prohibited by state legislation that limits the release of personally identifiable information such as street addresses, and that even in those cases an inventory without specific addresses should be made publicly available. One commenter stated that they "do not believe there is a substantial, real public concern about this information being available so we urge the Agency to require or at least highly encourage and incentivize use of specific property information about the location of lead service lines by utilities and not just allow identification to a nearby intersection or landmark."

Another commenter expressed support for using the exact address in the inventories although the commenter also explained that in some rural areas there may not be an exact physical street addresses, in which case the system should coordinate with state to ensure that a comparable identifier is used such as legal description (section, township, range), coordinates, etc. One commenter pointed out that the exact address will be easier to track, especially if multiple sites are on the same block. The same commenter also noted, correctly, that the regulatory language in the proposal does not preclude using exact addresses, and is therefore acceptable.

One commenter expressed concern about an inventory submitted to the primacy agency without the exact addresses which would assist the state in determining accurate notifications and cross referencing sample site selection with inventories much easier, as well as making compliance and enforcement more efficient and effective. Another commenter expressed concern that "[i[f the public cannot see the materials at a specific address, then no residents can know even their own service line materials even if they exist in a government database." Likewise, a commenter stated that they "do not see how the location identifier approach is workable – it is more likely to result in confusion and frustration by users."

One commenter argued that "the fact that lead service lines and galvanized lines pose a known and significant public health hazard makes it difficult to justify a water system's failure to disclose their precise location when this location is known. Such intentional non-disclosure seems antithetical to – if not in direct violation of – the Safe Drinking Water Act (SDWA)."

A commenter stated that in their "work with communities that have posted maps of their LSL inventories with exact addresses, we have heard of little or no concerns from the community about the disclosure. In fact, the disclosure has empowered property owners to investigate and update the information. And the disclosure reveals no real confidential information about the resident's exposure to lead since people may be using filters or fully flushing the lines before using them."

A commenter pointed out that "through various real estate listing services, detailed information on most homes, such as number of bedrooms and bathrooms and age of the home and significant renovations, is already publicly available" making it "difficult to see how the composition of the service line would be considered sensitive information."

Several commenters supported the proposed regulatory text that requires only a location identifier, and not a specific address, to be included in the publicly available inventory. These commenters expressed concerns related to privacy and confidentiality. One commenter expressed that this approach "respects the privacy of the individual owner, but allows for transparency for customers to know if they have LSLs in the vicinity of their home."

Some commenters expressed concern that a requirement to publish the exact address in the inventory could be a violation of state or local privacy laws, and that a requirement to include the specific address in the publicly available inventory could lead to "the possible burden to water systems of becoming unnecessarily involved in potential private real estate transactions" and therefore the "water system should be provided flexibility to determine if publishing exact addresses is the best approach for their community." The commenter pointed out that while "[s]ome communities have successfully done this, but others believe that publishing this information may lead to concerns of consumer privacy if the property resident hasn't consented to the release of this information."

Another commenter expressed "concerns that a publicly available, address-specific listing could adversely impact property values of the listed homes, especially when the information regarding service line construction material may be unreliable. Any utility placing this type of information in the public domain lends a certain amount of validity and credibility to the information that may not be justified given the potential uncertainty of the data. Our utilities do not want to be placed in the center of a dispute if a listed service line material is incorrectly reported."

One commenter, in consideration of the "common objection" that this information will have adverse effects on home and property value noted that "the problem cuts both ways: we must consider the seller and the buyer, the presence of lead and absence of lead. In a neighborhood or an entire water system that has concerns about lead, buyers facing uncertainty about service line materials will want to know. Indeed[,] there is a cost to that uncertainty, whereby buyers would offer a lower asking price. And from that reference point, one way the seller can increase the value of their home would be to demonstrate proof that the service line is in fact not lead. As a result, the property value could increase if a home seller can verify they do not have lead. So instead of worrying about the reduction in property value from the revelation of lead; we must also consider the value of the verification that the home does not have lead."

Agency Response

EPA acknowledges the many benefits commenters described of a publicly available inventory that includes specific addresses associated with LSLs and galvanized lines that are or were ever downstream of an LSL. The requirement to include a location identifier does not preclude any system from including the exact address in its publicly available inventory. However, because of commenters' concerns about violating privacy laws by releasing specific addresses, EPA has determined to not require the public disclosure of specific addresses in this regulation. Whether the concerns regarding privacy laws are real or perceived, they would hamper implementation of the inventory requirement for those systems with such concerns. In contrast, water systems without such concerns could include the specific addresses in the inventory – and may be more likely to than not because it would be less burdensome for the system to create one inventory rather than a second inventory to meet the public access requirement of the rule that replaces the specific addresses with a less precise location identifier. As noted previously, the PWS will need to maintain a non-publicly available inventory that includes the exact address in order to meet other requirements of the rule. Moreover, there may be state or local laws that require the inclusion of the specific address in the inventory.

Therefore, on balance, EPA determined that the better course of action would be to rely on the built in incentives and desires of many water system commenters who supported disclosure of the specific addresses, and allow flexibility for those systems where privacy laws would impede their ability to comply with a requirement to provide specific addresses in the publicly available inventory. While EPA considered requiring the disclosure of specific addresses except where prohibited by state or local law, that approach would be difficult for water systems to implement. Where it is not clear whether and to what extent the privacy laws would apply to the inclusion of specific addresses in the publicly available inventory, a water system would need to resolve that issue prior to making the inventory publicly available. That could be especially challenging in those states where there is active litigation regarding privacy and open records laws.

Irrespective of whether the inventory includes addresses, persons served by an individual lead, galvanized requiring replacement, or lead status unknown service line will learn of their service line's material status through PE and notification requirements under § 141.85(e). This provision is designed to educate consumers about their service line material as well as health risks faced and steps they can take to protect themselves. In addition, Section 1417(a)(2) of the SDWA authorizes EPA to establish requirements for water systems to "identify and provide notice to persons that may be affected by lead contamination of their drinking water" where it results from either the lead content in construction materials of the distribution system and/or corrosivity of the water. This allows notice for all "persons that may be affected" by lead in drinking water, not just property owners.

Also see the response to comment Section 5 for public accessibility of the inventory regarding its format and availability online.

5.6 Format of Inventory

General Format of Inventory

Summary of Comments

One commenter requested that EPA require water systems to generate maps to represent their inventory because that format "is far more informative to most people" and "increases transparency and trust." One commenter stated that EPA should require PWSs to notify customers of the inventory and instructions with how to view it. Some commenters also raised concerns about other factors affecting accessibility (e.g., non-English language, colorblind and use of color schemes). One commenter said that a standard format for inventories created by EPA would "make the information more accessible, especially to service providers who want to aggregate the data for broader disclosure on real estate listing services." The commenter continued, noting that while some states have developed their own systems, some states may lack technical expertise and financial capacity to do so, and a national portal would be more efficient. They also noted that a publicly accessible database would help maintain knowledge on system materials and other "first-hand knowledge" that may otherwise be lost with personnel changes. Alternately, two commenters stated that EPA should direct the states to compile state-wide LSL inventory information into a publicly accessible database. Commenters cite similar benefits for both of these approaches, including the ability for the public to access a wider range of inventory information from one source, the potential to minimize overlapping efforts from water systems and states, and to reduce the burden on small water systems that may lack the technical capacity to develop their own electronic databases.

Commenters noted that guidance "related to expected content and format" or example templates could ensure that the inventory is done correctly on the first attempt and does not require additional effort after states obtain primacy for the LCRR. Several commenters requested that EPA develop guidance within time frames ranging from concurrent with final rule publication to within six months of publication. One commenter also requested that any developed guidance be frequently updated in partnership with states and stakeholder organizations.

Agency Response

In order to allow for maximum flexibility, EPA is not requiring a standard inventory format or template for the inventory. The rule does not prescribe how systems must display the information required to be included in the inventory specified in § 141.84(a): all service lines connected to the public distribution system regardless of ownership status, categorized as described in § 141.84(a)(4), and for the publicly available inventory, a location identifier for each LSL and each galvanized requiring replacement service line, as provided in § 141.84(a)(8)(i). Beyond those requirements, EPA determined to provide systems with maximum flexibility in how they format that information because ease of implementation of the inventory requirement is especially important for this requirement as it applies to systems with a wide variety of circumstances that will affect how the inventory information is complied, which may in turn affect formatting. For example, EPA expects that some water systems that have very few LSLs, unknowns, and galvanized requiring replacement service lines will create a simple inventory meeting the minimum requirements of the final rule. EPA expects other water systems may create more complex inventories using spreadsheets or maps, especially if they have large numbers of LSLs and multiple crews performing LSLR on a frequent basis that requires a more coordinated approach to data management of the inventory. Some water systems may even include additional data fields that allow the public to access more information. Furthermore, a standard format would impose additional burdens on the many water systems that have proactively created inventories before required by federal regulation. While EPA agrees with commenters that there are some benefits to standardizing inventory formats, they are outweighed by the benefits of allowing format flexibility.

EPA disagrees with some commenters suggestion that the rule require all inventories to be in a map format. While EPA believes maps can be effective at conveying information and encourages all efforts to make inventory maps, EPA does not believe a national rule should mandate the use of maps as they become more difficult to interpret where a water system has few LSLs over a large service area, and lower-tech maps might not be searchable as a list would be. In addition, maps require greater burden to create and update than other inventory formats, and for systems that will be using location identifiers which are not addresses in the publicly available version of their inventory, using a map could be problematic. Therefore, EPA is not requiring that all inventories be in a map format.

EPA has decided not to create an online database or portal to host LSL inventories, nor does the final rule require states to do so. As many water systems have already proactively created their own inventories, a requirement to conform to an EPA portal would be duplicative. Requiring states to each create their own data management system to host the inventories would be burdensome, expensive and again duplicative to water systems that have already created their own inventory databases and online sites for public access. Thus, the final rule retains the flexibility for systems to choose their own inventory format rather than use a standardized federal or state format.

Regarding requests for guidance, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. EPA is aware that other organizations have published useful guidance on LSL inventory formats and encourages PWSs to seek out this information and incorporate best practices into their own inventory development. For discussion of comments on including addresses-level information in the inventory see the response to comment Section 5.

Making the Public Inventory Available Electronically

Summary of Comments

Most commenters gave broad support for the proposed requirement that PWSs serving greater than 100,000 persons must make the inventory available electronically. However, several commenters requested that EPA require more PWSs to post their inventory online, even if only by uploading a scanned image of a paper inventory. One commenter further stated that the size threshold of 100,000 would lead to a requirement that only 1 percent of all PWSs would need to make the inventory available electronically. Commenters provided a spectrum of recommendations regarding which PWSs should be required to post their inventory online, including all PWSs, all PWSs that already have a website, and all PWSs serving more than 500 people. One commenter noted that without an online inventory, inventory access is effectively limited by requiring customers to physically travel to the PWS's public office during business hours which may "have a disproportionate impact on low-income" communities. Several commenters requested that EPA develop a standardized online database or portal where water systems and states can directly submit inventory information. One commenter stated that an online portal would allow the CWS to "update and share LSL inventory data" thereby reducing public confusion. One commenter expressed concern that small systems will struggle to provide their inventories online due to technical and personnel limitations.

Agency Response

Initially, EPA proposed a requirement that all PWSs serving more than 100,000 people make their inventory available electronically. EPA's intent was that inventories be made available online, but based on comments, EPA now understands that the word "electronically" could be interpreted in multiple ways, some of which may not mean that the inventory is hosted on a website. For example, the inventory could be available electronically as a word document, pdf, or database that is made publicly accessible by sending it via email or a filesharing service, via a mailed electronic storage device, or allowing the public to access the inventory on a computer in the water system administrative office. For the final rule, EPA clarified the proposed regulatory text to be consistent with the intent to require that the inventory be made available electronically "online". Given that the requirement applies only to large systems that serve more than 50,000 people, a requirement to provide electronic transmission (e.g., email) upon request would not be practical and it would not have made sense to require that of only large systems since it would be more burdensome for them to respond to multiple individual requests than to make the inventory available electronically online. This clarification in the regulatory text will benefit water systems and the public. Publishing the inventory online also ensures consumers have immediate access to the most up-to-date information and do not have to return to the water system to view the most recent version. There are many free or low-cost services available, such as social media, web content hosting platforms, and cloud-based filesharing services that water systems can use to make their inventory available online. The format remains at the water system's discretion, so long as it meets the minimum content requirements of the final rule and is publicly available on the internet.

EPA agrees with commenters who suggest the proposed threshold to make inventories available electronically should be lower than systems serving greater than 100,000 people. More water systems hosting their inventory electronically or online leads to greater accessibility to the public. For the final rule, EPA is lowering the threshold to water systems that serve more than 50,000 people. EPA proposed systems serving greater than 100,000 persons to be consistent with the CCR rule (USEPA, 1998). However, the CCR was promulgated almost 20 years ago when access to free or low-cost social media, web hosting services, and filesharing platforms that water systems can use to host their inventories online were not available as they are today.

The final rule does not require all systems to post their inventory online due to the potential burden associated with digitizing and hosting the inventory on the internet. EPA selected 50,000 or more persons as the cutoff for this requirement because it would allow more customers nationwide to access the inventory online, and is feasible for these systems. All PWSs must make their LSL inventory publicly available; systems not required to post their inventory online may choose to do so in order to meet this requirement. All systems must include instructions in the CCR on how to access the inventory. Please see the response to comment Section 5 for further discussion on the requirement for water systems to make the inventory publicly available.

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6 Lead Service Line Replacement (LSLR)

In the proposed rule, EPA requested comments on LSLR, an LSLR plan, the removal of lead-bearing connectors, and protocol for mitigating risk after an LSLR or lead service line (LSL) disturbance under § 141.84, specifically:

- EPA requested comment on the proposed LSLR plan. EPA requested comment on how water systems conducting LSLR can identify and prioritize replacements at the locations that have the highest lead levels and/or the most susceptible populations. EPA requested comment on whether to require water systems to describe in their LSLR plan, how LSLR will be prioritized or to require a prioritization plan at the time LSLR is compelled.

- EPA requested comment on whether small water systems should be exempt from the requirement to prepare an LSLR plan concurrent with their LSL inventory, given that they may opt not to select LSLR as a compliance option if the action level is exceeded.

- EPA requested comment on including galvanized pipe in LSL inventories and in goal-based and mandatory LSLR rates under the proposed Lead and Copper Rule revisions (LCRR).

- EPA requested comment on proposed revisions to the LSLR program requirements. EPA requested comment on the goal-based LSL requirement for systems that exceed the trigger level, asking if the proposed goal-based LSLR requirement provided adequate incentives for water systems to achieve meaningful reductions in their LSL inventory. EPA also asked if the proposed goal based-program enabled systems to effectively incorporate LSLR into their infrastructure replacement programs. EPA requested comment on what criteria must be met for the EPA to establish a federal goal LSLR rate for water system under § 142.19. EPA also requested comment upon the feasibility of replacing a minimum of three percent of the LSLs a year for the systems that exceed the action level. EPA requested comment on whether the number of lines required to be replaced should be three percent of the number of LSLs plus the number of unknown service lines at the time the systems exceeds the action level.

- EPA requested comment on the feasibility for a water system to replace its portion of an LSL within 45 days of being notified that a customer has replaced the customer portion of an LSL, and if that timeframe should be longer or shorter. EPA also requested comment on whether such replacement by a water system should be mandatory or voluntary.
- EPA requested comment on the appropriateness of requiring two years of tap sample monitoring before water systems may stop LSLR to ensure enough time has passed to evaluate if corrosion control treatment (CCT) measures can consistently reduce lead to meet the action level.
- EPA requested comment on the appropriateness of pitcher filters for risk mitigation after LSLR or LSL disturbances given that the customer would be responsible for operation and maintenance.

EPA received many comments representing a wide range of perspectives about the proposed LSLR requirements. Several commenters generally supported full LSLR as a way to reduce lead exposure from drinking water. Commenters noted the significant costs associated with LSLR as well as the challenges that may arise from potential dual ownership of the LSL between the customer and the water system. Some commenters expressed that the final rule should require more LSLR at more water systems, while other comments believed that the requirements in the proposed rule were too burdensome. Some commenters expressed general support for the proposed LSLR approach, while recommending changes for the final rule regarding the LSLR plan, the goal and mandatory LSLR programs, removal of lead connectors, and risk mitigation measures after LSLR and LSL disturbances.

6.1 General LSLR comments

Summary of Comments

EPA received a range of comments regarding the proposed rule's LSLR requirements. Many commenters support LSLR in general, acknowledging that removal of legacy lead from drinking water infrastructure can reduce lead exposure. Commenters highlighted the significant time, resources, and coordination between the water system and customers that facilitate full LSLR. Some commenters stated that there is "inadequate funding at the federal level" for LSLR while others expressed concern that low-income or disadvantaged customers will not be able to pay for LSLR and cited environmental justice considerations. While a few commenters stated that water systems should pay for full LSLR, others agreed with the provisions in §141.84 reflecting that water systems are not required under the National Primary Drinking Water Regulations (NPDWRs) to bear the cost of replacement of customer-owned LSLs, goosenecks, pigtails, or connectors. Commenters offered support for proposed LSLR requirements to emphasize full LSLR, such as prohibiting "test-outs" and partial replacements from counting towards the annual mandatory and goal-based replacement rates in §141.84(f) and (g), respectively. Some commenters supported the proposed rule allowing partial LSLR to occur with risk mitigation measures to protect customers, while other commenters believed partial LSLR should be banned under all circumstances or allowed under a narrow set of circumstances.

Some commenters expressed dissatisfaction with the proposed LSLR program requirements, saying the proposed revisions to the LSLR program did not go far enough in reducing the risk of lead exposure and that “more emphasis should be placed on removing lead service lines.”

Conversely, two commenters indicated that LSLR should not be the main approach to reduce lead in drinking water, but one of several strategies public water systems (PWSs) could use including CCT, increased use of filters, and increased lead monitoring. A few commenters asked why LSLR is necessary if “CCT is working”. One commenter indicated that the small water systems that exceed the lead action level should be allowed to conduct test-outs in lieu of LSLR due to low sample size and variability of lead levels. Two commenters expressed concern that the focus on LSLR does not address lead sources in customer premise plumbing.

Two commenters recommended that LSLR take place on “a calendar year annual basis, with encouragement to start early coming from the states,” rather than the first day following the end of the monitoring period when a lead action level exceedance (ALE) occurred, in order to give the state more time to determine the 90th percentile lead level. Another commenter said a calendar year approach would be easier to implement by requiring fewer compliance dates to be tracked.

Several commenters stated that the replacement of customer-owned LSLs and lead-containing plumbing and fixtures would be better addressed by involving other state and local institutions, such as health departments and building departments. They noted that the proposed rule does not have protections for renters and home buyers and recommended adding a requirement for real estate regulatory bodies to require lead testing, inspection of service line material, and removal of LSLs during property sales, which would be more “economical and administratively feasible” than the proposed requirements. In a similar vein, several commenters suggested that LSL disclosure be required for all property sales and rental agreements.

One commenter stated that full LSLR will “require legislation and funding from local, state and federal bodies” and that states and EPA should evaluate existing state statutes and regulations to facilitate identification and replacement of LSLs (e.g., disclosure during building sale and rentals, protection of water systems from lawsuits for damage to private property, use of rate payer funds on private property). They suggested that EPA make this review a part of §142.16 and §142.19. A few commenters also requested that EPA give primacy agencies discretion to grant systems flexibilities for existing LSLR programs where there are inconsistencies with the proposed rule (e.g., replacement schedules, use of ratepayer funds).

One commenter suggested point-of-use (POU) devices be required for any home that “exceeds the AL [action level]” until LSLs or other lead-bearing plumbing can be replaced. One commenter suggested that EPA should provide vouchers to residents for pitcher filters and cartridges if they self-identify that their home is served by an LSL as an incentive to verify customer-side LSLs and to mitigate the potential increase in lead levels resulting from an LSLR.

Several commenters requested that EPA provide further rule guidance and clarification of specific aspects of the proposed LSLR revisions. One commenter, citing the complexity of the LSL definition, recommended that EPA include “a summary table or flow chart in the rule or preamble that better explains the components that would trigger certain actions required for a water system to complete under different scenarios." Two commenters indicated a need for national criteria for conducting LSLR in order to prevent wide variability across the country; one commenter recommended that EPA codify the ANSI/AWWA LSLR standard C810-17 (ANSI, 2017) into the LSLR requirements. One commenter asked EPA to deem trenchless pipe lining technologies as equivalent to LSLR. They stated that trenchless pipe lining technology would be more cost-effective, require less property restoration, would "eliminate lead contamination and provide benefits to customers," and allow water systems more time to secure funding for future full replacement.

One commenter requested that EPA adopt the provisions of the State of California's LSL program (State of California, 2016), which includes but is not limited to a target 10-year LSLR schedule that must be planned and drafted by each water system and submitted to the state, upon which the state will have 30 days to review the plans, recommend changes, and revise timetables, if needed.

Other commenters suggested that EPA provide financial resources to aid LSLR. A commenter suggested that EPA work with Congress and the Internal Revenue Service to offer tax incentives to property owners who remove LSLs, working with the state and the water industry to ensure that assistance programs for low-income families are available where needed, and finding sources of low-interest or principal forgiveness funding for LSLR. Finally, one commenter requested federal guidance on how to address "management, disposal, or recycling of removed LSLs [and] their respective economic and environmental costs" noting inconsistencies among state policies.

Agency Response

The final LCRR will require more water systems to conduct LSLR to reduce drinking water exposure to lead. The LCRR will prioritize LSLRs in the communities with the highest levels of lead by requiring a goal-based LSLR program for systems that exceed the lead trigger level of 10 µg/L and mandatory LSLR programs for systems that exceed the lead action level of 15 µg/L. EPA disagrees with commenters who state that the proposed LCRR unnecessarily compelled LSLR when "CCT is working." The final LCRR requires LSLR only when CCT is not able to reduce 90th percentile lead levels at or below the trigger level or action level and when customers have replaced their portion of an LSL, which can cause lead release into drinking water. In addition, when present, LSLs typically contribute approximately 50-75 percent of lead into drinking water (Sandvig et al., 2008). EPA is requiring that only full LSLR count towards LSLR programs in the LCRR, no longer allowing partial LSLR to count. The Science Advisory Board concluded that partial LSLRs have not been shown to reliably reduce drinking water lead levels in the short-term and may cause harm (USEPA, 2011). EPA does not agree with the commenters who argue that the LCRR should maintain the ability for water systems of any size to test out an LSL rather than physically replace the LSL. The levels of lead in drinking water vary over time as water quality conditions change; therefore, the final rule does not allow systems to consider a line replaced based upon testing results.

EPA disagrees with the commenter who suggested that given the increasing number of LSLR programs around the country, EPA should grant flexibilities to water systems with existing programs. EPA commends and encourages water systems to replace LSLs proactively, and the final rule establishes the minimum national LSLR requirements for water systems. Water systems that are proactively conducting LSLR programs may integrate their existing programs into their compliance with the LCRR if these systems exceed the lead trigger level or action level, or if the consumers of these systems replace their private portion of the LSL.

EPA is not incorporating commenter suggestions to begin the LSLR program with the calendar year, versus the day after the end of the monitoring period in which the system's 90th percentile exceeds the trigger or action level. EPA emphasizes the importance of beginning LSLR promptly after exceeding these lead thresholds given the public health benefits of timely action. Beginning the LSLR program with the calendar year may cause significant delays, in some cases up to one year, where a water system has elevated lead levels but would not be compelled into LSLR.

EPA disagrees with the commenter who suggested the LCRR requires systems to provide a voucher to customers that can verify they are served by an LSL to speed inventory development. EPA does not believe that this approach would be feasible for all water systems but the final LCRR does not preclude water systems from providing incentives, such as a filter or rate rebate, to encourage customer participation in inventory development.

EPA is not prescribing how water systems should pay for the costs of LSLR. The final rule includes a provision in the LSLR plan for water systems to identify strategies to prioritize LSLR at locations serving sensitive populations, such as schools and child care facilities, and disadvantaged households. EPA highlights several EPA and other funding opportunities to support LSLR, such as EPA's Drinking Water State Revolving Fund (DWSRF), Water Infrastructure Finance and Innovation Act (WIFIA) Program, Water Infrastructure Improvements for the Nation (WIIN) Act of 2016 grant programs, and Community Development Block Grants from Housing and Urban Development. There may be additional federal, state and local funding sources, as well as the use of rate revenue, that can further reduce the financial burden of full LSLR for the water system and customers. Regarding tax incentives for LSLR, this and other new forms of new financial assistance are beyond the scope of the LCRR and EPA's authority under the Safe Drinking Water Act (SDWA) to promulgate new and revised NPDWRs. Also please see response to comment 6.2.

Regarding commenters suggesting the LCRR should require lead testing/disclosure related to property sales, EPA does not have the authority under the SDWA to impose requirements on entities other than water systems in an NPDWR, and thus cannot establish requirements to facilitate or encourage LSLR that would require compliance by these other entities such as those involved in regulating rental, sale, or regulation of real property. EPA does not discourage the creation of laws or regulations involving lead plumbing upon the transfer of property; however, the LCRR establishes treatment technique requirements for PWSs under the SDWA. It is not feasible for PWSs to establish such requirements. EPA notes that some final rule requirements, such as the creation of an inventory, can indirectly create an incentive for LSLR either prior to or during real estate transactions. Please see the response to comment Section 5 for further discussion on LSL inventory comments.

EPA is not including pipe lining or coating technologies as a compliance path to LSLR under § 141.84. A Water Research Foundation study evaluated three pipe lining and coating technologies (WRF, 2017); however, these technologies have not been demonstrated to reduce health risks to the extent feasible. EPA determined not to incorporate these technologies for use in § 141.84 because the uncertainty of the technology's performance over time would require additional monitoring to ensure lead levels at the tap remain low, and EPA is not aware of any scientific evidence concluding that the performance or integrity of a lining or coating can be evaluated with tap samples. Additionally, the costs of pipe lining or coating, combined with the added costs of a site-specific evaluation to assess if these technologies are appropriate for a given LSL, regular monitoring over the duration of their use, and the eventual need for re-lining/re-coating or replacement of the LSL after the lining/coating's failure date may reduce the purported cost savings associated with these technologies relative to full LSLR, especially when compared to less expensive LSLR methods such as trenchless replacement.

In response to the commenter suggestion that the rule requirements mirror those required in the State of California, EPA does not agree. The Agency determined that the provisions in the final rule are most appropriate for a national rule, based on the EPA analyses as well as comments on the proposed rule. EPA notes that states may pass their own LCR requirements, so long as the rule is at least as stringent as the federal rule.

EPA disagrees that the final rule should specifically mandate POU devices be required for any home that "exceeds the AL" until LSLs or other lead-bearing plumbing can be replaced. EPA notes that find-and-fix requirements take effect when an individual residence tests above 15 µg/L. Depending on the source of lead contamination, the water system will provide education to the customer and may suggest a range of remedies, including flushing, use of filters, LSLR, or replacement of lead fixtures. Also, the final rule requires that where a water system conducts certain activities that disturb the LSL and are likely to cause increased lead levels, it is required to provide the customer with a pitcher filter. For more information, see response to comment Section 13.

Regarding requests for guidance, EPA understands that implementation guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. In response to the request for flow charts or tables in the final rule, EPA intends on utilizing rule guidance and training to support final rule implementation.

Commenters offered additional suggestions for the final rule's LSLR provisions (e.g., LSLR plan, mandatory and goal-based LSLR replacement rates, customer-initiated LSLR, requirements after an LSL disturbance, private property considerations, concerns about partial replacements, customer refusals or non-response). For EPA responses to these comments, please see the relevant comment responses below. For discussion of small system flexibilities for LSLR see the comment response Section 7. In response to comments requesting editorial changes and clarification, EPA has revised portions of §141.84 as appropriate.

6.2 LSLR Plan

General Comments on LSLR Plans

Summary of Comments

Several commenters expressed general support for the requirement that all water systems with LSLs in their distribution system must create an LSLR plan, and some expressed support for the proposed contents. These commenters cited the benefits of a strategy to provide information and a pitcher filter before LSLR, as well as reinforcement of the idea that LSLR is the best long-term solution for reducing the risk of elevated lead in drinking water. One commenter supported the proposed requirement that the LSLR plan be developed by the rule compliance date of three years after promulgation, "to ensure that the plan is complete in the event they [the PWS] trigger LSLR at the effective date of the rule." One commenter recommended that the LSLR plan include a description of how service line material compositions are identified as well as justification for why the recommended goal LSLR rate is appropriate given the system-specific factors, such as financial or legal factors. Some commenters expressed concern that years may pass between when the LSLR plan is developed and approved by the state and when it is actually used, depending on if and when the water system exceeds the lead trigger or action level, such that the LSLR plan out of date by the time it is used. One commenter incorrectly interpreted the proposed rule as requiring development of the LSLR plan only after a system's 90th percentile lead level exceeds the lead trigger level of 10 µg/L.

Other commenters had concerns that an LSLR plan would be "put on a shelf" after it is created, rather than be used to "advanc[e] lead service line replacement prior to exceeding the trigger or action level…" One commenter expressed a related concern that the proposed rule does not provide enough incentive for proactive LSLR and instead reduces the incentive for proactive LSLR by taking away LSLR resources to comply with other rule provisions.

One commenter said that systems without LSLs should not be required to create an LSLR plan, and asked for clarification if systems with unknowns must create an LSLR plan. Another commenter asked for clarification about how systems could create an LSLR plan where the entire service line is customer-owned. Another commenter said that the LSLR plan could become an "identification plan" if the inventory has several lead status unknown service lines.

Several commenters requested that EPA provide more general guidance on what level of detail the LSLR plan should contain and how long it should be.

Another commenter pointed out that the state will have the opportunity to review the plan before LSLR begins, minimizing potential implementation issues and reducing state burden with the consistency of regulatory requirements across PWSs regardless of size.

Agency Response

The final rule retains the proposed requirement for all water systems with LSLs or lead status unknown service lines to create an LSLR plan. EPA determined that LSLR plans are critical because they require water systems to consider its logistic, cost, communication and coordination needs before the system is required to implement LSLRs due to trigger level exceedance (TLE), ALE or a customer-initiated LSLR. This will allow water systems to quickly implement goal, mandatory, or customer-initiated LSLR and the associated required education and notification in the LCRR. As some commenters were unclear which water systems are subject to the LSLR plan requirement, EPA added regulatory text more clearly specifying that all water system with LSLs, galvanized requiring replacement, or lead status unknown service lines in their inventory must create a plan, regardless of their 90th percentile lead level. The plan will ensure that all applicable systems have a strategy to investigate potential LSLs and to replace known lead or galvanized requiring replacement service lines. EPA agrees that systems without any known or potential LSLs or galvanized requiring replacement service lines should not be required to create an LSLR plan as those systems would never need to implement such a plan. Further, community water systems (CWSs) that serve 3,300 or fewer people and all non-transient non-community water systems (NTNCWSs) are not required to recommend a goal LSLR rate in their plan because they are not required to conduct goal-based LSLR under the final LCRR.

EPA finds that an LSLR plan is vital to a well-operating LSLR program. In the previous rule, water systems that begin mandatory LSLR can face challenges meeting the annual LSLR rate because they must determine the technical, logistical, and financial details of LSLR while simultaneously conducting enough replacements to meet their LSLR rate. By requiring the plan to be completed by the rule compliance date, EPA is ensuring that water systems will be ready to implement an LSLR program immediately should they exceed the trigger or action level. This was supported by some commenters of the proposal. In the final rule, water systems at any 90th percentile lead level must also replace LSLs should customers initiate the LSLR. The water system must make a good faith effort to coordinate simultaneous replacement of its portion of the service line, and if that is not possible, the water system must replace its portion of the LSL as soon as practicable but no later than 45 days. If they system fails to meet that deadline, it must notify the state within 30 days and complete the replacement no later than 180 days of the original customer replacement. Thus, one important goal of the LSLR plan is to facilitate system compliance with the good faith effort requirement to coordinate simultaneous replacement. If is not possible, the LSLR plan will ensure that water systems at or below the lead trigger level, including small systems defined in the final LCRR as systems serving 10,000 people or fewer, can comply with the other applicable time frames for replacement of the system's portion of the LSLR when customers initiate LSLR.

To address comments regarding the appropriate length of the LSLR plan, EPA added the following text to §141.84(b): "The lead service line replacement plan must be sufficiently detailed to ensure a system is able to comply with the lead service line replacement requirements in accordance with this section." Water systems may make the LSLR plan as short or long, or as general or detailed, as they need, so long as the minimum content requirements are included and the plan contains sufficient detail to ensure implementation of the plan.

Some commenters expressed concern that the LSLR plan would be less useful to water systems if it were to simply "sit on a shelf" unused, especially given that water system circumstances may change from the time the LSLR plan is created to the time where it needs to be used. EPA notes that the final rule has LSLR requirements for water systems regardless of 90th percentile lead level, such as a strategy for service line materials investigation or procedures which apply to customer-required LSLR, making it likely that the LSLR plan will not sit on a shelf but rather be used immediately and with regularity. EPA acknowledges that some LSLR plan components may change over time due to changing circumstances. EPA encourages water systems to update their LSLR plan as necessary. EPA notes that while implementation of the contents of the LSLR plan is not enforceable (except the extent the plan includes the regulatory requirements), water systems stand to benefit from improved LSLR efficiency and ability to achieve full compliance with the regulatory requirements for LSLR by self-implementing the procedures set in the LSLR plan.

EPA disagrees that the proposed rule requirements reduced the incentive for proactive LSLR by requiring resources to be redirected from LSLR to comply with other rule provisions. EPA notes that creating an LSLR plan can facilitate LSLR because the water system will have planned for the logistical, financial, and technical operating procedures for LSLR, which in effect reduces the burden of conducting proactive LSLR.

The LSLR plan requirements still apply where systems don't own any part of the service line because the LSLR requirements of the LCRR also apply to those systems. In response to the commenter requesting clarification regarding this scenario, EPA highlights that creating an LSLR plan may be even more important for these systems, given the potential need for increased planning and coordination with the owners of the LSLs. For example, the plan's funding strategy to assist customers with paying for LSLR may require more planning and investigation of funding resources. Water systems could investigate the use of rate revenue, as well as grants or loans, to help customers pay for LSLR. Additionally, the plan would still outline procedures for conducting LSLR, as ownership of the service line by the customer does not relieve the system from the LSLR requirements that apply in the event of an ALE until the system has no remaining lead status unknown service lines in its inventory *and* the system obtains refusals to conduct full LSLR or non-responses from every remaining customer in its distribution system served by either a full or partial LSL, or a galvanized requiring replacement service line (see § 141.84(g)(7) of the final rule). Further, CWSs serving over 10,000 people must include a goal LSLR rate in the plan because LSLR is required in the event of a TLE, which also applies regardless of service line ownership. This is not a comprehensive list of requirements nor guidance to these water systems where the service line is owned solely by the customer but is intended to illustrate the ways in which the LSLR plan requirements are still applicable to systems with this ownership scenario.

Regarding requests for guidance for creating the LSLR plan, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

One commenter was concerned that PWSs "will need to develop [LSL] removal plans before states have primacy and will be in a position that they will be willing to discuss plans." EPA notes that LSLR plans themselves are submitted to the state but are not subject to state approval, only the goal LSLR rate within the plan.

LSLR Plans for Small Water Systems

Summary of Comments

Several commenters agreed with the proposal that small water systems should not be exempt from creating an LSLR plan. Commenters cited the benefits of an LSLR plan, such as allowing a small system to prepare to begin LSLR promptly after a lead TLE or ALE, which will facilitate the execution of an LSLR program. Commenters also noted that having an LSLR plan in place may set up small systems to execute a voluntary LSLR program even when not exceeding the lead trigger or action levels.

Conversely, some commenters recommended that small water systems be exempt from the requirement to develop an LSLR plan because they may choose a compliance option other than LSLR if they exceed the lead action level. Another commenter said that small systems with reasonable knowledge of no LSLs based on year of construction, with historical lead levels below 5 µg/L, should not have to prepare an LSLR plan. A few commenters thought that small water systems should have extended time for completing the plan, submitting it to the state past the final rule compliance date.

Agency Response

Some commenters stated that small water systems should not have to create an LSLR plan because it is too burdensome and potentially unnecessary given they may not pick LSLR as their compliance path under small system flexibility. EPA agrees with commenters that said small systems should not be exempt from creating the LSLR plan as it will facilitate LSLR should they elect LSLR as a compliance option. Additionally, having an LSLR plan in place should help inform the system's evaluation of the small system compliance options. EPA also notes that even if a small water system chooses POU or CCT under the small system flexibility provision (see response to comment Section 7), it is still required to conduct LSLR when a customer initiates replacement of the portion that they own. It is essential that small water systems complete their LSLR plan by the rule compliance date, given they might be conducting customer-initiated LSLR in the first year of rule implementation. An LSLR plan also sets up small water systems for executing proactive LSLR, if they choose to do so. Uniform LSLR plan requirements minimize burden on states by avoiding the need to track different requirements for systems of various sizes, especially if a water system gains or loses customers and changes size classification. EPA clarified in the rule text that although all water systems with known or possible LSLs must develop an LSLR plan, only CWSs that serve over 10,000 persons must recommend a goal LSLR rate with the state, as this rule provision does not apply to small systems. All other LSLR plan requirements apply to small water systems.

The final rule includes a provision that water systems of any size, including small systems, need not create an LSLR plan if they have no LSLs, galvanized requiring replacement, or lead status unknown service lines in their inventory. EPA disagrees that historical lead levels should determine whether a system should create an LSLR plan. Small water systems must comply with other rule provisions, such as having a strategy for investigating lead status unknowns, as well as completing customer-initiated LSLR, which apply regardless of 90th percentile lead levels. As mentioned above, an LSLR plan can help small systems evaluate their compliance options should their lead levels increase.

LSLR Prioritization in the LSLR plan

Summary of Comments

Several commenters stated that the LSLR plan should include LSLR prioritization criteria. Commenters believe that a prioritized approach to LSLR will target exposure reduction most effectively and allow faster response because LSLR priorities would have already been identified during earlier planning. Two commenters disagreed with this notion, stating that PWSs should not be required to describe in their plan how LSLR will be prioritized because it may require extensive analysis and may be subject to change over time.

Many commenters provided suggestions on how to prioritize LSLR, including targeting areas where large numbers of LSLs are present in the inventory and where lead tap and water quality parameter sampling data indicate high lead levels; conducting LSLR in areas where construction work is already scheduled and in coordination with emergency repairs; targeting areas that serve susceptible populations, such as daycares, schools, and medical facilities; targeting areas with older infrastructure; and using socioeconomic data to target areas where there are potential environmental justice communities. Another commenter suggested collaborating with stakeholder groups to develop prioritization criteria.

Several commenters recommended that EPA create a tool, develop a set of ranking criteria, or simply provide general guidance for prioritizing LSLR. Some of these commenters expressed concern that, without EPA guidance, the burden of reviewing water system criteria in LSLR plans would fall on the states. Several other commenters stated that a simple narrative providing general LSLR priorities would be sufficient for purposes of the LSLR plan.

Another commenter requested that EPA provide funding for LSLR and stated "…there should be explicit language in the revisions that require water systems to prioritize equity in their approach to LSLR" to avoid disproportionately impacting minority and low-income communities.

Agency Response

EPA agrees with commenters who stated that an LSLR prioritization strategy should be included in the LSLR plan and has included the requirement into the final rule. The water system can prioritize LSLR based on factors of its choosing, such as cost efficiency (*i.e.*, prioritizing LSLR where main replacement is occurring to make LSLR more affordable for the system and customers), as long as one of the factors includes targeting replacements for disadvantaged consumers and populations most sensitive to lead. The water system may, for example, begin its LSLR program by first replacing LSLs at any schools or childcare centers served by an LSL, as well as residences served by children or other vulnerable populations. This new requirement benefits public health by targeting LSLR where, for example, the people consuming the water are especially impacted by the health effects of lead in drinking water. It also benefits the water system by facilitating prompt implementation of their LSLR program, as they will have planned where they will begin their replacement efforts should they exceed the trigger or action levels. In addition to using the prioritization strategy when conducting LSLR after a lead TLE or ALE, the prioritization strategy may also be used in proactive LSLR should the water system choose to conduct proactive LSLR. The LCRR does not require water systems to collaborate with stakeholder groups to develop prioritization criteria, however, EPA agrees with commenters who stated that these groups may provide important input to how LSLRs should be prioritized and encourages water systems to involve communities in the development of these LSLR prioritization plans.

Some commenters called for EPA to designate LSLR priorities or create a tool to reduce state burden to review and approve individual water system priorities in their LSLR plans. EPA disagrees, noting that LSLR programs and priorities should be designed to address each individual community's specific needs within the limits of the rule, which requires one of the factors in the prioritization strategy to be "targeting of lead service line replacement for disadvantaged consumers and populations most sensitive to the effects of lead." For example, one community may serve a large number of schools and childcare facilities in its service area and choose to prioritize those locations for LSLR to reduce lead exposure in children's drinking water. Other communities may have recently conducted partial LSLR and wish to begin their LSLR completing those partial replacements. Other communities may be recipients of local, state, or federal grants or loans for LSLR that require specific criteria be met to use the funds that they would like to adopt into their LSLR plan prioritization strategy. EPA notes that there may be several other specific circumstances individual to a water system that could not be captured in a national regulation. EPA is therefore maintaining that aside from the minimum criteria specified in the final rule, water systems set their own LSLR priorities in their LSLR plan.

In response to public comments, EPA added a requirement for the LSLR plan requiring water systems to consider a strategy for funding LSLR where the customer wishes to replace the customer-owned LSL but is unable to afford the work. Nothing in this provision or anything in the final rule obligates the water system to pay for replacement of a customer-owned LSL. Water systems have flexibility in how they approaches their strategy, however EPA recommends water systems investigate using internal water system funding sources and external LSLR funding sources, such as EPA State Revolving Funds (DWSRFs), WIFIA Program, (WIIN Act of 2016 grant programs, Community Development Block Grants from Housing and Urban Development, and additional federal, state and local funding sources that could be used to assist customers pay for LSLR. Water systems may also choose to prioritize environmental justice communities for LSLR in the LSLR plan.

Pitcher Filter Tracking and Maintenance Plan

Summary of Comments

Several commenters disagreed with or asked for clarification regarding the proposed requirement that LSLR plans include a pitcher filter tracking and maintenance program. One commenter indicated that filter tracking and maintenance is unnecessary for short-term (up to 3 months) use because there would be nothing to track over time. A few commenters recommended that water systems simply be required to document that a pitcher filter was delivered, subject to review by the state.

Agency Response

Several commenters sought clarification about the proposed pitcher filter "tracking and maintenance plan" within the LSLR Plan. EPA's intent for this provision was for water systems to build a system to track which households have received a pitcher filter and when they are due for replacement filter cartridges. In light of comments on this issue, EPA determined that such a plan is not necessary because many water systems will simultaneously deliver the customer's pitcher filter, all replacement cartridges, and the associated public education, and therefore would not have to track cartridge replacements over time. This requirement has been removed from the final rule.

Other Comments Regarding LSLR Plans

Summary of Comments

One commenter recommended that the LSLR plan include the basis for the water system's inventory, including how uncertainty was considered in assigning pipe materials.

One commenter recommended that the LSLR plan include a communication strategy with customers with known or potential LSLs.

One commenter suggested rather than requiring water systems to develop a funding strategy for LSLR in its LSLR plan, it be required to pay for replacement of both the system-owned and customer-owned LSLR. Another commenter said that while full LSLR are preferable to partials, it is unclear how the financial burden of replacing the customer-owned side will be overcome.

Another commenter noted that replacing LSLs will lead to a sharp increase in demands for new service lines, increasing the price of purchasing new service lines. The commenter continued, saying that the rule should also add a section outlining the requirements for these service lines, including testing for what exact materials the service lines are composed of and its efficiency.

Agency Response

EPA disagrees that the replacement of LSLs will cause the price of pipes to significantly increase as a result of heightened demand. When the final rule is in effect, water systems will be required to conduct LSLR when there is an exceedance of the trigger level or action level, therefore, not all systems will be conducting LSLR at the same time. Additionally, given the wide range of options for service line material (i.e., copper and various types of plastics), demand will be dispersed across many products.

EPA disagrees that the final rule should require replaced service lines to undergo "testing for what exact materials the service lines are composed of and its efficiency," noting that the Reduction of Lead in Drinking Water Act and recent rulemaking by EPA (USEPA, 2020a) requires new plumbing products used in drinking water systems to meet the definition of lead-free, and the vast majority of products will be third-party certified as such. In addition, many states or municipalities require drinking water systems to conform to plumbing codes which may require additional specifications.

EPA agrees that water systems with many unknowns in their inventory would benefit from a plan to investigate service line materials. Therefore, EPA has added a requirement to the LSLR plan for water systems to develop a strategy to investigate unknowns. For comments about the inventorying of customer-owned service lines, please see response to comment Section 5.3. For more information regarding publishing inventory development methods and techniques, please see response to comment Section 5.4.

One commenter recommended that the LSLR plan include the basis for the water system's inventory, including how uncertainty was considered in assigning pipe materials. EPA agrees, noting that inventory development is directly linked to LSLR outcomes, and has added a requirement that the LSLR plan include a strategy for identifying lead status unknown service lines. EPA does not believe it is appropriate for the basis of each individual service line material identification to be included in the LSLR plan. For more information see response to comment Section 5.4.

EPA disagrees that the LSLR plan should include a communication strategy with people served by a service line known to contain lead or a lead status unknown service line because the communication requirements are outlined in the rule text under § 141.85(e). The LSLR plan components only include rule requirements related to LSLR, such as a strategy or notifying customers before a full or partial LSLR, and does not include reference to unrelated provisions in the LCRR. For EPA's response to comments on the requirement to notify persons served by an LSL, please see response to comment Section 8.3.

As part of the LSLR plan, the proposal required water systems to submit a state-approved goal LSLR rate by the rule effective date. Commenters noted a timing discrepancy, as states would not receive primacy for the LCRR final rule until three years after promulgation, so they would be unable to approve the LSLR goal rate until after the rule compliance date. EPA revised the final rule to require water systems to submit a recommended goal rate with the LSLR plan, and states will have six months to review and approve the goal rate or designate an alternative goal rate. For more information about the goal rate please see response to comment Section 6.7.

EPA disagrees that water systems should have to include justification, such as legal or technical, for its recommended goal rate in the LSLR plan. EPA does not believe it is necessary for to require water systems to conduct detailed legal or technical analyses to recommend a goal rate to the state. The state may request this information if it needs more information to evaluate the system's recommendation.

For more information about funding LSLR, see response to comment Section 6.1.

6.3 Types of Service Lines that Apply to Goal/Mandatory LSLR Rates

Inclusion of Galvanized Pipe in LSLR Rates

Summary of Comments

Several commenters indicated that galvanized service lines should not be considered LSLs and, therefore, should be excluded from inventories and LSLR requirements. One such commenter stated they "do not believe that they represent nearly the same level of adverse health impacts as LSLs…" One commenter stated they are "not clear on the reason why galvanized lines pose a sufficient risk as to warrant replacement but do not warrant including in the Tier 1 sample pool." Another commenter stated that focus on galvanized lines could dilute efforts to replace LSLs. Another commenter recommended that galvanized service lines be replaced, but not considered LSLs. One commenter stated that galvanized service lines are likely to be concentrated in lower income areas that "do not have the funds, or the desire, to replace their lines."

Two commenters expressed support for the "Michigan Rule," referring to Michigan's updated LCR, which like the proposed rule, requires replacement of galvanized service lines if the service line is or was downstream of lead piping (Michigan EGLE, 2019). One commenter said that galvanized service lines should be replaced if they were connected to lead piping, not just downstream of one. Another commenter requested clarification if a lead gooseneck connected to a galvanized line is considered an LSL. One commenter said that at their water system, all galvanized service lines are replaced at no cost to the customer and regardless of whether or not it was connected to an LSL, due to the poor condition of these service lines.

Agency Response

EPA determined that galvanized service lines that are or ever were downstream of an LSL require replacement. EPA is aware of the science that demonstrates galvanized service lines can adsorb lead particles from upstream lead sources and can contribute significant lead in drinking water. This potential lead exposure warrants a requirement in the final rule to be replaced as LSLs are. Coupling LSLs and these galvanized lines together with similar replacement requirements is efficient as water systems can engage the customer in similar ways and coordinate replacement using the same protocol in their LSLR plan. Thus, EPA has retained this structure for the final rule. While these "galvanized requiring replacement" service lines must be replaced, they are not treated as LSLs in the inventory or tap sampling tiering requirements. For more information about tap sampling and galvanized service lines please see response to comment Section 9.2. EPA is not requiring replacement of galvanized service lines that are or were downstream of a lead gooseneck. For more information, please see response to topic 5.3.

EPA agrees that including galvanized requiring replacement service lines into LSLR programs might slow replacements of pure lead lines. As mentioned above, however, these lines can contribute significant lead into drinking water and warrant replacement. Additionally, coupling these two types of service lines into one replacement program has efficiency benefits. The final rule maintains the proposed inclusion of galvanized requiring replacement service lines as part of a systems LSLR program for these reasons.

EPA disagrees that any galvanized service line connected to an LSL, regardless of whether it was upstream or downstream, should require replacement. EPA is not aware of any evidence that galvanized lines upstream of an LSL can contribute lead in drinking water from adsorbed particulate lead released from the LSL. For more information about how galvanized service lines can contribute lead into drinking water if they are or were downstream of an LSL, please see response to comment Section 5.3.

Inclusion of Lead Status Unknown Service Lines in LSLR Rates

Summary of Comments

Several commenters indicated that lead status unknown service lines should not be included in calculations of mandatory or goal-based LSLR requirements. Including unknowns, some commenters said, could set an unrealistic annual LSLR rate for some systems. One commenter said that unknowns that are determined unlikely to be LSLs should not be included in the LSLR rate. Other commenters recommended, instead, that if a water system investigates an unknown service line and determines it is not made of lead, then it should count as a replacement under the goal and mandatory LSLR rates. One commenter said that if investigation of unknowns are not counted towards the LSLR rate, water systems could fail to comply with the LSLR rate because they may not be able to find enough unknowns that are found to be LSLs to count towards the LSLR rate. One commenter said EPA should develop an "opt-out" mechanism for water systems with many unknowns which are unlikely to be LSLs. Another commenter said EPA should incorporate a "safe harbor" provision to prevent the water system from having to investigate all its unknowns in one year, such as designating that the investigation of two lead status unknown service lines as equivalent to one LSLR. Some commenters supported the inclusion of lead status unknown service lines in the calculation of LSLR requirements because it provides an incentive for water systems to conduct a full service line inventory and will be most protective of consumers.

Agency Response

EPA disagrees with commenters requesting that lead status unknown service lines be excluded from calculations of mandatory and goal-based LSLR requirements or providing an opt-out mechanism or safe harbor provision. Excluding lead status unknown service lines in determining the mandatory LSLR rate would disincentivize the water system from creating a robust initial inventory or investigating lead status unknown service lines over time. Under a rule structure where unknowns are excluded, water systems would be incentivized to leave vast portions of service connections inventoried as "lead status unknown" to minimize LSLR burden should the water system exceed the lead trigger or action level. This would be at the detriment of consumers who would continue to be exposed to lead from unknowns that are actually LSLs when the system is required to conduct under a goal-based or mandatory LSLR program. EPA also disagrees that the rule will result in systems with many unknowns unable to conduct the number of required replacements should they exceed the lead trigger or action level. Water systems must include a strategy for identifying unknowns in their LSLR plan and therefore, EPA expects over the course of normal operations that systems will improve and update their inventories, thus reducing the number of lead status unknown service lines over time.

EPA disagrees with commenters that suggest verification of a lead status unknown service line to be non-lead should count as a replaced LSL. While EPA values system efforts to identify service line materials, providing replacement credit for investigating lead status unknown service lines would be counterproductive to full LSLR goals – to permanently remove a significant source of lead in drinking water. This is consistent with the final rule requirements that eliminate counting test-outs and partial LSLR towards the full LSLR replacement rates. If EPA were to allow replacement credit for investigating unknowns, a water system could theoretically comply with LSLR requirements without conducting a single or a meaningful number of full LSLRs. Additionally, this may incentivize the water system to wait to update their inventory until the lead trigger level or action level is exceeded, allowing them to comply through material investigations instead of making a good faith effort to conduct full LSLR. Commenters who expressed concern that many unknowns in the inventory could make it difficult to find LSLs to replace and thus meet the LSLR rate may solve that problem through robust inventory development efforts over time. Using best professional judgement or a statistical method to determine where LSLs are more likely to be located can be beneficial to ensure that inventory and replacement efforts are most efficient.

EPA also affirms that, contrary to suggestions made in some comments, water systems are in fact rewarded for verifying the material of lead status unknown service lines. While they don't receive LSLR credit for material investigations, water systems can reduce the number of households that must receive the annual public education regarding LSLs and the potential number of LSLRs required if the system exceeds the action level by demonstrating lead status unknown service lines are non-lead. This incentivizes water systems to regularly update the inventory over time as a strategy to decrease the LSLR burden should it exceed the lead action level.

Inclusion of Customer-Owned Service Lines in LSLR Rates

Summary of Comments

Commenters suggested that because customer-owned LSLs are outside of system control, they are the customer's responsibility and there should be no requirement for the water system to replace them. Several commenters indicated that partial LSLR should count toward the LSLR rate. These commenters cite concerns about complying with LSLR rates should the customer be unwilling or unable to replace the portion he or she owns. One commenter recommended that partial LSL replacements count toward the replacement goal in two scenarios: "(1) Replacing private LSLs from previously conducted partial LSL replacements; and (2) Replacing the public side of an LSL due to unresponsive or recalcitrant homeowners. In the case of an unresponsive homeowner, a water system must reach out to the homeowner at least twice in two different ways (for example, some combination of mailing, doorhanger, or phone call)."

Two commenters expressed support for EPA's proposal to revise the previous LCR to require full LSLR.

One commenter requested clarification if conducing an LSLR on the customer side where a past partial occurred, asking if the replacement under that scenario counts as a full LSLR or partial LSLR.

One commenter requested that EPA require water systems to demonstrate that they replaced the system-owned and customer-owned LSL at the same time, as they could theoretically replace them as far as a year apart and still get full replacement credit while consumers could be served by a partially replaced LSL for an extended period of time.

Agency Response

EPA disagrees that customer-owned service lines should not be included in the LSLR rates if they are outside the system's control. EPA notes that the existing rule has many requirements that apply regardless of ownership status, such as § 141.84(b) (i.e., developing an LSLR plan) and § 141.90(e)(1) (i.e., submitting the LSLR inventory to the state). These requirements are critical to mitigating the risk of lead in drinking water because system actions can impact lead release from customer-owned service lines despite potentially being outside of system control. The final rule retains the inclusion of customer-owned service lines in LSLR rates.

Regarding the situation where a partial replacement of the water system-owned LSL was conducted in the past leaving in place the customer-owned LSL, EPA considers the subsequent replacement of the remaining customer-owned LSL to be a full LSLR because it fully replaces the LSL at the connection. EPA clarified its intent by adding definitions for full LSLR and partial LSLR in the final rule.

EPA does not agree that a water system should have to prove that it replaced the customer- and system-owned LSL simultaneously to receive replacement credit. Due to the increased costs to perform two separate replacements, as opposed to combining them, EPA expects water systems will try to coordinate LSLR as much as possible. Furthermore, the final rule includes notification and risk mitigation procedures to ensure consumers are informed and protected after partials are conducted in the event the customer- and system-owned portions are replaced at different times.

Regarding LSLR of customer-owned service lines when customers are unresponsive or decline to participate, EPA has included provisions to account for unresponsive customers. See response to comment Section 6.11.

Inclusion of Lead Goosenecks, Pigtails, And Connectors (Connectors) in LSLR Rates

Summary of Comments

Two commenters stated that replacement of lead connectors should count toward LSLR rates because they are a source of lead in drinking water and water systems should receive credit for efforts to remove them.

Agency Response

EPA agrees that lead connectors can contribute lead into drinking water but disagrees with commenters who requested that their removal count as an LSLR after a TLE or ALE. EPA determined that, given the requirement that they be replaced when encountered by the water system at any time, counting their replacement towards LSLR rates could reduce the number of LSLs replaced in LSLR programs. For example, every lead connector replaced during a planned main replacement may leave in service an LSL, which would have otherwise been replaced while the system is considered in compliance with the LSLR requirements. EPA has responded to other related comments in the Section 6.4 and 5.3.

6.4 Lead Connector Replacement When Encountered

Summary of Comments

Many commenters agreed that lead connectors should be replaced as they are encountered, with one commenter noting this is an existing practice for their water system. A few commenters did not agree with this proposed requirement. One commenter suggested replacement of lead connectors should be made voluntary as they are being treated with the same level of risk as LSLs. In addition, the commenter stated, the proposed rule does not provide tracking or reporting associated with lead connector replacement, which would make implementation more difficult and ineffective.

Commenters noted that because these pipes can leach lead into drinking water, they should be replaced as part of water systems' LSLR programs. Some commenters recommended that removal of lead connectors count as an LSLR for the purposes of goal and mandatory LSLR as described under proposed requirements in §141.84(f) and §141.84(g), respectively.

One commenter requested that EPA maintain a separate definition for lead connector and LSLs in the final rule. Some commenters requested guidance or clarification on the definition of a lead connector. Commenters also asked that EPA define the maximum length of a connector before it is considered an LSL. Additionally, some commenters stated that only replacing a lead connector may be considered a partial LSLR, which is prohibited within some state regulations (e.g., Michigan, Ohio). A commenter noted that lead goosenecks are counted as LSLs for purposes of the inventory in the State of California.

A commenter suggested that the risk mitigation procedures following a lead connector replacement were overly stringent "given the low-level risks associated with lead goosenecks."

A commenter suggested clarification about the proposed requirements for customer-owned lead connectors.

EPA Response

EPA agrees that lead connectors can be a source of lead in drinking water and disagrees that their removal should be voluntary when encountered during water system activities. Because connectors are typically owned by the water system and can be replaced at relatively low cost when done in coordination with other distribution system work, the final rule requires water systems to take advantage of the opportunity to remove this source of lead from drinking water infrastructure. EPA also disagrees that their replacement should contribute towards LSLR rates. Given the proposed requirement to remove lead connectors whenever encountered under § 141.84(c), including replacement of lead connectors in goal or mandatory LSLR programs could result in less lead being removed from the distribution system. Presuming the replacement of lead connectors in coordination with other activities would occur regardless, counting their replacement towards the water system's LSLR rate could leave in place an LSL that would have been scheduled for replacement at a different location. Furthermore, while connectors typically do not exceed a foot and a half in length, LSLs can be tens of times longer than connectors, suggesting they have a much higher potential to contribute to lead into drinking water. Thus, EPA is retaining the proposed lead connector removal requirements for the final rule, excluding them from the LSLR requirements but mandating they be removed whenever encountered during water system activities. EPA notes that if a lead connector is attached to an LSL replaced under § 141.84(f) or (g), the lead connector will be required to be simultaneously removed under § 141.84(c).

In response to comments requesting guidance or clarification on the definition of a lead connector, including the maximum length before a lead connector is considered an LSL, EPA is aware that connectors are generally a foot to two feet in length; however, the definition EPA included in the proposal emphasizes function over length as the defining feature of connectors. Specifically, EPA proposed that goosenecks, pigtails, and connectors are "used for connections between rigid service piping." Further, the final rule definition of a partial LSLR excludes the replacement of only a lead connector.

EPA does not consider removal of a lead connector attached to an LSL to be a partial LSLR. EPA agrees, however, that removing a lead connector and leaving a downstream LSL in place can cause an LSL disturbance that causes increased lead levels in drinking water. The final rule therefore includes many of the same risk mitigation procedures after replacement of a lead connector as required after a partial LSLR. These procedures include consumer notification, flushing, and filter delivery. EPA recognizes, however, that some states may define a lead connector as part of the service line, and ban all partial LSLR. Section 141.84(c)(6) of the final rule includes new text stating that "the requirements of 141.84(c)(1), (2),(3), and (5) do not apply if state law includes lead connectors in the definition of lead service lines, prohibits partial lead service line replacements, and requires systems to remove all lead service lines irrespective of a system's 90th percentile lead level." This will ensure that water systems can remain compliant with federal and state law, while ensuring that consistent progress is made towards the replacement of lead connectors over time. For more information, please see response to comment Section 6.4.

The final rule retains the proposed requirement for water systems to offer to replace customer-owned lead connectors. Because water systems do not control customer-owned lead connectors, they are not required to replace the connector should the customer refuse the replacement, nor is the water system obligated to pay for the replacement of a customer-owned lead connector.

The final rule includes a requirement for systems to periodically certify to the state it conducted replacement of any encountered goosenecks, pigtail, and connectors and therefore, EPA does not agree with the comment that the proposed rule does not provide reporting associated with lead connector replacement. Because the reporting requirement includes a certification requirement, it is expected that water systems will implement the requirement in such a way as to enable the system to make the certification using, for example, a standard operating procedure or a tracking system.

For more information about lead connectors in the final rule, please review response to comment Sections 5.3 regarding their inclusion in the inventory and 6.3 regarding LSLR requirements.

6.5 Customer-Requested LSLR

Summary of Comments

Many commenters expressed broad support for a requirement that water systems complete the LSLR after customers replace their portion. A few commenters said the 45-day timeframe to complete the customer-initiated LSLR is too long, with one commenter recommending 20 days instead. A few commenters said that the 45-day timeframe provides adequate time for the water system to complete the replacement. One commenter said that their water system routinely conducts construction work in response to emergency water leaks, and noted that customer-requested LSLR may have to be characterized as "emergencies" to obtain necessary permits to complete the work in time.

Numerous commenters indicated that while they agreed with the concept of completing a customer-requested LSLR, the proposed deadline of 45 days was too stringent. Commenters noted that many states and localities have construction moratoriums during winter months, which would make this LSLR during these months infeasible. Moreover, many commenters stated there could be other factors beyond the water system's control that could also make compliance with the 45-day requirement challenging. Some factors provided by commenters included weather-related delays, coordination of construction or street excavation efforts, obtaining replacement parts, safety issues, and local permitting requirements. Furthermore, some commenters noted that systems using contractors may require longer than 45 days to complete the replacement due to the process for bidding and awarding of contracts. One commenter said EPA did not provide justification for choosing a deadline of 45 days. A few commenters said 45 days should be a goal, not a deadline. Commenters suggested alternative deadlines to complete the LSLR of 2, 3, 4, 6, and 12 months as more appropriate. One commenter recommended EPA conduct a pilot program for different municipalities to determine the average time it takes to complete an LSLR. Another commenter suggested the final rule should have no deadline, instead basing compliance off a water system having a protocol for coordinating timely replacement, with records available upon request showing how long the water system took to complete LSLRs. A commenter suggested allowing systems, in coordination with the state, to develop a plan within 45 days to eventually replace the LSL, should seasonal or other issues cause delays. Another commenter suggested something similar, requiring the LSLR to be completed in 45 days “unless impractical,” which would allow the water system an extension. One commenter suggested tap sampling at the residence should be conducted after the customer-replacement, requiring the LSL to be replaced within 45 days if the sample exceeds the lead action level, with a longer timeframe for service lines that test below the lead action level.

A few commenters also expressed concern that there may be a surge in customer requests for LSLR following the release of the public LSL inventory, making compliance with this requirement more difficult. Several commenters asserted that water systems should instead have an established protocol within their LSLR plan, practical to the specifics of that system and agreements with customers, for timely replacement of the water-system owned portion of the LSL when a customer replaces their portion of the LSL.

Some commenters noted that customers may express their intention to replace their portion of the LSL, but not actually follow through with the replacement. Commenters claimed the proposed rule could be potentially interpreted as requiring the water system to replace their portion after a customer expresses intention to conduct LSLR, without following through and replacing their portion. Commenters recommended EPA amend §141.84(d) to apply if customers provide documentation or other proof, such as a plumbing permit, that the customer portion will be or has been completed in order to avoid partial LSLR should the customer portion remain in place after the system-owned potion is removed.

EPA also received comments stating EPA should provide rationale or clarification of §141.84(d)(5), which states that the water system is not required to complete the LSLR of the system-owned portion if the customer-owned portion of the LSLR occurred more than three months in the past. Additionally, some commenters did not support the three-month timeframe and requested it should be extended or that there be no end date for the water system to replace their portion of the LSL.

EPA received a comment asking what is required “if the existing lead service is of a size that is no longer used, say ½” or 5/8” of the various lead sizes- is the system obligated to replace in kind or must it adhere to its latest requirements. For instance if all new services are to be installed as 1-1/2” in size minimum and the lead service is an older 5/8” lead- what size is the system obligated to install or can the system require the requestor to offset the difference in cost for the upgraded service size?”

A commenter recommended language be added stating that if the customer does not request system-owned service replacement within 30 days of completing their side of the service replacement, the utility shall not have to proceed with the replacement at a higher priority than determined in their LSLR program.

A commenter suggested that water systems should be required to provide filters or an alternate source of water to the consumer until the replacement could be completed.

A commenter said that the rule should not require the water system to conduct LSLR where there are safety issues, such as the LSL entering the foundation of the home through an inaccessible crawlspace. In these situations, the commenter said, the water system should be allowed to replace as much of the line as it can while leaving in place any inaccessible part of the LSL.

A commenter recommended that the final rule should require water systems to maintain records that log its interactions with customers who have reported that they have replaced their privately owned portion of their LSL, and these records should be made available upon request to the state.

A commenter said that conducting LSLR individually in response to customer's request, rather than systematically, could increase the cost of LSLR and concentrate replacements in areas where customers can afford it. The commenter suggested that local governments should develop a plan to prioritize LSLR in areas that serve vulnerable populations. A commenter expressed concern that customer requested LSLR would disincentivize cost-effective LSLR, stating that systems can keep costs down by "coordinating with contractors to do projects at scale" and conducting LSLR during planned capital improvement plans.

A commenter said that water systems should be required to replace all past partials within 45 days of notification, not just those completed within the last three months as proposed. Another commenter said that given the length of time it took EPA to issue the final rule, it would be unfair to proactive customers who replaced their portion of the LSL and would not be subject to the proposed requirements for water systems to complete the replacement if it occurred up to three months in the past.

Agency Response

EPA agrees with commenters that some situations, such as a seasonal construction moratorium, might render a water system unable to complete its portion of an LSLR within 45 days of a customer-initiated LSLR. For the final rule, EPA retained the requirement in §141.84(d)(3) and §141.84(d)(4) that the water system must complete the LSLR within 45 days, with the ability to extend to 180 days upon notification to the state. This will ensure water systems make a timely effort to complete the LSLR, while allowing for additional time should other factors which make the 45-day deadline infeasible. The water system must provide a pitcher or POU filter to the consumer with six months of replacement cartridges to cover the entire time that there is a partial LSLR should the water system need the full 180 days to replace their portion. This addition offers flexibility given the potential for delays caused by factors outside of the water system's control, while ensuring that all customers that replace their portion of the LSLR receive a full LSLR and are protected from elevated lead exposure with a pitcher or POU filter provided at no cost. EPA disagrees with the commenter who suggested there should be no deadline to complete LSLR. In many cases the 45-day deadline will be feasible, and the 6-month extension provides adequate time for all other replacements that may be delayed due to seasonal or other factors. The deadline extension may also accommodate systems that receive a surge of requests for customer-replacement in a short period of time. EPA also recommends water systems engage with customers to coordinate replacement when possible, rather than take a reactionary approach where customers replaces their portion and initiates the deadline for the system to complete the replacement. While EPA encourages customer-initiated LSLR to be completed as soon as practicable, the Agency disagrees that water systems should be required to complete them in less than 45 days, given the potential for factors outside of the water system's control to cause delays, such as weather, permitting, and coordination with other utilities.

EPA disagrees that lead tap sampling should determine the deadline to complete a customer-initiated LSLR, for example mandating that sites that test above 15 µg/L must complete the replacement within 45 days and sites that test at or below may take additional time. Due to the variability of lead levels following a partial LSLR, a one-time sample may not capture representative lead levels at the tap. Additionally, the added costs and time to conduct sampling do not provide the flexibility intended by the commenter. It may take weeks for water systems to coordinate with the customer to visit the site to conduct tap sampling, or to ship sampling materials to customers and await receipt of the sample (provided the customer completes sampling and returns the samples in a timely manner), and then process the sample in a laboratory. Awaiting tap sampling results could make the deadline even harder to achieve, especially when sample results are above 15 µg/L and require the replacement to be completed within 45 days. Furthermore, this regulatory approach would not consider the other factors, such as seasonal delays, that other commenters raised as concerns for meeting the proposed deadline. The final rule, therefore, does not allow an extension based on tap sample results at the customer-initiated LSLR site.

EPA notes that the final rule's LSLR plan requirements already include operating procedures for LSLR as well as other components that can facilitate the timely completion of the customer-initiated LSLR. Establishing these procedures in advance can help the water system meet the 45-day deadline. For example, water systems using contractors to perform the work could attempt to establish contracts ahead of time to prevent having to undergo the bidding and awarding process within the 45-day replacement deadline.

Regarding the provision in §141.84(d)(5) that the water system is not required to complete the full LSLR with the replacement of their portion if the customer-owned LSLR occurred more than three months in the past, the final rule extends the time that water systems must complete past customer-initiated LSLR from three months to six months. The rationale for this change is to account for variable particulate lead release at some homes that may extend more than three months (USEPA, 2011). EPA does not agree with commenters who suggested that water systems must complete the LSLR of any partial replacement that has occurred at any point in the past. Past partials that occurred years before do not warrant imminent replacement due to the stabilization of these pipes over time. Therefore, the purpose of this requirement – to prevent and address those elevated lead levels – would not be served by extending this requirement to any partial replacement that has occurred in the past. Moreover, such a requirement could have the effect of concentrating a water system's LSLR resources in areas where lead levels are relatively lower. The unreplaced system-owned portion will remain in the inventory and eligible for replacement under §141.84(f) and (g).

EPA acknowledges the proposed LCRR could have been interpreted such that customers' intent to replace their LSL could trigger the requirements under § 141.84(d), even if they failed to follow through on their intent. EPA updated the regulatory text in the final rule to clarify that customers must actually replace their service line, or coordinate for simultaneous replacement with the water system, for the system replacement requirements in §141.84(d)(3) and §141.84(d)(4) to apply.

In response to the comment about service upgrades, EPA notes that the final LCRR does not mandate anything in regard to the material (except that it must meet the SDWA definition of lead free) or diameter of the replaced pipe. Instead, state or municipal plumbing codes may dictate these specifications, including those related to customers replacing their portion. The final LCRR also does not include any provision regarding whether customers can be charged for a service upgrade if their replaced pipe diameter is increased as it is not within EPA's authority to regulate how water systems charge for their services. EPA recommends water systems plan for these potential scenarios in their LSLR plan.

EPA disagrees that customers should have to request that the system-owned LSL be replaced, as they may not be aware of the potential for a partially replaced LSL can cause higher lead levels in drinking water. EPA disagrees that after 30 days, the partially replaced LSLs should become lower priority for replacement. Due to the potential for lead levels to remain elevated for months following a partial LSLR, water systems must complete prior partials that have occurred up to six months in the past in the final rule.

In reference to providing a filter or alternate water between replacement of the customer-owned and the system-owned LSL, please see response to comment Section 6.6.

EPA does not encourage LSLR where there are imminent safety issues; however, EPA does not agree with the commenter who suggested a water system would encounter the stated safety issues or inaccessible LSLs, such as in a crawlspace or confined area, in regard to this requirement. The system-owned portion often runs from the water main to the property line or in the customer's yard. The issues raised by the commenter would not apply in regard to customer-requested LSLR.

While EPA agrees that responding to individual customer-initiated LSLR, rather than replacing LSLs exclusively on a systematic basis, could increase the overall cost of an LSLR program, the potential for partial LSLR to cause lead levels in drinking water warrants the completion of a customer-initiated LSLR in a timely manner. EPA recommends water systems investigate ways to increase the efficiency of customer-initiated LSLR, such as conducting other nearby LSLR or service line material investigations for the inventory. EPA agrees that customer-initiated LSLR may occur disproportionately in areas where customers can afford to pay for LSLR. However, the LSLR plan includes requirements for prioritizing LSLR when conducted as part of a goal-based or mandatory LSLR program, as well as creating a strategy for funding full LSLR where the customer is unable to pay for the replacement of their portion. For more information see response to comment Section 6.2.

EPA believes it would create unnecessary burden to require water systems to maintain records of every interaction they had with a customer regarding customer-initiated replacement, and to keep these records available for review by the state. Water systems must certify annually under § 141.90(e)(6) that they have completed all customer-initiated LSLR in accordance with § 141.84(d), which will reduce administrative burden while ensuring this provision is enforceable.

6.6 Post-disturbance/Replacement Protocol

Customer Notification After LSLR and Other Disturbances

Summary of Comments

Commenters had a wide variety of perspectives about post-LSLR notification requirements. Some commenters found the proposed rule's notification requirements for LSLR to be confusing and requested clarification, suggesting some systems may avoid LSLR if not further clarified. A few commenters specifically asked that EPA clarify the definition of "within 24 hours" (i.e., 24 hours before the replacement starts or 24 hours after the replacement is complete). One commenter asked that if the water system is replacing the customer-owned portion of an LSL, the water system should provide more than 24-hour's notice to the customer that the water system is going to be taking actions for which the customer will be held financially responsible. Several commenters indicated that when planned full or partial LSLRs occur, information and filters should be provided prior to replacement. One commenter suggested that because water system repairs occur 24 hours a day, an initial doorhanger or brief notice following a repair could be supplemented with more complete follow-through including instructions for flushing or the provision of a filter within two business days of completing the replacement. Other commenters suggest that notification of risk mitigation measures in the event of an emergency partial LSLR within 24-hours should be extended to 3 days.

Some commenters requested clarification regarding which LSL disturbances trigger which required notifications and actions. Specifically, commenters asked for clarity on if a water main shutoff could trigger risk mitigation provisions to individual LSLs connected to the affected main, given the risk mitigation measures required after water is shut off at an individual LSL. Commenters stated that some disturbances, like the repair of water mains, valves, and hydrants, do not warrant public education because they do not dry out the LSL nor scour lead scales. Several commenters said that changing the water meter does not often result in a significant disturbance to the service line because the meter can be removed from the meter setter without cutting into the pipe. Additionally, commenters requested clarification about the applicable rule requirements when a disturbance occurs at a customer-owned service line inventoried as lead status unknown. One commenter asked for clarification about notification and filter requirements if a lead gooseneck is removed and a copper service line remains.

Some commenters requested that EPA cite ANSI/AWWA C810-17 (ANSI, 2017) as the required flushing protocol for LSLR. Other commenters suggested that EPA should not include the requirement for systems to supply flushing instructions during every temporary water shut off because of the associated burden. They suggested that EPA could allow water systems to provide alternative methods of outreach (e.g., publishing information on the actions to be taken during a water shut-off on the system LSL inventory webpage or through annual outreach materials).

Agency Response

For the final rule, EPA clarified the types of service line disturbances that would require public education and risk mitigation. As some commenters interpreted the proposed rule as triggering risk mitigation provisions at service lines connected to a main whose water has been shut off, the final rule specifies that disturbances include water being shut off at an individual LSL.

EPA agrees with commenters who described the variety of water meter configurations that could potentially lead to different degrees of LSL disturbances. For the final rule, EPA updated the final rule to require risk mitigation steps that involve a filter be restricted to changing the water meter setter or an inline meter; whereas, changing a tandem water meter with a bypass line would only trigger public education and flushing because it is less likely to cause a disturbance. The final rule takes a more cautious approach for inline water meters and requires a filter upon replacement due to the potential for more direct physical disturbance to the LSL.

Some commenters requested clarification about the time requirements to notify customers about various LSL activities. In the proposed rule, planned partial LSLRs would require notification of the customer at least 45 days before the planned replacement is scheduled to take place. For partial LSLRs that occur unexpectedly due to an emergency repair, a water system would be required to notify the customer within 24 hours after the partial LSLR. Due to the reactionary nature of emergency repairs, advanced notice is generally not possible. Some commenters requested that notification of risk mitigation measures in the event of an emergency partial LSLR within 24 hours be extended to three days. Other commenters requested that water systems with no LSLs in their inventory, who later find one, should be allowed more than 24 hours to provide consumers a filter certified to remove lead in drinking water because the system might not have a filter readily available. EPA disagrees with these commenters because providing notice and a filter within 24 hours allows for consumers to protect themselves from potential increases in lead levels in their drinking water. Additionally, water systems with no LSLs in their inventory might still have lead connectors in their distribution system, which require a filter post-replacement in the final rule.

Requirement for Water Systems to Provide Pitcher Filters Post-LSLR and After Other Disturbances

Summary of Comments

Many commenters agreed that pitcher filters were appropriate for risk mitigation after LSLR or other disturbances. Some commenters requested that EPA require water systems to provide filters for longer than the three months proposed, pointing out that if the proposed follow-up tap sample result arrived six months after replacement and showed lead levels remain elevated, but only three months of filters were provided, the customer could have unknowingly been exposed to higher lead levels for three months.

Some commenters did not support the requirement for water systems to provide pitcher filters after LSLR or other disturbances, raising concerns that the requirement would be overly burdensome or unnecessary. Some commenters thought providing filters was not needed following a full LSLR because the lead source is fully removed. Some commenters believed the customer should be responsible for paying for the filter. Others suggested that filters should only be provided to single-family residences, stating that it is not practical to provide filters to multi-family residences or other large buildings. Some commenters reasoned that filters are not always necessary when service lines are flushed and there is effective optimal corrosion control treatment (OCCT), suggesting that EPA emphasize flushing protocols and public notification and education as the main risk mitigation measures, using filters in situation-specific cases determined by the system with state oversight. A commenter stated that filters should not be required following all meter, gooseneck and pigtail replacements due the large number of filters that would be required. The commenter instead recommended a “good faith” effort to notify customers and to conduct flushing. There was one request for EPA to provide data showing that disturbances cannot be addressed by high velocity flushing. One commenter expressed a concern that filters would remove fluoride from water, negating the associated public health benefit of fluoride.

Several comments were received regarding the delivery protocols for pitcher filters after LSLR or service line disturbances and how water systems should track filter distribution. Some commenters see the requirement to deliver pitcher filters to the homeowner within 24 hours as unreasonable and ask that EPA consider extending the deadline. Other commenters noted that it may be less wasteful to make filters available upon request at no cost to the homeowner, instead of automatic delivery of filters, to prevent a customer from receiving a filter if they do not want a one or already have one. There were also requests for EPA to provide guidance on delivery of the filter in the case that there is a vacant home or no response from the homeowner. Another commenter offered that if a system submits an LSL inventory with no known LSLs, but finds an LSL in the course of repairs, the system should be able to offer reimbursement to the customers to purchase filters or EPA should make an exception to the 24-hour delivery requirement as those systems may not have available filters.

EPA received many comments requesting that the relevant certification standard be cited when requiring pitcher filters certified to remove lead. Several commenters requested EPA provide a list of approved filters. Some commenters expressed concerns about the market availability of pitcher filters certified to remove lead and suggested the final rule could allow the state to make alternative arrangements if there is not enough supply of filters. Many commenters also noted that customers may not properly install and maintain filters, and that there can be significant variabilities in the need for replacement cartridges given the number of persons using the filter and water usage needs for different customers. Moreover, commenters offered concern with the proposed rule only identifying pitcher filters as the risk mitigation strategy and asked that water systems have the flexibility to provide alternative compliance options such as bottled water, POU filters, or other certified devices, instead of being required to provide pitcher filters for lead removal as required in the proposal. Other commenters expressed that EPA should ensure that the rule is not written to restrict technological advances. Some commenters suggested that EPA should focus on requiring flushing instructions and education materials instead of requiring a pitcher filter.

Several commenters requested clarity about pitcher filter requirements after water shutoffs due to non-payment, asking if these customers would be entitled to a pitcher filter. A commenter objected to the required pitcher and cartridges following a resumption of service after a non-payment-related shutoff because it will add to the cost of non-payment shut offs and, potentially, delay the resumption of water service.

Commenters claimed that changing the water meter does not often result in a significant disturbance to the service line and should not require risk mitigation steps. Often the water meter is attached to a water meter setter, which is directly connected to the service line pipe. The water meter can be replaced after shutting off the water at an individual service line, but without making any cuts into the pipe itself. Replacement of the water meter setter, commenters stated, likely results in more disturbance of the service line. A commenter also requested that EPA only require a filter to be issued if plumbing changes to the meter setting were required.

One commenter said that the rule requirements were unclear as to who is responsible for maintaining or disposing of the filter after three months.

Agency Response

For the final rule, EPA is requiring that filters be provided for six months after LSLRs and certain types of disturbances. EPA agrees that requiring filters for six months instead of three months as proposed closes a potential gap in the health protection for consumers. Under the proposed rule requirements, a tap sample taken between three and six months could show an elevated lead level, but a filter was only provided for three months, resulting in the consumer’s potential exposure to elevated lead levels for up to three months after filter cartridges stopped being provided. To prevent this scenario from occurring, the final rule requires water systems to provide a pitcher filter for six months. EPA does not expect this requirement to add significant costs to the final rule. Some filters certified to remove lead offer cartridges lasting six months per unit, so water systems that already planned to use these filters would have no added costs. For other systems, costs can be minimized by ordering filters in bulk as many and delivering the filter and all replacement cartridges simultaneously, rather than delivering them separately in three-month increments.

EPA received many comments requesting that the relevant filter certification standard be cited in the regulation. EPA agrees and added the final rule language "pitcher filter certified by an American National Standards Institute [ANSI] accredited certifier to reduce lead" to ensure the filters are certified by an approved certifier. The relevant standard ANSI/NSF 53 is not mentioned by name to avoid potential Incorporation by Reference issues which would arise anytime the standard is updated. The new text will point water systems to the relevant standard. Additionally, EPA corrected text in the proposed rule that incorrectly read that ANSI was the certifier. Some commenters suggested EPA provide a list of certified filters. EPA disagrees because certifiers maintain their own list which provides water systems, consumers, and others with the most up-to-date information. EPA recommends that water systems follow manufacturer's instructions regarding issuing replacement cartridges.

Some commenters requested that water systems have the flexibility to provide bottled water or POU filters in lieu of pitcher filters for lead removal as required in the proposal. EPA agrees, noting that while pitcher filters are the most cost-effective compliance option, POU devices are a feasible and effective approach as well. EPA recommends that water systems distributing POU devices assist consumers or follow up with them to ensure that these filters are properly installed, given potential compatibility issues with these filters and certain faucets. Use of bottled water for risk mitigation would potentially be too burdensome alternative for consumers. The water system would have to determine what volume of water is adequate to supply for the consumers drinking and cooking for a six-month period, then either deliver the water all at once, or in multiple trips over six months. Some consumers may not have space to store bottled water adequate for all drinking and cooking uses for more than a few days or weeks at a time, increasing the likelihood that multiple trips would be needed to deliver bottled water. The logistics and coordination required for bottled water is too burdensome and therefore EPA is not including it in the final rule. Filters provide the most viable and efficient option for both water systems and consumers.

Some commenters expressed concerns about the market availability of pitcher filters certified to remove lead. They suggested the final rule should allow the state to make alternative arrangements if there is not an adequate supply of filters. EPA disagrees, noting that demand for pitcher filters that remove lead is increasing as many water systems around the country implement their own LSLR programs. Denver Water's variance from the previous LCR's CCT requirements involves the distribution of over 80,000 filters certified to remove lead to all homes with a known or suspected LSL. Additionally, the final rule requirements do not take effect until three years after promulgation, giving pitcher filter manufacturers time to build capacity to meet expected demand. Finally, the allowance of POU filters in the final rule can augment a system's supply of pitcher filters.

Commenters requested clarity about filter requirements after water shutoffs due to non-payment, asking if these customers would be entitled to a filter. Under the final rule, any customer who has their water shut off is entitled to public education and flushing instructions. Where a more significant disturbance occurs, such as a lead connector replacement or partial LSLR, the customer is entitled to a filter. EPA highlights that environmental justice concerns could be exacerbated if customers who had their water shut off due to non-payment were not provided the same risk mitigation actions as customers who could afford to pay. Water systems must follow the rule requirements regardless of the cause of the shut off or disturbance. In fact, customers who have had their water shut off for an extended period of time because of non-payment may be at increased risk of lead exposure than customers who had water shut off very briefly for a service line repair or meter replacement, due to the extended stagnation of water in the LSL that may occur. In this scenario, risk mitigation actions provide an even more significant opportunity to reduce lead exposure.

Some commenters sought clarification if the proposal required filter delivery where there is no response from the customer, or the home is vacant. Regarding non-responses, the water system must still provide the filter and public education. EPA acknowledges there may be situations precluding a customer from responding promptly, such as traveling. However, the customer could use the delivered filter upon returning to their residence. Regarding vacant homes, EPA does not view it as likely that a home which is truly vacant will have an active water service with a customer using the water. Therefore, water systems must still provide the filter and public education.

One commenter pointed their water system adds fluoride to its water for dental health purposes. The commenter noted that the filter requirements would undermine the decision to add fluoride because the filters would remove fluoride along with lead. EPA notes that pitcher filters that remove lead will not remove fluoride. Reverse osmosis is typically needed to achieve significant fluoride removal. Even if the filters interfered with fluoride, EPA notes there are many significant risks associated with lead exposure, and that the provision of filters in response to lead exposure mitigation is temporary.

A commenter suggested that elevated lead levels as a result of replacements or significant disturbances could be addressed with high velocity flushing rather than a filter. The commenter requested EPA provide data showing these scenarios cannot be addressed by high velocity flushing. EPA notes that the Agency has not encountered sufficient evidence that high velocity flushing can reliably reduce and stabilize lead levels following a replacement or a significant disturbance. EPA notes that lead release can be unpredictable, especially after a disturbance. EPA is requiring filters be provided to ensure that consumers are protected from potentially elevated lead levels following these incidents.

In response to the commenter who requested clarification of who is responsible for maintaining or disposing of the filter after the proposed time period of three months, EPA notes that there is nothing in the final rule requiring the water system to continue providing replacement filter cartridges after the time specified in the final rule, nor is it required to dispose of the filter. The consumer may purchase additional cartridges extending past the final rule’s six-month time frame, and the consumer may dispose of the filter if he or she chooses.

Requirement for Water Systems to Conduct Tap Sampling Post-LSLR and Other Types of Disturbances

Summary of Comments

Some commenters highlighted that the wording of the proposal required water systems to take a tap sample after LSLR and some types of disturbances, but noted that tap sampling requires voluntary participation from the consumer. Despite a good faith effort to obtain customer consent to take the tap sample, commenters noted that the water system may be unable to obtain consent and would be in violation of the rule. Commenters emphasized that compliance should be based on the water system making an offer to take a tap sample, not taking a tap sample itself.

Some commenters thought that follow-up tap sampling should not be required following full LSLR if flushing is proven effective to remove lead. A commenter pointed out that Michigan's LCR does not have such a requirement (Michigan EGLE, 2019). Other commenters thought tap sampling after a replacement or disturbance should be up to the water system. Other commenters suggested that there should be an indication of what lead concentration is acceptable for the required follow up sample so that the PWS can troubleshoot if the lead test result is too high or if filters may need to be provided for longer. Several commenters thought that water systems should be permitted to sample as soon as practical after the replacement or disturbance and requested that EPA explain its reasoning for the 3- to 6-month delay in follow up sampling.

Agency Response

EPA agrees with commenters who noted that the wording of the proposal required water systems to take a tap sample after LSLR and other disturbances, even though tap sampling generally requires voluntary participation from the consumer. EPA updated the final rule to require the water system to give consumers the opportunity to have their water tested, but not actually require a sample to be taken should the consumer refuse.

EPA disagrees with commenters that follow-up tap sampling should not be included as risk mitigation after a full LSLR. Full LSLR is effective at reducing lead in drinking water, but replacement is also a disturbance that can cause particulate lead to be released. While flushing is beneficial in reducing lead levels, a follow up tap sample provides assurance that particulate lead has been cleared from internal plumbing or the aerator.

Some commenters suggested that there should be a lead concentration that, if exceeded in a tap sample, water systems can troubleshoot the problem while consumers continue drinking filtered water. EPA notes that while find-and-fix does not apply to post-LSLR tap samples, the consumer will be provided with the tap sample results.

Several commenters thought that water systems should be permitted to sample for lead as soon as practical after the disturbance and requested that EPA explain its reasoning for the 3- to 6-month delay in follow up tap sampling. EPA has retained the 3 to 6-month delay in tap sampling in the final rule because the purpose of the testing is to ensure lead levels have not remained elevated over time. Waiting at least three months before taking a tap sample allows the distribution system to stabilize after the disturbance. Also, please note that EPA increased the amount of time that systems are required to provide filters to customers from 3 months in the proposed rule to 6 months in the final rule. This change was made to ensure the customer does not run out of filter cartridges before a follow up tap sample indicates that lead levels have stabilized.

6.7 Goal-based LSLR after TLE

Summary of Comments

Commenters expressed a wide range of views on the goal-based LSLR program following a lead TLE. Some commenters supported the proposed requirement, noting that unlike the current rule, LSLR would not be a last-resort action for systems that exceed the lead action level. Some commenters believed that all systems, including small systems, should implement goal-based LSLR after exceeding the lead trigger level. Some commenters asked for EPA to set a federal goal LSLR rate in the final rule to reduce inconsistent implementation, and thus public health protection, from state to state. Others thought that EPA should set a minimum goal LSLR rate while states could set a higher goal rate. Some commenters took the opposite approach, suggesting that EPA set a maximum goal rate, such as 3 percent. Other commenters suggested that EPA assign goal rates in tiers, based on water system characteristics such as size or the proportion of unknowns versus known LSLs. Commenters recommended that EPA build more flexibilities into the rule to allow the water system and state to determine the goal rate. Some commenters suggested that the goal rate should take customer input into consideration.

Some commenters disagreed with the proposed language in under § 142.19(b) which would allow EPA to designate an alternative goal rate. Commenters expressed concerns that it would decrease regulatory certainty, which they view as an important part of advancing LSLR. If this language does remain in the final rule, one commenter said, EPA should further define or provide guidance on what would be considered an acceptable goal-based rate.

One commenter said that performing public education after failing to meet their LSLR goal rate, rather than issuing a violation, was appropriate because it acknowledges that full LSLR may be outside of the system's control. Conversely, some commenters claimed that the goal-based LSLR program should be more enforceable. One commenter thought that the public education requirements following failure to meet the goal LSLR rate are neither measurable nor protective of public health. Commenters reasoned that if a water system is triggered into LSLR, failing to meet the goal rate should allow for strict enforcement actions, such as a violation.

A few commenters believed that states would be unnecessarily burdened with back-and-forth negotiations with water systems to review and approve or designate alternative goal rates. Commenters requested that EPA provide additional clarity on how water systems will work with their state to set replacement rates if they exceed the lead trigger level. Some commenters noted a timing discrepancy where the state reviews and approves the water system's recommended goal rate. They requested that the final rule recognize the number of system plans that the state must review and the timing of the review process. One commenter said that many water systems will likely conduct LSLR in coordination with their infrastructure replacement programs anyways, rendering this requirement unnecessary and burdensome.

Commenters were concerned that implementing a goal-based LSLR program that may be in effect for a limited time (i.e., two monitoring periods) would be overly burdensome for the potential limited number of LSLRs that would result. Some commenters believed the LSLR requirement should be more stringent, have a longer required duration, or not be allowed to stop once started. Another commenter suggested that a system could stop goal-based LSLR once, but would have to continue its LSLR program until all LSLs are replaced should it exceed the trigger level a second time.

One commenter agreed that the goal-based rate should be included in the LSLR plan but thought it was unproductive to set a goal rate potentially years before it is ever used. This commenter suggested that EPA instead require the plan to be created within six months of the first TLE and implemented after the second TLE.

Several commenters expressed concerns that LSLR will pose challenges for some water systems and customers and requested that EPA provide funding to support goal-based LSLR. Some commenters noted that the goal-based LSLR program may have environmental justice implications because the program incentivizes water systems to prioritize wealthy neighborhoods whose residents are more likely able to pay to replace their portion of the LSL.

Some commenters believe LSLR should occur regardless of the 90th percentile lead level, with some suggesting replacement of 10 percent LSLs every three years for systems at or below the lead action level. One commenter said that water systems should be required to conduct mandatory LSLR after exceeding the lead trigger level. Some commenters requested that EPA reconsider the provision in the proposed rule that allows a water system to discontinue its goal-based LSLR program if the water system has two consecutive, annual monitoring periods with lead levels at or below the trigger level.

Other commenters did not agree with the addition of a new trigger level in the proposed rule and consequently do not support the goal-based LSLR requirements.

A commenter believed that the goal-based LSLR program should be limited to the system-owned portion of the LSL.

Agency Response

EPA disagrees with commenters suggesting that EPA should prescribe a national minimum goal LSLR rate. Because priorities, characteristics, financial, managerial and technical capacity, community characteristics and demographics vary from system to system, EPA found it to be most appropriate for the water system to recommend a feasible rate and for the state to approve it or set an alternate goal rate. The water system and state will have a better understanding about individual water system's characteristics to determine which goal rate is appropriate.

EPA also determined that a federal maximum goal rate is inappropriate. As noted in the previous paragraph, water systems with state approval are in the best position to establish a feasible goal rate in consideration of their financial, managerial, and technical capacity as well as community characteristics. A federal maximum would also be inconsistent with Section 1414(e) of the SDWA which provides that nothing in the SDWA "shall diminish any authority of a State or political subdivision to adopt or enforce any law of regulation respecting drinking water regulations or public water systems." See also 40 CFR 142.4. Some commenters noted that without a maximum goal rate, the proposed rule could result in water systems with goal LSLR rates above 3 percent scaling back replacement efforts as systems' lead levels increase from a lead TLE to a lead ALE. EPA does not agree that the goal and mandatory LSLR rates are comparable in the way suggested by commenters because they are two distinct requirements with different consequences for failing to achieve the rate. Additionally, EPA notes that the final rule does not prohibit a water system's goal rate from being greater than the mandatory LSLR rate of 3 percent. The LCRR requires that the mandatory replacement rate be set higher by the state if feasible. If the goal LSLR rate is set higher reflecting feasibility, it is possible that the mandatory rate could be set higher as well. Thus, EPA has retained the proposed requirements for the final rule.

Some commenters called for customer input to be incorporated into the LSLR rate. EPA notes that the water system may solicit customer input when determining the goal LSLR rate that it will recommend to the state in its LSLR plan. The final rule grants the state, however, authority to approve the goal rate or set an alternative rate it if finds one to be more appropriate.

EPA disagrees with a commenter's suggestion that the goal rate should be set after a TLE opposed to the proposed timeline where water system recommend the goal rate before the rule compliance period and the state reviews it within six months. The final rule is designed so water systems are prepared for LSLR requirements that apply in the event of a TLE in advance so they are ready to immediately begin LSLR should they exceed the lead trigger level. EPA sees this pre-planning as a critical component of efficient and timely LSLR.

EPA has not retained the provision allowing EPA to establish an alternative LSLR goal rate for the final rule under § 142.19(b). Allowing systems and states to set the goal rate will provide them most regulatory certainty and will best reflect system abilities and state priorities for goal-based LSLR.

EPA disagrees that all systems should implement a goal LSLR program under the final LCRR. EPA supports all efforts to replace LSLs; however, the goal LSLR program designed to target systems with higher lead levels. Also, it is not applicable to CWSs serving 10,000 or fewer people because they follow a separate compliance path under § 141.93. For more information on LSLR requirements for small systems, please see response to comment Section 7.6.

Some commenters expressed a desire for the goal-based LSLR program to be more enforceable. EPA notes that the LSLR requirements after a lead TLE were intended to facilitate proactive, not reactive LSLR programs. Given that the trigger level LSLR requirements are designed to be goals and not mandatory replacement requirements, EPA did not believe a strict enforcement action, such as a violation, was an appropriate penalty for failing to meet a goal replacement rate. However, EPA recognized there should be some action by water systems if the goal LSLR rate is not met. The proposed rule required water systems who did not conduct the minimum number of goal replacements to conduct enhanced public education about the LSLR program, which could increase customer interest resulting in additional LSLR and facilitate the water system to achieve the goal replacement rate in the following compliance year, especially given that ownership of the LSL is often split between the water system and the customer. A water system that fails to conduct the required public education would be in violation of the LCR. The proposal is consistent with recommendations EPA received from the National Drinking Water Advisory Council (NDWAC, 2015). EPA determined this structure is the appropriate and has retained it for the final rule.

EPA disagrees that the goal LSLR program is unnecessarily burdensome because, as one commenter claimed, water systems already conduct LSLR on their own in coordination with infrastructure work. EPA notes that while there are some water systems conducting LSLR in coordination with other system activities, not all water systems are conducting full LSLRs. Additionally, some states may approve LSLR goal rates that accomplish LSLR at a higher rate than would be conducted solely by coupling LSLR with infrastructure work.

In the final rule, EPA has provided additional clarity on the process and timing of setting a goal LSLR rate. The final rule contains additional regulatory text to require CWSs serving more than 10,000 people to include a goal rate recommendation in their LSLR plans. The state has six months to review and respond to that recommendation, either by approving it or designating another goal rate that the state deems to be more appropriate. EPA disagrees that a water system and state should wait to set a goal LSLR rate until after the lead trigger level is exceeded, as the time required to recommend, review, and approve or designate an alternative goal rate would make it more challenging for the system to plan and meet its annual LSLR goal while the annual replacement goal program is in effect. Although there is administrative burden to the state to review and approve or set an alternative goal rate, this is a one-time requirement for states. States may wish to establish a state level LSLR goal rate structure – based on system size, capacity, etc., to facilitate timely review of LSLR goal rates. Additionally, this requirement would not apply to CWSs serving 10,000 or fewer people or to NTNCWSs, significantly reducing the number of systems needing LSLR goal rate to be reviewed and approved.

EPA has maintained the minimum timeframe of two years for water systems to demonstrate lead levels at or below the lead trigger level before ceasing goal-based LSLR. EPA believes that two years of monitoring is an adequate amount of time for a system to demonstrate that they have achieved a stable reduction of lead levels. EPA disagrees that the final rule should require goal LSLR in perpetuity because that requirement would not reflect a system's ability to reduce lead levels with changes to CCT.

In response to commenters that do not support a goal-based LSLR program because they oppose an inclusion of a lead trigger level in the LCRR, please see response to comment Sections 3.0 and 19.1.

In response to commenters who expressed concerns that LSLR will pose challenges for some water systems and customers, including concerns that a goal-based LSLR program will have environmental justice implications, please see response to comment Section 6.2.

In response to comments that noted a timing discrepancy regarding state review of goal LSLR rates, EPA has clarified that states have a 6-month review timeframe for states to review and approve LSLR goal rates or, if appropriate, establish a different goal rate. Also please see response to comment Section 6.2.

In response to comments about mandatory LSLR, please see response to comment Section 6.8. In response to the comment suggesting mandatory LSLR occur after exceeding the lead trigger level, please see response to comment Section 19.

Regarding requests for guidance, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA disagrees that the final rule should limit the goal-based LSLR program to system-owned LSLs. For more information, please see response to topic 6.3.

6.8 Mandatory LSLR and Rate

LSLR Rate

Summary of Comments

Some commenters claimed that a 3 percent mandatory full LSLR rate is too burdensome, while others believed it is not stringent enough to protect public health and should be raised to 5, 7, 10, 15, or 20 percent. Other commenters believed that due to the differences in water system circumstances, the mandatory LSLR rate should be scaled based on factors such as system size, prevalence of LSLs, financial capacity, or affordability, while multiple commenters recommended that the final rule LSLR rates be consistent across all system sizes. Some commenters requested clarification in the final rule about the number of LSLs that need to be replaced per year and if that number could be recalculated.

Some commenters suggested that a mandatory LSLR rate should apply regardless of 90th percentile lead level, effectively requiring an LSLR program at all water systems. They stated that because LSLR eliminates the largest source of lead in drinking water, water systems should always conduct LSLR, regardless of 90th percentile lead level. Some thought that if a system has few enough LSLs in its inventory, it should be required to replace all LSLs. One commenter requested that water systems be allowed more time to comply with LSLR requirements, given the requirement for full replacements and the inclusion of lead status unknown and galvanized requiring replacement service lines.

Some commenters thought it appropriate that the proposal required mandatory LSLR until tap sample monitoring results tests at or below the lead action level for two consecutive years. One commenter, however, suggested that one year of monitoring at or below the action level, as required in the previous rule, is enough to permit a water system to stop mandatory LSLR. Other commenters thought that water systems should continue their mandatory LSLR program once started, regardless of future tap sampling results. Several commenters suggested that water systems could cease mandatory LSLR after sampling at or below the lead action level the first time, but exceeding the lead action level a second time should require continued LSLR until all have been replaced due to the system's inability to keep lead levels consistently low. Other commenters suggested that LSLR could cease when sampling shows lead levels at or below the trigger level or lower (e.g., 5 µg/L was suggested).

Several commenters suggested that in addition to establishing a replacement rate for LSLs, EPA should also establish a time limit (e.g., between 10 and 20 years) for replacement of all LSLs. Commenters stated that such a time limit would help ensure complete LSLR. One commenter added that EPA could give primacy agencies the authority to provide a variance for truly exceptional water systems (such as large cities with high numbers of LSLs) under the authorities in sections 1415 and 1416 of the SDWA, or pursuant to a consent decree with regulators.

One commenter asked if failure to achieve the mandatory 3 percent LSLR rate would be a treatment technique violation, while another commenter requested clarification on the requirements when a customer is unresponsive.

Agency Response

For the final rule, EPA retained the proposed requirement that water systems must annually replace 3 percent of LSLs after exceeding the action level and clarified how to calculate the number of LSLR with a new section under § 141.84(a)(7). EPA disagrees that 3 percent LSLR is too slow to protect public health, and disagrees that the reduction of the LSLR rate from 7 percent to 3 percent is backsliding. Because a treatment technique rule is not centered on a single compliance level, but rather on an integrated set of actions designed to reduce the level of exposure to a contaminant, the backsliding analysis for a treatment technique rule is based on an assessment of public health protection as a result of implementation of the rule as a whole, rather than a comparison of numerical benchmarks within the treatment technique rule. EPA has determined that the revisions to the LCR as a whole will result in a 5- to 73-fold increase in full LSLR investments (see the "Economic Analysis for the Final Lead and Copper Rule Revisions; USEPA, 2020b). Under the previous LCR, many water systems who exceeded the lead AL never conducted LSLR because of potential scenarios that allowed systems to delay initiation of LSLR. For example, water systems without CCT may have been required to first conduct a study, obtain state approval for the recommended CCT, and obtain state approved OWQPs before LSLR began. Because a CCT study generally takes longer than one year to complete, many water systems were able to conduct two rounds of tap sampling at or below the action level and were not required to complete the CCT study. Subsequently, some water systems completed two rounds of tap sampling at or below the action level and replaced few or no LSLs. The final LCRR requires all water systems who exceed the TL to begin a goal-based LSLR program and those who exceed the lead AL to begin LSLR. Also, water systems must prepare an LSL inventory prior to the compliance effective date and systems must conduct four rounds (two years) of semi-annual tap sampling at or below the action level. This difference is also due to the previous rule not requiring full replacement of LSLs and allowing test-out of LSLs avoiding actual replacement. In the final rule, regardless of 90th percentile lead level, water systems will be required to complete customer-initiated LSLR. Additionally, LSLR programs will be initiated at systems that exceed the lead trigger level of 10 µg/L versus 15 µg/L in the previous LCR. The requirement for all systems to prepare an LSLR plan will avoid delays in initiating LSLR that have hampered progress under the previous rule. Furthermore, the more stringent sampling requirements in the final rule will better identify elevated lead levels, resulting in more systems exceeding the lead trigger and action levels and replacing LSLs. An emphasis on full LSLR over partial LSLR and test-outs, as well as the inclusion of galvanized requiring replacement and lead status unknown service lines in the LSLR rate calculation, will lead to further replacement of leaded drinking water infrastructure relative to implementation of LSLR under the current rule. The extended implementation of LSLR programs to a minimum of two years instead of one year will also increase the number of LSLR conducted and avoid inefficiencies of LSLR programs that operate in a manner where the program experiences several starts and stops to their programs over many years, which is especially relevant for systems whose lead 90th percentile levels hover around the lead trigger or action levels. These significant rule changes led EPA to reduce the mandatory LSLR rate from 7 percent to a feasible 3 percent national mandatory minimum LSLR rate, while retaining a provision from the previous rule that requires states to increase a system's LSLR rate if feasible. Given these numerous factors, EPA disagrees that the final rule backslides relative to the previous rule, whether considered as overall public health protection or number of LSLs being replaced.

Some commenters believe an annual rate of 3 percent full LSLR is too stringent for water systems to achieve. EPA disagrees, noting that the previous rule required 7 percent annual LSLR (partial LSLR and test-outs counted towards the LSLR rate in the previous rule but not the final LCRR). EPA highlights that under the previous LCR, most water systems have not in practice created a complete materials evaluation of their distribution system, nor executed an LSLR program until required to do so after a lead ALE. Thus, water systems that exceeded the lead action level had to first spend valuable time completing their LSL materials evaluation and creating an LSLR program from scratch, which can make it more difficult to achieve the number of replacements required under the annual LSLR rate. The final rule helps water systems overcome these challenges by requiring an inventory and LSLR plan to be developed within three years after the rule promulgation date, allowing for all efforts after a lead TLE or ALE to be devoted solely to achieving the minimum required replacements. In addition, the water system may count towards its replacement rate those LSLs which are replaced on an ongoing basis, regardless of a system's 90th percentile lead level, such as in coordination with other infrastructure activities, as a result of customer-initiated replacement, or from a system's goal-based LSLR program if it had exceeded the lead trigger level before the action level. The water system, therefore, may have an existing baseline of ongoing full LSLRs that may be used to meet the 3 percent minimum annually required LSLR.

One commenter thought that the LSLR rate should be consistent across systems of all sizes. EPA notes that in the final rule, small systems LSLR requirements apply under the small system flexibility provision in § 141.93. Please see response to comment Section 7.6 for an explanation of the LSLR rate applicable to small systems. EPA agrees with commenters who suggested that states should have the ability to set the mandatory LSLR rate so it is able to account for differences between water systems, such as system size, prevalence of LSLs, financial capacity, affordability, and other local factors, if these factors are used to determine feasibility. EPA notes that in the final rule the federal LSLR rate of 3 percent is a minimum, and that states are required to set a higher LSLR rate when feasible for the water system. Regarding the goal LSLR rate, the final rule allows the state to set goal LSLR rates which could also include consideration of the factors described by the commenters.

EPA disagrees with commenters who requested that water systems be given time to adjust to the increase in LSLR rate once the action level is exceeded. As previously noted, 3 percent full LSLR rate per year is feasible. Additionally, the LSLR plan requires proactive planning so systems will be ready to respond in case of an ALE. The LSLR plan will detail the standard operating procedures, planned funding channels, and other LSLR program details to allow for fast startup and efficient implementation of the LSLR program.

Variances are governed by Section 1415 of the SDWA and 40 CFR part 142 of the SDWA. The final rule also includes provisions which, under certain conditions, water systems can cease LSLR rather than seek a variance.

EPA notes that failing to meet the mandatory LSLR rate would be a treatment technique violation, unless the provision under § 141.84(g)(7) to document customer refusals or non-responses is utilized. For more information, see response to comment Section 6.11.

Agency Response to Comments about States Setting a Higher LSLR Rate

Summary of Comments

EPA received several comments regarding the requirement for primacy agencies to set a higher LSLR rate for water systems when feasible. A few commenters requested that EPA remove this requirement. Others requested that EPA provide guidance or criteria for when a higher LSLR rate is feasible. One commenter requested that EPA cap the rate that primacy agencies can require. Others recommended that the wording of the requirement be changed to include other considerations in establishing the rate, such as technical, managerial, and financial capacity.

Agency Response

EPA disagrees that the final rule should not require states to set a higher LSLR rate where feasible and notes that this has been a part of the LCR since 1991. This provision is especially relevant for water systems with relatively small proportion of LSLs to total service lines, with the capacity to replace more than the minimum 3 percent. Other commenters suggested EPA broaden this category beyond what is “feasible” to include factors such as “technical, managerial, and financial capacity.” EPA notes that these factors potentially contribute to feasibility and thus may be considered by states when determining if a higher LSLR rate is feasible. EPA disagrees that the final rule should set an upper limit to the LSLR rate set by the state. EPA notes, for example, there may be large water systems with only a few LSLs were 100 percent LSLR annual rate is feasible. Moreover, EPA cannot set a maximum LSLR rate because nothing in the SDWA or EPA's implementing regulations diminishes the authority of states to adopt or enforce more stringent standards. See SDWA Section 1414(e) and 40 CFR 142.4.

In response to comments requesting guidance for states about when states should set a higher mandatory LSLR rate, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

Mandatory, Proactive LSLR

Summary of Comments

Some commenters believed that LSLR should be required regardless of lead 90th percentile levels, or that LSLR should not cease once the water system begins replacement following its first lead ALE.

Agency Response

EPA strongly encourages all efforts to replace LSLs proactively, including when system-wide lead levels are low. EPA disagrees, however, that the final rule should require all water systems to proactively remove all LSLs. While the small system flexibility allows small water systems to opt-into a compliance path that requires complete LSLR, EPA does not agree this is appropriate nor feasible for medium and large systems. Small water systems that exceed the lead action level and choose the LSLR compliance path will rely on complete LSLR, not CCT, to reduce lead levels in drinking water, which is why it is necessary for these systems to commit to replace all LSLs. Moreover, small systems that conduct LSLR will have elected that as a compliance option, and therefore it can be assumed it would be feasible for those systems. For non-small systems, the final rule structure of the rule has been designed to ramp up LSLR requirements as lead levels increase, and conversely, reduce these requirements as system-wide lead levels decrease. In addition, medium and large systems will be installing and maintaining CCT to reduce system-wide lead levels. EPA notes that although the mandatory LSLR program is not in effect at or below the lead action level, water systems must complete customer-initiated LSLR at all times and implement a goal-based LSLR program after a lead trigger exceedance, meaning that LSLR will occur even when systems are below the lead action level.

Rolling Average LSLR Rate

Summary of Comments

Some commenters requested that the mandatory LSLR rate be calculated as a rolling average across multiple years. There could be instances, they pointed out, where an initial spike in customer demand for LSLR could pressure the system to replace the minimum number of LSLs required to ensure enough willing customer participants remain to comply with mandatory LSLR in later years of the LSLR program.

Agency Response

The Agency agrees that a rolling average construct is appropriate for the final rule. As commenters mentioned, a water system may receive heightened customer interest in LSLR immediately following a lead AL exceedance. Replacing more than 3% LSLs in the first year of an LSLR program under a rolling average rate is more protective of public health than a fixed rate of 3%, which could incentivize water systems to replace the minimum number of LSLs in the first year to ensure there is sufficient customer participation to achieve 3% in the second year. EPA notes that while the final rule requires states to set the mandatory LSLR rate higher than 3% where feasible, the short-term ability of a water system to replace more than 3% immediately following a lead AL exceedance when customer interest is highest is not necessarily indicative of long-term feasibility. EPA also notes that a rolling average approach could also provide flexibility to water systems. While not mentioned by commenters, some systems may need time to immediately secure have access to LSLR financing following a lead AL exceedance, and therefore would face increased challenges to meet the mandatory 3% LSLR in the first year. These challenges could be compounded where the water system experiences delays securing financing and then faces, as commenters noted in the context of customer-initiated replacement, construction moratoriums in the winter months. The rolling average approach could alleviate these challenges. EPA acknowledges that while a rolling average would require replacement of the same number of LSLs as a fixed rate would require, using the rolling average approach to delay LSLR program implementation could cause some customers to wait longer for their LSL to be replaced. EPA recommends that water systems attempt to begin LSLR as quickly as possible, and notes that their LSLR plan should facilitate timely implementation of other components of their LSLR program. EPA also suggests that water systems begin replacing LSLs where some financing may be immediately available, for example, if full replacement of system-owned LSLs can be achieved with existing funding.

LSLR Funding

Summary of Comments

Commenters were concerned that some water systems and customers lack the funding to fully replace LSLs. Commenters requested that financial support or loan forgiveness be offered to facilitate LSLR. Some commenters suggested that the proposed rule would create environmental justice concerns because it incentivizes water systems to prioritize LSLR in wealthy neighborhoods whose residents are more likely able to pay to replace their portion of the LSL. Two commenters stated that water systems should be required to pay the full cost of LSLR so that a customer's health risk from lead in drinking water is not tied to their ability to pay for LSLR.

Agency Response

For commenters concerned that some water systems and customers will lack funding required to replace LSLs and requested that financial support or loan forgiveness be offered for such systems, please see response to comment Section 6.1 for examples of federally funded loan and grant programs for LSLR. For information about creating an LSLR funding strategy in the LSLR plan, please see response to comment Section 6.2. For commenters who wrote about potential environmental justice concerns in the proposed rule regarding the ability to pay for customer-owned LSLR, please see response to comment Section 6.2. For commenters who believed the final LCR should require water systems to fund customer-owned LSLR, please see response to Section 6.10.

Timing of LSLR Requirements

Summary of Comments

One commenter expressed concern that "the proposed rule's allowance of a 3-year period to comply can be used by systems failing to meet the current 7% replacement rate to justify an additional 3-year delay in LSLR," recommending that EPA require compliance with the previous LCR during the 3-year period while an LSL inventory and replacement plan are developed under the final LCRR.

Agency Response

EPA notes that the previous LCR, LSLR requirements will apply during the 3-year period before the final rule's compliance date while the LSL inventory and replacement plan are developed. See Section 141.80 of the final rule.

6.9 Partial LSLR

Summary of Comments

Several commenters suggested that the final rule include an outright ban on water systems conducting partial LSLR under all circumstances. Commenters noted that the practice can cause lead levels to be temporarily elevated, with some commenters citing studies demonstrating such. Some commenters highlighted that full LSLR makes financial sense, noting the cost efficiency of replacing both portions simultaneously, as well as the health benefits of full LSLR versus partial LSLR. Some commenters expressed concern that given the cost of customer-owned LSLR, allowing partial LSLR has the potential to disproportionately impact low-income households and communities of color if policies require customers to self-finance replacement of the portion they own. One commenter suggested that partial LSLR should be allowed only when a water system obtains documentation that customer refusal to replace their portion was not due to financial hardship. Some commenters requested EPA make funding available to assist water systems to conduct full LSLR. One commenter suggested that water systems should be required to investigate plumbing codes or utility history to determine if ownership of the LSL is truly split.

Some commenters agreed that partial LSLR should be allowed for emergencies but requested that the final rule include clearly-defined criteria for the circumstances that partial replacements are allowed. Several commenters thought that all emergency partial replacements should be completed as full replacements within 30 days of the partial replacement. Some commenters said that partial LSLR should only be allowed for water systems that lack the funding to conduct full LSLR.

Many commenters expressed support for EPA's proposal as is, which does not ban partial LSLR and ensures that when a partial LSLR does occur, standardized risk mitigation steps are taken. These commenters believed that a total ban on partial replacements is not feasible. For example, one commenter said that "planned water main replacement project may result in a new alignment or spacing of the main, necessitating replacement of at least part of a lead service line."

Other commenters asked for partial LSLR to count towards replacement rates.

Agency Response

EPA discourages partial LSLR due to its potential to temporarily increase lead levels in drinking water, however the Agency disagrees that the final rule should include an outright ban on the practice because a ban would be infeasible. As commenters noted, there may be instances where partial replacement is unavoidable, for example a service line that requires emergency repair where the customer does not agree to replace the portion he or she owns for any reason. In another scenario, water systems conducting planned main replacement may require removal of at least a portion of the LSL due to the alignment or spacing requirements to connect the new main with existing service lines. In this case, which would be considered planned infrastructure work, the water system must notify the owner of any connected non-system owned LSL, their agent, and any non-owner resident and offer to replace the non-system owned portion. The LCRR does not require the customer to agree to replace his or her portion and the LCRR does not require the system to bear the cost of the replacement.

The final rule also mandates that standardized risk mitigation steps are taken after partial LSLR. These steps include delivery of information about lead in drinking water to the customer, flushing instructions, an ANSI-certified filter for lead removal or POU device with six months of replacement cartridges, and an offer to provide a follow up tap sample for lead between three and six months following the partial replacement.

Although the final rule does not ban partial LSLR, it was designed to disincentivize the practice. Water systems do not receive replacement credit for partial LSLR as they do in the previous rule, meaning that partial LSLR will likely only occur when there is an emergency repair or following planned infrastructure work where partial replacement is necessary. To further reduce the likelihood of partial LSLR, the final rule includes an added requirement to the LSLR plan that requires water systems to investigate ways to accommodate customers who wish to have the portion of the LSL they own replaced but are unable to afford the LSLR. This provision could make full LSLR more accessible to customers. EPA disagrees that water systems should be allowed to conduct partial LSLR only after receiving documentation from the customer that their refusal is not based on affordability, noting that systems may not receive customer consent to have their personal financial circumstances documented. In response to comments about LSLR and environmental justice, please see response to comment Section 6.2.

EPA disagrees that the final rule should define what constitutes an emergency where partial LSLR are allowed. Given the wide range of scenarios that could apply, EPA may fail to consider certain scenarios and define these emergencies too narrowly, in effect prohibiting partial LSLR in some cases where it is not feasible to conduct a full LSLR.

In response to comments about funding for LSLR, please see response to comment Section 6.1.

EPA encourages but chose to not require water systems to investigate plumbing codes or utility history to determine if ownership of the LSL is truly split. EPA recognizes that the history of service line ownership may not always be clear, but the question of service line ownership and/or division of responsibilities between the water system and the customer under current state law should be clear and therefore, EPA does not think a federal requirement is needed to require systems to determine the basis of the current state law. Water systems may choose to conduct such a review as part of their LSLR plan. For more information about the LSLR plan, please see response to comment Section 6.2.

For more information about the split ownership of LSLs, please see response to comment Section 6.10.

6.10 Issues of Private Property and Ownership/Control

Summary of Comments

Numerous commenters expressed concerns about the ability of water systems to comply with the proposed LSLR plan and full LSLR requirements given the potential for split ownership of the LSL between the water system and the customer. Commenters noted that in some cases, the system does not own any portion of the LSL. Furthermore, many commenters expressed that they lack legal authority to conduct LSLR of a customer-owned LSL and highlighted potential liability concerns associated with conducting construction or maintenance activities on private property. One commenter requested clarification of the requirement for water systems to “offer” to replace the customer-owned portion. Some commenters said the EPA should not require water systems to access private property or conduct LSLR on the customer-owned portion. One commenter suggested that EPA consider allowing a waiver of goal-based or mandatory replacement if (1) the water system establishes a complete inventory of system-owned LSLs, (2) the inventory indicates absence of system-owned LSLs, and (3) the system performs good faith effort to notify and educate affected customers with known LSLs in their property that is then certified by the state. Another commenter suggested that water systems should investigate and publish state rules or ordinances that affect their ability to conduct LSLR on private property. Some commenters requested guidance on how to comply with the LSLR plan and full LSLR requirements given split ownership of the LSL, or where the system does not own any portion of the LSL.

EPA received several comments concerning funding of the replacement of the customer-owned portion of the LSL. Many commenters supported the proposed rule language that water systems are not required to bear the cost of replacement of the portion of the LSL not owned by the water system. Moreover, numerous commenters stated that local or state ordinances may prohibit some water systems from using public funding or rate revenue to help fund customer-owned LSLR. Some commenters called for EPA to provide funding to assist the customer to replace their portion. Other commenters stated that customers should not be required to pay to replace their LSL due to potential environmental justice concerns that may arise when a customer wants but is unable to afford to replace their LSL, resulting in a partial LSLR or delayed full LSLR.

A few commenters suggested that customer-owned LSLR, as well as lead-based premise plumbing, could be covered through state enacted real-estate legislation where information about the presence of an LSL or leaded premise plumbing are required to be disclosed before a sale transaction.

A commenter raised the point that in addition to LSLs, premise plumbing and fixtures inside the home can be potential sources of lead in drinking water. One commenter believed water systems should not be required to provide filters after the customer performs a partial or full LSLR, questioning why systems should be obligated to provide them given the customer initiating the work, and noting that the remaining lead source would be premise plumbing.

Agency Response

Given the potential for water system activities to affect lead in drinking water, even where an LSL is owned solely by the customer, the final LCRR does not waive water system requirements where the customer-owned portion is affected. This is consistent with EPA’s approach to the control of lead in drinking water since 1991, which has required water systems to take actions with respect to service lines and premise plumbing not owned by the system – the requirement to optimize CCT even where the system owns no LSLs, and the requirement in § 141.84(d)(1) to notify and offer to replace, at customer’s expense, non-system owned LSLs. Similarly, water system activities such as replacing a gooseneck or water meter can disturb an LSL owned entirely by the customer. Fully removing LSLs is a critical component to public health improvements of the LCRR. When present, LSLs are the largest contributor to lead in drinking water (Sandvig et al., 2008). EPA acknowledges the shared responsibility between the customer and water system for lead in drinking water, therefore the final rule requires water systems to conduct activities to engage customers in an effort to achieve lead reduction goals, while at the same time not holding water systems responsible when customers are not willing or able to participate in LSLR. For more information on customer participation and refusals, please see response to comment Section 6.11.

Commenters noted that systems may lack authority to enter private property to replace LSLs and highlighted possible liability concerns associated with doing work on private property. Many communities across the nation are currently conducting full LSLR and there is a long history of public utilities conducting work on private property. Therefore, EPA has determined that it is feasible for them to manage liability concerns. One commenter requested clarification as to what it means for the water system to "offer" to replace the customer-owned LSL. EPA notes that this language is used in the existing rule. Although allowed, this language does not obligate the water system to fund customer-owned LSLR or to use system personnel to perform the work, it does require the PWS to "offer" to replace the LSL. While "offer" is not defined, EPA notes that it could mean the PWS offers to replace the line or facilitates coordination between the PWS's contractor and the customer, or it may involve assisting the customer to find a private contractor to perform the work and coordinating with the private contractor to perform a simultaneous full replacement. In response to commenter requests for additional guidance, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA notes that nothing in the final rule requires or specifies a payment strategy for LSLR. EPA acknowledges that funding customer-owned LSLR may require some research and planning, and yet several water systems across the country have conducted full LSLR even where the system doesn't own the LSL or owns only a portion of the LSL as outlined in EPA's "Strategies for Achieving Full Lead Service Line Replacement" (USEPA, 2019). Thus, the final LCRR requires water systems to investigate possible funding sources for LSLR, including the customer-owned portion, in their LSLR plan. This approach ensures water systems have a strategy for funding LSLR in advance before required to conduct a goal rate or mandatory LSLR program after exceeding the lead trigger or action levels. Due to comments that noted potential environmental justice concerns with the proposed rule, EPA added a provision to the final rule requiring water systems to also create a strategy to accommodate customers that want but are unable to afford replacement of the LSL they own. EPA determined that water systems with a funding strategy will be able to begin replacing LSLs immediately rather than spend weeks or months investigating potential funding sources, giving the water system adequate time to meet the minimum number of LSLR required under the goal or mandatory LSLR rate. EPA encourages water systems to research federal funding sources, such as EPA's DWSRF, the WIIN Act, Housing and Urban Development's Community Development Block Grants. EPA also encourages water systems to investigate their legal authority to fund or perform work on the customer-owned LSL, or if rate revenue can be used for customer-owned LSLR. EPA is not requiring in the final rule that water systems investigate this or any other specific funding source because it may not be necessary as part of the system's strategy. For example, the water system may find that federal funding sources cover the costs for LSLR, avoiding the need for water systems to investigate if they have the authority to fund the work with rate revenue. For more information about the LSLR plan, please see response to comment Section 6.2.

Regarding comments questioning why a water system should provide the customer with a filter after a customer-requested LSLR, especially if the entire LSL is customer-owned. As indicated above, the LCR has always required water systems to address lead in non-system owned materials. Water systems are in the best position to educate their customers about the short-term risks following the replacement and to provide mitigation measures as a part of their responsibilities to assure drinking water quality for their customers. Even when the water system is below the lead action level, the system will be involved in a customer-initiated LSLR because the new service line will be connected to the water main, which is under the system's control and ownership. Additionally, the water system may need to temporarily shut off the water service to the residence while the replacement is being completed. Furthermore, the customer's actions benefit the system, as removal of LSLs helps to avoid potential TLE or ALEs in the future, triggering rule requirements for the system. Finally, the customer may not be aware of the potential for service line disturbance or replacement to cause lead levels to be temporarily elevated until learning from the water system and receiving the filters. For more information about risk mitigation procedures following LSLR, please review response to comment Section 6.6.

EPA agrees that older premise plumbing and fixtures may contribute to lead in drinking water. EPA notes that the final LCRR contains find-and-fix requirements for the water system to investigate potential causes of tap samples testing higher than 15 ppb (see response to comment Section 13).

EPA notes that it does not have authority under the SDWA to regulate real estate transactions to require sellers to disclose the presence of an LSL or require replacement upon sale of a home.

For more information about including customer-owned LSLs into the LSLR rate, please see response to comment Section 6.

6.11 Mechanism to Cease LSLR by Documenting Customer Refusals

Summary of Comments

Many commenters noted the challenges of convincing customers to replace their portion of the LSL. One commenter said that even when funding is made available to customers through grants or loans, they may still refuse to have their portion replaced. Another commenter noted in their experience, the average customer participation rate for LSLR was only 24.7 percent. One commenter said that water systems should not be required to replace a customer-owned LSL if the customer objects.

As proposed, failure to meet the mandatory LSLR rate would require the water system to receive a written signature from each customer served by an LSL to document refusals for LSLR on the customer-owned portion. Numerous commenters noted that customers may not sign official documents or even respond to water system outreach efforts. One commenter noted that reaching the customer to obtain a signature could be especially difficult where the LSL serves a vacant home or where a residence is not owner-occupied. Commenters expressed concern that the proposed provision requiring signatures refusing LSLR would result in noncompliance of meeting LSLR goals and/or mandatory LSLR rates under the proposed requirements in §141.84(f) and §141.84(g). Commenters recommended EPA provide alternative ways to document customer refusals, such as providing a record of attempts to engage the customers. A few commenters believed that individual customer refusals should count towards the LSLR rate.

A few commenters suggested that water systems should still be subject to full LSLR requirements, even if customers do not agree to full LSLR. The proposed mechanism, commenters said, "allows water systems to do no LSLR if they can convince residents to refuse replacement." Thus, these commenters believed the proposed requirement to obtain customer refusals to conduct LSLR should not be included in the final rule.

Agency Response

EPA acknowledges that some customers may not agree to provide written signatures or respond to the water system's LSLR communication efforts, especially if the LSL serves a vacant or infrequently occupied home where the customer is not readily available. EPA agrees that compliance should be based on the effort to reach the customer to obtain a refusal, and that the water system should not be penalized as a result of customer actions. In response to comments, the final rule expands what can count as a "documented refusal." In addition to written signatures, the final rule includes verbal refusals or two non-responses from the customer after a good faith effort to reach the customer. This will ensure that the water system has engaged all potential customers but can remain in compliance despite customer non-response or refusal actions.

EPA disagrees that individual customer refusals should count towards the LSLR rate because this could impede progress towards LSLR. Moreover, non-consenting customers at a location could move and be replaced by consenting customers over time. The customer refusal provision is intended to be used at the end of an LSLR program when there may be a few remaining customers who refuse LSLR. If there are additional LSLs or galvanized requiring replacement service lines in the inventory, the water system must attempt to reach those customers to conduct an LSLR.

EPA disagrees that the customer refusal provision should be removed from the final rule. EPA notes that the Agency lacks the authority in an NPDWR under SDWA to require customers to replace their LSLs. Despite a water system's best attempts to identify potential funding sources and engage the customer for LSLR, the water system may encounter customers who refuse LSLR, even when provided at no cost to the customer. EPA has therefore maintained the proposed provision that allows water systems to remain in compliance with LSLR requirements despite potential customer refusals. For the final rule, EPA is requiring in § 141.84(g)(7) that, should the water system exceed the lead action level again, it must reach out to all customers with an LSL or galvanized requiring replacement service line, not just those where there has been a change in ownership as proposed. Even though a customer may have refused previously, the customer's financial circumstances may have changed since the previous time the lead action level was exceeded.

Regarding whether customer refusals should be included as part of the goal-based LSLR program in § 141.84(f), EPA points out that failure to meet the goal rate is not a violation. Failure to meet the goal LSLR rate will require the water system to start a public education program to encourage customer participation in the system's LSLR program if they do not meet their annual LSLR goal. Increased outreach may lead to some customers who in the past refused LSLR or did not respond to system outreach to agree to LSLR in the future. Avoiding these public education measures would be a missed opportunity to engage and inform the refusing customers about the benefits of full LSLR. Therefore, EPA does not find it appropriate to extend the customer refusal mechanism to the goal LSLR program.

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7 Small System Flexibilities

Background

In the proposed rule, EPA requested comment on the small systems flexibilities, specifically, EPA requested comment on whether:

- This flexibility is needed by systems serving between 3,301 and 10,000 persons and whether a different threshold is more appropriate.
- Different flexibilities would be more appropriate for small systems whether defined as water systems serving 10,000 or fewer persons or 3,300 or fewer persons.

EPA received many comments on the proposed requirements in § 141.93 - Small Water System Compliance Flexibility. EPA received comments both in support and opposition to the proposed compliance option flexibilities, comments regarding the small systems definition, as well as the compliance flexibility options -- corrosion control treatment (CCT), lead service line replacement (LSLR), point-of-use-device (POU) device and replacement of lead-bearing plumbing. EPA also received many comments regarding the technical, managerial, and financial capacity of small systems and the timing and implementation of the compliance flexibilities.

7.1 General Comments

Summary of Comments

A few commenters suggested that the small system compliance option flexibilities be extended to all systems subject to the Lead and Copper Rule revisions (LCRR). The commenters stated that if the compliance options adequately protect public health, the compliance option flexibilities should be made available to any system. Two of these commenters stated that large systems with a small number of lead service lines (LSLs) may want to use the same flexibilities. Another one of these commenters noted that the small system flexibilities would be helpful to medium and large systems that want to explore alternatives to optimized corrosion control treatment (OCCT). This commenter stated that allowing flexible compliance options for all systems might provide incentives to accelerate LSL removal.

Agency Response

The Lead and Copper Rule (LCR) is a complicated rule due to the need to control corrosivity of drinking water as it travels through often antiquated distribution and plumbing systems on the way to the consumer's tap. States and public water systems (PWSs) need expertise and resources to identify the sampling locations and to work with customers to collect samples for analysis. Even greater expertise is needed for systems and states to identify the OCCT and water quality parameter monitoring to assure that lead and copper levels are reduced to the extent feasible. The determination of the OCCT is specific to each water system because it is based on the specific chemistry of the system's source water, and must be designed and implemented to take into account treatments used to comply with other applicable drinking water standards (56 FR 26487; USEPA, 1991). System operators that do not already have it may be required to obtain advanced certification to properly operate and maintain OCCT.

Small community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs) tend to have more limited technical, financial, and managerial capacity to implement complex treatment technique rules such as the LCR (USEPA, 2011). Many small PWSs face challenges in reliably providing safe drinking water to their customers and consistently meeting the requirements of the Safe Drinking Water Act (SDWA) and the National Primary Drinking Water Regulations (NPDWRs) (USEPA, 2011). Long-term compliance challenges affect public health protection. The National Drinking Water Advisory Council Small Systems Implementation Working Group in its 2000 report identified the following challenges to small water systems:

- Aging water delivery infrastructure.
- Current and future compliance with treatment standards.
- Source water quantity, quality, and protection.
- Development of technical, managerial, and financial capacity.
- Availability and affordability of financing.
- Water affordability and related pricing issues.
- Long-term and least cost planning.

- Employee training and certification.
- Local policies and parochial cultures.
- Competing or differing agendas and priorities among agencies.
- Changing demographics and service population growth or decline.
- Availability of low cost and low maintenance technologies.
- Isolation or lack of geographic accessibility.
- Language or cultural barriers to effective communications.
- Managing information and setting priorities.
- Barriers to identifying and implementing effective solutions.

Recognizing the challenges small CWSs and NTNCWS face in reliably providing safe drinking water to their customers, EPA proposed alternative compliance options. The final LCRR modifies but maintains small systems flexibilities for this same reason. These options allow small systems to select the option that is most appropriate for their system and community, considering the technical, financial and managerial capacity of the system so it can reliably provide safe drinking water. Under the final LCRR, small CWSs that serve 10,000 or fewer persons and any NTNCWS that exceeds the lead trigger level of 10 µg/L but does not exceed the lead action level of 15 µg/L (i.e., has a trigger level exceedance (TLE)) and does not exceed the copper action level of 1.3 mg/L must evaluate the four compliance alternatives and make a recommendation to the state within six months on which compliance alternative the water system would implement if the water system subsequently exceeds the lead action level. The state must approve the recommendation or designate an alternative compliance option within six months of submittal. In the event these water systems exceed the lead action level, they must implement the state-approved compliance option. Any small CWS and any NTNCWS that exceeds the lead action level and had not previously exceeded the trigger level, must evaluate the compliance alternatives and make a recommendation to the state within six months. The state must approve the system's recommendations or designate an alternative compliance option within six months; these water systems must implement the state-approved compliance option.

EPA does not agree with commenters that recommend extending the flexibility options to all systems subject to the LCRR. The SDWA requires that a treatment technique prevent known or anticipated adverse effects on the health of persons to the extent feasible. EPA has determined that it is feasible for systems serving more than 10,000 persons to implement the multiple treatment technique actions of optimized CCT, public education and LSLR. These systems have the technical, managerial, and financial capacity to implement multiple treatment technique actions. They have managerial, field, and operator staff and expertise to manage CCT and LSLR programs. These systems also have economies of scale that make the cost of multiple treatment technique actions affordable. Section 1412((b)(4)(E)(ii) of the SDWA requires EPA to identify a list of technologies, treatment techniques, or other means that are affordable for three subcategories of small systems – PWSs serving between 10,000 and 3,330 persons, between 3,300 and 500 persons, and between 500 and 25 persons. Also, section 1412(b)(9) of the SDWA requires that any revision of a NPDWR "shall maintain, or provide greater, protection of the health of persons." The Agency determined that small water systems serving 10,000 or fewer persons typically do not have the capacity to implement multiple measures simultaneously such as CCT and LSLR programs. EPA has concluded that these small systems can work with their state to identify an affordable and feasible treatment technique to reduce drinking water lead exposure and improve public health protection. EPA's ability to extend the small system compliance flexibilities to all systems is limited by these provisions. Moreover, EPA determined that for systems serving more than 10,000 persons, the provisions of the LCRR (the technologies, treatment techniques, and other means) are both feasible and affordable. Finally, EPA determined that larger systems typically have greater technical, financial and managerial capability to implement CCT and LSLR and maintain compliance with the final LCRR, and therefore do not need the small system flexibility compliance options. Because the provisions of the LCRR protect against lead leaching from sources of lead other than LSLs, it would not be appropriate to extend the small system compliance options to systems based on the number of LSLs in the distribution system. See also Preamble Section III.E (USEPA, 2020a).

7.2 Comments Supporting Small System Flexibility

Summary of Comments

Several commenters support the intention to provide small systems with additional flexibilities in the LCRR § 141.93. Some commenters noted the technical managerial and financial capacity challenges that some small systems face justify the small system flexibility provisions in the proposed LCRR and that these flexibilities will allow small systems to achieve compliance and reliably provide safe water. One commenter noted that small system flexibility options are beneficial to small systems that struggle with maintaining chemical treatment by providing them with alternative options to remediate their lead and copper issues. One comment letter from a state agency specifically stated that they anticipate some of their small CWSs and NTNCWS will elect one of the flexibility options. Some commenters generally supported the small system flexibilities but noted that additional compliance options can increase the tracking burden for states. One commenter noted that "Maintenance of corrosion control and point-of-use devices may be beyond the technical and financial capability of these systems" and requested that financial and technical assistance be provided "at no cost to low income communities to maintain corrosion control treatment and point-of-use devices programs if a community opts for one of those programs."

Agency Response

EPA agrees with commenters that greater flexibility is needed for small CWSs and all NTNCWSs because they tend to have more limited technical, financial, and managerial capacity to implement complex treatment techniques. Small system flexibilities will provide alternatives to chemical treatment as it is difficult for many small systems to find operators that have the more advanced skills necessary to implement and maintain such treatment, particularly given the limited financial and programmatic capacity of many small utilities (Kane and Tomer, 2018). In the final rule, small systems that exceed the trigger level must select and obtain state approval for one of the four compliance options and implement the option in the event of an action level exceedance. In most cases, state approval is obtained before a lead action level exceedance allowing systems to quickly implement the approved option. This is public health advancement over the previous rule which allows a system to conduct two semi-annual periods of tap sampling to demonstrate lead levels at or below the action level following which the system is no longer required to implement CCT or LSLR. EPA acknowledges commenters concerns that the state tracking burden will be increased due to the implementation of small systems flexibilities. EPA has included estimates of the changes to the primacy agencies burden to oversee the small system flexibility options in the "Economic Analysis for the Final Lead and Copper Rule Revisions" or "Final LCRR EA" (USEPA, 2020b). EPA agrees that small systems need additional support. Separate from the LCRR, EPA provides technical assistance and financial support to small systems through grants and low or no cost financing programs such as the Drinking Water State Revolving Fund (DWSRF).

7.3 Comments Opposing Small System Flexibility

Summary of Comments

Several commenters opposed the small system flexibility provision as proposed in § 141.93 because of concerns for public health protection. One commenter stated that "[f]rom a philosophical standpoint, all water systems should be treated the same. Preventing lead exposure to protect the public health should be the same for all people." Another commenter expressed a similar concern and said "[a]ll water systems regardless of size should be subject to the same requirements." Another commenter said "… [Commenter] firmly believes that equal public health protection should be provided at all systems and to all individuals, regardless of the size or type of the system. Thus, we would strongly encourage EPA to reconsider the provisions in the LCR that inadvertently create a two-tiered public health system." One commenter stated that "EPA has failed to present how different flexibilities granted to small systems would provide equivalent public health benefits to the residents of those communities as compared to larger communities." Another comment stated that "EPA's proposal to weaken health protections for consumers served by small water systems would violate the SDWA" and argued that the proposed LCRR is in violation of the SDWA's anti-backsliding provision. Another commenter noted that "[l]essening [small systems'] requirement is counterproductive."

Several of these commenters proposed changes to the small system requirements to address their concerns. One commenter stated, "[t]o rectify these violations, EPA must strengthen its proposed provisions. To avoid unlawful backsliding, EPA must require small systems continuing to exceed the action level after having fully replaced lead service lines to install and maintain optimal corrosion control treatment to control lead release. [See id.] And in order to optimally protect public health, EPA should also require small systems that sustain a lead action level exceedance while replacing lead service lines to implement a filter installation and maintenance program for at least two consecutive six-month monitoring periods where the systems' 90th percentile lead levels are at or below the action level. [See 84 Fed. Reg. at 61,770–71.]" This commenter also recommended "[t]o comply with the SDWA, EPA must require NTNCWSs that sustain a lead action level exceedance during or after replacing lead-bearing plumbing to install and maintain optimal corrosion control treatment to diminish residual lead levels stemming from lead service lines or copper pipes with lead solder remaining in the systems' distribution infrastructure. EPA must additionally require NTNCWSs with lead service lines to conduct mandatory lead service line replacement following subsequent action level exceedances. [See 40 C.F.R. § § 300g-1(b)(9).]" For systems that have implemented a compliance flexibility option, but subsequently exceed the lead trigger or copper action level, a commenter suggested that the final rule provide states "discretion to require implementation of an additional flexibility beyond that originally implemented." Similar recommendations were made by another commenter that said "We urge EPA to tighten its proposed flexibility offerings by requiring:

*Corrosion control treatment when water systems choose the full lead service line replacement option,

*Full lead service line replacement when they choose the corrosion control treatment option, and

*Full lead service line replacement when they choose the point-of-use (POU) filter option."

Other commenters stated that they opposed the small system flexibility provision because they felt the provisions in § 141.93 did not adequately address the needs of small systems. One commenter stated of EPA's proposed LCRR "…its proposed revisions actually lack important safeguards and do not allow affected systems to choose traditional remedies." Another commenter asked EPA to "…consider practical alternatives that will allow small water systems the flexibility to navigate the requirements of the LCRR and properly ensure that public safety is upheld." One commenter recommended that instead of small system flexibilities, "grants should be more heavily allocated towards non communal water users."

Agency Response

EPA disagrees with the commenter that claimed that the proposed LCRR violated the SDWA's anti-backsliding provisions. Similarly, another commenter stated that the proposed LCRR small systems flexibility options "…raise serious questions about the agency's a) scientific rationale, b) perpetuation of a well-documented and widespread environmental injustice that has allowed small water systems to routinely deliver unsafe drinking water to millions of water users […] and c) potential regulatory backsliding." EPA disagrees with these assertions, and as a whole, finds that the proposed and final LCRR represent more stringent public health protection provisions than the previous LCR. Through strengthened treatment procedures, expanded sampling, and improved protocols for identifying lead, EPA's LCR revisions will require more water systems to progressively take more actions to reduce lead levels at the tap. Additionally, by improving transparency and communication, the rule is expected to increase community awareness and accelerate the replacement of LSLs. By taking these collective actions EPA, states, and water systems will be implementing a proactive holistic approach to more aggressively manage lead in drinking water.

EPA disagrees that the final LCRR violates the SDWA's anti backsliding provisions. The LCRR requires all water systems, including small systems, to complete and maintain a publicly available LSL inventory, provide annual notice to customers with an LSL, and collect tap samples from homes with LSLs if present in the distribution system. All systems, including small systems, must collect fifth liter samples that are representative of water that has been in the LSL for several hours, which will provide better information on the highest concentration of lead in drinking water. To reduce elevated levels of lead in certain locations, EPA's final rule requires water systems, including small systems, to engage in a "find-and-fix" process to identify the causes of these elevated levels as well as potential actions to reduce lead levels.

In addition to all of these other LCRR requirements, small systems that exceed the lead trigger level must recommend a compliance option and obtain state approval so if the system has a subsequent action level exceedance, it can implement the approved option quickly. The small system flexibility options assure that the water systems reduce drinking water exposure to the extent feasible for small water systems. Under the LCRR, a small system cannot discontinue implementation of the approved option, even if future tap sampling results are at or below the action or trigger level. For example, small systems that choose and are subsequently required to implement a LSLR program following an action level exceedance (ALE) must remove all the LSL in the system, within 15 years, even if the system never has another ALE. This is a public health protective measure that is incorporated into the small system flexibility requirements. This is public health advancement over the previous rule which allows a system to conduct two semi-annual periods of tap sampling to demonstrate lead levels at or below the action level following which the system is no longer required to implement lead reduction actions.

EPA would like to clarify an aspect of the flexibility requirements in response to commenters concerned about an ALE after LSLR has been completed, stating "[t]o avoid unlawful backsliding, EPA must require small systems continuing to exceed the action level after having fully replaced lead service lines to install and maintain optimal corrosion control treatment to control lead release." In the final rule, if a subsequent TLE occurs following complete implementation of any recommended and approved compliance flexibility options, water systems would be required to re-evaluate and recommend an additional compliance option to the state and implement the approved option should a subsequent ALE occur in accordance with 141.93 (a) and (b). It is important to also note that EPA designed the compliance flexibility options so that they must be implemented completely, which reduces the chance of a TLE or ALE following completion of the elected option.

In response to commenters concerned about requirements for systems that elect LSLR and have another ALE during implementation of the LSLR plan, as well as the commenter that recommended EPA require a 7 percent removal rate for small systems that elect to conduct complete LSLR, EPA disagrees with these approaches and has decided not to require a minimum percentage removal rate for small CWSs and any NTNCWS that elect the LSLR compliance option. The LCRR allows states to determine an appropriate replacement schedule for small systems and specifies that the replacements timeframe should not exceed 15 years. EPA designed this option with small systems with few LSLs in mind, and the appropriate removal rate for those systems may in fact be higher than 7 percent per year. EPA understands states are in the best position to determine the LSLR rate and schedule for small systems based on system specific circumstances.

EPA disagrees with the commenter that recommended EPA require LSLR for NTNCWSs that elect the replacement of lead-bearing plumbing compliance option. EPA notes that this requirement is not necessary as the final LCRR makes this compliance option available only to systems with no LSLs or systems that first remove the LSL. This commenter also recommended that EPA require OCCT following replacement of lead-bearing plumbing to reduce corrosion from LSLs and copper pipes with lead solder. EPA does not agree. As indicated above, systems that select removal of lead-bearing plumbing materials must either have no LSLs or remove LSLs with lead-bearing plumbing materials. While lead solder on copper pipes is a source of lead, EPA's analysis indicate passivation of lead solder has reduced lead in drinking water from this source. However, if a system had an ALE following complete implementation of the plumbing replacement, it would be required to implement another option. Further, if there is a simultaneous or subsequent copper ALE, requirements remain unchanged for responding to a copper ALE from the previous rule.

EPA disagrees with commenters that called for EPA to provide additional flexibilities beyond those in the proposed LCRR. Commenters did not provide any detail of how the desired additional practical flexibilities would reduce drinking water lead exposure to the extent feasible. EPA has determined the small system flexibility options in the final LCRR are actions that reduce drinking water lead exposure and are feasible for small CWS and NTNCWS. EPA also disagrees with the commenter that recommended that the Agency allocate grant funding to small CWSs and NTNCWSs instead of allowing the small water system compliance flexibility. EPA has determined that providing grant funding would not completely address the challenges that small systems face in consistently meeting the requirements of the SDWA and NPDWRs. In addition to limited financial capacity, EPA recognizes that small systems may also lack the technical and managerial capacities to implement complex treatment technique rules such as the LCRR. Separate from the LCRR, the EPA provides financial support to small systems through technical assistance grants, Water Infrastructure Improvements for the Nation (WIIN) grants, America's Water Infrastructure Act (AWIA) grants, as well as the DWSRF. These programs provide much needed financial assistance to maintain or improve compliance through infrastructure improvements as well as support small systems through training and technical assistance to improve technical, managerial, and financial capacity.

7.4 Comments on the Small System Size Threshold

EPA requested comment on whether the flexibility provisions in § 141.93 are needed by systems serving between 3,301 and 10,000 persons and whether a different threshold is more appropriate. EPA received comments in support of the threshold in the proposed LCRR, advocating for the alternative threshold of 3,300 or fewer, and advocating for a threshold below 3,300.

Summary of Comments

Many commenters recommended that the small system flexibility provisions apply to systems serving 3,300 or fewer persons. These commenters stated that this threshold would allow for consistency across NPDWRs. Some commenters stated that there were differences in challenges and requirements of systems serving 3,300 or fewer persons than those serving between 3,301 and 10,000 persons. One commenter said, "Systems that serve 3,301 or more persons have the adequate financial, technical, managerial, and operational resources available to handle the requirements that are proposed by the LCRR." Similarly, another commenter said "…the waterworks serving more than 3,300 persons in [State] do not require the same degree of flexibility as those serving 3,300 or fewer persons." This commenter said "[Commenter] believes that waterworks serving over 3,300 persons likely would have adequate TMF [technical, managerial, and financial] to implement the LCRR requirements without the small system compliance flexibility." One commenter noted that the costs of POU filters and replacement of lead-bearing plumbing in particular would be greater than treatment at the entry point for systems serving between 3,301 and 10,000 persons. Another commenter supported the definition change to 3,300 or fewer persons stating, "water systems with 10,000 population or more are actually quite big" and that "3,300 people is a more reasonable threshold." This commenter suggested that if EPA chooses to use the "…10,000 person limit then EPA should consider additional breakdowns in population for this rule such as: 10,000, 3,300, 1,000, and 250. Adding that based on POU or LSL replacement costs, the small system flexibility options are most likely beneficial for water systems that serve less than 1,000 people." Other commenters supported the proposed LCRR small systems threshold of systems that serve 10,000 people or fewer and recommended that the small system flexibility provisions of the final LCRR apply to systems serving 10,000 or fewer persons. One commenter said "[t]he rule is very complex and small system flexibility will be needed for PWSs serving 10,000 or fewer." Two of these commenters suggested EPA differentiate systems further within the category by defining small water systems as serving a population between 3,300 and 10,000 and very small water systems as serving fewer than 3,300 people.

Some commenters suggested the small system threshold be further lowered below 3,300 or fewer persons. One commenter stated that EPA should use 250 persons as the threshold. One commenter said of the small system threshold of 10,000 and fewer "[t]his will allow an unacceptably high amount of water systems to opt out of the LCR's most protective requirements, even though most of these systems likely have sufficient resources to comply with the LCR," and suggested a small system be defined as serving no more than 500 persons. Another commenter also mentioned a 500 customer or fewer threshold, then went on to recommend the flexibilities should “possibly be eliminated altogether.” Another commenter said “[t]he small system flexibility applies to systems that are too large. While corrosion can be managed/addressed differently by these systems, too much leeway given to a system with limited managerial capacity can be troublesome. The options should be restricted to special circumstances and much smaller systems than currently established.”

Two commenters proposed that small system flexibilities be extended to all systems serving 100,000 or fewer persons. Another commenter recommended that EPA consider expanding flexibilities to systems serving fewer than 50,000 persons.

Agency Response

The LCR is a complicated rule due to the need to control corrosivity of drinking water as it travels through often antiquated distribution and plumbing systems on the way to the consumer’s tap. States and PWSs need expertise and resources to identify the sampling locations and to work with customers to collect samples for analysis. Even greater expertise is needed for systems and states to identify the OCCT and water quality parameter monitoring to assure that lead and copper levels are reduced to the extent feasible. The determination of the OCCT is specific to each water system because it is based on the specific chemistry of the system’s source water, and must be designed and implemented to take into account treatments used to comply with other applicable drinking water standards (56 FR 26487; USEPA, 1991).

Small CWSs and NTNCWSs tend to have more limited technical, financial, and managerial capacity to implement complex treatment technique rules such as the LCR. Many small PWSs face challenges in reliably providing safe drinking water to their customers and consistently meeting the requirements of the SDWA and the NPDWRs. See response to comment Section 7.9 for further discussion of the challenges small systems face.

Recognizing the challenges small CWSs and NTNCWS face in reliably providing safe drinking water to their customers, EPA proposed alternative compliance options. These options allow small systems to select the option that is most appropriate for their community, considering the technical, financial and managerial capacity of the system so it can reliably provide safe drinking water. Therefore, the final LCRR will include small systems flexibilities slightly modified from the proposal. Under the final LCRR, small CWSs that serve 10,000 or fewer persons and any NTNCWS that exceeds the lead trigger level but does not exceed the lead and copper action levels must evaluate the four compliance alternatives and make a recommendation to the state within six months on which compliance alternative the water system would implement if the water system subsequently exceeds the lead action level. The state must approve the recommendation or designate an alternative compliance option within six months of submittal. In the event these water systems exceed the lead action level, they must implement the state-approved compliance option. Any small CWSs and any NTNCWS that exceeds the lead action level and had not previously exceeded the trigger level, must evaluate the compliance alternatives and make a recommendation to the state within six months. The state must approve the system’s recommendations or designate an alternative compliance option within six months; these water systems must implement the state-approved compliance option.

EPA agrees with commenters that supported the small system flexibilities for systems serving10,000 or fewer persons . The Agency agrees that small water systems serving 10,000 or fewer persons typically do not have the capacity to implement multiple measures simultaneously such as CCT and LSLR programs. Small CWSs serving 10,000 or fewer persons and NTNCWSs tend to have more limited technical, financial, and managerial capacity to implement complex treatment technique rules such as the LCR (USEPA, 2011). Many small public water systems face challenges in reliably providing safe drinking water to their customers and consistently meeting the requirements of the SDWA and the NPDWRs (USEPA, 2011). The Agency determined the compliance flexibility options would be most appropriate for small water systems that serve 10,000 or fewer persons, as they are most frequently the systems that are struggling to maintain compliance with the previous LCR and/or do not have the capacity to operate CCT in conjunction with other complex treatment technique requirements. Small water systems serving 10,000 or fewer persons have more monitoring and reporting (M&R) violations, approximately a total of 90 percent of all M&R violations for all NPDWRs. The number of violations decreases as system size increases (USEPA, 2011). Recurring M&R violations can obscure more important water quality problems because the maximum contaminant level (MCL) and maximum residual disinfectant residual level (MRDL) violations may not be discovered if a system fails to conduct routine monitoring. M&R requirements are often the simplest compliance requirements and systems that cannot complete these procedures may have other technical, financial and managerial issues (USEPA, 2011). Small system flexibilities will provide alternatives to chemical treatment as it is difficult for many small systems to find operators that have the more advanced skills necessary to implement and maintain such treatment, particularly given the limited financial and programmatic capacity of many small utilities (Kane and Tomer, 2018). EPA has concluded that these small systems can work with their state to identify an affordable and feasible treatment technique to reduce drinking water lead exposure. EPA expects that small systems will work with their state to identify the single most cost-effective measure from this list of affordable and feasible compliance options. That measure will depend upon the characteristics of the small system including the number of service connections, the number of LSLs, and the technical capacity of the system's operators.

Some commenters recommended that a threshold 3,300 of fewer persons should be used in the final rule as it would allow for consistency across NPDWRs. EPA notes that the NPDWR for lead and copper is a unique and complicated treatment technique rule that requires water systems with elevated lead to take a suite of actions to reduce lead levels in drinking water. To improve public health protection, the final rule maintains or modifies regulatory requirements from the previous LCR and includes new requirements that apply to all system sizes, for example, preparing an LSL inventory, collecting all tap samples from homes with LSLs, conducting "find-and-fix" assessments, conducting water system side LSLR when customer-initiated LSLR occurs and providing filters, providing filters in the event of an LSL disturbance, and conducting public education outreach to customers served by an LSL. Additionally, the final rule establishes a new trigger level that, when exceeded, prompts a set of actions designed to protect public health. Given the complex requirements associated with this treatment technique rule, EPA has determined that it is not feasible for water systems serving 10,000 or fewer persons to implement the full suite of requirements in the final LCRR because, in most cases, they lack the technical, financial, and managerial capacity to do so. EPA has concluded that small system flexibilities are appropriate and allows water systems, with state approval, to take the lead reduction approach that both maximizes public health protection to the extent feasible and is best tailored to their community.

EPA does not agree with commenters that support the small system flexibilities only for systems serving 3,300 or fewer persons. Similarly, EPA does not agree with commenters that suggested lowering the threshold below 3,300 persons served. EPA recognizes that while small systems serving between 3,301 and 10,000 persons may have greater technical, managerial and financial capacity than smaller systems, they still face financial and managerial limitations. EPA has determined that it is not feasible for systems serving 10,000 or fewer persons to implement the multiple treatment technique actions of optimized CCT, public education and LSLR due to the need to obtain financial, managerial, and technical capacity. Implementing such a complex program requires consequential managerial, operational, and financial investment. The systems serving 10,000 or fewer persons have less professional staff than larger systems; these systems have an average of 0.4 to 2.4 full time operators and 0.5 to 2.4 managers per system, which is approximately 2 to11 times less than the average number of operators in the larger systems. The lack of managerial oversight indicates these systems cannot appropriately plan and coordinate multiple treatment actions. Average revenues for systems serving 10,000 or fewer persons are about 4 to 170 times smaller than average revenues for large systems (USEPA, 2009).

EPA understands that states play a critical role in the flexibility requirements due to the need for state review and approval. Applying small systems flexibilities to systems serving 10,000 or fewer persons would impose more burden on primacy agencies.

EPA acknowledges commenters' input regarding the infeasibility of some of the compliance flexibility options for systems between 3,301 and 10,000, particularly POU devices and complete LSLR. EPA's analysis indicates that if provided an option, few systems serving greater than 3,300 persons would select full LSLR or POU compliance options over CCT due to relative cost considerations. EPA has found that as CWS population served increases, POU device costs can exceed CCT, re-optimization and LSLR costs (See Chapter 5 of the Final LCRR EA (USEPA, 2020)). Nevertheless, EPA recognizes that systems and states are in the best position to elect and approve, respectively, from the compliance flexibility options. There may be water systems serving between 3,301 and 10,000 persons that after evaluating site specific conditions to determine which compliance option is most appropriate, elect a compliance option other that CCT with state approval. After considering the comments received, EPA determined it is appropriate to retain the small systems compliance flexibility threshold of the final LCRR to allow compliance flexibilities for small CWSs serving 10,000 or fewer persons, as well as NTNCWS of any size.

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7.5 Corrosion Control Treatment

In the proposal, EPA requested comment on whether different flexibilities would be more appropriate for small systems, regardless of the applicability threshold applied i.e., to water systems serving 10,000 or fewer persons or to systems serving 3,300 or fewer persons.

Systems Currently Operating Corrosion Control Treatments

Summary of Comments

Several commenters urged EPA to clarify the process for small systems that have CCT in place currently and wish to choose another small systems flexibility option under § 141.93. One commenter said "…US EPA should include language emphasizing that small systems with CCT already in place cannot stop treatment without prior approval from their state in order to pursue another small system flexibility. These systems should be required to continue to operate and maintain OCCT and meet their OWQPs [optimal water quality parameters], as applicable." Another commenter expressed a similar concern and said "[w]e suggest that the rule clearly state a mechanism to switch from OCCT to a small system flexibility option or state that this option is not allowed." Commenters stated that "[t]his will prevent systems from undermining their lead reduction efforts with CCT by moving to an alternative technique too quickly."

One commenter expressed support for the small system flexibility CCT option in the proposed LCRR § 141.93 and said the provision is helpful in "[e]ncouraging small systems to actively consider corrosion control without subjecting them and the states to the ongoing monitoring and reporting requirements of making such systems maintain 'optimized corrosion control."

Agency Response

EPA agrees with commenters that recommended that small systems with CCT in place should not make treatment changes based on the flexibility options without obtaining state approval first. Treatment changes made too quickly or without state review and approval can lead to elevated lead and/or copper levels at the tap.

After considering the comments received, EPA added regulatory language to § 141.81(a)(3)(i) and § 141.93 to clarify that if a system with CCT recommends a different compliance option, they cannot discontinue CCT until the state has determined the alternative compliance option is effective in reducing lead levels. For example, a state may require a small system with CCT that recommends POU devices as a compliance alternative to continue to maintain and operate CCT until the state determines it is no longer needed (i.e., the system has fully implemented a point of use program).

In response to the commenter that expressed support for small systems utilizing corrosion control without being required to maintain OCCT, EPA would like to clarify that any water system that has CCT installed must re-optimize its CCT in accordance with § 141.81(d). Water systems required by the state to optimize or re-optimize CCT must follow the schedules in § 141.81 (d) or (e), respectively, beginning with Step 3 (the CCT study) of the appropriate paragraph unless the state specifies OCCT pursuant to either § 141.81(d)(2)(ii) or (e)(2)(ii), as applicable. Should a TLE or ALE occur at a small CWS or any NTNCWS with CCT, the system may submit another compliance flexibility option recommendation to the state for approval. These systems cannot discontinue CCT prior to state approval.

Corrosion Control Treatment and Lead Service Line Replacement

Summary of Comments

Some commenters expressed concerns that small systems that elect to conduct LSLR under § 141.93 would not be required to use control corrosion or POU devices in addition to LSLR. One commenter said "[t]hese households may receive high lead levels for potentially 15 years without CCT and/or pitcher filters." This commenter wrote that the LSLR provision for small systems is too lenient and "…is not acceptable from public health, health equity or environmental justice perspectives." Another commenter said "[b]y not requiring installation of corrosion control treatment, customers in small water systems could be exposed to higher levels of lead until completion of the lead service line replacement program, which could be as long as 15 years. The rule is unclear as to what interim measures are required." Another commenter stated, "[i]n addition, requiring that a small system provide CCT would protect against situations where an exceedance is caused by appurtenances such as lead goosenecks, pigtails, and connectors, or indoor plumbing." Another commenter requested that "…even a 'small system,' be required to add corrosion control treatment or continue to provide corrosion control treatment, analogous to the way in which this is required for large and medium systems. Lead service line replacement should be encouraged in small systems through financial incentives, but not as an alternative to corrosion control treatment." Another commenter said that "[v]ery small, and medium systems that have not exceeded the Trigger Level or Action level and have not chosen to install CCT will not have the potential for lead leaching assessed in any way under the LCRR."

Other commenters expressed concern about CCT without mandating LSLR as an option for small system compliance under § 141.93. One commenter stated, "…[Commenter] cautions EPA against an approach that allows lead service lines to remain in the ground indefinitely (especially once a system has exceeded the lead Action Level)." Another commenter stated that LCRR "… will unintentionally require costly Corrosion Control Studies and Treatment that may not solve the underlying lead problem. One commenter supported the LSLR option for small systems with limited financial and technical resources as written in the proposed LCRR. Another commenter stated "[f]ailure of the revised LCR to require the full removal of lead service lines in small systems will risk leaving many of these lines in operation for decades, if not centuries, and will raise serious environmental justice concerns."

Agency Response

In response to commenters suggesting that the LSLR compliance option allows potentially high lead exposure for up to 15 years, EPA would like to underscore that for some systems that elect this option, particularly systems with few LSLs, complete LSLR may be achieved in a shorter time period. States are in the best position to work with water systems to determine and approve LSLR timeframes on a system by system basis. The state must require a system to replace LSLs on a shorter schedule, taking into account the number of LSLs in the system, where a shorter replacement schedule is feasible. Rather than split resources between installing CCT and conducting LSLR, the final rule allows often limited resources to be focused on LSLR to accelerate completion of the program and permanent removal of a significant source of lead in drinking water.

EPA would also like to emphasize both the LSLR and CCT compliance options require implementation and maintenance to continue even if a water system's 90^{th} percentile lead levels subsequently drop below the action level to ensure that effective solutions are maintained, rather than potentially allowing systems to cycle between short term actions with limited effectiveness and ALEs. EPA estimates that water systems with few LSLs that could be removed within a few years will select the LSLR option. Systems with many LSLRs would likely select CCT as the most cost-effective compliance option. The Agency's economic analysis demonstrates that as system size increases, the least costly option is typically CCT.

In response to commenters concerned that the CCT compliance flexibility option allows LSLs to remain in the ground indefinitely, section 1412((b)(7)(A) of the SDWA requires EPA to establish a treatment technique that prevents known or anticipated adverse effect to the extent feasible. Section 1412(b)(9) of the SDWA requires that any revision of a NPDWR "shall maintain, or provide greater, protection of the health of persons." EPA determined that small water systems serving 10,000 or fewer persons typically do not have the capacity to implement multiple measures simultaneously such as CCT and LSLR programs. EPA has concluded that these small systems can work with their state to identify an affordable and feasible treatment technique to reduce drinking water lead exposure. For more information on this determination, see response to comment Section 7.4 and the final LCRR Preamble Section III.3 (USEPA, 2020a).

Additionally, in response to commenters concerned about small CWSs and NTNCWSs implementing CCT without conducting LSLR, EPA would like to emphasize that when properly installed and operated, OCCT is an effective treatment technique for reducing lead levels in tap water. Should a TLE or ALE occur at a small CWS or NTNCWS with CCT, the system may submit another compliance flexibility option recommendation to the state for approval. These systems cannot discontinue CCT prior to state approval.

In response to the commenter that raised a concern over the lack of assessment of potential for lead leaching under the LCRR for small systems that do not exceed the trigger level or action level, EPA emphasizes that other provision in the rule address this concern. For example, small systems must continue to collect tap samples and must do so at LSL sites when they have LSL sites and must conduct find-and-fix actions for any tap sample site that has a result above 15 µg/L.

After considering the comments received, EPA maintains CCT may be a preferable compliance option for some systems and finalized this provision as proposed. The final LCRR will afford all NTNCWSs and small CWSs more flexibility in evaluating the best treatment technique to control lead and to implement their chosen approach based on state approval. For more information on CCT requirements, see response to comment Section 4. For further discussion of the timeframe for the LSLR compliance option, see response to comment Section 7.6.

7.6 Lead Service Line Replacement

In the proposal EPA requested comment on whether different flexibilities would be more appropriate for small systems, whether they are applied to water systems serving 10,000 or fewer persons or 3,300 or fewer persons. EPA received comments on the feasibility and appropriateness of LSLR for small CWS and all NTNCWS.

Summary of Comments

Some commenters raised concerns over lack of flexibility for small systems in § 141.93 that is allowed for medium and large systems in the LCR. One commenter asked "[t]he larger CWS can still discontinue the LSL replacement in 141.84 (g) (6) when they drop below the AL [action level] for four consecutive monitoring periods (two years, assuming it is a 6-month sampling period). Why is the same option not allowed for the smaller system under “flexibility”? It seems to be punitive.” Another commenter expressed a similar request and asked that EPA “…allow small water systems to elect to comply with the same requirements as medium and large systems (including off-ramps where 90th Percentile values fall below the action level) and provide safe harbor levels of effort to counteract uncooperative homeowners.” One commenter stated that the LCRR “….proposed revisions actually lack important safeguards and do not allow affected systems to choose traditional remedies.” Another commenter raised concern over the requirement to document customer refusal and stated that the provision in the proposed rule “…effectively precludes successful compliance with the small system flexibility provision by a community water system committing to complete removal of all lead service lines.”

One commenter suggested specifically that EPA reduce the amount of time that a NTNCWS has to complete LSLR from 15 years to one year. This commenter stated that “[t]he one-year LSLR timeframe would be consistent with the Replacement of Lead-Bearing Plumbing option which involves replacing LSLs and all lead-bearing plumbing within the water system. There is no justification for allowing the same 15 years that a CWS has to replace LSLs in a NTNC system, which might have only one or two LSLs to replace, whereas a CWS might have hundreds of LSLs to replace.” Another commenter recommended the LSL removal timeline for small systems be reduced to 10 years.

Agency Response

EPA disagrees with commenters concerned that the small system flexibility options are “punitive” and do not allow small systems to choose “traditional remedies.” The small system flexibilities allow systems to choose among CCT, LSLR, POU and replacement of lead-bearing materials under § 141.93. Without this provision, systems serving 10,000 or fewer persons would be treated as medium and large systems under the rule and therefore, could be required to replace LSLs and install, operate, and continue to maintain CCT. (Once installed by systems serving more than 10,000 persons, and all NTNCWSs CCT must be maintained and operated even if the system discontinues LSLR because it has not exceeded the lead action level for 4 semi-annual tap sampling rounds.)

Regarding the requirement that small systems that elect to conduct LSLR must complete LSLR on a schedule not to exceed 15 years, EPA intentionally did not set a lower mandatory rate or include an “off-ramp” even if 90th percentile levels drop below the ALE because EPA anticipates that this option is a feasible and affordable, as well as practical choice for small systems that have few LSLs that could be removed within a few years; thus, potentially avoiding the need to add a CCT process that would need to be continually operated and maintained. However, it still may not be feasible to remove all LSLs in a shorter time frame due to the need to: coordinate with homeowners to complete full LSLR, obtain permits, and account for winter months when LSLR may not be practical or possible. EPA understands that in order for this compliance option to be most effective, systems that elect this option must commit to removing all LSLs. After considering the comments received, EPA finalized the provisions as proposed to require elected small system flexibility options to be continued even if lead levels are reduced at or below the trigger or action levels.

In response to the concern over the requirement to document customer refusal of LSLR, EPA designed the associated provision to prevent a water system from violating the LCRR for customer decisions outside of its control. For more discussion of the customer-owned service lines and customer refusals of LSLR, see Section 6.11. EPA also disagrees with commenters that recommended shortening the timeframe for NTNCWSs and CWSs to complete LSLR. EPA chose to provide a maximum amount of time for LSLR, 15 years; however, the Agency anticipates that for some systems, including NTNCWSs with few LSLs, complete LSLR can be achieved in a much shorter period of time. For those systems, according to § 141.84(g)(9), states must require replacement of LSLs on a shorter schedule, i.e., a higher annual percentage than required under the federal rule, where the state determines a shorter schedule is feasible. For more discussion of the rationale for the small systems compliance flexibility options, see response to comment Section 7.3. For more information on small systems LSLR plans, see response to comment Section 6.1 .

7.7 Point-of-Use Devices

In the proposal, EPA also requested comment on whether different flexibilities would be more appropriate for small systems, whether they are applied to water systems serving 10,000 or fewer persons or 3,300 or fewer persons. EPA received comments in support and opposition to the POU device option, comments requesting clarifications, comments expressing concerns regarding oversight, implementation and maintenance burdens, and recommendations to limit POU device use to very small systems.

General Support for POU Device Compliance Option

Summary of Comments

Some commenters expressed support for the inclusion of the POU device compliance option in § 141.93. One commenter noted that the support is conditional on the proper installation and maintenance of POU filters. One commenter said that the POU device option is well suited to NTNCWS because "…the entity owns and operates all of the taps within its facility; it has complete legal and physical control of its system. It would still be an expensive option and other less expensive treatment or plumbing replacement projects, would be encouraged." Another commenter supported allowing POU devices for systems serving 10,000 customers and fewer. One commenter noted that POU device implementation is a cost effective and immediately effective solution to complex compliance issues. Another commenter said "[n]umerous studies have been published on the effectiveness of using point-of-use devices to mitigate lead in drinking water, and there is also a place of Point of Entry (POE) devices in quickly and affordably solving corrosion-related water quality issues."

Agency Response

EPA agrees with commenters who wrote that POU devices have the potential to be a feasible and effective compliance options for some systems. EPA has determined that with proper installation, maintenance, testing and public education, POU devices are an effective option for lead removal for some small CWSs and NTNCWSs. EPA disagrees with the commenter suggesting that POE devices should be included in this compliance option, because installing POE device at each household even for very small CWS is very likely to be cost prohibitive. Therefore, EPA did not include POE devices as a small system compliance flexibility option.

General Opposition to POU Device Compliance Option

Summary of Comments

Some commenters opposed the POU filter small system flexibility option in § 141.93 of the proposed LCRR. Commenters expressed concern with maintenance and performance issues, difficulty in ensuring the POU filters are used properly, and the capability of POU filters to remove lead to below the action level. One commenter stated concern that POU devices can give users a “false sense of security that the problem is resolved.” This commenter recommended that POU devices be used only as a short term interim measures while systems are working on a long term solution and be limited to small community and NTNC systems that have total control of the operation and maintenance of buildings that are served by a water system. Another commenter stated “[a]s written, EPA’s proposed provisions fail to provide sufficient direction to utilities in how to “maintain” POU devices and ensure that devices are reducing lead levels at the tap. EPA should require systems to implement an adequately protective filter installation, maintenance, education and training program.”

Another commenter noted that if POU devices are only required to be installed at one tap in each household, water systems have no way of ensuring which taps customers use for consumption. They also note that it “…would be almost impossible to ensure adoption as home ownership or tenants change with time.” Similarly, another commenter stated “[t]his is not a feasible option as most households and facilities have more than one tap where drinking water can be obtained.” This commenter also claimed “[t]he POU device option cannot be implemented at a water system that has any restaurants, hospitals, or other facilities where a POU device cannot meet drinking water demand.” One commenter recommended EPA require small systems to provide at least three POU devices to each household where necessary, assist residents with installation and maintenance, train customers through active demonstration on POU installation, and perform periodic filter inspections.

One commenter noted “[a] point of use approach leaves the source of lead in place at those premises for generations to come.” Another commenter noted that POU filters should not be allowed without a full LSLR plan. Another commenter stated that systems “can continue to violate the lead action level with the only recourse being that it ’take corrective action’ at the site at which a sample exceeds 10 µg/L, a mandate that requires additional clarity.”

Agency Response

In response to the comment related to the capability of POU filters to remove lead to at or below the action level knowing that POU devices are certified using a challenge concentration of 150 ppb (i.e., µg/L) total lead, based on research and field evidence (Bosscher et al., 2019; Deshommes et al., 2012). EPA expects that POU devices are effective at removing lead at levels higher than 150 ppb. At typical drinking water pH and lead concentrations higher than 150 ppb, most lead is in particulate form (Schock et al., 1996; 2011). In a particulate form, lead would be trapped and physically removed by filters. However, in some water qualities, lead may not be particulate and flushing the tap prior to use may be necessary to reduce lead from levels above 150 ppb to 10 ppb or below (CDM Smith, 2019).

EPA disagrees with the assertions from commenters that it is difficult to ensure that POU devices are maintained properly because they are “primarily maintained by the customer,” or that they should be an interim solution, EPA has designed the LCRR POU device provision to ensure that POU devices are ultimately the responsibility of the water system, not the homeowner. Section §141.93(a)(3)(iii) of the final LCRR requires PWSs using POU treatment units to maintain the treatment units to ensure proper operation and maintenance and compliance with the treatment technique according to manufacturer's recommendations to ensure continued effective filtration, including but not limited to changing filter cartridges and resolving any operational issues. It also requires that the POUs be equipped with mechanical warning devices to ensure that customers are automatically notified of operational problems. This addresses concerns of commenters regarding situations where a change in tenants creates a potential interruption to maintenance. This mandatory education will inform users, including new tenants, how to properly use the units to maximize the units' effectiveness in reducing lead levels in drinking water. Furthermore, the water system must provide public education to consumers in accordance with § 141.85(j) to inform them on proper use of POU devices to maximize the units' lead level reduction effectiveness.

In response to the commenters that expressed concern over the ability to meet water demand with POU device by a water system that has any restaurants, hospitals, or other facilities, EPA acknowledges that the POU device compliance option may not be the best option for every small CWS and NTNCWS. Water systems electing to use this compliance option are likely to consider a multitude of factors, including water demand, access to POU devices for testing and maintenance, and ability to resolve operational issue for consumers before submitting a plan to their state for approval. States will ultimately have the discretion to evaluate site specific conditions and determine if a water system's recommended compliance plan is appropriate, including the POU device option because § 141.93(a) provides that "[t]he State must approve the recommendation or designate an alternative from compliance options (1) through (4) of this paragraph within six months of the recommendation by the water system."

In response to commenters that raised concerns that the requirement of one POU device per household is not sufficient, EPA would like to emphasize this is a minimum that may be suitable for some households served, and, as commenters noted, not for others. For households, installing a POU device at the kitchen tap is consistent with EPA's guidance "Point-of-Use or Point-of-Entry Treatment Options for Small Drinking Water Systems" (USEPA, 2006). However, water systems and states may consider if it is appropriate to install POU devices at additional household taps. EPA estimates that the cost effectiveness of POU compared to CCT drops off substantially for systems serving more than 500 people.

Additionally, section § 141.93(a)(3)(iv) of the LCRR requires water systems to annually sample one-third of these devices to ensure that they are operating properly. In the case that samples are above the trigger level systems are required to document the problem and take corrective action at the site. In response to the commenter that said this mandate requires additional clarity, EPA disagrees. The provision is sufficiently clear for implementation, and EPA intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA agrees with commenters that stated that POU devices are not a feasible option for larger systems and that costs will likely be prohibitive for systems serving more than 3,300 people. In the Final LCRR EA, EPA estimates that small systems will select the least costly option and that as the size of the water system increases, they are less likely to select the POU compliance option (USEPA, 2020b). EPA anticipates that that some small water systems can cost effectively install and maintain POU devices in their customer's homes and can educate their customers on the proper operation of these devices.

Most NTNCWSs own and control all the outlets in their system and can ensure proper operation and maintenance of installed units.

The commenter that stated that systems seem to be allowed to continue to violate the lead action level with the only recourse being that it “take corrective action” at the site at which a sample exceeds 10 µg/L, a mandate that requires additional clarity” should not that should a TLE or ALE occur at a small CWS or NTNCWS with CCT, the system may submit another compliance flexibility option recommendation to the state for approval.

Request for Clarifications

Summary of Comments

Several commenters recommended edits to clarify the certification of POU filters. These commenters clarified that “[t]he products are not certified by ANSI [American National Standards Institute], they are certified to NSF/ANSI standards by independent third-party certification bodies for the reduction of lead.”

One commenter asked EPA to clarify that states with restrictions on POU devices will be able to retain them, and asked EPA to modify the final LCRR to reflect the limitations on the use of POU devices that exist in some states.

One commenter expressed concern that use of POU filters could have unintended microbial issues. Another asked if bacteria testing would be required for POU filters.

One commenter suggested extending the POU filter option to childcare facilities. This commenter stated “[g]iven that lead is present in virtually all plumbing, a POU strategy for schools and child cares that includes regular maintenance will result in an immediate source of safer drinking water with improved protection from lead in drinking water.”

Agency Response

In response to the commenter that suggested that the final LCRR specifies that the POU device should be maintained according to the manufacturer’s instructions, EPA agreed with this commenter and added language to the final LCRR to reflect this. The final LCRR in § 141.93(a)(3)(iii) reads “the POU device must be maintained by the water system according to manufacturer’s recommendations to ensure continued effective filtration, including but not limited to changing filter cartridges and resolving any operational issues” in order to further clarify this requirement.

In response to commenters that expressed concern over microbial issues associated with POU devices, EPA agrees that the microbiological safety of the water is an important consideration. The SDWA requires that POU units must be owned, controlled, and maintained by the PWS or by a contractor hired by the PWS to ensure proper operation and maintenance of the devices and compliance with NPDWRs. Appropriate maintenance of POU devices is required under the final LCRR and replacement of POU cartridges to comply with the LCRR will also address potential microbial issues. While the final rule requires testing of POU devices for lead, the final rule does not require testing for bacteria.

EPA recognizes that restrictions on POU devices exist in some states and 40 CFR 142.4 recognizes this state and local authority. POU devices represent one small systems flexibilities compliance option in the final LCRR. While some states may restrict the use of POU devices for compliances purposes, the remaining small systems flexibilities are still available. Further, EPA expanded the allowance of replacement of lead-bearing plumbing to CWS based on public comment.

In response to the commenter that stated POU devices compliance option should be “modified” to apply to schools and child care facilities, EPA understands that some small CWS and NTNCWS eligible for the flexibility options may in fact be schools and child care facilities. Schools and child care facilities that are either a small CWSs or NTNCWSs may comply with the LCRR using the flexibilities provided in § 141.93 If they exceed the trigger or action level, they may evaluate all of the compliance options, including POU devices, and submit a selection to the state for approval.

EPA agrees with commenters that the proposed small system flexibilities for the LCRR could be improved. EPA clarified the final LCRR regarding the POU device certification requirements in response to the several commenters that proposed additional or alternative language for that provision. EPA has revised §141.93(a)(3)(ii) to state that the POU device must be independently certified by a third party to meet the ANSI standard applicable to the specific type of POU unit to reduce lead in drinking water.

Oversight, Implementation, and Maintenance Burden

Summary of Comments

Several commenters expressed concern that the POU small system flexibility option would create an additional oversight burden for states. One commenter noted that both the state and the system will be required to track, manage and maintain these devices. Another commenter stated that the Safe Drinking Water Information System (SDWIS) has a limited capacity for POU tracking. Another commenter noted that states with many small systems will face oversight challenges in providing the flexibility. One commenter asked EPA to include a provision to provide states with “…deference with respect to determining the on-going capacity of the system…” and noted “[i]t is likely that system management will commit to installation of POU treatment but later realize they do not have the capacity to manage the on-going POU program.”

Some commenters noted the implementation and maintenance burden that small water systems may face with the POU compliance option. Several commenters expressed concern that small and medium CWS do not have the resources to implement a POU program. One commenter noted that it is difficult to attain 100 percent participation from the community and stated it will likely not be possible in systems serving more than 250 people. This commenter also stated that POU installation may require overtime work after hours to gain access to the customer’s homes. One commenter noted that in previous experiences “[n]egotiating ownership of the POU device and access for testing has been an issue…” and that “[t]he ownership and testing access issue has delayed implementation or made use of POU infeasible.” Another commenter noted that “…the POU compliance option can be more expensive than other alternatives when factoring in device approval, operation, perpetual maintenance, monitoring and testing.” One commenter said “[f]or waterworks serving between 3,301 and 10,000 persons, the cost of installing and maintaining point of use treatment will be greater than the cost of completing the study and installing entry point treatment.”

Several commenters suggested creating a separate lower threshold under which the POU option would be available. These commenters note the limitations of implementing POU filters in systems serving between 3,301 and 10,000 people but suggest limiting the availability of POU filter option further below the small system threshold of 3,300 or fewer people served. Commenters suggested different thresholds for the POU filter option including 500, 250, 100, and 50 customers served instead of 3,300 or 10,000 customers served. These recommendations are based on suggestions that POU is only feasible in very limited cases.

Agency Response

EPA agrees with commenters that the POU compliance option will require significant oversight on the part of states, and significant implementation efforts from water systems that select a POU compliance option. However, EPA recognizes that this option may be a viable compliance alternative for some systems subject to the LCRR, particularly very small CWSs that serve relatively few households, and NTNCWSs that are responsible for the facility's plumbing. EPA understands that, as some commenters noted, gaining access to customers' homes can be a challenging requirement to meet; however, EPA understands that providing a POU device to all households or buildings served will be a critical component of ensuring this provision is protective of public health. Even homes without LSLs would need to be provided with a POU device to address lead leaching from lead solder or plumbing fittings and fixtures that contain lead because system-wide CCT would not be provided under this option.

In response to commenter's concerns over the large number of systems potentially eligible for this option, EPA would like to emphasize that the Agency expects primarily very small systems will elect the POU device option. In the Final LCRR EA, EPA estimates that small systems will select the least costly option and that as the size of the water system increases, they are less likely to select the POU compliance option (USEPA, 2020b).

In response to concerns over the capacity of SDWIS to track POU devices, EPA intends to support the data management needs of states for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR.

EPA agrees with the commenters that stated that the costs of POU device implementation and maintenance can exceed the costs of CCT in some situations. EPA has found that the POU device implementation can be the least cost alternative when the number of households in the system is low and therefore, EPA expects that systems will be less likely to select the POU option as water system population size increases. In response to commenters that recommended EPA set a POU option threshold below 3,300 people served, EPA disagrees and did not find an additional limiting threshold necessary because eligible water systems, as well as state reviewers are expected to evaluate costs and feasibility on a case by case basis. In addition, states may limit the POU option to different size thresholds either through state regulations or policy.

For more information on EPA's response to commenters concerns over state policy regarding POU device, see subsection Request for Clarifications in response to comment Section 7.7 POU devices.

7.8 Replacement of Lead-Bearing Plumbing

In the proposal, EPA requested comment on whether different flexibilities would be more appropriate for small systems, whether they are applied to water systems serving 10,000 or fewer persons or 3,300 or fewer persons. EPA received comments on the timeline for replacement of lead-bearing plumbing and requesting guidance on implementation of this compliance option.

Summary of Comments

Some commenters expressed support for the option to replace lead-bearing plumbing that is available in § 141.93(a)(4) for systems that have control over all plumbing in its buildings and no unknown, galvanized service lines or LSLs. Several commenters expressed concern that the one-year replacement timeline in the proposed LCRR was too short. One commenter noted that "[s]tates can have some large NTNCWS, such as industrial facilities, sports venues, and military bases, among others, and completing replacement of lead- bearing plumbing within this short timeline would be incredibly challenging." Another commenter stated "[f]or some systems, this time frame may be problematic if funding or approvals from the state or funding agency and local plumbing jurisdictions are needing to be obtained prior to beginning the replacement." One commenter suggested extending the timeline for replacement to three years, another commenter suggested 18 to 24 months. Another commenter recommended "…allowing states to set a timeline for the replacement to be completed would allow state to customize the option so that systems can better plan and budget for the replacements."

Some commenters recommended that this option should apply to copper as well. One commenter noted "[Commenter] has advised such waterworks to replace copper plumbing, observed decreases in that contaminant as a result, and approved this process for practical, cost effective public health protection."

Many commenters recommended that "…the Lead-Bearing Plumbing Replacement option currently reserved for Non-Transient Non-Community Water Systems (NTNCWS) should be included in the final LCRR as a compliance option for Community Water Systems (CWS) and that the use of this option be at a state's discretion." One commenter echoed this recommendation for small CWSs and said "[w]ater systems of this size may find this alternative preferable to installing corrosion control treatment, which can be technically challenging and require a level of skill that the operators of these systems might not possess." Another commenter noted "[t]he Lead-Bearing Plumbing Replacement option may be beneficial for very small, disadvantaged communities that would rather replace fixtures and plumbing than commit resources to maintaining POU devices in perpetuity. Several states have seen success with small systems using a similar approach to replace copper plumbing and fixtures." One commenter provided examples of small CWSs and said "[e]xamples of community water systems that could take advantage of such an option include assisted living facilities, boarding schools, apartment buildings, and other state-identified situations where the system 'regularly serves at least 25 year-round residents' and a single person or entity owns the property. [42 U.S. Code § 300f(15).]"

Some commenters asked EPA to clarify the requirements and provide guidance on implementation of this option. One commenter said, "detailed guidance must be provided on how this will be implemented, including how to address when plumbing replacement is not successful." Another commenter asked Is the system "deemed" to have optimized upon replacing plumbing components? If so, how is it optimized/re-optimized? EPA must then identify what to do if plumbing replacement is not successful." This commenter also expressed concern that the option to replace premise plumbing will raise jurisdictional challenges.

Agency Response

In response to the commenters that expressed concern that the one-year timeframe is too short and recommended that EPA extend the timeframe to replace all lead-bearing plumbing, EPA disagrees with these commenter's recommendations. EPA understands that complete replacement of all lead-bearing plumbing, particularly for larger NTNCWSs, may not be feasible, and would like to emphasize that systems where that may be the case would be able to select a different flexibility option. EPA determined it is feasible to achieve replacement in a one-year timeframe for certain types of systems eligible for the flexibilities, and therefore, finalized this timeframe in the final rule.

EPA disagrees with commenters that recommended this option should apply to copper ALEs as well. EPA has found that CCT is likely to be more cost effective than complete copper plumbing replacement for systems with copper ALEs. In determining the scope of the proposed LCRR, EPA decided not to make revisions to the copper provisions of the rule and therefore did not propose extending this option to small CWS and NTNCWS with copper ALEs.

EPA agrees with commenters who recommended that replacement of all lead-bearing plumbing be available to small CWSs as well NTNCWSs. Research has shown that corrosion of lead-bearing premise plumbing has the potential to leach higher levels of lead in drinking water (Elfland et al., 2010). Lead from premise plumbing contributes on average 20-35 percent of lead in drinking water where an LSL is present (Sandvig et al., 2008), and could potentially represent an even greater percentage where no LSL is present. In this light, EPA acknowledges that in certain circumstances, when small CWSs have no LSLs and control all of the plumbing materials in its building, replacement of all lead-bearing plumbing material might be the most cost effective option for them. As commenters noted, some small CWSs may in fact have complete ownership or control of the plumbing materials in a system such as prisons, boarding schools, apartment buildings and long-term care facilities, among others. In small CWS where water is primarily delivered through premise plumbing rather than a distribution system, replacement of lead-bearing plumbing might be the best option for reducing the sources of lead in a system that does not have LSLs, and therefore potentially more appropriate than CCT or POU devices for reducing exposure. EPA is therefore including the replacement of lead-bearing plumbing materials as an alternative path to compliance for small CWSs as well as NTNCWSs that have control over all plumbing materials in the system and have no LSLs.

In response to commenters requesting additional guidance on the implementation of this compliance option, EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

7.9 Technical, Managerial and Financial Capacity

Summary of Comments

Many commenters discussed the lack of technical, managerial, and financial capacities that small systems can be challenged with. Commenters raised concerns that small systems can be short staffed, lack the capacity to comply with complex rules, and may lack technical expertise. Commenters noted that small systems may be unable to conduct CCT studies, implement CCT, implement LSLR, or install and maintain POU devices. Some commenters suggested increased flexibility beyond what was included in the proposed LCRR, including longer compliance time frames.

One commenter expressed concern that the deadlines for small system compliance flexibilities may not be achievable. This commenter said "[s]ystems trying to get access to consumers' homes for plumbing replacement or to install a POU device might need additional time to get legal authority to access properties." Another states that EPA's "…mind-set towards large systems is still prevalent and some of the requirements set forth in this proposed rule do not fully consider the resource and financial burden it will place on smaller systems."

One commenter asked that EPA give small systems the "flexibility of testing out of permanent treatment requirements" without any further detail or explanation.

Agency Response

EPA agrees with commenters that raised concerns over the technical, managerial, and financial capability challenges that small systems can face. EPA has determined that small CWSs and all NTNCWSs need greater flexibility to comply with the requirements of the LCRR because they tend to have more limited technical, financial, and managerial capacity to implement complex treatment techniques. Many small PWSs face challenges in reliably providing safe drinking water to their customers and consistently meeting the requirements of the SDWA and the NPDWRs. These challenges include, but are not limited to: (1) lack of adequate revenue or access to financing; (2) aging infrastructure; (3) retirement of experienced system operators and the inability to recruit new operators to replace them; (4) lack of managers and operators with the requisite financial, technical or managerial skills; (5) lack of planning for infrastructure upgrades or the ability to respond to and recover from natural disasters (e.g., floods or tornadoes); and (6) lack of understanding of existing or new regulatory requirements and treatment technologies. As a result, some small systems may experience frequent or long-term compliance challenges in reliably providing safe water to their customers while others may be in compliance now but lack the technical capacity to maintain compliance (OIG, 2016).

EPA designed the flexibilities to ensure the LCRR requirements for these systems are feasible, particularly for small systems for which operating and implementing OCCT may be a challenge. In response to the commenters that suggested the flexibilities actually increase the burden on small systems because they would have to evaluate multiple options and select a recommended option, EPA is requiring water systems, including small water systems, that have already installed CCT and subsequently exceed the lead action level to re-optimize CCT.

Additionally, EPA understands that early and frequent communication between states and waters systems, particularly those eligible and interested in evaluating the small system compliance flexibility options, can help to reduce implementation burdens. For more information on implementation guidance, see response to comment Section 7.10 Timing and Implementation.

7.10 Timing and Implementation

Recommendations for Timing of Small System Flexibility Requirements

Summary of Comments

One commenter stated "[m]andating all three options at Section 141.93 of the proposed rule to all water systems would set a reasonable timeline to replace all lead service lines and remove the lead threat, it would implement corrosion control to quickly lower lead levels and prevent lead levels from rising, and it would provide point of use devices to protect people at the tap to allow people to have safe drinking water immediately."

One commenter suggested that small systems be required to propose a preferred compliance alternative to the state either at the same time as the LSL inventory submission or with a phased submission approach. This commenter recommended that adding this requirement before a TLE or ALE would allow for a quicker response if the action level is subsequently exceeded One commenter suggested requiring systems to implement the compliance flexibility options "after their first ALE, rather than their second ALE."

Agency Response

EPA does not agree with one commenter's suggestion that all small systems should be required to submit their compliance alternative selection for State approval at the same time as the LSL inventory. Completing the LSL inventory will be a significant effort for water systems to compile and submit and requires a significant amount of review and approval time for states. The LCRR does not require simultaneous submission of the LSL inventory, the flexibility option recommendation, and the associated plans because it would likely overwhelm the capacities of both the small water systems and their state reviewers. In response to the commenter considering first and second ALEs, EPA would like to clarify that implementation of the approved compliance flexibility option is required after the first ALE. EPA introduced the trigger level in the LCRR, in part, to encourage a more proactive approach to addressing lead in drinking water. EPA determined that the timeline for developing a recommended option for small systems following a TLE is sufficient for ensuring systems are prepared to take action should an ALE occur. For more information on EPA's rationale for the trigger level, see response to comment Section 3.

Requested Implementation Clarifications

Summary of Comments

Commenters requested various clarifications on § 141.93 implementation by states.

One commenter said "[t]he Agency will have to be clear in the rule how it will assure that State primacy agencies utilize this compliance option." This commenter also said "[f]or example, it is not clear in the proposed rule if the states will accept lead service line replacement in lieu of corrosion control or if they will rely on triggers in the rule to require additional action by individual systems." This commenter also noted that current EPA guidance on POU and POE filters will have to be updated to align with the final LCRR.

Other commenters asked that the final LCRR encourage systems to work with states in the initial development of their compliance alternative plan. These commenters noted that "States can assist small systems in developing a system-specific plan rather than states having to spend their already limited resources reviewing an entire plan with which they are unfamiliar and/or making an alternative suggestion based on their own review of the system. Having the State involved early on will reduce time wasted on developing non-viable alternatives." Another commenter recommended that EPA extend the state review timeline to greater than six months and stated "[s]mall systems may have limited records and resource constraints that will limit the capacity for [Commenter] to review things like engineering plans and CCT within a six-month timeframe."

Some commenters requested clarification from EPA on how the small systems flexibilities would apply in certain circumstances. One commenter noted “There is no discussion about how the small system flexibility applies when there is also a copper action level exceedance. There are times when a system exceeds both action levels.” Another commenter asked EPA to clarify if systems that implement a small system flexibility option are “deemed optimized.” One commenter asked “Is a system permitted to do a combination/mixture of different options under the Small System Flexibility? If a system has limited LSL to the point where replacing them won’t make a wide-spread improvement, could they also do LSLR and POU Installation?” One commenter noted “[t]here is not currently a protocol for rescinding the small system flexibility and mandating a more conventional approach.” Another commenter suggests that in this case, “…the primacy agency should be given discretion to require implementation of an additional flexibility, beyond that originally implemented.” Another asked that EPA allow for “off ramps” for the selection option, asking EPA to “[p]lease include language to allow a waterworks to change or stop a selected option, with state approval, if the facts change.”

Agency Response

EPA disagrees that it must “assure that State primacy agencies utilize this compliance option.” As provided in Section 1414(e) of the SDWA and EPA’s primacy regulations (40 CFR 142.4), nothing in the SDWA or the implementing regulations diminishes the authority of a state to adopt or enforce a more stringent law or regulation regarding drinking water or PWSs.

EPA agrees that it is mutually beneficial for small CWSs and NTNCWSs and states to coordinate in the initial development of their compliance alternative plan. EPA agrees with commenters that early engagement between systems and states would particularly help streamline the development and review process and could reduce the amount of work and/or revisions required to approve a plan. EPA encourages States to initiate early engagement at that time they notify the water system of the TLE.

In response to the commenters concerned about a state’s timeframe for review of compliance plans, EPA disagrees that the timeframes proposed should be extended in the final LCRR. EPA understands that a six-month review period for states might be challenging in some cases; however, the Agency determined it is essential to require timely action in case a subsequent ALE occurs.

In response to commenters that asked if the flexibilities apply to copper ALEs, EPA would like to clarify that the flexibilities do not apply. Small systems that exceed the copper action level are required to implement CCT to reduce copper corrosion. The small systems that exceed both the lead and copper action levels could work with their states to optimize CCT to reduce both lead and copper levels.

In response to comments about combining flexibility options and determining if a water system is optimized; these flexibilities are designed as individual options. A small system that selects CCT is deemed to be optimized as long as it meets its OWQPs. For systems that select POU, LSLR, or replacement of lead-bearing materials, the system is in compliance as long as they meet the requirements for the selected option. In response to comments regarding “off-ramps” during implementation, and other implementation questions, EPA does not believe that off-ramps are appropriate for water systems that have exceeded the action level. EPA is requiring that small water systems carefully evaluate the four options and is providing systems six months following a trigger level exceedance to identify the most appropriate action for their system to reduce drinking water lead levels. EPA is also requiring systems to submit their selection to the primacy agency for their review and approval. EPA is providing states with six months to review and approve this designation. EPA believes this is sufficient time for small water systems working with their states to identify the most appropriate action so that the system is ready to implement steps if it exceeds the action level. EPA believes that providing small systems with off-ramps could unnecessarily delay the actions needed to reduce drinking water lead exposure. EPA acknowledges that there may be challenges encountered in systems that implement small system flexibility options. EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

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8 Public Education Requirements

EPA received many comments on the proposed public education requirements in §141.85. EPA specifically requested comment on the following:

- Whether the Agency should require water systems to provide public education materials to consumers served by service lines of unknown materials as proposed in §141.85(e);
- The appropriateness of the outreach activities proposed in §141.85(g) for community water systems (CWSs) that exceed the lead trigger level and fail to meet their goal rate for lead service line removal (LSLR) and comments on additional actions or outreach efforts water systems could take to meet their LSLR goal rate and;
- The appropriateness, frequency, and content of required outreach in §141.85(h) to State and local health agencies and whether the requirements should apply only to a subset of the country's CWSs.

In addition to these topics, EPA also received comments on the proposed mandatory health language in §141.85(a)(1)(ii), the development and accessibility of public education materials, the requirements in §141.85(d) to provide notification within 24-hours for a lead action level exceedance (ALE) and for individual sites where the tap sample exceeds 15 µg/L, comments on personnel and resource burden in carrying out the requirements of §141.85, and comments on proposed changes to the Consumer Confidence Report (CCR).

8.1 Public Notification and Public Education Development, Timing, and Delivery

EPA received comments on the mandatory lead health effects language proposed in § 141.85(a)(1)(ii) that is required in public education materials as well as the CCR and the public notice of a lead ALE. EPA also received comments on the burden of effort needed for water systems to carry out the proposed public education provisions specified in § 141.85. EPA received comments on the timing of some of the public education provisions including notification of tap sampling results in § 141.85(d). EPA received comments on how to reach different kinds of consumers. EPA received comments on availability of public education materials in different languages, in reference to § 141.85(b)(1). Lastly, EPA received comments suggesting additional opportunities for public education.

Mandatory Lead Health Effects Language and Risk Communication

Summary of Comments

Many commenters supported the proposed updates to the mandatory language on health effects of lead, finding it easier to read and understand compared to the language required in the previous rule. However, EPA also received many comments requesting modifications to the proposed mandatory lead health effects language. Some commenters characterized the proposed language as redundant, too long, and questioned how well the proposed language followed risk communication principles and how accurately it portrayed risks of lead exposure. Some commenters recommended using more definitive language about the health risk in adults. Several commenters thought the statement did not emphasize enough that there is no safe level of lead, whereas some commenters expressed concern that the health effects language would cause undue fear of tap water among consumers. Many commenters took issue with the statement's reference to evidence of cardiovascular and other health risks of lead as "recent," citing EPA's 2013 Integrated Science Assessment for Lead and noting that a statement required in all public education materials should be timeless (USEPA, 2013). Many commenters also thought the statement included redundant language and provided suggestions for making it more concise. One commenter found it unclear whether the reference to increased prenatal risk was referring to the pregnant woman, the fetus, or the pregnancy itself. Many commenters provided recommendations for addressing the issues they identified. One commenter said that health effects language and information should come from the state health department to ensure consistency of the message across the state.

Many commenters also offered suggestions for making the mandatory health effects language more accessible and inclusive. Some commenters suggested requiring systems to provide public education materials in different languages in communities where English is not the most prominently spoken language. One commenter provided Michigan's Lead and Copper Rule as an example which requires water systems serving communities where at least 10 percent of the population primarily speak a language other than English to provide public education materials in that language (Michigan EGLE, 2019). Another commenter requested the statement use gender-neutral language in order to align with their state's communication policies. While commenters supported the improved risk communication, one commenter noted that informing consumers is not enough without addressing socioeconomic factors that may make certain lead risk reduction actions inaccessible.

Agency Response

In response to comments requesting modifications to the proposed mandatory lead health effects language, EPA has revised the mandatory health effects language to address and incorporate many of these suggestions in the final rule. For example, EPA has removed reference to "recent" studies as suggested by a commenter and has revised the language to be timeless, clearer and more concise. The updated mandatory health effects language in the final rule can be found in § 141.85(a)(1)(ii).

In response to the commenter who requested that the mandatory health effects language be gender neutral in order to align with their communication policies, EPA has taken this into consideration and has added flexibility for a water system to modify the language with state approval.

EPA disagrees with the commenter that it is necessary for lead health effects information to be delivered by the health department. Water systems are responsible for lead levels at the tap and therefore, it is important that they provide information to consumers about the health effects of lead, sources of lead in drinking water, actions consumers can take to reduce their exposure to lead in drinking water and provide information on how to get water tested for lead. When revising the previous rule, EPA consulted risk communication experts and updated the mandatory health effects language in all public education materials, the CCR and public notification to ensure that consumers receive accurate and consistent health information.

EPA considered comments requesting that the Agency update the requirements for providing public education materials in different languages. The previous rule required that for systems that serve a large proportion of non-English speaking customers as determined by the state, public education materials must include a statement that the materials provide important information about the customer's drinking water and directing the customer to contact the water system to get a translation. Because this existing provision is sufficient in its requirements to make public education materials accessible to non-English speakers, EPA has retained this in the final Lead and Copper Rule revisions (LCRR).

EPA acknowledges that socioeconomic factors may pose a barrier to effective risk communication. However, EPA notes that the health effects language in § 141.85(a)(1)(ii) is intended to be a clear, concise, and easy to understand statement. EPA also notes that there are multiple requirements for public education in § 141.85 and opportunities for consumer engagement, including information to consumers served by a lead service line (LSL), galvanized requiring replacement, and lead status unknown service lines (see Section 8.3), targeted outreach to consumers when a system exceeds the lead trigger level of 10 µg/L and fails to meet the LSLR goal rate (see Section 8.6), and information in the CCR (see Section 8.7). EPA notes that water systems are encouraged to use delivery methods that increase accessibility, such as posting their CCR on a website or via electronic delivery and notes that the outreach options listed in § 141.85(h) also offer opportunities for various types of consumer engagement. EPA also notes that water systems are required under § 141.84(b)(7) to consider funding strategies in their LSLR plans to "considers ways to accommodate customers that are unable to pay to replace the portion they own."

Burden of Public Education and Public Notification Material Development

Summary of Comments

Many commenters considered the proposed public notification and public education requirements to be burdensome on water systems, particularly their frequency and timing. Many commenters found the requirement to notify customers of an individual tap sample exceeding 15 µg/L within 24 hours challenging due to staff availability and the need to review results and letters prior to delivery, with a few commenters suggesting that 3 days would be more practical. Some commenters took issue with the frequency of public education and notification requirements (e.g., annual notification of an LSL or lead status unknown service line). EPA also received comments that questioned whether water systems have the health communication expertise for these efforts or whether these efforts would be better suited to public health agencies. Many commenters requested technical support and guidance on developing public notification and public education materials. One commenter thought that the requirement for water systems to annually certify they are adhering to public education and public notification requirements was unnecessary for implementation.

Agency Response

EPA believes that water systems have the capacity to conduct the public education and public notification requirements of the LCRR and notes these activities are necessary to help inform and educate the public of the health effects of lead, sources of lead, and steps they can take to reduce their risk to lead exposure. EPA acknowledges commenters' concerns about some of the proposed public notification and education requirements being challenging for water systems. In response to requests to allow water systems more time to deliver the notice of an individual sample exceeding 15 µg/L, EPA extended the 24-hour deadline in the final rule to "as soon as practicable but no later than 3 calendar days after the water system learns of the tap monitoring results." For more information on timing of notification of tap sampling results, see the response to comment Section 8.4. For response to comments on the 24-hour public notification requirement for a systemwide ALE, see Section 8.2. EPA disagrees with requests to reduce the frequency of notifications to consumers served by an LSL or lead status unknown service line; for more information on timing and frequency of LSL notification, see responses to comment Section 8.3.

EPA also acknowledges commenters' concerns that water systems may lack the health communication expertise for developing public education materials; however, they are responsible for providing customers with drinking water and must keep them informed of the quality of their water and how to reduce their exposure to contaminants in drinking water. While systems are required to provide public education to consumers in accordance with the various public education provisions, EPA notes that systems may develop the materials in consultation with public health agencies. One of the goals of the new public education provisions is to encourage collaboration between water systems and local and state health agencies on lead public education efforts (see response to comment Section 8.5). EPA also acknowledges commenters' request for guidance. EPA understands that development of public education materials and public notices is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA disagrees with the commenter that stated that it is unnecessary for water systems to annually certify that they are adhering to public education and public notification requirements. EPA notes that the public education requirements of § 141.85 are an important component of the Lead and Copper Rule (LCR) and are necessary to help inform and educate the public of the health effects of lead, sources of lead, and steps they can take to reduce their risk to lead exposure, therefore EPA has retained them in the LCRR. Failure to comply with the requirements of § 141.85 constitutes a violation of the treatment technique. Certification that a water system has conducted the public education and notification requirements is necessary to ensure compliance.

Delivery and Timing

Summary of Comments

Many commenters expressed concern that the frequency of public notification and public education would unnecessarily alarm consumers. One commenter thought some of the proposed public education provisions like the annual notification of an LSL or lead status unknown service line would lead to "unnecessary concern and degradation of customer confidence," and that corrosion control is enough to protect customers. Many commenters requested guidance on how to reach different kinds of consumers (e.g., transient populations) in order to provide public notification and public education, particularly with regards to LSLs. Some commenters also requested clarity on the timing of delivery of public education, specifically notification of tap sampling results under § 141.85(d).

Agency Response

EPA considered commenters' concern about how water systems notify transient consumers, especially to deliver LSL notifications. EPA notes that the LCRR requires systems to provide notification of a lead, galvanized requiring replacement, or lead status unknown service line to all persons at a service connection with a lead, galvanized requiring replacement, or lead status unknown service line. This includes residential consumers, but not necessarily transient populations such as Bed and Breakfast guests and restaurant patrons whose addresses are unknown. EPA acknowledges the importance of ensuring such transient populations are informed; however, it is not feasible for water systems to locate and notify each of these consumers. EPA encourages the property owner who receives the notification to notify their guests or patrons if they are served by a lead, galvanized requiring replacement, or lead status unknown service line. Consumers can also refer to the LSL inventory which is publicly available and includes locational identifiers for LSLs as specified in § 141.84(a) of the final rule. EPA understands that reaching as many consumers as possible is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA notes some confusion about the timing of delivery of public education, specifically notification of tap sampling results. One commenter thought that notification of all lead and copper tap sampling results is required within 24 hours. However, notification within 24 hours is only required when lead tap sample results exceeded 15 µg/L, while tap sampling results at or below 15 µg/L must be provided within 30 days of the system learning of the results. As noted above, in the final rule, EPA extended the 24-hour deadline for providing an individual tap sample exceeding 15 µg/L to no more than 3 days after the system receives the result.

For more information on timing of notification of tap sampling results, see § 141.85(d) of the final rule or the responses to comments in Section 8.4. For timing of Tier 1 public notification of a lead ALE, see § 141.202 and response to comments in Section 8.2. For information on timing of outreach activities systems must conduct if they fail to meet their goal LSLR, see § 141.85(h) of the final rule and response to comments in Section 8.6. For information on timing of outreach to local and state health agencies, see § 141.85(i) of the final rule and response to comments in Section 8.5. For timing of the CCR, see § 141.152 and response to comments in Section 8.7.

Many commenters expressed concern that the frequency of public notification and public education would unnecessarily alarm consumers. One commenter thought some of the proposed public education provisions like the annual notification of an LSL or lead status unknown service line would lead to "unnecessary concern and degradation of customer confidence," and that corrosion control is enough to protect customers. EPA disagrees; the Agency believes that public education is an integral part of protecting public health by helping to ensure that customers are informed, aware of risk, and can decide to take actions to protect their health. Further, notifying customers that they are served by an LSL can help encourage customer-initiated LSLR, regardless of a system's 90th percentile level. For responses to comments on notification of LSLs, see the response to comment Section 8.3.

Requests for Additional Requirements

Summary of Comments

A few commenters requested additional public notifications, including notifying consumers before a source water treatment change and to provide public notice of the results of the mandatory study. A few commenters requested updates to copper public education and public notification requirements, taking issue with the fact that public notification is not required when there is a copper ALE even though the copper AL is health-based.

Agency Response

EPA considered commenters' suggestion that systems be required to notify customers when considering a source water or treatment change and provide public notice of the results of the mandatory study. EPA does not believe this notification to be necessary as systems are already required to notify the state and obtain approval for a source water or long-term treatment change prior to making the change.

EPA also considered comments requesting that the Agency require public notification of a copper ALE. Such a provision was not part of the previous rule or the proposed rule revisions. Water systems are required to issue Tier 2 Public Notification if the system has a treatment technique violation in response to a copper ALE. In addition, a system must report copper tap sampling compliance information in its annual CCR. The Agency is retaining these requirements as they pertain to a copper AL exceedance. The Agency expects that any elevated copper levels will be addressed by corrosion control treatment adjustments and that in the event a system does not adequately address those issues, the appropriate health effects language is provided to consumers through public notification or the CCR.

In the final rule, EPA is clarifying the requirement that small CWSs and non-transient non-community water systems (NTNCWSs) that select point-of-use (POU) devices as their compliance option in response to a lead AL exceedance must provide public education materials to inform users how to properly use POU devices to maximize the units' effectiveness in reducing lead levels in drinking water.

8.2 Public Notification Tier 1 Requirements

EPA received comments on the proposed rule's incorporation of the 2016 Water Infrastructure Improvements for the Nation Act (WIIN Act) amendments to section 1414 of the Safe Drinking Water Act (SDWA) in 40 CFR 141 subpart Q-Public Notification of Drinking Water Violations (and as necessary into any provisions cross-referenced therein) and the addition of lead ALEs under § 141.80(c) to the list of Tier 1 violations or exceedances subject to the new 24-hour notice requirement. In particular, EPA received comments on the categorization of a lead ALE as Tier 1 violation. EPA also received comments on the 24-hour delivery requirement of the notice to sites where the tap sample was > 15 µg/L. Finally, EPA also received comments on the methods for delivering the public notice of a lead ALE.

Appropriateness of a Tier 1 Public Notice Designation

Summary of Comments

EPA received comments on the proposed public notification requirement to categorize lead ALEs as Tier 1. Specifically, EPA received comments on the appropriateness of the proposed amendments to § 141.201 to categorize lead ALEs as Tier 1 violations, as specified under the current Public Notification Rule. Many commenters recognized the importance of transparency through clear and timely communications, however expressed concern or objected to the proposed amendment and suggested that Tier 1 notices are generally reserved for contaminants that have a significant potential to cause adverse effects on human health as a result of short-term exposure, such as "risks posed by microbial contamination where there is the prospect of immediate acute health consequences for anyone exposed to a very small concentration of pathogens." Some commenters stated that providing Tier 1 public notices based on a 90^{th} percentile concentration greater than 15 µg/L is inconsistent with Congress' instructions to provide such notices to the public after a lead level exceedance that "has the potential to have serious adverse effects on human health as a result of short-term exposure." A few commenters suggested that the AL (action level) is "not a health-based standard" and therefore does not meet the definition of a Tier 1 Public Notice categorization as described in section 2106 of the WIIN Act. These commenters recommended that EPA classify lead AL exceedances as Tier 2 violations if the Agency retains the public notification requirement. Many commenters felt these notifications would cause undue panic and mistrust amongst consumers, and some commenters suggested that primacy agencies should be given the flexibility to add their own language about the AL. One commenter asked if the inclusion of an ALE as a treatment technique violation in Appendix B to Subpart Q of Part 141 of the proposed rule was an error.

A few commenters also suggested edits to the mandatory health effects language required in the Tier 1 public notice of a lead AL exceedance as well as the CCR and public education materials. A summary of public comments on the mandatory health effects language can be found in Section 8.1.

Agency Response

EPA does not agree with commenters and notes that Section 2106 of the 2016 WIIN Act required that a notice “be distributed as soon as practicable, but not later than 24 hours, after the public water system learns of the violation or exceedance” “that has the potential to have serious adverse effects on human health as a result of short-term exposure.” In the final rule, EPA is giving effect to that amendment and maintaining its categorization of a lead ALE as a Tier 1 violation, resulting in Tier 1, 24-hour notification. The scientific evidence demonstrates that exposure to lead is associated with serious adverse health effects, including prenatal risks, cognitive effects in infants and children, as well as cancer and cardiovascular, renal, reproductive, immunological, and neurological effects in adults (USEPA, 2013; National Toxicology Program, 2012; USEPA 2004). Given there is no safe level of lead, EPA believes that lead AL exceedances even in the short term could have serious adverse health consequences and that to avoid these impacts, consumers must be notified as soon as possible.

EPA agrees with commenters that guidance will be important for successful implementation. For recommendations that EPA provide guidance on managing risk communication challenges associated with such notices, including provisions to allow water systems to add additional language in a manner as to "not cause undue confusion and public panic" or "damage public trust," EPA understands this is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA notes that a lead AL exceedance is not considered a treatment technique violation. However, failure to take the required actions after an AL exceedance (LSLR, OCCT, source water monitoring, Public Education) is a violation of the treatment technique. This has not changed as a result of the final LCRR.

EPA has incorporated many of the suggestions that commenters provided into the mandatory health effects language. The mandatory health effects language in the final rule can be found in Appendix B to Subpart Q of Part 141. For a summary of the comments and the Agency's response on the mandatory health effects language, please see response to comment Section 8.1.

Scope, Timing, and Delivery of Tier 1 Public Notifications

Summary of Comments

EPA received many comments expressing concerns about the ability of water systems to meet the proposed 24-hour distribution requirement for notification of an AL exceedance. Specifically, EPA received comments on the distribution of public notifications to be made "as soon as practicable, but not later than 24 hours after the public water system learns of the violation or exceedance" and that such notifications must also "be provided to the Administrator and the head of the State agency that has primary enforcement responsibility under section 1413 of the SDWA, as applicable, as soon as practicable, but not later than 24 hours after the public water systems learns of the violation of exceedance," as described in the 2016 WIIN Act and in the proposed LCRR. Many commenters had concerns with the logistics and feasibility of issuing notifications within 24 hours and believed additional flexibilities should be afforded to water systems. Suggestions included extending delivery time to several business days instead of 24 hours. Some commenters expressed concern with the need to validate sample results before making such notifications and if included as proposed, many commenters requested EPA allow for additional time to provide such notification (e.g., allow several business days or until a confirmation sample is collected). A few commenters asked for flexibilities to broadcast this information in a manner that makes sense for their system (e.g., on a public website or other broadcast media as a delivery option), and suggested that EPA should provide additional guidance on the timing and delivery of notifications and a mechanism to report to EPA via fax or email.

Many commenters also had questions on when the notification clock starts (e.g., at time of sample collection or when samples are properly assessed for quality assurance). Some commenters requested clarification on how water systems should provide these notices to the state and EPA as these systems "are not normally in direct contact with the EPA" and it may result in more administrative violations as these systems "navigate the challenges of this unfamiliar communication path."

Some commenters recommended the rule prioritize and target notifications to a subset of the customer base that are potentially more affected by lead ALEs. For example, a few commenters suggested that notifications within 24 hours should "only be required for individual households impacted." A few commenters did not believe that all customers should receive a notice about a 90th percentile lead ALE "at the same time as customers who do in fact receive their water through a lead service line." One commenter recommended that EPA revise the provision to require "public notice within 24 hours to all individuals with a known service line, galvanized steel, or unknown services, as this customer population may be potentially affected" as opposed to notifying all customers within the water system. One commenter recommended that the Agency allow an option for a water system to distribute its notice to the entire service population if that system may be hesitant to "divide their post-exceedance public notification in this manner."

Agency Response

EPA acknowledges commenters' concerns; however, the Agency disagrees that systems would not be able to provide the notice within 24 hours. Water systems must comply with Tier 1 public notification (i.e., within 24 hours) for other situations now and already have the mechanisms in place to do so. The Agency notes that it is not revising the form and manner of these notices as currently outlined in § 141.202. Water systems may have a template notice prepared in advance and may choose from several options that make it feasible to provide the notice to all persons served by the system within 24 hours of learning of the exceedance. These options include broadcast media such as radio and television, posting the notice in conspicuous locations throughout the area served by the water system, hand delivery of the notice to persons served by the water system, or another delivery method approved by the primacy agency. The body of scientific evidence supports the Agency conclusions that exposure to lead can result in serious adverse health effects which the Agency believes necessitates such notifications to be made as expeditiously as possible. Therefore, EPA is maintaining the provision for distribution of public notices to be made "as soon as practicable, but not later than 24 hours after the public water system learns of the violation or exceedance." In addition, the Agency is maintaining the provision as proposed to provide a copy of the public notice to the primacy agency and the Administrator (as applicable). However, EPA is clarifying in the final rule that the requirement for water systems to provide a copy of the Tier 1 public notice to the Administrator and the head of the Primacy Agency as soon as practicable, but not later than 24 hours after the public water systems (PWSs) learns of the violation or exceedance will only apply to lead AL exceedances and not all Tier 1 public notices.

Some commenters requested that EPA provide additional clarification and guidance on the timing and delivery of such notifications (e.g., when does the 24-hour window start) and what appropriate mechanisms are available to notify the EPA Administrator and state agencies. In the final rule, EPA is clarifying that the deadline for providing public notice of a lead ALE is within 24 hours of the system receiving and calculating the 90^{th} percentile value that exceeds the lead AL. EPA agrees this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA does not agree that guidance is needed on the form and manner for Tier 1 public notification. The current Tier 1 Public Notification rules provide the form, manner, and timing of such notices to the relative risk to human health. There are certain elements that must be included in a public notice which are described in 65 FR 25982 (USEPA, 2020). EPA believes the current notification rules and EPA's Public Notification Handbook are adequate for notifying persons served by the water system that there is a potential risk to public health and is not considering revising them at this time.

EPA acknowledges comments regarding the timing of notification for individual tap sample results. EPA has revised the requirement in §141.85(d)(2)(ii) to require water systems to provide a notice of individual tap sample results that exceed 15 µg /L of lead "as soon as practicable but no later than 3 calendar days after the water system learns of the tap monitoring results" instead of within 24 hours. For those comments related to individual tap sample results, please reference the response in Section 8.4 on individual samples above 15 µg/L.

8.3 Public Education about Lead, Galvanized Requiring Replacement, and Lead Status Unknown Service Lines

EPA received comments on the proposed requirement in §141.85(e) for water systems with LSLs to provide education materials to all consumers with an LSL or service line of unknown material within 30 days of completion of the LSL inventory required under §141.84(a) and repeat notification on an annual basis until the customer no longer has an LSL. EPA specifically requested comment on "whether the Agency should require water systems to distribute education materials to homes with unknown service line types." EPA also received comments on the proposed requirement in §141.85(f) (i.e., §141.85(g) in final rule) for water systems with LSLs that exceed the lead trigger level of 10 µg/L to provide consumers with LSLs information on the water system's LSLR program. EPA also received comments relating to the proposed requirement in §141.85(e)(5) (i.e., §141.85(f) in final rule) for notification and public education to consumers if a water system causes disturbance to an LSL.

Scope of Requirements

Summary of Comments

EPA received many comments regarding its proposal for water systems with LSLs to provide education materials to all consumers with an LSL or service line of unknown material within 30 days of completion of the LSL inventory required under § 141.84(a) and repeat notification on an annual basis until the customer no longer has an LSL, as specified in § 141.85(e). Many commenters supported the requirements to provide public education materials to consumers with an LSL or lead status unknown service line as a method towards encouraging homeowner engagement in LSLR; however, many commenters felt that distributing materials to consumers with unknown service lines types could cause unwarranted concerns, stating that doing so could "potentially cause fear, concern and mistrust" towards the water system and "foster distrust in the community." Some commenters also expressed concern with the potential for mis-categorization in the proposed LSL inventory provisions under §141.84(a) and how potential errors could affect the public education requirements for lead status unknown service lines. These commenters recommended that EPA provide clearer definitions for the inventory categories to "ensure that resources are not spent unnecessarily to address a risk that doesn't exist." A few commenters requested additional guidance on the information and language to be included in such notices.

EPA also received a few comments relating to the proposal in § 141.85(e)(5) (i.e., § 141.85(f) in the final rule) for water systems that cause a disturbance to an LSL that results in the water being shut off, and without conducting a partial or full LSLR, to provide the consumer with information about the potential for elevated lead in drinking water as a result of the disturbance as well as a flushing procedure to remove particulate lead. Specifically, these commenters requested clarification if "unknown service lines are considered lead service lines" and requested additional guidance on the information and language to be included in these various types of notices. One commenter also recommended that EPA "separate the annual notification of an LSL from the intermittent notifications for users of an LSL (subparagraph 5) as a result of a disturbance into separate paragraphs."

Agency Response

EPA requested comment on whether the Agency should require water systems to distribute education materials to homes with lead status unknown service lines to inform them of the potential for their line to be made of lead and the actions they can take to reduce their exposure to drinking water lead. In response to these comments, EPA has maintained the provision in §141.85(e) for public education materials to be distributed to consumers with a lead status unknown service line. EPA believes that water systems have a responsibility to educate consumers served by a service line of unknown lead status that may be lead and what opportunities are available for reducing exposure to lead, including participation in LSLR programs. EPA disagrees that this will foster "distrust" between the consumer and the water system. EPA notes that this type of notification reflects transparent risk communication that fosters consumer awareness of their potential for lead exposure and is necessary for consumers to take steps to mitigate potential risk from LSLs or a lead status unknown service line. Additionally, EPA anticipates that educating customers with lead status unknown service lines will enhance their potential for LSL inventory participation and would encourage them to work with water systems to determine the lead status of their service line. For example, a water system could include instructions in the notification in accordance with §141.85(e)(3)(iii) for the consumer to identify the customer-owned portion of the service line. Likewise, greater consumer awareness of the opportunities under §141.84 for LSLR will likely enhance consumer participation under goal-based and mandatory LSLR as required in §141.84(f) and (g), respectively. For more details on the requirements of LSLR see response to comment Section 6.

EPA notes that some commenters expressed concern with the proposed LSL inventory provisions under §141.84(a) and the effect of potential mischaracterization of service line material on public education requirements. EPA also acknowledges requests for clarity in the definition of service line materials for the inventory under §141.84 and §141.85. To reduce potential confusion around the terminology used to define a service line's material, EPA has updated the language in the final rule to refer to "lead status unknown service lines" rather than "service lines of unknown material". This change acknowledges that the material of the service line may be unknown but that the lead status is known. EPA has also refined the notification requirements under § 141.85(e) in the final rule to require systems with lead, galvanized requiring replacement, or lead status unknown service lines in their inventory to notify and provide public education materials to households served by a lead, galvanized requiring replacement, or lead status unknown service line. EPA is clarifying in the final rule that a galvanized requiring replacement service line refers to a galvanized service line that was or is downstream of an LSL. EPA also notes that the public education content requirements under §141.85(e)(3) vary based on service line type to contain the most appropriate information. For comments related to the identification of service line materials and the implementation of the LSL Inventory, please refer to response to comment Section 5.

EPA agrees with the commenter that recommended revising §141.85(e) to move the requirements for notification of a disturbance to a separate section. EPA has moved § 141.85(e)(5) to a newly titled section § 141.85(f) "Notification due to a disturbance to a known or potential service line containing lead." In the final rule and consistent with the updated terminology reflected within § 141.85(e), EPA is requiring water systems that cause a disturbance to a lead, galvanized requiring replacement, or lead status unknown service line to notify persons at the service connection and provide them with information to reduce their exposure to potentially elevated lead levels. This can include disturbances resulting in the water to an individual service line being shut off or bypassed, such as operating a valve on a service line or meter setter. It can also include disturbances caused by partial or full LSLR or those resulting from the replacement of an inline water meter, a water meter setter, or gooseneck, pigtail, or connector.

EPA also received several comments requesting Agency guidance on implementation of the revised rule. Specifically, a few commenters requested EPA provide additional guidance on the language and content of the education materials. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant parts of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

Timing and Delivery of Notifications

Summary of Comments

Many commenters supported EPA's proposed provision in §141.85(e)(1)(iii) for systems to distribute initial and repeat education materials to homes with lead status unknown service lines to inform them of the potential for their line to be made of lead and the actions they can take to reduce their exposure. However, some commenters cited logistical concerns associated with the timing and frequency of these notifications and believed this process would be too onerous to track and maintain. Some commenters suggested a longer timeframe for distributing such notices (e.g. first notification be, at a minimum, 90 days instead of 30; subsequent notices repeating every 5 years instead of on an annual basis). If finalized as proposed, these commenters suggested additional mechanisms to provide such notification to consumers, such as the use of electronic delivery methods. Several commenters also supported the proposed requirement in §141.85(f) (i.e., §141.85(g) in the final rule) for water systems with LSLs that exceed the lead trigger level of 10 µg/L to provide customers that have an LSL information regarding the water system's goal-based LSLR program and opportunities for replacement of the LSL within 30 days of the end of the tap sampling period in which the trigger level exceedance occurred. One of these commenters, however, expressed concern that the 30 day timing is "unnecessarily rigid" and recommended that such notifications be revised to allow staggered mailing.

Agency Response

EPA acknowledges concerns regarding the timing and frequency of notification to consumers with an LSL or lead status unknown service line. EPA disagrees with reducing the frequency of notification from annual to every 5 years. EPA notes that the inventory in §141.84(a) is updated annually for systems on 6-month and annual monitoring and every 3 years for systems on reduced monitoring. New information is added to the inventory as service lines are identified and systems undergo goal-based or mandatory LSLR programs. Notifying consumers once every 5 years could result in provision of outdated information to consumers. For example, a consumer may not know if a lead status unknown service line has been confirmed as lead or not lead if public notification is conducted years after the inventory was last updated. Annual notification is necessary to ensure that consumers have timely and accurate information about their service line, potential lead risks, and actions they can take to reduce their exposure. Annual notification also ensures that new homeowners, renters, or other individuals are aware of the status of their service line. Furthermore, annual notification is intended to encourage participation in LSLR programs. EPA also disagrees with commenters suggesting that the initial notification should occur 90 days after the completion of the LSL inventory instead of 30 days. EPA believes that consumers should be notified of potential lead risks in a timely manner and notes that the commenter requested more time to “develop informative and appropriate educational materials.” As noted above, EPA intends to develop guidance and supporting materials that will help states and water systems implement the revised rule.

EPA believes that the timing and frequency of distribution for these notifications is adequate and that water systems should have the capacity to distribute education materials within 30 days of completion of the LSL inventory and any subsequent notification on an annual basis and is therefore finalizing the timing requirements under §141.85(e)(2) as proposed. In the final rule and consistent with the updated terminology reflected within § 141.85(e), EPA is requiring delivery of such notices to be provided to persons served by the water system at the service connection with a lead, galvanized requiring replacement, or lead status unknown service line.

EPA disagrees with changing the requirement in §141.85(g) to provide consumers with a lead, galvanized requiring replacement, and lead status unknown service line with information regarding the water system’s LSLR program and opportunities for replacement of the LSL within 30 days of a system exceeding the lead trigger level, to a longer time period. EPA notes that water systems will already be required to send out annual notification of LSL material under §141.85(e) and should therefore be readily able to send out information to their consumers in the event of a trigger level exceedance. As noted above, EPA believes that water systems have a responsibility to provide timely and transparent notifications so that consumers can take actions to reduce their risk to lead exposure.

EPA acknowledges concerns regarding the burden of implementing and tracking these notification requirements. EPA also notes commenter suggestions to allow water systems to utilize additional delivery options to make implementation of these requirements more efficient and timelier. EPA agrees with this suggestion as long as those delivery methods are approved by the state and has included the option of “other method approved by the State” to §141.85(e)(4) and §141.85(g)(3). EPA anticipates that this may help reduce implementation burden and costs for systems.

8.4 Notification of Individual Tap Sample > 15 µg/L

EPA received comments on its proposed revisions to the requirement to provide notification of lead tap water monitoring results in § 141.85(d). Specifically, EPA received comments on the proposed provision that all water systems must provide a notice of individual tap sample results that exceed 15 µg/L of lead no later than 24 hours after the water system learns of the tap monitoring results, as specified in § 141.85(d)(2)(ii).

Scope, Timing, and Delivery of Notifications

Summary of Comments

Many commenters supported EPA’s proposed provision for water systems to provide timely notification of tap sample results exceeding 15 µg/L. However, some commenters also objected or expressed logistical concerns with the proposed 24-hour timeframe and suggested that additional flexibilities with respect to timing be granted. Some commenters stated that water systems would not be able to deliver the notice to people at the sampling site within 24 hours and that the timing is too restrictive. If retained, some commenters suggested that longer notification timeframes (e.g., 48-hours, 72-hours, or several business days) would be necessary to account for extraneous circumstances such as staffing shortages or holidays.

Some commenters suggested that additional methods of notification of tap sampling results exceeding 15 µg/L would speed up delivery. Some suggestions included the use of rapid notification mechanisms (e.g., text messages or broadcast media) or other forms of delivery (e.g., certified mailing, hand delivery). Some commenters also suggested allowing delivery by email, while others pointed out water systems may not have email addresses readily available.

A few commenters suggested that notifications to persons served at the sampling site be made for individual sample results when any level of lead is detected, not just > 15 µg/L. These commenters suggested the action level is "far too high and arbitrary for public education purposes."

A few commenters also suggested that EPA "should adopt proper risk communication practices" to allow systems to have flexibilities to generate targeted messages around these notifications.

One commenter requested that EPA amend the scope of the proposed changes to § 141.85(d) to be limited only to compliance monitoring results and not, for example, results from "find-and-fix" sampling. The commenter stated that providing consumers with information about "find-and-fix" follow-up sampling results may be more complex than notifying them of compliance sampling results since the former may involve contextualizing the data in terms of information about internal plumbing materials and pipe volumes. The commenter requested that water systems be given enough time to review and provide this information. The commenter also noted that EPA's economic analysis "considered the implications of this provision only for compliance monitoring samples."

Agency Response

EPA believes that water systems have a responsibility to notify consumers as soon as practicable when they may be exposed to elevated levels of lead and opportunities available for reducing lead in drinking water. However, after considering commenters' concerns, EPA has determined that it may not be possible to provide the consumer notice within 24 hours. Therefore, the final rule requires water systems to provide the consumer notice as soon as practicable but no later than 3 days after the water system receives the results. EPA determined this 3 day timeframe allows water systems time to review results and in consideration of extraneous circumstances such as staffing shortages or holidays.

Based on suggestions from commenters, EPA has incorporated additional methods of delivery into §141.85(d)(4)(ii) of the final rule for results that exceed 15 µg/L. Once water systems receive tap sampling results that exceed 15 µg/L, they can choose from several options that make it feasible to provide the notice to persons served at the sampling site within 3 days, including delivery electronically, by phone, by hand, mailing with a post mark within 3 days, or any other method approved by the state.

EPA agrees that consumers should receive results of any lead levels found in their tap water, as there is no safe level of lead. EPA notes that water systems are already required to provide a notice of individual tap results from lead tap water monitoring carried out under the requirements of § 141.86 to the persons served by the water system at the specific sampling site from which the sample was taken (e.g., the occupants of the building where the tap was sampled). This requirement is not limited to lead levels exceeding 15 µg/L. For individual samples that do not exceed 15 µg/L of lead, water systems must provide a notice of individual tap results no later than 30 days after the water system learns of the tap monitoring results, in accordance with § 141.85(d)(2)(i). The requirements is maintained from the previous LCR.

EPA agrees with commenters that suggested flexibility for water systems to target messages and recognizes the importance of crafting language so that sample results can be contextualized. At a minimum and as outlined in § 141.85(d)(3), the consumer notice must include the results of lead tap water monitoring for the tap that was sampled, an explanation of the health effects of lead, steps persons at the sampling site can take to reduce exposure to lead in drinking water, and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from § 141.153(c).

EPA acknowledges the commenter’s concern about the differences between notifying consumers of compliance sampling results and “find-and-fix” follow-up sampling results; however, the Agency believes water systems should have adequate time to decide how to present the data, particularly given that in the final rule water systems will have up to 3 days rather than 24 hours to deliver the notice. Therefore, EPA is maintaining that the notification requirement in the final rule include “find-and-fix” follow-up sampling results. For further responses to comments relating to the “find-and-fix” provisions of the rule and the economic analysis, please refer to response to comments in Sections 13 and 16, respectively.

Requests for Additional Guidance

Summary of Comments

EPA received several comments requesting Agency guidance on implementation of the revised rule. Specifically, a few commenters expressed concern with laboratory processing times and requested that EPA provide additional guidance surrounding what constitutes a system "learn[ing] of the tap monitoring results" for purposes of fulfilling the notification requirement in §141.85(d). A few commenters asked EPA to further define who should be receiving communications on individual sampling results (i.e., customers or property owners).

Agency Response

To address commenters requesting clarification on timing, EPA considers systems to have learned of the tap sampling results when they receive them. For example, if the tap sampling results are processed in a lab, the water system learns of the results when it receives them from the lab; the system then has up to 3 days to deliver the consumer notice in the case of a sample exceeding 15 µg/L or 30 days in the case of a sample that does not exceed 15 µg/L. EPA understands this is a critical component to ensure the rule’s effectiveness in protecting public health. EPA intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA notes, as stated in the proposed and final rule, systems must provide the notice to persons served by the water system at the specific sampling site from which the sample was taken; that is, the occupants of the site where the tap was sampled. This means the water system should provide the notice to the same address where sampling was conducted.

8.5 Outreach to Local and State Health Agencies

EPA received comments on the proposed requirement for CWSs to provide public education to local and state health agencies in accordance with § 141.85(h) of the proposed rule (i.e., § 141.85(i) in the final rule). EPA requested comment on the appropriateness, frequency, and content of required outreach to state and local health agencies and whether the requirement should apply only to a subset of the country's CWSs.

Summary of Comments

Many commenters supported the spirit of collaboration between CWSs and local and state health agencies but felt that the requirement in §141.85(i) is an ineffective mechanism to foster those relationships. Many commenters felt that EPA interpreted the National Drinking Water Advisory Council's (NDWAC's) recommendation inappropriately (i.e., commenters suggested that the recommendation is to achieve collaboration with other stakeholders whereas the rule would lead to a flooding of correspondences with unclear benefit). Many commenters felt that the proposal for all water systems to send these materials were unrealistic, not reflective of the intentions of NDWAC's recommendations and burdensome. Many commenters felt that water systems serving as the messengers is inappropriate and that state health departments should be the focal points as they have existing relationships to leverage. Many commenters felt that local water systems may not have the necessary tools and contacts to make this outreach fruitful. Some commenters suggested that the outreach requirement be limited to CWSs with ALEs or CWSs with LSLs. Additionally, many commenters recommended that outreach be led by the state.

EPA proposed that all CWSs conduct annual outreach to state and local health agencies to explain the sources of lead in drinking water, discuss health effects of lead, steps to reduce exposure to lead in drinking water, and explore collaborative efforts per § 141.85(h) of the proposed rule. Many commenters requested that EPA clarify the content of the annual outreach to local and state health agencies under § 141.85(i). Many commenters also requested clarification of whether this provision requires systems to provide public education to health care providers and caregivers, noting a discrepancy between §141.85(h) and the preamble in the proposed rule. They noted that many water systems do not have established points of contacts for communication with these groups. Many commenters requested additional guidance for the content and scope of outreach to these agencies.

A few commenters suggested the timeframe for conducting outreach with local and state health agencies was inappropriate. Specifically, a few commenters suggested that additional flexibilities be granted with the timing of such communications (e.g., providing materials throughout the year on a rolling basis, timing the delivery with the annual CCR).

Agency Response

EPA acknowledges concerns about the amount of information health agencies would be receiving from water systems; however, under the final rule each CWS will be providing unique information to these health agencies. Health agencies may benefit from important information on sources of lead in drinking water and actions to reduce lead in drinking water and can incorporate this information into their lead poisoning program materials. CWSs must also provide system-specific information about find-and-fix activities and information about school and child care facility testing. While some commenters suggested the requirements of §141.85(i) be limited to CWSs that exceed the lead action level or CWSs with LSLs only, EPA notes that it would be inappropriate to limit this outreach to a subset of CWSs. Regardless if a system has LSLs or an ALE, information about system lead levels may be useful to state and local health agencies. It is important that all CWSs provide this information so that the state and local health agencies in their service area can evaluate it along with other data they may have, such as blood lead levels, and take steps to investigate other potential sources of lead in the communities they serve. The purpose of this outreach is also to provide an opportunity for CWSs to explore collaborative efforts with local and state health agencies and work together on public education programs; therefore, EPA believes it is important for all CWSs to participate. Collaborating with local and state health agencies serves as an additional way for CWSs to reach consumers who may be affected by lead in their drinking water, so they can take measures to reduce their exposure.

In response to commenter requests for clarification, EPA is clarifying the content of the annual outreach to local and state health agencies in § 141.85(i) of the final rule to include both public education materials and information on find-and-fix activities conducted in the previous calendar year. The public education materials must meet the content requirements of § 141.85(a), excluding (a)(1)(i) and (a)(1)(v). The information on find-and-fix activities conducted in accordance with § 141.82(j) must include the location of the tap sample site that exceeded 15 µg/L, the result of the initial tap sample, the result of the follow up tap sample, the result of water quality parameter monitoring and any distribution system management actions or corrosion control treatment adjustments made.

EPA also acknowledges commenters' confusion on whether the outreach activities per § 141.85(i) applies to health care providers and caregivers for which water systems may not have established points of contacts for communication; EPA is clarifying that outreach to these groups is not required in the final rule. The requirement is for CWSs to conduct annual outreach to local and state health agencies, including the state health department and city or county health department. For tribal systems, this would be the Indian Health Service Area, Division of Environmental Health Services program, or applicable tribal program if administered through self-determination contracts or compacts under the Indian Self-Determination and Education Assistance Act. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA agrees with commenters who suggested coordinating the timing with other water system outreach activities, such as the CCR. In the final rule, EPA modified the reporting date from January 15 to July 1 of each year in §141.85(i)(2), to coincide with the LCRR requirement to notify local and state health agencies of school sampling results, and issuance of the CCR. CWSs may send one letter that covers both find-and-fix activities and school sampling results to local and state health agencies. Water systems will already have been gathering information for the CCR, also due July 1 each year, so including this information in outreach to local and state health agencies should not require additional significant preparation.

8.6 Outreach Requirements for Failing to Meet Goal Rate for Lead Service Line Removal

EPA requested comment on the appropriateness of the required outreach activities proposed in § 141.85(g) (i.e., § 141.85(h) in the final rule) and on other actions or additional outreach efforts water systems could take if they do not meet their LSLR goal rate in response to a trigger level exceedance. EPA received comments on the appropriateness of the outreach activities to help water systems to inform customers and reach their LSLR goal rate. EPA also received comments on the effectiveness of the outreach activities to communicate with consumers and received suggestions for additional methods of outreach. EPA received comments requesting guidance on some of proposed outreach activities. Lastly, EPA received comments on the burden of the proposed outreach requirements for water systems.

Summary of Comments

Many commenters supported the proposed requirement for systems to conduct outreach activities when they fail to meet their goal LSLR rate in response to a trigger level exceedance. Some commenters noted that providing public education and outreach would be a good way to get homeowners to participate in the LSLR program, whereas some commenters did not see how the outreach activities would help systems meet their LSLR goal. One commenter suggested it would be more effective to provide funding for removal of all LSLs.

Many commenters supported the spirit of outreach for LSLR goals but noted the activities should be more reflective of best risk communication practices. Many commenters expressed concern that some of the outreach activities (e.g., social media campaigns) would exclude some customers. Commenters suggested the use of alternative means of communication that are fit for their customer base while a few suggested activities that involve more direct forms of communication with customers. Suggestions included phone calls, newspaper ad, radio, and reverse 911 calls. A few commenters also suggested that flexibilities be granted for primacy agencies to approve alternative methods of communication. Many commenters requested that EPA provide clearer guidance on what constitutes an acceptable social media campaign. A few commenters suggested that EPA should provide guidance on minimum language standards for outreach activities.

One commenter requested clarification on when outreach activities must be conducted, “For example, suppose a water system failed to meet its annual LSLR goal in 2020 and chose to conduct a town hall meeting for its outreach activity during the 4th of July celebration in 2021. If that water system collects a set of samples from January through June 2021 in which the 90th percentile concentration is back below the lead trigger level prior to July 4, 2021, is the system still required to conduct the town hall meeting?”

One commenter thought that the designation of failure to meet the goal LSLR as a treatment technique violation is enough to encourage water systems to take efforts to resume compliance, making the proposed activities unnecessary. Another commenter stated that failing to meet the goal LSLR should be considered a treatment technique violation requiring a Tier 2 public notice. Several commenters thought that failure to meet the goal LSLR should require a Tier 3 public notice to all customers, with one commenter suggesting it be included in the CCR, in lieu of required outreach activities.

One commenter suggested that a system’s compliance with the rule should not be determined by their ability to meet their goal LSLR since it is dependent on customer willingness to participate. Another commenter requested that EPA and states meet to review a water system's reason for not meeting their goal LSLR before requiring outreach activities, providing as an example a situation where a water system may only have a few LSLs left to replace but the customers refuse to participate in the LSLR program. One commenter noted that the proposed outreach activities may not be enough to increase LSLR if socioeconomic factors are also a barrier while another commenter questioned why outreach activities are not also required for water systems that fail to meet the 3 percent LSLR required in response to an ALE.

One commenter expressed concern that providing outreach "based on not meeting a goal may be difficult to communicate (Is it a problem? Is it not? How was the goal originally set?)" One commenter thought the outreach activities would cause a "public scare." One commenter suggested the outreach activities include providing alternate sources of water or filters to ensure safe drinking water for customers. One commenter asked whether water systems that meet their LSLR goal would be required to conduct this annual outreach.

Finally, some commenters expressed concern with the amount of resources needed to comply with the outreach requirements. Another commenter expressed concern about it being "difficult and burdensome for states to track and validate outreach activities if a water system does not meet the LSLR rate in response of a trigger level," referring to the requirements as "unenforceable."

For the updated outreach requirements for water systems that fail to meet their goal LSLR, see § 141.85(h) of the final rule. For responses to comments on the lead trigger level, please see the response to comment Section 3.

Agency Response

EPA acknowledges many comments both supporting and opposing the requirements in §141.85(h) to require CWSs to conduct outreach activities if they do not meet the LSLR goal rate in accordance with §141.84(f) after exceeding the lead trigger level of 10 µg/L. EPA notes that as suggested by the NDWAC, EPA proposed options that are effective activities for meeting the community engagement requirement which is intended to increase customer awareness and advance customer interest in the goal-based LSLR program.

In response to commenters' concerns that some activities may exclude some consumers, EPA agrees that for example, a social media campaign on its own may exclude some segments of the population and has revised the outreach requirements in the final rule to be more inclusive. In the final rule, conducting a social media campaign is still an option but must be accompanied by at least two other forms of outreach to ensure that water systems reach individuals who may not use social media. At least one of the activities must include the following: (1) send certified mail to customers with lead or galvanized requiring replacement service lines inviting them to participate in the LSLR program, (2) conduct a townhall meeting, (3) participate in a community event to provide information about its LSLR program and distribute public education materials, (4) contact customers by phone, text message, email, door hanger, or (5) use another method approved by the state to discuss the LSLR program and opportunities for LSLR. EPA has added some of the outreach efforts commenters suggested (e.g., newspaper, television, and radio) as additional options that CWSs may select if they continue to fail to meet their goal LSLR. In addition to conducting at least one of the above five activities, CWSs must conduct at least two activities from the following list if they continue to fail to meet their goal LSLR: (1) conduct a social media campaign, (2) conduct outreach via newspaper, television, or radio, (3) contact organizations representing plumbers and contractors by mail to provide information about lead in drinking water, (4) or visit targeted customers to discuss the LSLR program and opportunities for replacement. EPA understands these outreach activities are a critical component to ensure the rule's effectiveness in protecting public health. In response to commenter requests, the Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA is clarifying that a water system that fails to reach its LSLR goal rate as required by §141.84(f) to complete the selected outreach activities in accordance with §141.85(h) in the following year it fails to meet the LSLR goal, even if the system no longer exceeds the trigger level. Once a system no longer exceeds the trigger level for two consecutive annual tap sampling monitoring periods or meets the replacement goal in accordance with §141.84(f)(5)(i), the system will not have to continue carrying out outreach activities in the subsequent year. EPA also notes that this outreach requirement only applies to CWSs serving more than 10,000 persons that fail to meet their LSLR goal in response to a trigger level exceedance. Therefore, water systems that meet their LSLR goal would not be required to conduct this annual outreach.

EPA notes that some commenters suggested that the requirements of §141.85(h) are not needed and recommended that failure to meet the LSLR goal be a treatment technique violation. The Agency reiterates that failure to meet the LSLR goal would not be a violation; however, failure to conduct public outreach activities triggered by the failure to meet the goal would result in a treatment technique violation. EPA disagrees with commenters that failure to meet the LSLR goal rate should result in a Tier 2 or Tier 3 violation requiring public notice as these tiers are defined in the Public Notification Rule (USEPA, 2020) and the SDWA. The intent of §141.85(h) is to conduct targeted outreach to consumers with lead and galvanized requiring replacement service lines to inform them of opportunities to replace their service lines and encourage participation in the water systems LSLR program.

EPA also disagrees that outreach activities should be replaced with a notice in the CCR. EPA notes that the activities in §141.85(h) vary in type and level of consumer engagement, with options given to water systems to select a set of activities that best fit their needs. However, failure to meet the mandatory replacement rate after a lead ALE is a violation. EPA notes that consumers with LSLs, galvanized requiring replacement service lines, and lead status unknown service lines will still receive annual notification of their service line status and information on their water system's LSLR program under §141.85(e). For more information on goal-based LSLR after a trigger level exceedance, see response to comment Section 6.

EPA also acknowledges commenters' concerns about customer participation in LSLR programs and notes that the public education and outreach requirements in §141.85(h) are intended to encourage customers to participate in the program, including those who may have refused before. While some commenters expressed concern that the outreach activities may not be enough to increase participation if socioeconomic factors are a barrier, EPA notes that water systems are required in §141.84(b)(7) to include a funding strategy in their LSLR plan to help address such issues (see the response to comment Section 6). As noted above, failure to meet the replacement goal is not a violation; however, failure to conduct public outreach activities triggered by the failure to meet the goal would result in a violation.

The Agency does not agree that outreach will scare the public. The final rule provides water systems with a variety of outreach options to choose from; they may choose the methods they find most appropriate for the communities they serve and that they find easiest to communicate about the goal LSLR program. Providing educational outreach to customers helps empower them to make informed decisions and thereby reduces fear. In addition, risk communication can be developed in a way to reduce fear as well. The Agency also does not agree with the commenter who suggested EPA include an outreach option for systems to provide alternative sources of water. EPA does encourage water systems to provide alternate sources of water or filters in appropriate cases; however, the Agency is not requiring this as an outreach activity in the LCRR. The outreach activity options were developed to increase customer awareness of the potential higher exposure to lead from an LSL and advance customer interest in participating in the goal-based LSLR program.

Finally, EPA acknowledges concerns regarding water system burden and challenges of tracking outreach requirements. EPA notes that the public education requirements of §141.85 are an important component of the LCR and are necessary to help inform and educate the public of the health effects of lead, sources of lead, and steps they can take to reduce their risk to lead exposure. As noted above, EPA intends for the requirements of §141.85(h) to help increase participation in LSLR programs to help systems achieve the goal rate after a trigger level exceedance and subsequent failure to meet the rate. EPA disagrees that these requirements are "unenforceable" and notes that failure to conduct the required activities in §141.85 is a violation. EPA believes that water systems have the capacity to conduct these outreach activities.

8.7 Consumer Confidence Report Requirements

EPA received comments on the proposed mandatory health effects language required in the (CCR, as specified in Appendix A to Subpart O of Part 141. EPA also received comments on the proposed informational statement about lead in drinking water required in the CCR, as specified in § 141.154(d)(1). EPA received comments on the proposed requirement in § 141.153(d)(4)(vi) to provide information on tap sampling results in the CCR. EPA also received comments on the inclusion of information on LSLs and LSLR programs in the CCR. EPA received comments regarding templates provided by states for developing the CCR. Finally, EPA also received comments on the appropriateness of the CCR as a method to communicate contaminant information to consumers.

Mandatory Health Effects Language

Summary of Comments

Many commenters supported the proposed modifications to the mandatory health effects language that is required in the CCR and all public education materials, as specified in Appendix A to Subpart O of Part 141. Commenters noted that the language is easier to understand than that required by the previous rule. One commenter supported how the revised statement makes it clearer that lead affects people of all ages. Many commenters also provided suggestions for making the language clearer and more accurate. One commenter suggested using gender neutral language for greater inclusivity. A few commenters were concerned that the revised health effects language would cause fear of any amount of lead reported by the system and suggested it should be "crafted to avoid unnecessary fear of tap water by consumers." One commenter found it unclear whether the reference to increased prenatal risk was referring to the pregnant woman, the fetus, or the pregnancy itself. One commenter felt that dissemination of health effects language should come from the state health department to ensure consistency of the message across the state. One commenter asserted that "EPA's proposed language is marred with omissions," leaving out information for topics such as "the half-life of lead in blood." For a more comprehensive summary of the comments on the mandatory health effects language required in the CCR and all public education materials, please see response to comment Section 8.1.

Agency Response

EPA considered the suggestions many commenters provided for making the mandatory health effects language that is required in the CCR and all public education materials clearer and more concise, accurate, and inclusive. EPA has incorporated several of the commenters' recommendations in the final rule. However, EPA does not agree that extensive information that goes beyond the health effects of lead (e.g., the half-life of lead in blood and the challenge of catching exposures through routine blood lead screening) is warranted or appropriate. EPA applied risk communication principles in development of the proposed and final LCRR mandatory health effects statement. The health effects language is intended to be a concise, easy to understand statement that informs consumers that lead exposure is associated with serious health effects, what the health effects are, and who is at risk. Information about the half-life of lead in blood and uncertainties of lead screening may cause more confusion at this stage. EPA provides additional resources that include more in-depth discussions of lead risk at https://www.epa.gov/lead. In addition, some of this information would be available to consumers through follow-up with health departments or their doctors as needed. For information on how EPA addressed comments on the mandatory health effects language, including a request that dissemination of health effects language come from the state health department, please see response to comment Section 8.1. The revised mandatory health effects language required in the CCR can be found in Appendix A to Subpart O of Part 141 of the final rule.

Informational Statement about Lead in Drinking Water

Summary of Comments

Many commenters suggested revisions to the informational statement on lead in drinking water required in the CCR, as specified in § 141.154(d)(1). Commenters provided recommendations to make the language more readable and useful to consumers. One commenter suggested that EPA include information in the statement on sources of lead other than drinking water, such as paint, soil, and dust. One commenter noted that the statement should refer to filters certified to "reduce" not "remove" lead. One commenter thought the options provided to consumers to reduce exposure to lead in their home (e.g., "removing lead materials within your home plumbing," flushing pipes, and using a filter) were incomplete and "can cause consumers to take actions that may increase their exposure to lead in water." One commenter thought the activities listed in the statement as ways to flush pipes (e.g., "running your tap, taking a shower, doing laundry or a load of dishes") were too specific and could be interpreted to mean only those activities. One commenter recommended that the statement note that longer flushing may be needed for homes served by LSLs. One commenter recommended beginning the statement by stating "Some homes served by [NAME OF UTILITY] have been tested and contain lead in their water" if monitoring indicates detectable lead levels at the tap.

Agency Response

EPA agrees with commenters who suggested revisions to increase the clarity and accuracy of the informational statement about lead in drinking water required in the CCR, while keeping it concise and has modified the informational statement in the final LCRR. For example, EPA updated the language to refer to filters certified to “reduce” lead rather than “remove” it. Following recommendations from commenters, EPA also revised the language to clarify the role of water systems in providing drinking water and removing lead pipes while noting that materials in plumbing components inside the home are outside their control. This improved informational statement is more accurate and informative. For information on how EPA addressed comments on the mandatory health effects language please see response to comment Section 8.1. One commenter recommended beginning the informational statement by stating “Some homes served by [NAME OF UTILITY] have been tested and contain lead in their water" if monitoring indicates detectable lead levels at the tap. EPA disagrees with requiring this sentence because other CCR lead reporting in the final rule requires CWSs to report the range of tap samples, the 90^{th} percentile and the number of samples above 15 ug/L. This is a more transparent method of providing information to all consumers regarding lead levels in the water system.

One commenter thought the options provided to consumers to reduce exposure to lead in their home (e.g., removing lead materials in home plumbing, flushing pipes, and using a filter) were incomplete and “can cause consumers to take actions that may increase their exposure to lead in water.” The commenter noted that “If a PWS is not providing appropriate corrosion control or removing lead service lines, consumers are limited in their ability to adequately protect themselves from lead in water.” While EPA agrees that appropriate corrosion control and LSLR are essential, the Agency believes it is important for consumers to be informed in steps they can take themselves to protect their health and minimize exposure to lead in drinking water. Another commenter thought the suggestions for ways to flush pipes (e.g., “running your tap, taking a shower, doing laundry or a load of dishes”) were too specific and could be interpreted to mean only those activities. While EPA agrees with the commenter that the statement leaves out other options, the Agency notes this is not intended to be a comprehensive list and believes it is clear these are provided as a few examples of how consumers can flush pipes. The commenter also recommended that the statement note that longer flushing may be needed for homes served by LSLs. EPA agrees that longer flushing may be needed for homes served by LSLs; however, due to the wide variation in LSL lengths and interior plumbing configurations it is not possible to provide guidance appropriate for every home. This is intended to be a concise statement for all consumers served by the water system; homes with LSLs receive targeted public education that addresses how they can reduce their exposure. One commenter suggested that EPA include information on sources of lead other than drinking water in this statement. While EPA believes information on other sources of lead is important, the Agency reiterates that this is intended to be a short informational statement about lead in drinking water in the CCR; information on other sources of lead can be found in other public education materials provided to consumers in accordance with public education requirements of the LCRR.

Tap Sampling Results

Summary of Comments

Many commenters supported the proposed requirement in § 141.153(d)(4)(vi) to include the range of tap sampling results from the most recent round of sampling, along with the 90^{th} percentile concentration and the number of sampling sites exceeding the action level in the CCR. However, one commenter thought inclusion of the range of sample results and number of samples exceeding the action level in the CCR would cause "undue lack of confidence" if the samples are not confirmed to be "valid" or "typical." One commenter requested all compliance results be provided in the CCR while another thought all sampling data including investigation and source water sampling should be made publicly available.

Agency Response

EPA disagrees with the comment that reporting the range of sample results and number of samples exceeding the action level in the CCR would cause "undue lack of confidence" if the samples are not confirmed to be "valid" (i.e., appropriate stagnation period range, collection methodology) or considered "typical". Tap sample results that are invalidated are not used for compliance purposes and thus are not included in the 90th percentile calculation or reported in the CCR. Further, including the range of lead tap sample results should be provided to consumers for transparency. EPA also notes that the number of sampling sites exceeding the action level was already required to be included in the CCR and this rule does not change this requirement.

To further promote transparency, EPA revised the final rule to require the 90th percentile concentration of the most recent "round(s)" of sampling (previously "round") to ensure results for each sampling event completed in the reporting period are provided. For example, water systems on 6-month monitoring should include both rounds of lead and copper results.

One commenter recommended requiring that all water systems "report in their CCR that their water was tested for lead and give the result (0) even if no lead was detected," since the commenter notes that some systems do not mention lead was sampled in such cases. EPA agrees with the commenter that people should be informed that their water was tested for lead regardless of what level was found, and notes that this information is included in tap sampling results that water systems are required to deliver to persons at the tap that was sampled, in accordance with public education and customer notification requirements in the final LCRR.

One commenter thought including full addresses of homes sampled should be required in the CCR. EPA disagrees with including full addresses of homes sampled; EPA does not believe this information is necessary in the CCR for safeguarding public health. It is also beyond the scope of the CCR which is intended to be a brief, easily readable communication about the water system. One commenter requested that all compliance results be provided in the CCR. EPA agrees that compliance results should be publicly accessible and has added a requirement in §141.153(d)(4)(xii) to the final rule for water systems to include in the CCR a statement on how to access complete tap sampling results. Number of samples may also be found with complete tap sampling results as one commenter requested. Another commenter thought all sampling data including investigation and source water sampling should be made publicly available, however did not provide supporting rationale or detail. While EPA is not requiring this data to be publicly available, water systems may provide this information.

Information about LSLs

Summary of Comments

There was confusion among some commenters regarding what kind of information related to LSLs, lead status unknown service lines, and LSLR programs is required in the CCR. One commenter thought one of the proposed revisions to the CCR was to include language regarding the water system's LSLs and LSLR programs. In contrast, another commenter suggested adding a statement about the water system's LSLR programs as a requirement in the CCR. One commenter asked what LSLR program information is required in the CCR when a system does not exceed the trigger level. One commenter said they were opposed to using the CCR to notify about lead status unknown service lines.

Agency Response

The Agency notes some confusion in the public comments about what information related to LSLs and service lines of unknown lead status is required in the CCR. One commenter said they were opposed to using the CCR to notify consumers about lead status unknown service lines. EPA notes that there is no requirement to notify consumers about lead status unknown service lines in the CCR in either the proposed or final rule. One commenter thought one of the proposed revisions to the CCR was to include language regarding the water system's LSLs and LSLR program. Another commenter asked what LSLR program information is required in the CCR when a system does not exceed the trigger level. CCRs provide Americans information about their local drinking water quality. EPA determined that lead in drinking water should be included in the CCR but is not the only source of information for customers about the lead levels in their CWS. In the final rule, water systems are required to provide information on how customers can access the LSL inventory and tap sample results. EPA determined that providing access to the LSL inventory will ensure consumers have a means to the most up to date LSL information. In addition to the CCR, water systems must directly provide customers with LSLs information annually and also send these customers information about their LSLR program when the system exceeds the trigger level. This direct communication with LSL customers is more appropriate than using the annual CCR. For more information on these two requirements, please see response to comment Section 8.3. With regards to the CCR, any water system with LSLs (including inventories consisting only of a statement that there are no lead service lines) will be required to include a statement that a service line inventory has been prepared and is available for review either on the water system website or at the water system offices, as specified in § 141.153(d)(4)(xi) of the final rule.

CCR Templates

Summary of Comments

A couple of commenters had questions about state-provided templates for developing the CCR. One commenter asked if water systems are required to use the templates that states provide to update the CCR language. Another commenter requested that EPA allow states to "pursue a single, holistic modification of software to generate CCRs" that meet the requirements of the LCR, America's Water Infrastructure Act (AWIA), and the WIIN Act in order to reduce duplication of effort.

Agency Response

One commenter asked whether EPA is requiring water systems to use state-provided templates to update the CCR language. EPA does not require through regulation the use of state-provided CCR templates. EPA notes these templates are intended to support water systems in updating CCR language and ensuring all required CCR information is included; however, water systems are not required by the LCR to use them. EPA welcomes states to "pursue a single, holistic modification of software to generate CCRs" that meet the requirements of the LCR, AWIA, and the WIIN Act, as requested by one of the commenters.

CCR Effectiveness

Summary of Comments

A couple of commenters shared concerns about the effectiveness of the CCR as a method of communicating with customers. Commenters believe it is no longer an effective mechanism to communicate drinking water contaminant related issues. Among their reasons, commenters said customers may not read the CCR or may have difficulty understanding it; one commenter also noted the CCR sometimes contains errors. One commenter suggested that the CCR should be "completely revised" or replaced with the annual information being provided over social media. One commenter noted that the CCR should follow EPA's risk communication guidelines of clearly explaining "the situation, the risks, and the remedies" and specified information that should be included in the CCR (USEPA, 2007). One commenter recommended that EPA conduct a focus group and consult with experts in public health communication. One commenter was concerned about the lack of multiple, diverse channels of communication. The commenter also expressed concern with the lack of consumer-friendly explanations of the LCR.

Agency Response

A couple of commenters questioned the effectiveness of the CCR to communicate to consumers, citing consumer-centered risk communication research to suggest the CCR is outdated. One commenter noted the CCR may be difficult for consumers to understand, suggesting that social media would be a more effective method of communicating. EPA acknowledges that not all consumers may read the CCR and supports using multiple, diverse methods of communication to reach consumers. EPA notes that the CCR requirements provide various communication channels to disseminate the CCR among consumers, in addition to delivering a copy to each customer; these include posting reports on the internet, mailing to postal patrons in metropolitan areas; advertising the availability of the report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers; and delivery to community organizations. Although not addressed in the rule itself, EPA also encourages systems to use social media to disseminate the CCR. In addition, the new public education provisions in the final rule encourage various forms of consumer outreach including use of social media, broadcast media, townhall meetings, and more to convey information about water systems' LSLR programs.

EPA has also worked to improve risk communication by consulting with risk communication experts, adopting clearer and more concise health effects language, and keeping the health effects language consistent across all public education, CCR and public notification materials.

One commenter appeared to inquire why water systems are required to provide annual lead public education to schools and child care facilities if they already provide lead health risk information in the CCR. EPA does not agree this may be duplicative and notes that all lead public education materials are required to include the mandatory health effects statement on lead; however, each type of public education also includes other information and serves other goals and purposes. The CCR is a report developed for all customers and consumers of a system's drinking water. As a separate requirement, water systems must provide targeted public education directly to schools and child care facilities they serve. EPA determined it is important to provide targeted public education to schools and child care facilities because students and young children are especially vulnerable to lead exposure and spend a large portion of their day in schools and child care facilities. Lead in drinking water can be a significant contributor to overall exposure to lead, particularly for infants whose diet consists of liquids made with water, such as baby food, juice, or formula. Young children and infants are particularly vulnerable to lead because the physical and behavioral effects of lead occur at lower exposure levels in children than in adults. In addition to providing lead health risk information, this public education also notifies schools and child care facilities that the water system is required to sample for lead and provides other important information on lead sampling in schools and child cares. EPA believes this is a necessary step to help ensure that schools are informed on lead health risks and opportunities for testing so that they can determine whether additional actions are needed to reduce lead exposure and protect children who are a sensitive subpopulation in their care. For a summary of comments on school and child care sampling more generally, please see response to comment Section 12.

One commenter wrote that the CCR should provide "accessible interpretations of the table that features regulatory compliance data, including the meanings and definitions of acronyms like "ppb," "MCLG," "LAL," and "90th percentile." EPA agrees that results should be presented in a way that helps consumers understand and interpret them. EPA notes that the previous rule requires definitions for maximum contaminant level goal and action level in the CCR; the Agency also encourages systems to explain any other acronyms and statistics such as the 90th percentile in the CCR.

EPA acknowledges one commenter's concern with the lack of a consumer-friendly explanations of the LCR and intends to develop materials such as factsheets, Q&A, and infographics to help consumers understand the final LCRR.

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9 Monitoring Requirements for Lead and Copper

In the proposed rule EPA requested comment on monitoring requirements for lead and copper (tap sampling), specifically, EPA requested comment on:

- an alternative revision to the tap sample collection method provisions, in lieu of the current first-draw first liter sampling.
- whether water systems with lead service lines (LSLs) should be required to collect tap samples that are representative of water that was in contact with the LSL during the 6-hour stagnation period.
- an alternative tap sampling technique for sampling locations with LSLs. EPA requested comment on requiring tap samplers to collect the first gallon of water from the tap following the stagnation period (referred to as the fifth liter), then collect a one liter sample for analysis. EPA also requested comment on a sampling protocol that would allow for the collection of the first liter copper sample and a fifth liter lead sample and data that demonstrate collecting a different liter is more representative of water that has been in contact with the LSL during the 6 hour stagnation period.
- whether EPA should require a minimum tap sampling frequency following a change in source water or a significant change in treatment. EPA requested comment on whether the EPA should specify a minimum tap sampling frequency of once every six months or once every year following one of these changes.

9.1 General Comments

Summary of Comments

Several commenters raised concerns about the data quality associated with the use of untrained tap water samplers. A commenter recommended tap samples be collected by trained technicians or technicians work with residents. Commenters noted examples of samples rejected due to samplers (residential customers) failing to properly follow sample collection instructions, sampling incorrect locations, collecting samples after point-of-use (POU) filters, etc. Related to this issue, several commenters noted the difficulty utilities face in recruiting customers to participate in tap sampling programs. Commenters state that a consequence of nonparticipation results in variability in the sampling pool based on the willingness of customers to collect tap samples.

A commenter asserted that EPA must ensure that the Lead and Copper Rule revisions' (LCRR's) sampling protocol provides an accurate measure of the true impact of an LSL on lead levels found in a home. Other commenters suggested that focusing exclusively on lead associated with LSLs fails to ensure that corrosion control is adequate for the entire service area stating that this bias will become more severe as LSLs are removed. A commenter noted that water systems with LSLs should be required to collect tap samples that are representative of water that was in contact with the LSL during the stagnation period. A commenter requested that EPA consider alternative testing protocols in lieu of testing at homes to better evaluate reductions in corrosivity.

Some commenters noted that both the previous Lead and Copper Rule (LCR) and the proposed revisions lack comprehensive sampling of the distribution system. The commenters indicate that corrosion control management should be implemented within the entire distribution system because lead from in-home plumbing can be significant. Commenters state that corrosion control treatment (CCT) provisions and tap sampling do not consider lead release from in-home plumbing. Some commenters encourage voluntary customer-initiated tap sampling programs and allowing local governments the ability to establish locally-supported tap sampling plans for homes and schools.

Several commenters suggested the need for separate tiering for copper. Commenters noted that the worst-case results for copper will not be reflected in the new lead sampling pools. They ask that separate criteria be established to prioritize buildings vulnerable to copper contamination.

Other commenters request guidance on invalidation of samples that may have been improperly collected. One commenter, however, recommended that sample invalidation should be prohibited.

Some commenters suggested improved public access to tap sampling data including sampling protocols, sample invalidations and LSL locations. One commenter, however, noted that providing the addresses of locations with action level exceedances could discourage involvement of the public in the sampling program. Some commenters asserted that sampling statistics along with calculation of the 90th percentile is difficult for systems and the general public to understand and can result in biased values. They requested clarifying language to make sure the 90th percentile is calculated correctly and communicated clearly to the public. A commenter requested clarification if tap sample results need to be posted on the utility website or if a link to the results posted on the state's website is sufficient.

Some commenters voiced concern that tap sampling under the revised rule will inadequately protect families and communities that are most at risk. One commenter requested that drinking water providers test tap water for free for low-income and health-impacted citizens that live in older homes or lead-contaminated communities.

A commenter raised concern about the issues associated with rental properties and rental owners' responsibilities for communicating risk to tenants.

A commenter asserted that site selection for tap samples do not account for systems that utilize both groundwater and surface water sources. The commenter suggests that the final rule address collection of tap samples from each zone of influence for different water sources. Additional commenters suggest rotation of tap sampling sites among different residences during each compliance period while maintaining adherence to the rule's tap sampling tiering criteria regarding LSLs.

One commenter indicated the need for the final rule to address consecutive water systems and how monitoring and CCT should be handled.

Some commenters noted corrections to cross references in the regulatory text (missing or incorrect) and suggested alternate language to consider for the final rule. A commenter noted the proposed changes add considerable scope and cost to what utilities are required to do. Some commenters stated that the proposed rule should include funding support. A commenter recommended that water systems should be prohibited from increasing the number of samples (i.e., "sampling out") to reduce the 90th percentile lead value below the action level of 15 µg/L.

Other commenters suggested the final LCRR needs to have flexibility for the start date of LCRR tap sampling using the updated compliance sampling plans. These commenters asserted that states will need some flexibility in start-up of updated compliance sampling, i.e., if systems that are on every three years monitoring switch to monitoring every six months, for the approximately 11,000 CWSs with LSLs. A commenter suggested the proposed LCRR doesn't address the need nor the timing for updating compliance sampling plans based on the inventories and tier structure changes.

A commenter recommended that EPA consider using the highest (that is the fifth sample) for compliance purposes for small water systems that are only required to collect 5 samples, rather than average the 4th and 5th highest sample results. The commenter argues this isn't mathematically a 90th percentile. The commenter is referring to § 141.80(c)(4)(i)(D) where water systems only required to collect 5 samples, average the first and second highest sample results for their 90th percentile value. This provision only applies to water systems serving fewer than 100 people. For these water systems that have received state approval to collect fewer than 5 samples, or is unable to collect 5 samples, the highest result is the 90th percentile value.

Agency Response

EPA acknowledges water systems may face challenges with customers collecting samples, however, EPA notes that water systems may collect tap samples with their own personnel. EPA further notes that residents, homeowners and volunteers have demonstrated they are capable of collecting samples since the LCR was promulgated in 1991. In the final rule, EPA requires the state to approve the tap sampling protocol provided to customers and can provide additional guidance to ensure the proper tap sample collection. Water systems can also provide training for tap sampling to ensure the protocol is followed correctly. Tap sampling protocols that include pictures or diagrams, or video instructions can help assure customers are properly collecting tap samples. Further, the LCRR contains many new public education actions that are intended to increase customer awareness of lead in drinking water. EPA expects that increased awareness will increase the number of customers interested in participation in tap sampling and lead service line replacement (LSLR) programs.

EPA has revised the tap sampling requirements for the LCRR in § 141.86 to require state approval of tap sampling protocols prior to use, to prohibit including instructions to conduct pre-stagnation flushing or aerator removal prior to sample collection and to require the use of wide-mouth bottles. In addition, EPA agrees that tap samples should be representative of water that has been in contact with an LSL, therefore the LCRR requires water systems with LSLs to collect tap samples from LSL sites and to collect and analyze the fifth liter, because when present, LSLs are the greatest contributor to lead in drinking water (Sandvig et al. 2008). Regarding the comment to use alternative testing protocols in lieu of testing at homes to better evaluate reductions in corrosivity, EPA notes that while water quality parameter (WQP) monitoring in the distribution systems informs the effectiveness of CCT, lead levels at the tap must be measured to understand overall effectiveness of CCT in reducing lead levels from LSLs and premise plumbing. The final LCRR does include new tap sampling requirements for schools and child care facilities under § 141.92. The Agency agrees with the commenter about encouraging voluntary customer-initiated tap sampling programs and supports local governments establishing locally-supported tap sampling plans for homes and schools, however, EPA does not agree this should be allowed under the LCRR instead of the mandatory tap sampling to inform the 90th percentile and compliance with the lead action level of 15 µg/L and lead trigger level of 10 µg/L because a mandated program is necessary to ensure that some testing is carried out. For more information on the school and childcare testing, see the response to comment Section 12.

In response to commenters suggesting that the previous LCR and proposed LCRR testing lack comprehensive testing of the distribution system, EPA disagrees. Tap sampling is meant to determine the effectiveness of CCT in the entire system, not for testing at every site. A larger proportion of sites are tested as the population of the system increases and with the final rule revisions and revised tap sample site selection tiering criteria assures that sites at risk of elevated lead levels.

The tap sampling provisions of the LCR are designed to evaluate the effectiveness of CCT in the distribution system. Optimal corrosion control treatment (OCCT) is defined in the previous and final LCRR as the treatment that minimizes lead and copper levels at the tap. The tap sampling protocol and requirements are designed to evaluate CCT throughout the distribution system, including premise plumbing. For tap sampling sites that do not have an LSL, the first liter is collected and analyzed which is representative of lead contributions from lead solder and brass/bronze fixtures in premise plumbing. Since tap sampling sites must be from the highest potential lead sources, the results of the sampling are an effective way to monitor the CCT.

Regarding the comment to have separate tiering for lead and copper to select sites for sampling, the LCRR targets sites most likely to have elevated lead levels and not necessarily sites that may have elevated copper. EPA finds that because the source of lead and copper in drinking water are generally the same (i.e., corrosion from fixtures or pipes containing the metal), and because the treatment technology for elevated copper levels is also the primary treatment for lead (i.e., reducing corrosion in the distribution system), it is logical to group these two contaminants into a single rule. Additionally, both lead and copper require sampling at taps, rather than at the entry point of the distribution system. While EPA's focus in the LCRR is lead, and the Agency did not propose revisions to address copper, the rule revisions will also reduce copper levels when systems optimize or re-optimize CCTs such as pH and alkalinity adjustment and orthophosphate inhibitors because they are effective mechanisms for controlling copper corrosion as well. The re-optimization of existing corrosion control for systems above the lead trigger level will likely reduce copper levels as well due to the improved corrosion control. Additionally, the find-and-fix requirements related to lead will reveal potential distribution system issues as systems are required to take WQP samples at a location on the same size main in the same pressure zone located within one half-mile of the sampling site where lead exceeds 15 µg/L. Solutions to elevated lead levels can include changes to the CCT or changes in distribution system practices, such as flushing to reduce water age or nitrification, which in turn may reduce copper levels. The rule also allows states to add other WQPs for monitoring that it deems necessary for corrosion control. In this way, although the tiering structure has not changed with copper as a focus, Tier 4 still includes sites with copper lines, thus sampling will occur at higher-risk copper sites.

In addition, commenters note the difficulty in recruiting customer volunteers to collect tap samples and recruiting and maintaining two sample pools, one for lead and one for copper will further complicate the rule. EPA believes that the sample site selection criteria balances the need for sampling from sites with the highest risk (lead) with sites that have copper pipes. Recognizing the inherent complexity of the LCR, the Agency has refrained from developing a separate tiering structure for copper sites to ease implementation.

Regarding the comments about sample invalidation, the LCRR does not revise or included additional invalidation criteria under §141.86(f). EPA has determined the existing sample invalidation criteria is sufficient because it contains a wide range of reasons for invalidation from discovering the sample was not taken from a site using the site selection criteria to improper sample analysis at the laboratory. If EPA were to broaden these criteria even further, this would run the risk of water systems' using "invalidation" as reasons to discard higher sample results. Doing so, may artificially lower the 90th percentile and reduce the public health benefits of the rule in those systems.

In the final rule, lead and copper compliance tap sampling results are required to be publicly available within 60 days of the end of the tap sampling monitoring period. EPA recognizes there may be privacy concerns related to release of addresses where sampling was conducted and therefore, including addresses is not required in the final rule. EPA does not agree that providing public access to the tap sampling protocol is necessary or informative to consumers, as they can view the tap sampling methods under the final rule. Water systems may use any publicly available site, such as a state's website, to post tap sample results; large systems serving more than 50,000 people are required to have this available in a digital format, whereas small and medium systems must make the results available in either digital or written format. The water system would still be responsible for ensuring the timeliness and accuracy of the data.

In response to comments with concern that the LCRR will not adequately protect families most at risk of elevated lead levels, EPA has specifically included changes to the tap sampling requirements to target the highest risk locations. Because LSLs are the most significant contributor to lead in drinking water, the revised rule requires water systems to prioritize these sites and only include sites not served by an LSL when they no longer have enough to meet the minimum number of samples required. Under the revised rule, systems must sample at 100 percent LSLs sites if available, while under the previous LCR, systems were only required to sample at 50 percent LSLs. The tiering has been updated to prioritize LSLs and lead-containing material, so that the most-at risk sites will be included in the sampling pool and therefore the 90th percentile calculation. The aim is to capture the most at-risk sites so that the system will be triggered into action such as LSL replacement, CCT, and public education. In this way, it is protecting those sites and communities most at risk. In response to providing sampling to low-income and health-impacted communities, water systems do not directly charge customers for tap sampling for lead and copper for compliance under § 141.86 for all sites selected in the sampling pool. Many community water systems (CWSs) provide free and low-cost testing beyond what is required by § 141.86 of the LCRR. EPA encourages (and in some cases requires) water systems to offer testing to any customer who requests it. EPA recommends that systems have a plan for providing these services for free or at a low-cost for consumers who request it.

Regarding the comment about sampling from different zones of influence, EPA has not made this a requirement for various reasons. First, the Agency has made sampling at sites with the higher potential for lead the priority of the LCRR, and second due to the complexity of the sampling protocol already. However, although it is not a requirement, the Agency encourages water systems with multiple sources of supply that may be significantly different such as ground water and surface water sources, to sample from each zone of influence where possible when selecting tap sampling sites under § 141.86(a), after its prioritization in line with the Tiers of the rule. EPA maintains the requirement to retain the same sampling sites for each monitoring period where possible in the final LCRR. See § 141.86(b)(4). This is to track levels over time and to minimize sampling errors.

In response to a commenter expressing the need for the final rule to address consecutive water systems, specifically how monitoring and corrosion control treatment applies, see response to comment Section 4.

Regarding the commenter concerned about increasing the number of samples from sites known to be lower in lead, thereby reducing the 90th percentile value, which they called "sampling out," there are provisions built into the final rule to prevent this circumstance from occurring. First, water systems are not able to add lower-tiered sites, until all higher-tiered sites are used in the sampling pool, where higher tiers are of higher potential risk of lead levels (e.g., LSL sites). In addition, there is a provision under § 141.86(e), where if the water system takes additional samples, beyond the minimum required in the sampling pool, from lower tiered sites (3, 4 and 5), these sample results must be submitted to the state but not included in the 90th percentile calculation. In this way, the water systems may not add more lower-tiered lower-risk sites voluntarily to intentionally reduce their 90th percentile level. Water systems with LSLs that sample at lower-tiered sites, may only use the highest values from those lower-tiered (Tiers 3, 4 and 5) in their 90th percentile calculation, see § 141.80(c)(4)(iii)(A).

EPA agrees that water systems will need to update tap sampling plans based on new LCRR requirements using information obtained from the LSL inventory. As such, EPA added provisions to require development and approval of a tap sampling plan under § 141.90(a)(1)(iii)(A). However, EPA does not agree that staggered implementation start dates are warranted as this would delay the public health benefits of the LCRR. Water systems will have three years to update their tap sampling plans to address these new requirements.

In response to commenters notation regarding incorrect cross references, EPA has revised the regulatory text to ensure cross references are correct.

EPA does not agree with the commenter who recommended changing the methodology for calculating the 90th percentile for systems that are required to only collect 5 samples (with a population of 100 or less) from averaging the two highest values, to using the highest sample as the 90th percentile. EPA disagrees and has retained the previous rule method of using the highest two concentrations out of five samples and averaging them. The 90th percentile calculation is to multiply 0.9 times the number of samples, thus with 5 samples, it would be the 4.5th sample or average of the 4th and 5th highest sample. EPA concluded that the improved tap sample site selection and tap sample protocol, including collecting the fifth liter at LSL sites will achieve improved public health protection.

9.2 Sampling Sites (Tiering)

Summary of Comments

Several commenters supported the proposed revised tap sampling site selection tiering criteria. There were also many commenters seeking further clarification or suggesting alternate tiering criteria. Several commenters requested that the tap sampling pool include other materials in addition to LSLs. They assert this allows detection of lead from all contributing sources (LSLs, copper lines with lead solder, etc.), provides a more geographically diverse representation of the distribution system and would provide a better understanding of copper corrosion. A commenter states that monitoring in more locations than just homes with LSLs allows a utility to consider all sources of lead when evaluating CCT effectiveness. Several commenters expressed concern that sites with high copper levels could be overlooked due to the new tiering specifications. Commenters suggested a 70:30 split between LSL and copper sites. Several commenters requested that the tiering criteria in the previous rule be retained stating that the current composition of Tier 1 sampling sites under the previous LCR provides a better representation of locations of concern and should not be changed.

Several commenters requested clarification regarding galvanized steel service lines and how they are considered in the proposed site selection tiering. Commenters noted that the proposed rule preamble states that galvanized service lines do not count as LSLs in selecting sampling sites, but galvanized services lines are included in the definition of an LSL. As a result, it is unclear which sampling tier would apply and whether galvanized service lines should be inventoried and counted as LSLs in replacement rate calculations. Several commenters asked EPA to consider adding known or suspected goosenecks and pigtails to the definition of Tier 3 sampling sites or into some part of the tiering structure. Other commenters recommended creating a sampling tier for galvanized service lines and lead connectors for systems that do not have enough LSLs in their tap sampling pool.

Several commenters recommended elimination of Tier 2 sampling sites, noting that multi-family structures are typically tenant-occupied with transient populations and are often unresponsive to water system communications. One commenter suggested that multi-family residences (MFRs) with copper plumbing and lead solder should be included within the revised Tier 3 category along with single family structures because they can represent a significant source of lead in drinking water. Several commenters suggested Tier 1 tap sample site criteria should not be applied to customer-owned portions of service lines identified as lead if the customer chooses not to replace their portion of the line.

Some commenters expressed concern about water system's ability to obtain a sufficient number of volunteer consumers to collect 100 percent of tap samples at LSL sites, stating nonparticipation of homeowners. Specifically, that water systems should not be penalized if they are unable to obtain the required number of samples from homes with known LSLs. Commenters suggested the final rule should allow water systems to shift to a lower tier of sampling sites if they are unable to obtain consent from the owners and residents to participate in tap testing. A commenter requested clarification of sample site selection procedures for systems with insufficient known LSLs to identify a pool of Tier 1 and Tier 2 sites. A commenter requested clarification whether systems with unknown service lines (but not any LSLs) would need to confirm all service line material before sampling from Tier 3 sites.

A commenter recommended that the final rule not allow water systems to use lower tiered sites when they still have a significant number of unknown service lines, asserting they must first identify the material of all service lines. Another comment suggested an incentive for maintaining lead levels below the action level by revising the requirement for sampling of Tier 1 at LSL homes. They suggest the water system could reduce from 100 percent LSLs or Tier 1 sites, to 50 percent then 25 percent as the system reduces its inventory of LSLs to 50 percent and then 25 percent of its initial inventory count. Another commenter suggested exclusion of sampling for locations that are expected to have "lead free" plumbing fixtures, such as buildings that are constructed after 2010, which would be before the 2011 Reduction of Lead in Drinking Water Act (Public Law 111-380), which reduced the maximum lead content allowed in plumbing and wetted surfaces.

Some commenters recommended that if Tier 3 and/or Tier 4 samples are needed to complete the sampling pool, only the highest values should be used from those sites in determining the 90^{th} percentile.

Agency Response

In the LCRR, changes in the tiering requirements are designed to increase the likelihood of collecting tap samples at sites expected to have elevated lead levels. The final rule includes new more stringent sampling requirements that will better identify elevated lead levels and result in more water systems taking required lead mitigation actions. The LCRR tap sample site selection criteria is designed to target sites most likely to have elevated lead levels and research demonstrate that when present LSLs represent the greatest contributor to lead in drinking water (Sandvig et al., 2008). EPA does not agree that homes with a customer-side LSL should not be considered a Tier 1 site unless the customer agrees to replace their LSL. Regardless of ownership, LSL sites are most likely to have elevated lead in drinking water.

EPA agrees with commenters who suggested the final rule should modify the tiers to consider sites with plumbing materials other than LSLs, such as galvanized pipes, lead goosenecks, and other lead fittings. Section § 141.86 of the final rule has been modified to include sampling at sites that have galvanized service lines impacted by LSLs, or lead goosenecks, pigtails, or connectors. Galvanized service lines downstream of a lead source are potential contributors of lead in drinking water, and the main contributors for non-LSL water systems or those with few LSLs. Studies show that corroded galvanized service lines can adsorb lead particles from lead sources upstream resulting in lead levels entering drinking water in significant amounts. Accordingly, EPA believes the lead-impacted galvanized lines at single family structures should be prioritized in tap monitoring in systems with few or no LSLs, and therefore are categorized as Tier 3.

EPA does not agree that the final rule should reduce its focus on LSL sites, and should instead include provisions for geographic representation of tap sample sites within the distribution system and that non-LSL sites should be represented proportionately in tap sampling pools. EPA evaluated recent studies on the contribution to lead in drinking water from copper pipes with lead solder and concluded this no longer represents sites likely to have elevated lead in drinking water. Therefore, the final rule places these sites in a lower site selection Tier (Tier 4). EPA does not agree that MFRs should be excluded from the tier criteria because these locations when served by an LSL (i.e., Tier 2 sites) are likely to have elevated lead in drinking water. EPA does not agree that the “more transient” populations that reside in MFRs would be less likely to participate in tap sampling programs and therefore should be removed. The previous LCR included MFRs in the tiering criteria and EPA determined it is still appropriate to collect tap samples from these sites. EPA notes commenters concerns about obtaining a sufficient number of Tier 1 site participants; however, the final rule includes a requirement to prepare an LSL inventory which should provide the water system with more accurate information about LSL sites resulting in a larger potential Tier 1 tap sample pool. In addition, new outreach requirements to LSL customers is expected to increase consumers’ interest in participating in tap sampling programs.

Regarding comments related to using lower-tiered sites (Tiers 3, 4 and 5), in the final rule these sites may be used only after the water system does not have enough a sufficient number of higher tiered sites (Tier 1 and 2). The tap sample site selection must be based on the LSL inventory and the final LCRR does not allow water systems to sample at sites where the service line material in unknown. The final rule requires water systems to update their LSL inventory annually or triennially (depending on their tap sampling monitoring period) resulting in continuous inventory improvement. In addition, EPA has included a requirement for the LSLR plan to include a strategy for identifying unknown service line material. These LCRR provisions will require water systems to gain a better understanding of the materials that are in their distribution system and the most appropriate locations for tap sampling. Regarding the comment that the final LCRR should include provisions to reduce the 100 percent LSL sites to a lower percentage to reflect LSLR, EPA notes that as water systems undertake LSLR through customer-initiated, goal based LSLR after a trigger level exceedance and mandatory LSLR after an action level exceedance, the number of LSL sites will be reduced. As such, the LCRR takes into account that the number of LSL sites will be reduced over time and systems will then create their tap sample pools from lower tiered sites. Thus, reducing the required number of LSL sites to 50 percent, 25 percent etc. will occur commensurate with and as a result of the system conducting LSLRs without overly complicating the tap sampling requirements. Regarding the comment to exclude sampling locations that are expected to have "lead free" plumbing fixtures, such as buildings that are constructed after 2010, the Agency notes, that the new Reduction of Lead in Drinking Water Act definition of “lead free” became effective in 2014. The Agency expects water systems to use existing records as well as the date of any state, local or federal lead ban to identify LSLs for purposes on the inventory. As such, these sites would be considered Tier 5, and water systems can use these sites only when there are no longer any Tier 1-4 sites.

EPA agrees that a water system should use tap sample results that represent the highest lead levels to calculate the 90th percentile to determine if there is an action level exceedance or trigger level exceedance. EPA proposed that LSL water systems that are unable to collect the minimum number of samples from Tier 1 or Tier 2 sites shall calculate the 90th percentile using data from all the LSL sites and the highest lead and copper values from lower tier sites to meet the specified minimum number of sites. The final LCRR includes this requirement; therefore, water systems needing to complete their sampling pool with sites from tiers 3, 4 and/or 5, may only use the sites with the highest sampling results to meet the minimum number of sites used for the 90th percentile calculation.

9.2 First vs. Fifth Liter Option

Summary of Comments

In the proposed LCRR, EPA requested comment on an alternative tap sampling technique for sampling locations with LSLs. EPA requested comment on requiring tap samplers to collect the first gallon of water from the tap following the stagnation period (referred to as the fifth liter), then to collect a one-liter sample for analysis. The sampler would be instructed to pour out the gallon container or to use it for other purposes (e.g., watering plants) and to submit the one-liter tap sample for analysis.

Several commenters supported the option of requiring analysis of a fifth liter tap sample because LSLs may run fifty feet or more from a consumer’s household to the water main and collection of the fifth liter will provide a sample for the higher risk water within the LSL. One commenter noted that in some cities the public side of the service line is lead but often the customer side is not, thus the fifth liter is more likely than the first liter to capture water that has been in contact with an LSL. One commenter stated that first liter samples are inadequate for identifying at risk systems, communicating the risk of LSLs, triggering public education and LSLR programs, and measuring the effectiveness of CCT. Some commenters suggested that the final rule should use the highest lead concentration of the first draw and fifth liter for calculating the 90th percentile lead concentration to more accurately capture what homeowners are actually being exposed to. Another commenter noted that for a variety of reasons fifth liter sampling is logistically more implementable than collecting water from later samples (e.g., liters 6-10). A commenter suggested the fifth liter better measures the potential range of exposure to lead in water in LSL homes and better represents the effectiveness of CCT for addressing multiple lead sources in plumbing. A commenter referenced studies for residential systems with LSLs and stated that the first draw sample after stagnation typically does not have the highest lead level, and that determinations of action level exceedance would differ significantly if a mid-point (e.g., 5th-9th liter) sample is used. A commenter stated that a first liter sample creates a false sense of assurance about water quality within a home with an LSL. Another commenter observed that when the sampling protocol does not measure the highest risk water, the systems that need improved corrosion control to better protect their consumers are not triggered into taking protective actions.

Several other commenters supported retaining the current first-draw sampling protocol. The commenters expressed concern that implementation of the fifth liter option would complicate the tap sampling protocol and result in unreliable data due to variability among customers collecting the samples. Commenters noted that the first draw sampling protocol is easy to understand and communicate to customers whereas explaining the fifth liter sampling concept and the sampling requirements may affect the willingness of customers to participate in lead and copper tap sampling programs. The commenters noted that samplers would need to be well trained and capable of properly conducting the fifth liter sampling option. Another commenter noted that the frequency with which fifth liter samples at LSL sites exceed lead levels compared to the first liter sample at the same site, is not significant enough to warrant the extra complexity of sampling but did not provide evidence. A commenter asserted that If the first draw sampling methodology was replaced for LSL sites, these fifth liter samples could not be analyzed in comparison to historical LCR data that contains only first draw samples. One commenter states that EPA has a duty under SDWA to establish feasible treatment techniques and consider the burden placed on states to administer the LCR. The commenter wrote that a revised sampling protocol that increases the number of systems that must take additional steps, would represent an additional challenge to states to implement. This commenter suggested that EPA should not establish a different protocol for LCR compliance tap sample monitoring for systems with LSLs as these systems will bear the most significant costs under the proposed LCRR.

Several commenters noted that the first draw sample is appropriate for determining optimized corrosion control treatment and the fifth liter option would be more useful for diagnostic evaluations such as find-and-fix efforts for lead abatement. Commenters suggested that the fifth liter sampling protocol does not accurately reflect the lead concentration when a homeowner fills a container for consumption, i.e. they do not flush five liters prior to consumption and it would be more appropriate to address the health risk at the tap using the first liter. Some commenters disagreed with the concept that the fifth liter draw would be representative of peak lead levels due to factors such as service line length, pipe type, plumbing configuration and water usage.

One commenter expressed concern regarding a sample collector’s ability to conduct the fifth liter protocol as proposed and notes choosing to use a gallon container would require the individual taking samples to successfully remove a 8.34 lb. container of water from the tap with one hand while properly capturing the desired liter with another. Another commenter observed that a first liter and fifth liter sample collection protocol has been successfully implemented in Michigan.

Additional commenters offered alternate tap sampling protocol suggestions, including:

- Instead of a fifth liter, use a sixth liter approach. Draw the initial first liter for copper determination. Draw and dispose of a gallon volume of water. Then draw the sixth liter for lead analysis.

- Instead of a fifth liter, draw the second sample when the temperature of the tap water changes. Performing concurrent analysis of iron in both the first and second liter samples would give an indication of the prevalence of old galvanized iron plumbing and the potential that it could be contributing lead at the tap.
- Perform a timed flush to capture higher lead levels.

Some commenters expressed concern about how the fifth liter protocol would impact the copper sampling methods. These commenters thought that copper levels could either be diluted from taking a fifth liter sample or that copper sampling would require a separate tap sampling event on another day.

A commenter recommended sequential sampling for LSL sites. Sequential sampling involves collecting multiple water samples from a customer's tap, one after another, to determine how lead in drinking water concentrations change throughout the premise plumbing and service line.

An additional commenter recommended that if the fifth liter sampling option is implemented that EPA provide clear documentation that this sampling protocol is only used for confirmed LSL sites. Also, EPA should provide guidance on how the first liter and fifth liter results would be used in the compliance calculation and if the homeowner side is a partial LSL, whether that would be captured in this tap sampling design.

Agency Response

Tap sampling is required under the LCRR to evaluate the effectiveness of CCT and to determine if additional actions including LSLR are needed to reduce drinking water lead exposure. OCCT is specific to each water system because it is based on the chemistry of the system's source water and must be designed and implemented to take into account treatments used to comply with other applicable drinking water standards (56 FR 26487; USEPA, 1991). Significant expertise is needed to maintain OCCT to assure that lead and copper levels are reduced to the extent feasible due to daily variations in water chemistry and operations. Furthermore, lead corrosion does not occur at a predictable and stable rate. Data from Flint and other communities demonstrate that there can be low levels of lead at a given residence on one day, and high lead at the same residence the next day or week or month. In locations with LSLs, first liter samples have been shown to miss the highest levels of lead present in a home's drinking water and, consequently, first liter samples risk underestimating system lead levels. Such underestimation of system lead levels based on first-draw sampling could allow water systems to be unaware that their CCT is not working well (Lytle et al, 2019). Without appropriate awareness from tap sampling, systems will not take actions to reduce lead exposure and communicate lead in drinking water risks to consumers.

Numerous studies have evaluated the contribution of lead in drinking water from different sources (*e.g.,* service lines, faucets, meters). A study published by American Water Works Association (AWWA) Water Research Foundation (2008) ''Contributions of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues'' (Sandvig et al., 2008) estimates that 50 percent to 75 percent of lead in drinking water comes from LSLs. Thus, when present, LSLs are the greatest contributor of lead in a home's drinking water. Research using sequential tap sample collection techniques on homes with LSLs indicates that a first draw sample may not represent the significant contributions of LSLs to a home's drinking water lead levels (Lytle et al., 2019). Therefore, relying on first liter samples could allow a situation in which there may be high lead levels in a system but a 90th percentile concentration at or below the trigger level or action level.

Given that LSLs are the greatest contributor of lead in drinking water, EPA reviewed the sampling data in the Sandvig et al. (2008), Del Toral (2013), and Lytle et al. (2019) studies to determine the liter in any given sequential sampling profile that was most likely to contain the water that remained stagnant within a customer-owned LSL prior to sampling. Based on this information, EPA selected the fifth liter as the most likely to capture this water and any elevated levels of lead. Additionally, the fifth liter is more likely capture the water from the customer-owned portion of the service line which is the most likely to portion of an LSL remain in place at when of partial LSLRs were conducted by systems under the previous rule. Therefore, the final LCRR requires systems to collect fifth liter samples at LSL sites, which will provide better information on the highest concentration of lead in drinking water. Thus, data gathered from fifth liter samples to calculate the 90th percentile is a better indicator of the effectiveness of CCT in a system.

EPA finds that requiring the fifth liter sample for tap sampling would be more representative of lead concentrations in service lines than the first liter sample, which will provide better information on the highest concentration of lead in the system's drinking water. This better information will appropriately identify the need for required actions designed to reduce lead and copper exposure by ensuring effective CCT and re-optimization of CCT when water quality declines; enhancing WQP monitoring; implementing a "find-and-fix" process to evaluate and remediate elevated lead at a site where the individual tap sample exceeds 15 µg/L; and making consumers aware of the presence of a LSL, if applicable, to facilitate replacement of LSLs.

EPA agrees with commenters who support the fifth liter sample option for locations with LSLs. EPA has determined the fifth liter is the most appropriate sample for sites served by an LSL. There is evidence that a fifth liter sample is likely to represent water that has been in contact with the LSL during the stagnation period. Research show that where present, LSLs are the most significant source of lead in drinking water (Sandvig et al., 2008) and that the first liter may not represent the higher levels of lead in homes with LSLs (Del Toral, 2013; Lytle et al., 2009). Tap sampling is required under the LCRR to evaluate the effectiveness of CCT and to determine if additional actions including LSLR are needed to reduce drinking water lead exposure. In locations with LSLs, the fifth liter sample is a better indicator of the effectiveness of CCT and the need for LSLR because it better represents corrosion from LSLs. The first draw sample represents water that has traveled through the service line but that has sat in contact with the plumbing materials inside the home prior to the tap for the stagnation period. The first draw is an effective sampling technique to identify lead corrosion from taps, solder, pipes and fittings within the home but is not an effective sampling approach to capture corrosion from LSLs.

In response to the comment that fifth liter sample data will not being comparable to historical LCR data which is based on first liter samples only, EPA does not anticipate a need for water systems to evaluate historical tap sampling data to tap sampling data collected under the LCRR. Nevertheless, for water systems without LSLs, tap sample data will be comparable and, the final rule maintains and enhances requirements for WQP monitoring. Therefore, important water quality data collected through WQP monitoring will be comparable to historic distribution system water quality data.

EPA agrees with commenters who suggested the first liter is appropriate for evaluating the effectiveness of CCT for systems without LSLs. In the final rule, water systems without LSLs will collect first liter samples. However, EPA determined that for water systems with LSLs, the fifth liter is likely to represent water that has been in contact with the LSL during the stagnation period and is thus a better sampling approach to evaluate the effectiveness of CCT.

Some commenters suggested that the fifth liter is not representative of how a consumer would normally use the water because they do not flush four liters before drinking a glass of water. The EPA disagrees with commenters who stated that the fifth liter sample option should not be required because it does not represent water that is typically consumed. The LCRR tap sampling requirements are not intended to represent typical consumption; rather, the tap sampling is intended to determine the effectiveness of CCT and to determine if additional actions are needed including LSLR and public education to reduce drinking water exposure to lead. While the protocol is not designed to capture typical consumption, there is no reason to expect that water that has sat for a period in a LSL is not consumed. Water use patterns vary widely, people across communities draw water from the tap and consume it variably and in multiple ways over the course of each day.

EPA disagrees with commenters that assert that a fifth liter sampling protocol would not be feasible because of the increased burden on primacy agencies and public water systems, EPA has evaluated the burden of the LCRR on primacy agencies and on public water systems as a part of the Agency's Economic Analysis (USEPA, 2020). EPA has determined that it is feasible for water systems to collect a fifth liter lead sample in homes with LSLs. This sampling protocol has been effectively implemented in the State of Michigan. EPA has further determined that it is feasible for the water systems with LSLs to implement the actions required if their system exceeds the TL or action level. Systems with LSLs have significant sources of drinking water lead and the LCRR targets actions to those systems where lead levels are elevated.

EPA disagrees with commenters who stated that a fifth liter sample option is too complicated for samplers to perform. Clear instructions, numbered bottles and other best practices will assist samplers. The viability of this approach has already been demonstrated in the State of Michigan, where a similar protocol is being implemented. In addition, the final rule requirement for water systems to prepare an LSL inventory and make it publicly available and the annual notice to customers with LSLs will raise awareness of LSLs and their contribution to lead in drinking water and raise interest in participation of tap sampling and LSLR programs.

EPA agrees with commenters who expressed concern that the proposed alternative protocol of collecting the first gallon of water from the tap following a stagnation period, then to collect one liter sample for analysis would not allow for collection of lead and copper samples at a sampling site at the same time. EPA agrees with commenter's concerns with requiring two separate tap sampling events to collect both lead and copper tap samples. EPA determined it is more cost effective and efficient to collect tap samples for both copper and lead at the same time. Accordingly, the tap sampling protocol for LSL sites described in the preamble to the proposal has been modified in the final rule to require the collection of five consecutive liters in wide-mouth bottles while the tap is continuously open or running. The first and fifth liter will be analyzed: the first liter will be analyzed for copper and the fifth liter will be analyzed for lead.

EPA is aware that for some water systems that the tap sampling monitoring periods for lead and for copper may be different (i.e., annual lead tap sampling and triennial copper tap sampling). In those circumstances, for sampling at LSL sites, the first liter would not need to be analyzed for copper in years when copper sampling is not required.

EPA considered suggestions for other sampling methodologies such as random-daytime sampling. EPA disagrees with this comment. EPA determined first liter samples at non-LSL sites and the fifth liter at LSL sites are the most appropriate means to evaluate CCT for both lead and copper and the contribution of lead in drinking water from water that has been in contact with an LSL. Suggested methods such as random-daytime sampling is too complex for compliance sampling that is implemented by customers and would require an increased cost and burden to water systems. Random daytime sampling is a practice that collects samples at random locations in the distribution system at random times throughout the day. Lead levels vary significantly from location to location based upon differing plumbing materials. Lead levels also vary over time based upon water use at a location. The LCRR controls for these variables by tiering sampling locations to select sites with leaded plumbing materials and by requiring a stagnation period prior to collecting a sample. These protocols will assure that elevated lead levels will be found if present. Similarly, EPA does not agree with the recommendation for sequential sampling at LSL sites. EPA evaluated the feasibility of conducting sequential sampling techniques for every tap sample site for the public water systems that are subject to the LCRR. EPA finds it is not feasible due to the complexity of the sequential sampling technique, the number of samples that must be analyzed and the difficulty of interpreting the results from multiple tap samples.

9.4 90th Percentile Calculation

Summary of Comments

Commenters asked EPA to specify which types of tap sampling data to use in the 90th percentile calculation. Several commenters did not support including customer-requested samples in the 90th percentile calculation, noting that such samples could distort the statistical basis of the 90th percentile value, may not be vetted to determine whether they meet Tier 1 criteria, and are not part of the state-approved tap sample site plan. A commenter asserts that this type of sampling is currently discouraged by the previous rule because water systems are often concerned that “complaint” or “customer“ samples would be included into the required 90th percentile calculation with potential mandatory response actions if it exceeded the action level. This resulted in systems not offering sampling or having the samples be analyzed through a private lab and thus the data would not be available for any utility management or regulatory purpose. Another commenter noted that customer-requested tap samples may not comply with tier requirements or may not be sampled correctly.

Commenters asked for clarification, if a customer-requested sample is collected from a Tier 3 site and has a higher lead value than the Tier 1 samples that were collected under the approved tap sampling plan requirements, how (or if) the customer-requested sample affects the system’s 90th percentile calculation. In addition, if customer-requested samples are collected outside the compliance period or if the water system does not have LSLs, it is unclear how such samples would count toward the 90th percentile compliance calculation. Several comments suggested that only the highest result from each site be included in the 90th percentile calculation. A couple of commenters suggested that the 90th percentile calculation as specified in the existing LCR be maintained in the revised rule.

Multiple commenters asked for clarification and provided recommendations for the calculation of the 90th percentile value if lower tiered sites are used to complete the sampling pool when there are insufficient Tier 1 sites to meet the minimum required number of samples. A commenter notes, while the proposed approach prevents a “no gaming” perspective, the definition of the 90th percentile is the value for which 90 percent of the data points are smaller. What EPA is proposing is not by definition the 90th percentile, mathematically the 90th percentile is the value for which 90 percent of the data points are smaller. They state that because the 90th percentile calculation in the rule includes, all LSLs and only the highest samples from lower tiered sites, it’s not technically a 90th percentile and should be named otherwise. Other commenters recommend that EPA provide clarification for completing the sampling pool in a verified order when both Tier 1 and 2 and Tier 3 and 4 sites are used. A commenter provides the following example: a system with a mix of Tier 3 and Tier 4 sites should not dilute the sampling pool by addition of more Tier 4 sites that may not contain lead or copper. Instead, the commenter argues that such systems with sufficient Tier 3 sites should be required to calculate the 90th percentile based on these sites, similar to systems with Tier 1 and Tier 2 sites.

A commenter suggested that sampling completed by customers often results in sampling errors such as sampling the moment returning from a month-long vacation or sampling from a tap that is rarely used, and as a result of these errors, the water provider should not be required to report the results as part of the 90th percentile calculation. The commenter asserts these sample results are not representative of the overall water system or water that is consumed by a customer.

A commenter requested that small systems be permitted additional flexibility to allow them to include additional samples in the 90th percentile determination when one high sample result could be eliminated due to the possibility of premise plumbing issues or homeowner sampling error. Another commenter was similarly concerned that, for the specific subset of small systems that collect five lead and copper tap samples per monitoring period, “a single sample collected from an inappropriate location or after a long standtime but which could not be invalidated, could cause a lead 90th ALE [action level exceedance].”

One commenter noted that follow-up samples collected under the proposed find-and-fix requirements are not included in the 90th percentile calculation and thus, if repeat sample(s) prove a sampling error was the cause of the initial high result, then the initial sample should not count towards the 90th percentile calculation. Several comments were received requesting clarification on whether samples collected for follow-up monitoring after partial or full LSLR should be included in the 90th percentile calculation. One commenter noted that including such samples could deter utilities from proactively removing LSLs. Another commenter asserted that samples collected during LSLRs and flushing activities should never be included with LCRR compliance monitoring efforts and associated compliance calculations as sampling after an LSLR is not intended to be used to monitor the effectiveness of the CCT, rather it is intended to ensure that the internal plumbing was flushed adequately.

One commenter noted that the limited number of samples that must be taken (based on population served) for calculation of the 90th percentile is not representative of the entire system, especially for the largest water systems.

One commenter requested clarification on whether school/day care monitoring samples are included as Tier 4 samples and whether they are counted as individual samples or as a single group.

One commenter provided additional sampling options to consider for 90th percentile determination for multi-family residences with shared LSLs.

One comment requested clarification on whether samples collected after a customer treats the water with a softener should be included in the 90th percentile.

A commenter stated they use the Safe Drinking Water Information System (SDWIS) to calculate the 90th percentile and asked EPA to update SDWIS to be able to meet the LCRR requirements.

Agency Response

In response to commenters seeking clarification on how customer requested tap samples should be used in the 90th percentile calculation, the final LCRR requires these samples to be included if: they meet the systems tap sample site tiering – i.e., for water systems with LSLs the sample was collected at an LSL sites, the sample was collected using the appropriate tap sampling protocol and the sample was collected during the tap sampling monitoring period. In addition, the final rule requires that when the water system is calculating the 90th percentile, and using sites of lower tiers (i.e., Tiers 3, 4 and/or 5), only those sampling results with the highest lead and copper values from those lower tiered sites can be used in the 90th percentile to meet the required number of tap samples based on system size. EPA determined it is important to calculate the 90th percentile level using data that are collected from higher risk sites in accordance with the final LCRR protocol are most appropriate to determine effectiveness of CCT and if additional actions, LSLR and public education, are warranted.

EPA concluded that fifth liter tap samples collected at LSL sites is the best indicator of CCT effectiveness; therefore, tap samples from all Tier 1 sites must be included in the 90th percentile in the final rule. To clarify, a system can only sample at a lower-tiered site (lower risk for lead levels) when it no longer has any sites remaining from the next higher tier. Service lines that are unknown cannot be used under any of the Tiers 1-4 in § 141.86(a). If a lower tiered site has a higher lead or copper value than a higher tiered site, these may be included once there are no higher tiered sites left to complete the 90th percentile calculation. The LCRR revised previous provisions to ensure only the highest values from the lower tiered sites may be used in the 90th percentile calculation.

EPA does not agree with commenters who suggested that samples collected incorrectly by customers should not be used, because if the water system is not present, they will not know if it was collected incorrectly. In addition, if the water system is concerned about sampling error by the resident who is sampling, they may collect tap samples themselves or hire professionals to carry out sampling. Unless the sample meets the invalidation criteria it must be used; this will prevent a potential of invalidating too many samples or samples with high results when there is only a suspected error. Therefore, section § 141.86(b)(2) of the final rule provides that "[i]f a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results." Clear tap sampling protocols and customer training will ensure samples are corrected properly.

In response to the comment about not including tap samples in the calculation if a follow up sample indicates the sample was improperly collected, EPA disagrees with this approach. In the final LCRR, water systems must collect a follow up sample at any tap sample site that yields a concentration above 15 µg/L. This allows the systems to determine if the elevated level of lead is due to customer premise plumbing, an LSL, or deteriorating water quality in the distribution system. Systems must report their findings to the state and recommend a corrective action as appropriate. A water system that identifies sampling error, may want to find an alternative site – that meets the required tier criteria -- to avoid future sampling errors, or the system may use the opportunity of the follow up sample to train customers in the proper tap sampling technique.

EPA has modified the 90th percentile in this final rule by updating the tap sampling tiering criteria to target high-risk lead sites and ensuring these are used in the calculation. EPA disagrees with the comment to maintain the rules in the previous LCR for the 90th percentile calculation because it would not adequately capture the highest lead concentrations. The final LCRR provisions for calculating the 90th percentile require consideration of the "results of all lead or copper samples taken during a tap sampling period" (141.80(c)(4)(i)(A)). Section § 141.86(e) of the LCRR requires that "[t]he results of *any* monitoring conducted in addition to the minimum requirements of this section (such as customer-requested sampling) shall be considered by the water system and the State in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subpart. Systems must submit data from additional tier 3, 4 or 5 sites to the State but may not use these results in the 90th percentile calculation. Water systems must include customer-requested samples from known lead service line sites in the 90th percentile calculation if the samples meet the requirements of this section." Further, the find-and-fix samples may be outside of the tap sampling monitoring period or collected using a different tap sample protocol. The purpose of the tap sampling in § 141.86 is to evaluate the effectiveness of CCT or for systems without CCT to ensure lead levels are not elevated at customers taps. The purpose of the find-and-fix tap sample is to identify the source of elevated lead at a site and the purpose of the post LSLR sample is to ensure that lead levels have stabilized after a LSLR or LSL disturbance. However, these samples must be submitted to the state under § 141.90(g).

EPA does not agree with the commenter that suggested water system should collect more samples so that the number of samples is proportional to the size of the system. Tap water samples are variable, to address this variability in the distribution of lead levels in tap samples, EPA concluded that the 90th percentile is the most appropriate, as opposed to the mean, to account for this variability. The requirements of the LCRR seek to strike a balance between the desire for representativeness of the sampling results and the need to ensure that the sampling requirements are reasonable and implementable by public water systems. While increasing the number of sites where samples must be taken provides greater certainty of the representativeness of sampling results, there are costs (in terms of identification and access to homes as well as sampling and testing) associated with increased sampling. The final LCRR better targets highest risk sites, requires 100 percent of samples be collected from LSL sites, collection of the fifth liter at LSL sites to represent water that has been in contact with the LSL and an improved tap sampling protocol will identify those systems that need to take actions to reduce lead in drinking water, such as LSLR, CCT installation or re-optimization and public education. Therefore, the final rule maintains the number of samples by system size from the previous rule.

Regarding school and child care sampling, the final LCRR has separate sampling and public education requirements for CWSs. Samples collected under those provisions should not be included in the 90th percentile calculation because there is a different tap sampling protocol and purpose. An exception would be an in-home child care may be a Tier 1 site and may be used for tap sampling in § 141.86. Since children risk the most significant harm from lead exposure, EPA is requiring that CWSs test for lead in drinking water in school and child care facilities. The purpose of the school and child-care facility sampling program under § 141.92 is not the same as the tap sampling requirements for purposes of the 90th percentile calculation. See response to comment Section 12.

EPA appreciates commenter suggestions for an alternative method for calculating a 90th percentile using tap samples collected from MFRs; however, the LCRR is already a complex rule and the Agency does not believe the additional complexity of the suggested 90th percentile calculation methodology is appropriate. EPA reiterates that the purpose of tap sampling is to evaluate CCT effectiveness. EPA is not aware of studies that have evaluated applying percentage of “stagnation time” from MFRs based on the number of units and therefore does not have a scientific basis to determine the appropriate percentages to apply.

In response to questions about sampling at sites with a water softener, the final rule does not allow tap samples to be collected at these sites because these may alter the lead levels.

Regarding concerns with updates to SDWIS, EPA intends to support the data management needs of primacy agencies for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR. EPA will work closely with state program and information technology staff on LCRR database needs and on overall SDWIS modernization. EPA will engage with states in the development and testing of the SDWIS Modernization data system. EPA intends to provide LCRR Date Entry Instructions (DEIs) that will provide detailed guidance to primacy agencies regarding the data requirements for LCRR monitoring, record keeping, and reporting.

9.5 Frequency and Number of Samples

Summary of Comments

Several commenters noted the proposed LCRR will increase the tap sampling workload, especially for large systems with LSLs. For example, large systems on annual monitoring will be required to collect 100 samples in a four-month window (June-September). In the past, these systems on reduced monitoring were only required to collect 50 samples in the same time window. They asked that if collection of 100 samples is going to be required, consider expanding the annual monitoring window to six months (May-October) to allow systems to plan and coordinate sample collection.

Several additional commenters asserted that that the number of samples for large systems on annual tap sampling should be 50, and not the standard number of sites of 100 because the larger the required tap sample pool, the more difficult it is to maintain customer participation.

Commenters expressed concern that every water system subject to the rule must submit a revised sampling plan and requested consideration of phased implementation as the current triennial sampling cycles proceed, based on observed lead levels or presence/absence of CCT and the water system’s size.

Many commenters requested clarification regarding reduced monitoring and the use of historical (grandfathered) data. Specifically, commenters asked for clarification as to whether all systems on reduced monitoring schedules would be returned to standard (six-month) monitoring when the rule takes effect or remain on their current schedules. Other commenters asserted the rule is unclear regarding how historical (grandfathered) data may be utilized under the proposed rule to meet to establish the monitoring frequency.

Commenters noted that water systems should be allowed to stay on their current (reduced) monitoring plan if the lead levels are below the trigger level, CCT is employed, and they have not changed source water or treatment. Commenters requested additional clarity to clearly differentiate monitoring requirements following a lead trigger level exceedance but not an action level exceedance.

Many comments were received noting that under the new rule, systems that exceed the lead trigger level or action level, but not the copper action level, will have their lead and copper sampling frequencies diverge. The commenters stated that this will create data management challenges and cause an undue burden on customers who participate in collecting tap samples at their residences. Commenters requested that the lead and copper tap sampling frequencies remain the same.

Many commenters supported the LCRR's increased requirements for systems to qualify for reduced monitoring and several requested that further restrictions be implemented, such as no longer allowing tap sampling once every 9 years. Commenters requested elimination of reduced, three-year monitoring cycles, or at least, significantly reduce the number of systems eligible for triennial monitoring by imposing more stringent requirements for eligibility. Some commenters suggested that only systems with no LSLs should be eligible for reduced monitoring or that monitoring should be conducted no less frequently than every six months until all LSLs have been removed and optimized CCT has been confirmed for at least two years.

One commenter suggested an alternate monitoring schedule for a lead action level exceedance: instead of standard monitoring for a two-year period, compress monitoring into an annual quarterly testing period.

One commenter noted that the complications of the revised LCR's action level and trigger level make sampling provisions difficult to follow. The final rule should include only the action level but restrict monitoring to at least annually or more frequently.

One commenter requested additional lead and copper monitoring be performed if a drinking water utility makes a change in disinfection technique (e.g., a free chlorine 'burn out' in a distribution system that uses chloramines for secondary disinfection).

Agency Response

EPA acknowledges that the final LCRR will result in more frequent tap sampling for many water systems due to the establishment of the lead trigger level and new limitations for qualifying for reduced monitoring. However, the Agency has determined this is necessary in order to ensure actions water systems take in response to a trigger level exceedance or action level exceedance related to CCT installation or re-optimization are reducing lead levels in the distribution system. The final rule includes new criteria for water systems to be eligible for reduced monitoring based on the trigger level. For example, water systems serving 50,000 or fewer people must meet the lead trigger level (10 µg/L) to reduce their monitoring schedule to every three years. Water systems meeting the lead action level (15 µg/L) but exceeding the trigger level must monitor every year at the standard number of sites. Because the monitoring frequency in the revised rule is based on the lead action level as well as the lead trigger level, water systems must meet stricter criteria to move into reduced monitoring at the reduced number of sites. EPA believes this is an improvement to the previous rule in response to commenters asking for more strict criteria for reduced monitoring in the final rule.

EPA also believes the sampling window of June through September provides adequate time for the collection of 100 samples for large systems on annual monitoring under the final LCRR. It is important for samples to be collected during the warmest months of the year especially of they are only sampling annually. Studies indicate that lead leaching into water from pipes increases with increasing temperatures. The final LCRR includes provisions for development of an LSL inventory and outreach to customers that are served by LSLs which will result in increased customer interest in participation in tap sampling programs and LSLR. EPA concluded it is feasible for water systems to collect the standard number of samples during the June through September and this is important to improve public health protection.

In response to questions about the use of grandfathered data (i.e., sampling data taken between the final rule promulgation and the rule compliance date that meets all of the sampling requirements of the new rule under § 141.86) to determine the water system's tap sampling schedule, EPA determined that few systems would have such data because of the changes to the sampling requirements in the LCRR, especially since the final LCRR requires sites served by an LSL must collect a fifth liter for lead.

EPA understands the challenges water system may face when they have different monitoring schedules for lead and copper. Under the final LCRR, the tap sampling frequency for lead may be greater than that of copper; however, for reasons discussed elsewhere, the increased monitoring is critical to the goal of the rule to prevent know and anticipated adverse health effects from lead to the extent feasible. EPA acknowledges that different copper and lead tap sampling monitoring schedules will create some additional burden for water systems. However, the Agency concluded that public health improvements can be achieved by reducing lead in drinking water. The rule will better identify high levels of lead, improve the reliability of lead tap sampling results, strengthen CCT requirements, expand consumer awareness and improve risk communication. In addition, the rule will accelerate LSLRs by closing existing regulatory loopholes, propelling early action, and strengthening replacement requirements.

EPA determined that waivers for systems serving 3,300 or fewer people that allow them to sample once every nine years are still appropriate and has retained this provision from the previous LCR, due to the very strict criteria that water systems must meet to receive a waiver. Water systems may qualify for nine year tap sampling monitoring frequency if they certify to the state that the system has no lead and/or copper-containing plumbing materials in their system and have sampling data with levels of lead less than or equal to 0.005 mg/L and for copper less than or equal to 0.65 mg/L. The final LCRR includes many provisions that will require systems to increase tap sampling frequency and take other actions if they exceeded the lead trigger level or action level. EPA concluded that water systems with elevated lead should not be allowed able to qualify for reduced monitoring while systems with low lead levels are able to reduce tap sampling frequency. Therefore, the final LCRR maintains the nine-year tap sampling frequency for systems that do not have lead or copper materials in the distribution system.

Several commenters urged EPA to increase the number of samples required especially for large systems with populations over 100,000, while others asked for the number of samples to be decreased due to inherent challenges with customer participation. EPA has maintained the number of samples required for each water system based on its population under § 141.86(c). EPA has also strengthened the tiering requirements to assure samples are collected at locations with the most significant sources of lead. Targeting these samples to these tiered locations, assures a large enough sample size for evaluation of CCT effectiveness.

In response to commenters requesting clarification, EPA revised the regulatory text to streamline and clarify requirements in § 141.86.

In response to a comment asking EPA to require additional monitoring after certain changes such as a change in disinfection technique see response to comment Section 11.

9.6 Sequential Sampling

Summary of Comments

EPA requested comment on an alternative sampling methodology for water systems with LSLs. In the request for comment, EPA states "The EPA evaluated the feasibility of conducting sequential sampling techniques for every tap sample site for the public water system that are subject to the LCR. The EPA finds it is not feasible due to the complexity of the sequential sampling technique, the number of samples that must be analyzed, and the difficulty of interpreting the results from multiple tap samples." EPA received comments on sequential sampling methods, with some supportive of this technique and others opposed.

Sequential or profile sampling can be used as a diagnostic tool to assess the potential source of lead in drinking water. One-liter tap samples of water are collected, typically 10 to 20 samples, in succession after a defined stagnation time. Each liter sample represents a portion of the service from the water main to the tap, with the first few liters collected typically representing water from premise plumbing and subsequent samples representing water from the service line. This method tends to be intensive of labor, cost, and analysis.

Commenters noted that sequential sampling is too complex to be considered for compliance sampling purpose. They state that it requires numerous samples to be collected and the results may be difficult to interpret. Commenters state that sequential sampling would be difficult for homeowners to implement resulting in a burden to both the customer and the water system. However, commenters suggest that sequential sampling could be a useful tool for systems to use in sample site assessments, though it is important for EPA to provide proper guidance.

One commenter noted that sequential sampling would be an issue for collecting tap samples for copper. If a first liter sample is not used for lead tap sampling compliance, elevated copper may not be identified. One commenter suggested the use of sequential sampling for homes with LSLs if a first liter sample exceeds the trigger level as a means to obtain a more accurate measure of lead exposure.

One commenter suggested that if sequential sampling is required for compliance purposes EPA should consider: exempting systems that do not have LSLs, limiting small systems with LSLs to one sequential sampling event per monitoring period, limiting medium-sized systems with LSLs to three sequential sampling events per monitoring period, and limiting large systems with LSLs (including galvanized pipe) to five sequential sampling events per monitoring period.

Agency Response

EPA agrees with some commenters that performing sequential sampling techniques for compliance sampling under § 141.86 would be too complex and burdensome for water systems and customers. EPA does not believe sequential sampling is feasible for compliance tap sampling purposes due to the aforementioned reasons, that is it not feasible because of the complexity of the technique, the high number of samples that need to be collected and the difficulty interpreting results from multiple tap samples. EPA believes this is valuable tool that may be helpful to identifying source of lead for find-and-fix follow up sampling under section § 141.82(j). In the final LCRR, water system with LSLs, must collect fifth liter samples at LSL sites. EPA believes requiring water systems to collect the fifth liter at LSL sites is appropriate to ensure the sample is likely to capture water that has been in contact with the LSL. EPA has maintained a first liter sampling method for copper as well and for lead at sites not served by an LSL. See response to comment Section 9.2 regarding the fifth liter tap sampling requirements.

9.7 Setting a Minimum Tap Sampling Frequency Following Addition of a New Source Water or a Long-term Treatment Change

In the proposed LCRR EPA requested comment on requiring more frequent monitoring for lead and copper at the tap following a change in source water or long-term treatment change that is significant. EPA also sought comment on requiring water systems to monitor at the tap either biannually or annually. A summary of some of the comments received from this request for comment is below.

Several commenters indicated that a “significant” change in source water or treatment can encompass a wide range of scenarios influenced by multiple factors that need to be considered in establishing an appropriate sampling frequency. They noted that there are several factors that come into play that should determine the appropriate tap sampling frequency following the change, including: full WQP sampling of the new source, applicable saturation indices results, current or proposed CCT, blending with existing sources, size of system, and previous LCR tap sampling.

Several commenters recommended that the final rule not prescribe the minimum tap sampling frequency but should allow states to determine the appropriate tap sampling frequency based on the type of change and the associated risk profile.

Several commenters suggested the rule should specify a minimum of two rounds of six-month tap sampling following a source water or significant treatment change that affects WQPs or requires a CCT study. These commenters also requested clarification on specific types of treatment changes that would trigger additional monitoring.

One commenter recommended that EPA require annual tap sampling during the hottest months after a source water change or treatment change citing that it would be more feasible to perform than once every six months. A couple of commenters suggested that EPA require biannual sampling when a completely new source is used and annual sampling for treatment changes. One commenter noted that treatment changes can involve several years for completion, asserting the rule does not speak to this and a window of three to five years should be allowed for such changes to be implemented.

Several commenters requested that EPA provide a list of specific treatment changes that would require State approval before a system can make the changes and to help the states identify appropriate tap sampling frequencies.

Several commenters recommended allowing states to have the discretion to set a water system’s monitoring schedule if the system has two wells in the same aquifer with the same water quality characteristics.

One commenter recommended that the final rule allow targeted monitoring when a source water change only applies to a portion of the distribution system.

One commenter requested clarification of LCRR applicability for systems that haul in water and add it to their storage tank during drought conditions, explaining that if sampling occurs, they may not be sampling their water.

Agency Response

After a full evaluation of these comments, EPA has determined a minimum tap sampling frequency of once every six months following a change in source water or long-term treatment change is appropriate unless the state determines that the addition of the new source or long-term treatment change is not significant in accordance with §141.86(d)(iv). EPA has determined that States will make the determination of when a treatment change by system is not significant enough to require the system to increase the frequency of monitoring. Deterioration in water quality or unintended consequences of source water or treatment changes will be more quickly identified and therefore addressed when tap sampling occurs every six months. Section § 141.90(a)(3) includes examples of long-term treatment changes. States have the expertise to determine whether the addition of a new source or long-term treatment change is not significant and therefore would not warrant standard six-month monitoring. While some commenters requested that EPA allow States to also determine the appropriate sampling frequency after the addition of a new source or long-term treatment change, EPA has set a minimum tap sampling frequency of once every six months to ensure national consistency. EPA notes that under §141.86(d)(iv) a system will remain on standard monitoring until the system is under the lead and copper action level for two consecutive six-month monitoring periods. EPA also disagrees with commenters who requested EPA allow for treatment changes to be implemented (e.g., 3 or 5 years) prior to requiring monitoring. As stated above, six-month monitoring allows for early and timely detection of water quality deterioration or other unintended consequences of source water and treatment changes.

EPA acknowledges comments regarding monitoring requirements for systems with more than one well in an aquifer. EPA intends to develop guidance and provide training and other supporting materials to assist primacy agencies and drinking water systems in achieving the public health protections under the LCRR. For more information, see response to comment Section 11.

9.8 Sampling Protocol and Methods

Summary of Comments

Numerous commenters supported the proposed sampling protocol specifying the use of wide-mouth bottles, elimination of pre-stagnation flushing and prohibition of aerator removal in §141.86(b). A few commenters requested the Agency clearly communicate that this protocol is to be used for compliance sampling only. They stated that many utilities try to educate consumers to flush stagnant water and clean their aerators to lower exposure to lead in drinking water and they expressed concern that the protocol could cause confusion if not clearly explained.

A couple of commenters disagreed with prohibiting pre-stagnation flushing. By not allowing both pre- and post-stagnation flushing they stated it may be more difficult to pinpoint the source of elevated lead. One commenter disagreed with the prohibition on aerator removal during sample collection stating that poorly maintained aerators could negatively impact sample results.

Many commenters supported maintaining the 6-hour stagnation period prior to sampling, but also requesting a mandatory *maximum* stagnation period for residences. Commenters noted that establishing a maximum stagnation time would not allow tap samples collected where residences have not been used for long periods of time as this can bias tap sample results. Some commenters suggested in these situations, pre-stagnation flushing would be appropriate prior to the start of the 6-hour stagnation period to simulate normal water usage. Many of the commenters suggested that the final rule establish a maximum 18-hour stagnation period which aligns with the requirements for school and child care sampling in §141.92(b) and as recommended in the 3Ts (USEPA, 2018). One commenter also requested that the Agency consider consistency in the bottle size, sample volumes collected, and minimum and maximum stagnation periods between the home sampling and school and child care sampling requirements to minimize system error and aid in compliance.

Many commenters recommended that the tap sampling protocol require sampling from the cold-water tap, explaining that many households now use faucets with a single lever that delivers both hot and cold water.

Numerous commenters requested that the final rule standardize and codify the language for sampling instructions sent to customers. They stated that the sampling protocol needs to provide detailed and precise instructions so that samples taken are scientifically valid. The protocol needs to be clear that samples are drawn from taps that are used on a regular basis for drinking and cooking.

Several commenters expressed concern that the LCRR still relies on untrained homeowners to conduct sampling with no certification or assurance of adherence to the sampling protocol, sampling location(s), or stagnation periods. Some commenters suggested that sampling should be conducted by licensed water operators, trained technicians or other locally appointed, state-certified water quality experts. Otherwise, utilities need to have the ability to invalidate improperly collected samples if a confirmatory sampling indicates a sample collection error.

A couple of commenters suggested allowing locally-governed water utilities to develop monitoring plans and schedules based on local preference including sampling during day-time hours, targeting schools for testing, varied aerator removal, targeting homes with children such as in-home daycare centers, homeowner non-participation, sampling flushed water samples versus first draw, historically negative sampling results, and findings of no potential lead sources.

A couple of commenters suggested alternate sampling methods such as the use of pipe loop sampling or other devices at specific approved points within the distribution system in order to assess lead levels without requiring homeowners to collect samples. One commenter suggested an alternate collection approach of testing fixture mounted carbon filters for total lead after consumers have used them under normal conditions for a week. The commenter asserts that this method would better represent actual lead exposure. Another commenter suggested that EPA consider the random daytime sampling practice utilized in the UK and European Union for the LCRR. Commenters recommended random daytime sampling as an alternative technique.

One commenter suggested that a certified water operator take two samples – one outside at the connector to the residence and another within the residence following the requisite 6-hour stagnation period. This would eliminate homeowner sampling issues and assist in troubleshooting sources of lead contamination. One commenter requested the option to collect four 250-mL samples instead of a single one-liter sample to assess brass corrosion.

A couple of commenters requested that the sampling protocol add the specification that sampling sites may not include point-of-entry (POE) treatment devices and sample taps may not have POU devices. The commenters requested additional clarity regarding POU filters and sampling.

Agency Response

EPA disagrees with commenters who supported allowing pre-stagnation flushing in LCRR tap sampling. Flushing, or running taps, has long been understood to decrease water lead levels in a home, and thus has been a recommendation by federal, state, and local authorities as a way to reduce lead exposure prior to water use, especially in residences of higher risk (e.g., houses containing LSLs) as well as a beneficial practice at homes that may have lead solder or faucets and fixtures that are not “lead-free”. Flushing removes water that may be in contact with LSLs for extended periods of time, which is when lead typically leaches into drinking water (USEPA, 2016). As a general matter, EPA recommends consumers flush taps as a regular public health protective practice to reduce household exposure to lead in drinking water. However, this practice may mask potential higher lead levels and is prohibited in this final rule because the purpose of the tap sampling is not to determine the source of the lead or typical exposure, as suggested by commenters, but to measure whether corrosion control is effective in controlling lead from all sources, including premise plumbing. EPA also disagrees with commenters who supported removing and cleaning the faucet aerator prior to sampling. The taps used for monitoring likely contain an aerator as part of the faucet assembly, and particulate matter, including lead, may accumulate within these aerators. Thus, removing and/or cleaning these aerators only prior to sample collection could mask the contribution of particulate lead. However, it is advisable to regularly remove and clean faucet aerators to avoid particulate matter build-up. As a general matter, EPA recommends consumers clean faucet aerators as a regular public health protective practice to reduce household exposure to lead in drinking water. However, if customers only remove and clean the aerators before sample collection, the sample results will not be representative and serve the purpose of tap sampling – to determine whether corrosion control is effective in controlling lead, including particulate lead, from contaminating drinking water. Thus, EPA has prohibited the removal and/or cleaning of the faucet aerator as part of the procedures for collection of lead and copper tap samples.

Regarding stagnation times, EPA does not believe that a maximum stagnation period is necessary for the rule. Water systems can choose other sites from the same tier in the sample pool if they are aware that homes are vacant for extended periods of time. Most systems have a data sheet with time the water was last used and when the sample was taken. When a system looks at the data sheet and see the water was not used extended periods of time, then they can choose not to submit that sample to the lab for analysis. Therefore, EPA has not added a maximum stagnation time into the final rule requirements.

In response to commenters who asked that the final rule explicitly require sampling from a cold-water kitchen tap, this provision was in the previous LCR and EPA maintained it in the final LCRR. EPA believes that the final rule includes sufficient detail in the tap sampling collection methods under § 141.86(b), therefore is not codifying the instructions that water systems provide to customer samplers. Water systems may wish to add additional information or provide context for consumers.

Several commenters suggested that EPA include alternative sampling techniques such as random daytime sampling or using filters to measure the lead levels after water is used under normal conditions for a specified period of time. EPA considered other sampling methodologies such as random daytime sampling. However, EPA determined first liter samples at non-LSL sites and the fifth liter at LSL sites are the most appropriate means to evaluate CCT for both lead and copper. Random daytime sampling is a practice that collects samples at random locations in the distribution system at random times throughout the day (variable stagnation times). Under this method, lead samples are collected to characterize typical lead exposure and is not necessarily representative of maximum lead levels. EPA reiterates that the purpose of home tap sampling under §141.86 is to determine if CCT is effective system-wide at controlling lead levels. EPA is aware that lead levels vary significantly from location to location based upon differing plumbing materials. Lead levels also vary over time based upon water use at a location. The LCRR controls for these variables by tiering sampling locations to select sites with leaded plumbing materials and by requiring a stagnation period prior to collecting a sample resulting in a standardized and reproducible method across systems. Rather than selecting random sites throughout the distribution system, the LCRR prioritizes sites that are most likely to have the highest lead levels to evaluate CCT effectiveness (see the response to comment Section 9.2). These protocols will assure that elevated lead levels will be found, if present, which enables the system to evaluate corrosion. EPA also believes that including random sampling will increase rule complexity and would incur further costs and burden to water systems. EPA notes that water systems may use alternative sampling methods for customer-requested non-compliance samples that are fit for the desired purpose (see response to comment Section 9.9).

In response to comments regarding who collects samples, EPA does not specify in the LCRR who must carry out sample collection efforts leaving the decision to the water system and/or state. Locally appointed or state-certified water quality experts could be designated to conduct tap sampling instead of relying on customers. In response to commenters who expressed concern that the LCRR rule still relies on untrained homeowners to conduct sampling also see the response to comment Section 9.1.

In response to sampling at sites with POEs and POUs, EPA agrees with commenters and has clarified this language in the final rule to improve understanding of the sites and taps allowed under § 141.86(a), "Sampling sites may not include point-of-entry (POE) treatment devices and taps used at sampling sites may not have point-of-use (POU) devices designed to remove inorganic contaminants, except for systems monitoring under § 141.93(a)(3)(iv) and water systems using these devices for the primary drinking water tap to meet other primary and secondary drinking water standards and all service connections have POEs or POUs to provide localized treatment for compliance with the other drinking water standards.."

EPA recognizes that there are a few differences in the requirements for sampling methods for schools under § 141.92 and under compliance sampling in § 141.86, such as the stagnation times and volume of sampling bottles. However, these differences are due to the different purposes for tap sampling (i.e., evaluation of CCT effectiveness vs. identification of a lead source in a non-residential building), water use patterns, and plumbing configurations. For comments on the tap sampling protocol for schools and child care facilities see the response to comment Section 12.

9.9 Customer-Requested Samples

Summary of Comments

EPA received several comments on customer-requested lead samples. One commenter noted that customer-initiated sampling can inform and empower households. However, several commenters cautioned that customer-requested samples should be required to conform with the standard sampling protocol to ensure consistency of the data results. One commenter requested guidance on response actions that should be taken for compliance samples versus voluntary sample results.

One commenter also sought clarification on how to add residents to the sampling pool when the water system receives a request for tap sampling. Specifically, the commenter asked whether a resident that requests a sample during the compliance period can be added to the sample pool or only if the residence has an LSL and how to handle the results if the samples are collected and analyzed outside of the compliance period.

Agency Response

EPA agrees it may be desirable for customer-requested samples to be collected consistent with the protocol required for compliance tap sampling for consistent data results. However, EPA acknowledges that customer-requested samples may not meet tap sample site selection tiering criteria, may be requested for specific purposes such as identification of an LSL or other sources of lead in drinking water, or collected outside of the tap sampling period, and therefore, EPA determined that it is appropriate to allow water systems to design a customer-requested tap sampling programs that meets the needs of its customers. Accordingly, the final LCRR does not require customer-requested sampling to conform to the standard sampling protocol. EPA notes that if a customer requests sampling during the monitoring period and the site meets the appropriate tiering criteria in accordance with § 141.86(a), the sample can be used as a compliance sample if it is collected as specified in § 141.86(b).

In response to request for guidance, compliance tap sampling and required actions, including the actions associated with the new trigger level and find-and-fix requirements are critical components to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

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10 Water Quality Parameter (WQP) Monitoring

EPA received numerous comments on the proposed revision to § 141.87 – water quality parameter (WQP) monitoring. The Agency received comments related to the frequency of WQP monitoring for standard and reduced schedules, additional parameters that were suggested be included, and parameters EPA proposed to remove.

10.1 General Comments

Summary of Comments

There were numerous comments related to the frequency of WQP monitoring in the distribution system. Some commenters suggested more frequent monitoring, for example monthly, than the standard monitoring and numerous commenters were concerned with the reduced monitoring frequency, especially triennial monitoring. Commenters suggested that WQPs should be monitored frequently enough to identify developing trends in water quality that could indicate a challenge to corrosion control.

A commenter suggested that actions should not be driven by tap sampling, but rather scientific WQPs and corrosive testing by the PWS within its distribution system should be the determining factor for any corrective actions by the public water system (PWS) as required.

There were several comments on the regulatory requirements in § 141.87(b) indicating that the section header of initial monitoring for systems without corrosion control treatment was inconsistent since subsection (2) covered systems with corrosion control. Commenters requested clarity on WQP monitoring requirements for systems with and without corrosion control treatment (CCT) following a trigger level exceedance (TLE) and an action level exceedance (ALE).

There were a few comments on requirements for WQP excursions. Several commenters suggested allowing flexibility to impose other requirements rather than a violation when excursions exceeded the nine-day threshold. Several commenters suggested more frequent monitoring than the minimum in the rule both at the entry points and at distribution system locations. Some commenters were concerned about potential violations occurring for systems on bi-weekly entry point monitoring as the daily value would be the value from the last day when a sample was collected unless the system fixed their CCT and took samples to demonstrate it before nine days had passed.

There were several commenters that requested guidance on consecutive system monitoring and WQP analytical methods instrumentation and calibration.

Agency Response

EPA agrees with commenters that triennial WQP monitoring does not provide enough data on water quality in the distribution system, especially at the reduced number of sites. Even the largest systems may only be taking 20 samples over the course of a three-year period. EPA has revised the WQP reduced monitoring provisions to eliminate triennial WQP monitoring. EPA also removed associated regulatory requirements such as the timing for triennial WQP monitoring since it is no longer applicable. EPA determined that triennial WQP monitoring does not provide enough data which are critical to demonstrating optimal corrosion control treatment. EPA added a requirement for systems on annual monitoring to collect the WQP distribution system samples evenly throughout each six-month monitoring period to reflect seasonal variability and better characterize the water in the distribution system.

EPA does not agree that WQP monitoring should be the regulatory driver for actions when elevated lead levels are found. Tap sampling is critical to evaluating the effectiveness of CCT throughout the distribution system.

To address commenters request for regulatory text clarification, EPA revised the regulatory language in § 141.87(b). Subsection (b)(2) is now titled “initial sampling for water systems” and covers both systems with and without CCT. EPA has also clarified that the initial WQP monitoring sampling is required for one year beginning in the month immediately following the end of the monitoring period in which a small or medium system, those serving 50,000 or fewer people, exceeded the lead action level or for some systems with CCT, the trigger level.

EPA does not agree that flexibility should be provided for violations issued for excursions because meeting the optimal WQPs is critical for systems to ensure they are maintaining optimal corrosion control treatment. Systems should correct the excursion as soon as possible to ensure optimal corrosion control treatment is being maintained and to reduce the likelihood of a treatment technique violation. Systems that wait 14 days to take the next entry point sample after an excursion at that entry point, will exceed the nine-day threshold and receive a violation for being outside the optimal WQP range for one or more key WQPs. EPA notes that the biweekly monitoring is a minimum and systems can monitor more frequently. EPA notes that the LCRR retains the existing calculation procedures in § 141.82(g)(1), (2), and (3) for calculating daily values for WQP ranging from multiple samples on the same day to days where no sample is collected. Requirements for systems monitoring daily (or more frequently) were included in the previous Lead and Copper Rule (LCR) and the same requirements apply under the LCRR. The daily value under § 141.82(g)(3) when no measurement is taken shall be the daily value calculated on the most recent day on which the WQP was measured at the sampling location. Systems should fix their CCT as soon as they discover the excursion to ensure optimal CCT and conduct sampling to demonstrate that the system is back within the optimal water quality parameter (OWQP) range.

EPA notes that the monitoring rules for consecutive systems in § 141.29 is outside the scope of this lead and copper rulemaking. Section 141.29 allows the state, with the EPA Regional Administrator‘s concurrence, to modify the monitoring requirements imposed by these requirements to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. In approving a consecutive system agreement that reduces WQP monitoring, states could consider requiring samples at the interconnection along with samples in the distribution system of the purchasing system. Regarding guidance for consecutive systems and analytical methods instrumentation and calibration for WQPs, EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

10.2 Monitoring Requirements for Systems w/CCT Above Trigger Level, but At or Below Action Level

Summary of Comments

There were several comments that relate to WQP sites being added due to the find-and-fix requirements when systems are at or below the lead action level. Several commenters expressed concern with requirements for small and medium systems with CCT to monitor WQPs, even if they were at or below the action level. Some commenters supported WQP sampling for medium and small systems at or below the action level at a reduced frequency and number of sites with lesser consequences for non-compliance. Other commenters suggested WQP sampling is only necessary if a small or medium system exceeded the action level.

Agency Response

For the comments that relate to the addition of find-and-fix sites, see the response to comments Section 13. Regarding the comments about requiring small and medium systems with CCT to monitor WQPs, EPA agrees that systems should be monitoring WQPs to ensure the OCCT is operating correctly regardless of system size for good process control, but does not believe that all data needs to be submitted to the state. In the final rule, EPA has provided states discretion to require systems above the trigger level to conduct WQP monitoring and submit it to the state. Section 141.87(c)(2) of the LCRR, gives states the discretion to require small and medium-size systems with treatment for which the state has not been required to designate OWQPs that exceed the lead trigger level but not the lead and copper action levels to conduct WQP monitoring as described in paragraph (c)(1) of this section or the state can develop its own water quality control parameter monitoring structure for these systems. As noted in Section 10.1, EPA disagrees with commenters suggesting lesser consequences for small or medium systems with excursions for operating outside a specified optimal WQP range.

10.3 Additional Corrosion Control Parameters in Addition to Those Listed in the Proposed Rule - Sulfate, Chloride, Oxidation/Reduction Potential

Summary of Comments

EPA received mixed comments about removing the WQPs associated with the calcium carbonate stabilization process that EPA proposed to delete as a CCT. EPA proposed to remove the mandatory calcium, conductivity, and temperature measurements associated with the calcium carbonate stabilization as OWQPs. Several commenters asserted that currently systems are optimized using calcium carbonate stabilization and that the parameters should remain as OWQPs. Several commenters noted that calcium carbonate stabilization indices like the Langlier Saturation Index are not relevant indicators of susceptibility or non-susceptibility of waters to lead or copper corrosion. Other commenters suggested retaining calcium as an OWQP as it could be useful for some individual systems.

Commenters also suggested adding new mandatory WQPs, including sodium, chloride, sulfate, manganese, iron, aluminum, free chlorine, and oxidation-reductions potential. Commenters cited several case studies to support adding other potential key WQPs, such as chloride, sulfate, chlorine residual, and oxidation-reduction potential. Case studies cited included Flint, MI, Washington, DC, Greenville and Durham, NC. Several commenters suggested requiring chlorinating systems to investigate the effectiveness of chlorination to maintain a tetravalent lead scale.

Agency Response

As discussed in Section 4 of this document, EPA received mixed comments on its proposal to remove calcium carbonate stabilization as a mandatory CCT and the removal of calcium, temperature and conductivity as mandatory WQPs when it was selected as the CCT. As noted there, EPA believes that calcium carbonate stabilization has not been shown to be an effective system-wide CCT and has removed it from the list of treatments that need to be evaluated by systems. As such, there is no need to retain calcium, conductivity, temperature as mandatory WQPs for monitoring. EPA agrees with the commenters that calcium carbonate stabilization indices are not relevant indicators for lead and copper corrosion control. EPA also noted that for systems that have previously been deemed optimized using this treatment approach, the key WQPs of pH and alkalinity are being maintained in the rule and § 141.82(f)(1)(vi) allows the state to designate additional WQPs determined by the state to reflect optimal corrosion control (which could include calcium, conductivity and temperature) if the state believes that calcium carbonate stabilization is an effective CCT. EPA has removed calcium carbonate stabilization and its mandatory associated unique WQPs from the final rule.

EPA disagrees with commenters about requiring additional parameters for all systems. Several of the suggested parameters that relate to potential increases in corrosivity would be due to long-term treatment changes but are not directly related to a CCT process. EPA notes that most of the cited case studies were regarding increased lead levels that were a result of long-term treatment changes. Long-term treatment changes require state approval prior to the change. In the final LCRR, EPA emphasizes the requirements for prior state approval for long-term treatment and for source water changes.

EPA notes that the cited Washington, DC example was a result of a change in disinfectants from chlorine to chloramine to address disinfection by-products due to the relatively high free chlorine levels, which also produced a tetravalent lead (Pb(IV)) scale due to the high oxidation/reduction potential. The lower oxidation/reduction potential after the switch to chloramine favors divalent lead (Pb(II)) scales, which are highly influenced by low and fluctuating pH levels present at the time of the exceedance (USEPA, 2007a).
(https://nepis.epa.gov/Exe/ZyNET.exe/P1007ZEI.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2006+Thru+2010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C06thru10%5CTxt%5C00000018%5CP1007ZEI.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpf

r&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL)

In Flint, MI, the lead level increase resulted from switching sources from purchased water treated with orthophosphate to a poorer source water that was not treated with orthophosphate for corrosion control (USEPA, 2017). Elevated lead levels in Greenville and Durham resulted from a change in the coagulant chemical from alum to ferric chloride, which altered the sulfate to chloride ratio (Renner, 2009) (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2799485/). Systems considering long-term treatment or source changes should examine the impact of those changes on corrosion control prior to the change as was required for most systems by the 2007 Lead and Copper Rule Short-Term Revisions USEPA, 2007b). EPA believes that many of the suggested additional WQPs should be evaluated as systems explore long-term treatment changes that could affect those parameters and the impact those changes might have on the system's CCT or need for CCT. Systems may need to revise their CCT in conjunction with the implementation of the long-term treatment or source water changes based on that evaluation. States may need to revise the optimal WQP ranges for systems adjusting corrosion control (such as increasing pH or orthophosphate) to counter the potential impact of a long-term treatment or source water change. See the response to corrosion control studies in Section 4 for additional responses related to key WQP monitoring.

EPA disagrees with the comment about requiring chlorinating systems to evaluate the effectiveness of chlorination to maintain a Pb(IV) lead scale. EPA does not believe that many chlorinating systems have the conditions to produce a consistent Pb(IV) scale throughout the distribution system. Two of the best examples for a Pb(IV) are the Washington, DC system in the early 2000s with very high chlorine doses and Cincinnati, OH where the system uses granular activated carbon to remove disinfection by-product precursors. EPA also finds that Pb(IV) cannot be reliably predicted from water quality and CCT implementation factors, and, as such, is not actionable as a control mechanism (Tully, et al., 2019). EPA noted in the 2016 OCCT Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems that questions remain on how systems and primacy agencies can ensure that disinfectant residuals required for the formation and maintenance of PbO_2 scales are maintained in LSLs throughout the distribution system (USEPA, 2016). This may be a particular challenge with homes that go unoccupied for an extended period of time. Systems that are triggered into a CCT study will be using their existing treatment as a control and can compare the results with the orthophosphate and pH/alkalinity adjustment results to compare the approaches.

The WQPs that must be monitored in the CCT study are the critical parameters associated with each treatment strategy. EPA agrees that system may want to add other parameters based on their system-specific water quality considerations. However, EPA disagrees with mandating that all systems conducting studies add all of these parameters as it would significantly increase the cost of the study and many of the parameters may be unnecessary. EPA has provided costs for harvested pipe loops in the "Economic Analysis for the Final Lead and Copper Rule Revisions" (USEPA, 2020) with a default set that includes some of the additional parameters. The following is intended to demonstrate the impact of additional parameters on the cost of the CCT study. EPA used the default value for costing purposes. The baseline cost estimate for a pipe loop for systems serving greater than 50,000 people is $304,617 that includes monitoring for lead, pH, alkalinity and orthophosphate. The default value cost for a pipe loop is $342,476 that includes monitoring for calcium, iron, free and total chlorine, ammonia, heterotrophic plate count, total coliform, and total dissolved solids. The addition of chloride and sulfate to the default would result in a pipe loop study cost of $367,643. Similarly, the addition of mandatory parameters would also increase the cost of WQP monitoring.

In the final rule, § 141.82(f)(1)(vi) contains language that allows the state to designate values for additional water quality control parameters to reflect optimal corrosion control for the water system. Thus, for systems where the state has designated calcium, conductivity, and temperature as optimal WQPs for calcium carbonate precipitation or other reasons, the states will still have the authority to designate the necessary WQPs to allow these systems to maintain this treatment as optimal corrosion control unless the system exceeds the lead trigger level or action level. This provision also allows the state to require other parameters such as oxidation-reduction potential or iron and manganese to demonstrate optimal corrosion control if the state believes they are critical parameters for corrosion control and the state can establish an effective range for the parameter. Several of the parameters listed by commenters would be important in evaluating long-term treatment changes, such as chloride and sulfate if a system is considering switching coagulants but may not be key parameters in assessing the effectiveness of the CCT. EPA believes that additional WQPs can best be implemented through this system-state interaction.

10.4 Monitoring frequency at Entry Points

Summary of Comments

Several commenters suggested more frequent entry point monitoring than the biweekly minimum required by the LCR. There were also several comments dealing with consecutive water systems where commenters are recommending that purchasing water systems be required to monitor at the interconnection with the wholesale system.

Agency Response

EPA notes that the biweekly monitoring is a minimum and systems can and should monitor more frequently, especially to ensure good process control. EPA notes that the LCRR retains the existing calculation procedures in § 141.82(g)(1), (2), and (3) for calculating daily values for WQPs ranging from multiple samples on the same day to days where no sample is collected. Systems sampling daily (or more frequently) are already covered by the rule, even prior to the LCRR. The daily value under § 141.82(g)(3) when no measurement is taken is the daily value shall be the daily value calculated on the most recent day on which the WQP was measured at the sampling location. Systems only sampling biweekly would incur a treatment technique violation if they wait 14 days to take an entry point sample following the initial excursion.

EPA notes that the monitoring of consecutive systems in § 141.29 is outside the scope of the LCR. The language in this section states that the state may modify the monitoring requirements imposed by this part to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. In approving a consecutive system agreement that reduces monitoring, states could require samples at the interconnection along with samples in the distribution system of the purchasing system.

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11 Source Water Monitoring

EPA received comments on the proposed requirements in § 141.88 - Monitoring Requirements for Lead and Copper in Source Water. The Agency received comments on the need for a thorough evaluation and approval prior to source water and treatment changes, waivers for source water monitoring, guidance on the state approval process and requirements following source water changes, and source water monitoring requirements and reporting.

11.1 Need for Evaluation Prior to Source Water and Treatment Changes

Summary of Comments

Some commenters stressed the need for any changes in source water or treatment to be thoroughly evaluated and approved prior to implementation. These commenters expressed concern that the proposed Lead and Copper Rule revisions (LCRR) do not adequately address the drivers of large-scale lead in drinking water problems in the past at water systems in Flint, MI; Washington, DC; Pittsburgh, PA; University Park, IL; and others. Other commenters were concerned that the proposed revisions are not sufficient to prevent similar events from occurring in the future. A commenter suggested that clarity is need on when a new corrosion control treatment (CCT) study, re-optimization, or additional monitoring will be required in preparation for a source or treatment change. Additional detail is needed for water systems to understand when they are required to submit written documentation to the state for approval for source and treatment changes; what the level of state review and evaluation entails; and the appropriate actions. The commenter requested specific circumstances be considered in the LCRR, such as "Where any other event impacts water quality such as a contamination incident or modification to the water system not related to the Lead and Copper Rule," and "Where a small system might think they can discontinue or stop CCT without notifying the state or undertaking any follow up actions. Examples of treatment changes that a small system might consider insignificant or 'not CCT-related' but still impact water quality and corrosivity include (but not limited to): discontinuing or changes to iron and manganese sequestration, changes in mixed phosphate and orthophosphate chemicals, changes in treatment pH goal or operating range; and change in free chlorine residual goal or operating range at the entry point to the distribution system."

One commenter recommended that EPA "…require water systems to notify all consumers when they are considering source water and treatment changes, and make any studies investigating potential changes - including corrosion control studies - available to the public." Comprehensive water quality studies were emphasized by one commenter as a critical means of protecting public health. This commenter stated that "[s]uch studies can also identify whether different overall treatment approaches might be more effective at controlling contaminants of concern rather than adding treatment to address one contaminant at a time." One commenter stated that any change in water source should be evaluated to determine the need for corrosion control measures, emphasizing that source water changes should not be driven solely by politics or economics.

One commenter wrote that the proposed LCRR requires only water systems with reoptimized or optimized corrosion control to notify the state in writing prior to a source or treatment change. The commenter recommended the Agency clarify that the requirement to evaluate source water and treatment changes applies to all water systems subject to the LCRR.

Agency Response

EPA agrees with commenters stating the need for any addition of a new source or long-term treatment changes to be evaluated and approved prior to implementation. EPA acknowledges the importance of fully evaluating potential changes in water quality that result from adding a new water source and/or treatment that may impact the effectiveness of CCT. Changes in water quality have been demonstrated to impact CCT effectiveness as seen in Flint, MI; Washington, DC; and other localities. Therefore, the proposed and final LCRR §141.90(a)(3) requires all water systems that add a new source or make long-term treatment changes to obtain approval from the state before the new source is added or the treatment change is implemented by the water system. EPA is not including more specific provisions in the LCRR to describe all of the potential source water changes or treatment changes that would require state approval as some commenters recommended. It is not possible to give highly targeted guidance in a rule for system-specific circumstance because of the wide variation in system sizes, capacity, source water types, and treatment. Additionally, the state may require any such water system to conduct additional monitoring or to take other actions the state deems appropriate. The final LCRR §141.90(a)(3) provides that a water system must submit written documentation to the state describing the change or addition. The state must review and approve the addition of a new source or long-term treatment change before it is implemented by the water system. For more information on systems with CCT in place that choose to elect a small system flexibility, see the response to comment Section 7.4.

EPA does not agree with the commenter recommending that the LCRR requires public notification of source water treatment changes or investigations of potential source water changes, as well as public availability of CCT studies. EPA agrees that increasing consumer awareness is critical for public health protection. However, EPA does not believe that a regulatory requirement for public access to information is necessary for an intended source water or treatment change or a CCT study. Further, EPA has determined that providing public access to source water data may be confusing to consumers who might think they represent lead levels at the tap. It may be a burdensome requirement for water systems to present this information in a manner that the public will readily understand. EPA is strengthening other provisions in the LCRR, including public education and notification requirements, that are likely to be more informative and beneficial for consumers. See the response to comment Section 8.0 for more information on public education.

EPA agrees with the commenter that noted the language that requires water systems to notify their state in writing prior to addition of a new source or treatment as written in the proposed LCRR was inadvertently written as a requirement limited to systems with reoptimized or optimized corrosion control. EPA corrected the final LCRR §141.90(a)(3) to require reporting for all systems subject to the LCRR. For more information on guidance and reporting requirements prior to a new source or long-term treatment change, see response to comment Section 11.3. and response to comment Section 15.

11.2 Waivers for Source Water Monitoring

Summary of Comments

Several commenters expressed support for source water monitoring waivers as outlined in the proposed LCRR. One commenter specifically expressed support for source water monitoring waivers to be issued by the state or primacy agency in the case of an action level exceedance as outlined in the proposed LCRR. One commenter opposed the provision of a source water monitoring waiver and stated the "[w]aiver for source water sampling is inappropriate when the data is not available to the public. Remove this new requirement." Although in support of the waiver, another commenter emphasized that lead can occur naturally in source water in some geologic settings and that they have "more than a dozen public water systems that treat for naturally occurring, elemental lead found in their source water and even more systems with low levels of lead that do not require treatment." The commenter suggests that the final LCRR language be amended to reflect this and that Agency websites and factsheets also reflect this.

Agency Response

EPA agrees with commenters' support for the monitoring waivers for source water monitoring under certain circumstances. Lead and copper are rarely found in the source water in significant quantities (Chin and Karalekas, 1985; USEPA, 1988; USEPA, 1990); thus, where the state has decided that source water treatment is not needed, as specified in §141.83(b), the state may waive source water monitoring for any subsequent action level exceedance under the specific conditions specified in §141.88(b)(1)(i) through (iii).

In response to the commenter that suggested waivers only be issued if source water monitoring results are required to be made public. EPA does not agree that waiving source water monitoring should be determined based on whether or not the data is publicly available, it should be based on previously measured concentrations and the three considerations stated above. The source water monitoring waiver criteria do not preclude states, or utilities from obtaining the source water information necessary to determine if source water treatment is needed. States retain the ability to require additional source water monitoring following an action level exceedance and can only issue waivers under the conditions allowed in the final LCRR §141.88(b)(1)(i) through (iii). For more discussion of source water monitoring results availability, see response to comment Section 11.4.

In response to commenters suggesting that EPA acknowledge that lead and copper are naturally found in source water, the Agency does not dispute that lead and copper may be found in source water in certain geologic settings and has revised all Agency materials to reflect that. Section 141.88(c) of the LCRR requires that any system which adds a new source must collect one source water sample from each entry point to the distribution system (EPDS) until the system demonstrates that drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the state in § 141.83(b)(4).

11.3 New Sources and Guidance on the State Review, Approval and Requirements Following Addition of New Sources and Treatment Changes

Summary of Comments

Many commenters asked for further clarification on what constitutes a new source under the final LCRR §§141.88 and 141.90. Commenters provided examples of complicating circumstances that may make this distinction unclear, such as addition of a small water source to a larger water source with different water quality parameters (WQPs). One commenter requested that EPA clarify under what conditions a source water change should be considered a new source and trigger requirements or further actions. The commenter recommended that the Agency consider establishing thresholds for percent change in WQPs following source water changes above which the rule would require additional actions.

Other commenters identified specific situations that they don't believe should be considered a new source under the final LCRR. One commenter requested that EPA clarify that expanding the capacity of existing sources and treatment facilities is not considered a source water or treatment change. One commenter requested that "[n]ew groundwater wells drawing from the same aquifer as existing approved groundwater wells, demonstrated to have comparable pH and alkalinity as existing wells should not compel a re-optimization of corrosion control." Another commenter agreed that a new well from the same field should not be considered a new source and requested that EPA include a provision to demonstrate equivalent water quality of the new well in the final LCRR. A commenter asserted that including a matrix of common source and treatment changes and guidance on the type of additional study that the state should consider requiring would be invaluable when communicating with systems about the potential impacts of these changes and help systems more adequately plan for corrosion control studies. One commenter recommended EPA consider exemptions to seasonal changes in water sources that have already been considered in CCT development and approved by the state. This commenter recommended that any increased tap sampling frequency change should include criteria to allow systems to go back to routine or reduced tap sampling.

Many commenters asked that EPA increase specificity in the rule language, provide guidance, or both on the process that water systems must follow to request state approval prior to a new source water or treatment change. The commenters also recommended that the Agency provide guidance for states on how to review and approve the proposed source water or treatment changes. One commenter stated that the guidance must provide clear instructions about the types of documentation that the water systems must submit to the states when planning for source water or treatment changes. Likewise, the guidance must provide clear instructions and tools for states to evaluate those requests for source water or treatment changes and develop strong criteria for approval of these changes. Commenters asked that the Agency also provide guidance for specific circumstances such as when is a pipe loop study vs. a CCT study is needed when new sources require re-evaluation. This commenter also suggested that a matrix of common source and treatment changes and guidance on the type of study states should consider requiring would be invaluable when communicating with systems about the potential impacts of these changes and help systems more adequately plan for corrosion control studies. Also, commenters emphasized that the Agency must explain the implications of these requirements for wholesale and consecutive systems.

Agency Response

EPA recognizes, as some commenters stated, that it may be challenging for states to determine the criteria for approval of new sources and treatment changes. EPA is not including more specific provisions in the LCRR to describe all of the potential source water changes or treatment changes that would require state approval given the wide variation in system size, capacity, source water types, and treatment. EPA received several comments requesting Agency guidance on implementation of the revised rule, including this issue. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop guidance and provide training and other supporting materials to assist primacy agencies and drinking water systems in achieving the public health protections under the LCRR. In response to questions regarding applicability, the reporting and need for state approval requirement in §141.90(a)(3) applies to wholesale and consecutive systems.

11.4 Source Water Monitoring Requirements and Reporting of Results

Summary of Comments

Several commenters opposed the use of the term "source water" in the Lead and Copper Rule (LCR). One commenter argued that "[a] sample collected at the entry point to the distribution system and after any application of treatment is an entry point sample and should be called such. Calling an entry point sample, a 'source water sample' is confusing." Commenters stated that source water can be a misleading term indicating water at the intake rather than at the EPDS and suggested changing the term in the final LCRR from "source water" to "entry point to the distribution system."

One commenter suggested that source water monitoring should occur more frequently and be conducted at both the utility intake and the EPDS. The commenter argues "If they are taking their single 'source water sample' in a source of fluctuating water quality, and they catch it on a good day, the treatment could be adequate for removing the contaminant from that source. However, if that contaminant fluctuates up in that source water, it is entirely possible that existing treatment might no longer be adequate for removing that contaminant. A single entry point sample that is called a "source water sample" is a sham when it comes to providing information about whether lead might be present in source water." The commenter noted that a single sample does not inform the variability of source water quality and potential need for treatment responses.

The commenter also proposed that source water monitoring results must be made available to the public in the same way that other lead data are. The commenter argued that "water systems frequently state that lead is not found in their source water but they do not make this data available to the public…" and "in a related note, the ability of state to determine a "maximum permissible source water level" is difficult to reconcile with the rest of the LCR that claims that lead in water comes only from pipe, solder, fittings, and fixtures. Lead should be non-detectable at the entry point to the distribution system."

Agency Response

Several commenters suggested to change the use of the term "source water sample" for a sample that is collected at the EPDS. One of the commenters found the use of the term "source water confusing." EPA disagrees. The term "source water sample" has been used in the 1991 LCR since it was first promulgated (USEPA, 1991). Most water systems and states are familiar with how this monitoring is to be conducted. Because water systems may have treatment in place that reduces lead and copper before it enters the distribution system, EPA has determined the EPDS to be the appropriate place to monitor lead and copper levels. Monitoring at the utility intake and the EPDS would be redundant. Monitoring at EPDS is more protective because, if no lead is present in the EPDS, it means that either there is no lead or copper in the source water, or that treatment is effective for those water systems where lead or copper are found in source water (i.e., the water system is meeting the state-established maximum permissible source water levels).

In addition, the rule provides some flexibility by allowing water systems to collect a sample in the distribution system at a point which is representative of each source after treatment in lieu of the EPDS. The Agency has found it is important to provide the option to take source water samples at other more representative locations in the distribution system, if applicable. In some cases, system-specific circumstances make source water samples elsewhere in the distribution system more representative of source water quality, such as water systems that augment their water supply. For example, some systems may have a well or wholesale supplier that connects directly into the distribution system at a location separate from the facility's EPDS. The Agency will finalize these requirements as proposed.

EPA decided not to revise the provision for state review of source water treatment and specification of maximum permissible source water levels. The provision in §141.83(b)(4) requires that the maximum permissible lead and copper concentrations for finished water entering the distribution system reflect the contaminant removal capability of the properly operated and maintained treatment and the state must explain the basis for its decision. EPA does not agree that the maximum permissible source water levels should be mandated as a single value nationally because differences in source water including those certain geologic settings where lead may be found naturally create variability.

In response to commenters concern about source water quality variability, §141.88(c) of the final LCRR requires that any system which adds a new source shall collect one source water sample from each EPDS until the system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the state in § 141.83(b)(4). EPA has determined that this requirement is adequate for states and water systems to understand and address any fluctuations in source water lead levels that may occur.

EPA disagrees with the commenter that recommended that source water monitoring results should be required by the LCRR to be made publicly available because source water sampling results are not representative of water quality at the tap. The proposed and final LCRR strengthen requirements regarding public education and public notification of tap water lead and copper monitoring results, which is a more informative measure of potential exposure than source water monitoring results. See response to comment Section 8 for more information.

References

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12 Sampling for Lead in Schools and Child Care Facilities

In the proposed rule, EPA requested comments on requiring community water systems (CWSs) to conduct public education and monitoring for lead in schools and child care facilities once every five years (mandatory), specifically:

"The EPA requests comment on whether it should revise the rule to require community water systems (CWSs) to offer to collect samples from schools and child care facilities every five years or to collect samples from a school or a child care facility only if requested (on request). CWS would still be required to provide the schools and child care facilities information on the health effects and sources of lead in drinking water, and the 3Ts guidance."

EPA received many comments on the proposed requirements in §141.92 including comments on both the mandatory and on request options, comments in opposition to the requirements, and requests for exemptions to the requirements. EPA received comments on the sampling details in §141.92(b) such as the number of required samples, sampling frequency, collection protocol, and applicability of the requirements. EPA also received comments on the role of CWSs including compiling a list of schools and child care facilities in §141.92(a), conducting outreach in §§141.92(a) and (c), comments on whether CWSs should be responsible for the requirements over other entities, and comments on the financial and personnel burden of the requirements. EPA also received comments on the lack of remediation requirements and associated action level for schools and child care facilities and the provision of results in §141.92(f). Finally, EPA received many comments on granting waivers under §141.92(d) to CWSs where schools and child care facilities are being tested for lead through existing state or local programs.

12.1 Mandatory vs. On Request Sampling of Schools and Child Care Facilities

Summary of Comments

EPA received comments on the proposed requirements in §141.92 for CWSs to conduct public education and monitoring for lead in schools and child care facilities once every five years (mandatory). EPA specifically asked for comment on an alternative proposal for CWSs to conduct monitoring for lead in schools and child care facilities only when requested by the facility (on request). In the on request option, CWSs would conduct annual outreach to schools and child care facilities informing them of the opportunity to be tested. Some commenters supported the proposed requirements citing the importance of testing in schools and child care facilities, while others supported the alternative option citing the benefits of providing public education materials and sampling to interested facilities while reducing burden to CWSs. EPA also received comments suggesting a third "voluntary" option and removal of mandatory requirements from the final rule. Some commenters asserted that CWSs should not be required to conduct sampling in schools and child care facilities and that the responsibility should fall on the school or child care facility or other entity. Others stated that the requirements are an "overreach" and cited concerns about costs and CWS resources. These comments are discussed in further detail below.

Agency Response

Based on public comments, EPA has decided to combine the proposed and alternative options by incorporating both mandatory and on request sampling into the final rule. EPA has revised requirements such that a CWS will conduct public education outreach and sampling in elementary schools and child care facilities as described in the proposed requirements for one cycle of sampling (over a 5 year period). EPA has added a new requirement which states that while a CWS is conducting sampling in elementary schools and child care facilities, they will also conduct outreach to secondary schools annually, but will only conduct sampling at the request of the facility. After a CWS completes sampling in all elementary schools and child care facilities they serve once, they must continue to conduct outreach to all schools and child care facilities annually, but will only conduct sampling at the request of the facility. During the one cycle of mandatory sampling, CWSs will be required to sample 20 percent of the elementary schools and child care facilities they serve per year.

The Lead and Copper Rule revisions (LCRR) school and child care sampling requirements are part of a targeted public education effort to educate schools and child care facilities and their users of the risks from lead in premise plumbing and the importance of sampling for lead in drinking water as well as to help them make decisions to mitigate lead risks. EPA has included these requirements because students and young children are especially vulnerable to lead exposure and spend a large portion of their day in schools and child care facilities. The requirement for CWSs to conduct sampling provides an added measure of protection, above the other elements of the treatment technique rule, in light of the vulnerabilities of the population served and the potential variability of lead levels within the system and within a school or child care facility over time. Lead levels vary between outlets within a building and over time. The lead in drinking water information provided by the LCRR school and child care sampling requirements provides facilities with an improved understanding of the importance of lead testing, and is not a replacement for comprehensive testing as detailed in the 3Ts (USEPA, 2018a). These sampling requirements will provide a preliminary screen for lead in drinking water at schools and child care facilities. The one cycle of sampling for elementary schools and child care facilities accompanied by continued lead in drinking water outreach will provide schools and child care facilities with an understanding of how to create and manage a drinking water testing program that is customizable to their needs. Children under the age of 7 are at the greatest risk of drinking water lead exposure, and prioritizing sampling in those facilities with the greatest risks will reduce burden on CWSs and will enable them to focus upon those schools and child care facilities with the most susceptible population. This construct will also allow CWSs, following the initial two cycles of sampling, to focus resources on sampling in schools and child care facilities that request assistance. EPA anticipates that after one sampling cycle, elementary schools and child care facilities will better understand the process and benefits of lead testing and be more likely to implement their own 3Ts programs. Secondary schools will be tested for lead by the CWS on request during the first sampling cycle. Thereafter, any school or child care facility interested in further assistance will have the opportunity to be tested for lead by the CWS on request prompted through annual outreach.

Proposed Mandatory and Alternative On Request Options for Sampling

Summary of Comments

Some commenters supported the proposed requirements of §141.92, citing the health risks posed by lead in schools and child care facilities, the significant time children spend in these facilities, the benefits of protecting children from lead exposure, and asserting CWSs have the technical expertise to assist with sampling. A few commenters “commended” the addition of the proposed requirements, expressed their agreement with increased sampling at schools and child care facilities, and asserted that standardized lead testing will “help to keep kids safer.” One commenter noted they “strongly encourage” sampling of drinking water outlets in schools and child care facilities by the CWSs while another stated that mandatory testing should be required for “all fountains and drinking sources that children use.” Another commenter expressed support for mandatory sampling noting that while some states have implemented testing programs, many states lack requirements. A commenter also requested that the proposed requirements apply to child cares regardless of whether the facility is commercial or operated from a home. Some commenters objected to the alternative proposal and suggested that schools and child care facilities may not request lead sampling due to a lack of knowledge about lead risks and the importance of sampling for lead, or fear of the results. One commenter noted that in their experience, child care facilities may be particularly reluctant to request testing for these reasons. A few commenters further noted that facilities with fewer resources or public accountability may be less likely to request lead sampling from the CWS and could result in inequitable access to safe drinking water.

Conversely, some commenters preferred sampling on request if the requirements of §141.92 are retained, noting that water systems could spread costs and resources over multiple years while still providing benefits to school and child care facilities through annual outreach as proposed and suggesting that §141.92 state that CWSs must “offer” to sample for lead. One commenter suggested that the participation rate for on request sampling would not differ from the proposed requirements, while others noted instances of low school and child care facility participation rates during voluntary sampling programs. Another commenter stated that under a state testing program, few samples exceeded the action level for lead, and that repeat sampling “in perpetuity” as proposed, would increase costs over time and provide fewer benefits.

Some commenters expressed concern that CWSs would be subject to violations if a school or child care facility did not respond to CWS outreach, and suggested that the on request option would remove “arbitrary targets or benchmarks for the water system to meet” as well as encourage collaboration among CWSs and schools and child care facilities. Some commenters stated that if the requirements of §141.92 remain, that clarification is needed in §141.92(d) to allow states with existing programs that require or offer lead testing and remediation to exempt CWSs from the requirements.

Agency Response

EPA agrees with comments on the importance of public education and sampling in schools and child care facilities, and notes support for these requirements. EPA proposed these requirements because students and young children are especially vulnerable to lead exposure and spend a large portion of their day in schools and child care facilities. The intent of the requirement for CWSs to conduct sampling at schools and child care facilities is to inform and educate targeted CWS customers and users about risks for lead in premise plumbing at schools and child care facilities since large buildings, such as schools, can have higher potential for elevated lead levels due to complex premise plumbing and inconsistent water use patterns. Furthermore, the requirements provide an added measure of protection, above the other elements of the treatment technique rule, in light of the vulnerabilities of the population served and the potential variability of lead levels within the system and within a school or child care facility over time. The combination of potential higher lead levels in large buildings, vulnerability of children to lead, and the length of time spent at schools and child care facilities presents lead risks to children that can be mitigated through public education, sampling, and voluntary remediation actions.

EPA acknowledges both commenter concerns regarding potentially low participation levels for on request sampling and concerns regarding facilities with fewer resource and the potential inequalities that could arise as a result. EPA agrees with commenters that the on request sampling option will provide benefits to schools and child care facilities through annual public education requirements. However, EPA disagrees that participation rates for the on request alternative will likely not differ from the participation rate in the mandatory option. As noted by commenters, participation has typically varied across voluntary programs for school and child care sampling. In the final rule, EPA has maintained the proposed requirements for one cycle of sampling in all elementary schools and child care facilities because public education and water system sampling will provide schools and child care facilities with experience and assurance in the process and benefits of managing a drinking water testing program and the information necessary for them to take actions to reduce lead risk. Elementary schools and child care facilities serve children with the greatest risks from lead exposure, and one cycle of mandatory sampling reduces the burden on CWSs while enabling them to prioritize facilities with the most susceptible population. EPA anticipates that after one mandatory sampling cycle, elementary schools and child care facilities will better understand the importance of lead testing and will be more likely to implement their own sampling programs utilizing the 3Ts Toolkit. EPA notes that secondary schools will receive annual outreach from the CWS and may request sampling during the initial cycle of mandatory sampling in elementary schools and child care facilities. After the initial sampling cycle (5 years), schools and child care facilities that are interested in further assistance will be able to request lead sampling from their CWSs. While one commenter indicated that sampling "in perpetuity" will increase costs and reduce benefits over time, the Agency notes that lead levels at an outlet or within buildings have been shown to vary with repeat testing over time. Offering sampling on request after one cycle of mandatory sampling in elementary schools and child care facilities maintains the benefits of public education and sampling while also allowing CWSs to focus resources on sampling in schools and child care facilities that request assistance, particularly those serving vulnerable or disadvantaged populations and facilities that are not currently testing for lead. While not required, EPA encourages CWSs to consider factors such as age of students, building construction date, socioeconomic indicators, presence of lead service lines (LSLs), and federal funding through Title 1 (20 USC 6301 *et seq*.) and Head Start (42 USC 9801 *et seq.*) to prioritize sampling in facilities that serve vulnerable or disadvantaged populations. EPA reiterates that CWSs must offer sampling on request to all secondary schools they serve during the one cycle of mandatory sampling in elementary schools and child care facilities. EPA disagrees with commenters who suggest sampling all outlets used by children for drinking. EPA has retained the proposed requirement for CWSs to sample five outlets per school and two outlets per child care facility. These requirements are intended as a preliminary screen for lead in drinking water and an improved understanding of the importance of lead testing and is not a replacement for comprehensive testing as detailed in the 3Ts (USEPA, 2018a).

The Agency recognizes that some commenters are concerned that a lack of school or child care facility response will place the water system in non-compliance and that a CWS must meet "a target" of sampling 20 percent of facilities per year. EPA also notes that some commenters cited these concerns as rationale for supporting sampling on request only. EPA agrees with commenters that the CWS does not have the authority to "force" schools or child care facilities to participate in sampling and that some facilities may not respond to outreach. The Agency does not intend for CWSs to be subject to violations based on lack of school and child care facility participation. In response to comments, EPA revised the requirements to allow a CWS to document a non-response after they have made two "good faith" efforts to reach the facility, and will only apply to elementary schools and child care facilities during the one cycle of mandatory sampling. The Agency also clarified that both non-responses and refusals may be accounted for in the 20 percent of elementary schools and child care facilities sampled per year during the first five years after the compliance date. Likewise, EPA notes concerns from commenters regarding challenges identifying the schools and child care facilities they serve. As noted in the final rule water systems must make a "good faith" effort in developing and maintaining the list of schools and child care facilities. See the response to comment Section 12.3 for further details.

Support for a Voluntary Sampling Option

Summary of Comments

Some commenters agreed with the concept of CWSs assisting with lead sampling in schools and child care facilities but suggested that any efforts be left to the discretion of CWSs (voluntary) as lead risks in institutional buildings are often due to premise plumbing. A few commenters suggested CWSs should provide support as resources allow in lieu of a "regulatory compliance role" where they would be subject to violations for non-compliance. Other commenters expressed concern regarding recurring sampling at facilities with "no lead contamination in premise plumbing." One commenter stated that schools and child care facilities are responsible for providing "a healthy environment for children in their care" and that CWSs should be prepared to assist facilities as a "civic service" and not through a regulatory requirement. One commenter noted that grants for school and child care testing established by the Water Infrastructure Improvements for the Nation (WIIN) Act (section 1464(d) of the Safe Drinking Water Act (SDWA)) are currently being implemented and suggested that CWSs could assist in ongoing efforts voluntarily.

Agency Response

EPA disagrees with commenters that CWSs should only provide testing and support for schools and child care facilities on a voluntary basis and commenters requesting that the requirements be removed from the final rule. Voluntary participation by CWSs is not significantly different than current efforts. EPA notes that while some states and localities have established mandatory and voluntary programs to test for lead in schools and child care facilities, many schools and child care facilities have not been tested for lead. In a 2017 national survey, the Government Accountability Office (GAO) found that 41 percent of school districts had not tested for lead and 16 percent did not know if they ever had (GAO, 2018). Furthermore, 60 percent indicated they were not familiar with the 3Ts guidance. The requirement to test for lead in schools is an opportunity to address this education gap through CWSs providing public education and sampling for lead in schools and child care facilities. EPA notes that one commenter suggested removing sampling requirements and "modifying the small system flexibility requirements of §141.93 option (3) for point-of-use [POU] devices to apply to schools and child cares" citing that POU devices would "immediately reduce lead levels in schools and child care facilities." However, EPA notes that most schools and child care facilities are not public water systems regulated under the SDWA and the Agency does not have the regulatory authority to require these facilities to install and maintain POU devices or to require them to implement testing programs. EPA further notes that requirements authorized by the SDWA for CWSs to take steps to prevent health effects from lead exposure are not a "civic service" to customers.

EPA also disagrees that CWSs do not have the necessary experience to conduct lead sampling in schools and child care facilities. Water systems have developed the technical capacity to do this work in operating their system and complying with current drinking water standards. EPA acknowledges commenters who state that many CWSs do not have experience addressing premise plumbing issues. EPA notes that CWSs are not required under §141.92 to conduct remediation activities or replace premise plumbing.

Removal of Sampling Requirements from Final Rule

Summary of Comments

Some commenters argued that CWSs lack the authority to compel schools and child care facilities to submit to testing, that CWSs do not have the necessary expertise to sample and address plumbing issues in schools and child care facilities, that CWSs are not responsible for premise plumbing, and that CWSs should not have to pay for school sampling. One commenter asserted that sampling for lead in schools and child care facilities "should not be addressed through [the] SDWA," but also stated that if retained, the CWS role should be "supporting sampling upon the request of these facilities." Another stated that the requirements for CWSs to sample all schools and child care facilities once every five years are an "overreach." One commenter stated that the proposed requirements have federalism implications and that without an exemption CWSs "operating in states that prohibit cross-subsidization, the proposed program is contrary to law." The commenter further stated that the requirements affect the "distribution of power" between states and the federal government and requested a federalism summary impact statement. A few commenters further stated that schools have demonstrated the ability to conduct their own sampling, that public funding cannot be used on private property, and that it is unlawful to "force water systems to ensure that protocols have been followed in legally separate facilities."

A few commenters supported the concept of monitoring for lead in schools and child care facilities but suggested that the requirements be removed from the final rule. They stated that state education and child care licensing agencies are better positioned to address water quality and safety issues within these facilities. One commenter stated that the proposed requirements would not provide benefits to schools and child care facilities due to limited sampling and lack of remediation while also imposing a financial burden on water systems.

Agency Response

EPA disagrees with commenters who state that EPA does not have the authority to include requirements for school and child care lead testing under the SDWA and that the requirements will not provide benefits. EPA's authority to promulgate the requirement for CWSs to conduct sampling and public education for this vulnerable subset of customers is under EPA's authority to promulgate a treatment technique rule to "prevent known or anticipated adverse effects on the health of persons to the extent feasible" (SDWA 1412(b)(7)(A)). The sampling requirements are part of a targeted public education effort to educate schools and child care facilities and their users of the risks from lead in premise plumbing, the importance of sampling for lead in drinking water, and to help them make decisions to mitigate lead risks. EPA disagrees that the proposed requirements are an "overreach" of this authority. Large buildings such as schools can have a higher potential for elevated lead levels because, even when served by a water system with well operated optimal corrosion control treatment (OCCT), there may not be technical improvements that the system can make to the OCCT. However, with information about lead levels, risk can be mitigated through public education and voluntary remediation action such as replacement of premise plumbing. The LCRR requires distribution of information on the 3Ts program along with testing results to both increase awareness of the need for lead testing and provide schools and child care facilities with information and tools to reduce lead risks in their drinking water. EPA anticipates that increased familiarity with the 3Ts will assist facilities in taking steps to reduce lead risks. Therefore, school and child care facility sampling contributes to increased public awareness of the potential for elevated levels of lead in premise plumbing independent of a water system's 90th percentile value. In addition, EPA disagrees with the premise that state prohibitions on cross-subsidization are implicated since schools and child care facilities are customers of the utilities and sometimes so are the families of the children at the schools and child care facilities. The public health benefit to the vulnerable population of children will likely benefit all rate payers. Because the public health benefit is to the entire community, testing in schools and child care facilities would not be a "service" to any specific rate payers that might trigger cross-subsidization requirements. Therefore, federalism principles would not be at issue since the requirement would not require a shift of balance between a utility following state law or federal law.

EPA also disagrees that school and child care lead sampling would be more appropriately addressed by another entity, such as school and child care licensing agencies, the state, or through other mechanisms such as interagency agreements. Please see the response to comment Section 12.4 for discussion.

EPA notes that there were many comments on existing state and local lead sampling efforts and requests for flexibility in implementing the proposed requirements. Some commenters stated that the proposed requirements would be a "duplication" of efforts where there are ongoing programs and data collection. EPA acknowledges that there are various state and local sampling requirements, schools and child care facilities conducting sampling as part of district or internal policy, and voluntary programs funded through grants under Section 1464(d) of the SDWA (WIIN Act: Lead Testing in School and Child Care Program Drinking Water). EPA notes that the Agency conducted a thorough review of existing state requirements of school and child care facility sampling programs. See Chapter 4, Section 4.3.9.2 of the "Economic Analysis for the Final Lead and Copper Rule Revisions" for details (USEPA, 2020a). EPA disagrees with comments that §141.92 would result in duplicative sampling but acknowledges that additional clarity is needed. In response to these comments, §141.92(d) has been updated to clarify situations under which states may exempt water systems from the requirements of §141.92. Please see the response to comment Section 12.8 for details. EPA also received a comment that the Agency had not considered the number of non-transient non-community water systems (NTNCWSs) that are schools and child care facilities and are subject to lead sampling requirements under §141.86. EPA accounted for schools regulated as NTNCWS in state-level estimates of schools and child care facilities (see Chapter 4, Section 4.3.9.1 of USEPA (2020a) for details) and notes that the requirements of §141.92 do not apply to NTNCWS.

12.2 Scope of Monitoring Requirements and Sampling Protocol

EPA received comments on the proposed requirements in §141.92(b)(1) for CWSs to "collect five samples per school and two samples per child care facility at outlets typically used for consumption." This includes comments on the required outlets in §§141.92(b)(1)(i-iv) and sampling protocol in §141.92(b)(1)(v). EPA also received comments on the required frequency of sampling in §141.92(c)(3) of once every five years and on the related requirement in §141.92(b)(1)(v)(D) that "samples may be collected by either the customer, school or child care facility, or the water system." Finally, EPA received comments on the applicability of §141.92 and received requests for exemptions based on factors such as testing results, LSL status, and system 90th percentile lead levels.

Number of Samples and Frequency of Sampling

Summary of Comments

Some commenters stated that the proposed requirements in §141.92(b)(1) to collect samples from five outlets per school and two outlets per child care facility is inadequate and recommended that the number of taps sampled should be in proportion to the size of the facility and or total number of taps. A few commenters stated that the requirements may not capture the variability of lead within these facilities, that limited sampling may create a "false sense of security" or be "misleading" for facilities receiving low or no detections of lead, and that EPA has not justified limited sampling. Some commenters indicated the sampling scheme is incapable of capturing worst case scenario lead levels and lacks a requirement for remediation. Some commenters noted that the proposed number and frequency of sampling is inconsistent with EPA's 3Ts (USEPA, 2018a), which recommends sampling all outlets used for drinking and cooking annually, and requested that EPA align its requirements with the 3Ts. Commenters also noted that the 3Ts recommends follow-up second draw samples and suggested that CWSs collect additional samples for outlets that exceed a specified threshold. Conversely, one commenter suggested testing less frequently than once every five years due to limited water system resources and the commenter's perceived complexity of the requirement. Some commenters also requested that EPA clarify the types of outlets considered to have POU devices in §141.92(b)(1) and allow for sampling at these outlets.

Many commenters also requested clarification of the proposed requirements in §141.92(c)(1) for water systems to collect samples from at least 20 percent of schools and 20 percent of child care facilities served by the system per year. Some commenters stated that they interpreted the 20 percent to include facility refusals and requested clarification. A few commenters also suggested flexibility in scheduling sampling such that a water system could sample all facilities once every five years, but not be required to sample 20 percent each year. Some commenters indicated that requiring CWSs to sample 20 percent of facilities annually could be resource prohibitive for systems with a large number of schools and child care facilities. One commenter suggested the sampling schedule should be targeted and prioritize sampling the most susceptible populations and focus sampling where needed most (e.g., where CWS demonstrate inadequate corrosion control treatment (CCT)). Another comment stated that sampling limited to only 20 percent of facilities per year raises environmental justice concerns. A few commenters also requested information on how the sampling approach (e.g., number of samples, frequency of sampling, exemptions) aligns with environmental justice principles.

Agency Response

EPA is retaining the proposed protocol in §141.92(b) for lead testing in schools and child care facilities. EPA has revised the proposed requirements to require CWSs to sample all the elementary schools and child care facilities they serve at least once during the first five years after the rule compliance date. EPA has added a requirement in §141.92(c) and §141.92(a)(4) that during the one mandatory sampling cycle in elementary schools and child care facilities a CWS will offer to conduct sampling on request to secondary schools. After the one mandatory cycle, a CWS will offer to conduct sampling on request to all schools and child care facilities in accordance with §141.92(g) (see the response to comment Section 12.1 for more detail). The Agency disagrees that the required sampling approach is inconsistent with the 3Ts. The requirements in §141.92(b)(1)(vi) (§141.92(b)(1)(v) in the proposal) state that samples must be 250-ml first-draw with a stagnation time of 8-18 hours, which is consistent with the 3Ts. However, while the 3Ts recommends that schools and child care facilities sample all outlets used for drinking and cooking, the Agency notes that the proposed requirements in §141.92 are not intended to replace the 3Ts recommendations. The intent of §141.92 is to inform and educate targeted CWS customers and users about risks for lead in premise plumbing at schools and child care facilities. Sampling under §141.92 provides a preliminary screen for lead risks within schools and child care facilities, and is intended to initiate lead sampling in schools and child care facilities, particularly where no testing is currently being conducted. One cycle of CWS sampling in elementary schools and child care facilities are intended to reinforce the importance and benefits of lead sampling in schools and child care facilities, while prioritizing facilities that serve young children who are at the greatest risk of drinking water lead exposure. EPA notes that all schools and child care facilities will receive annual outreach and have the opportunity to request sampling from their CWS.

The Agency disagrees with comments that results from a limited number of outlets will provide a "false sense of security" or be "misleading" if results show low or non-detected lead levels. The accompanying 3Ts clearly discusses the variety of factors (e.g., plumbing configurations, stagnation time) that should be taken into consideration when evaluating lead risks. CWS dissemination of public education materials (including the 3Ts Toolkit) is intended to inform schools and child care facilities of ways to mitigate lead risk, including expanded sampling, follow-up sampling, and remediation actions. For response to comments requesting a requirement for CWSs to conduct follow-up sampling, see response to comment Section 12.3. EPA anticipates that increased familiarity with the 3Ts will help to reduce potential misconceptions regarding sampling and strategies to reduce lead risks (see the response to comment Section 12.6 for more detail on remediation resources). The required testing by the CWS is not meant to supplant other recommended lead testing measures.

EPA is aware that schools and child care facilities may install POU devices on outlets typically used for cooking and drinking. To accommodate facilities that install POU devices, the Agency has added an additional provision in §141.92(b)(1)(iv) that outlets with POU devices may be sampled if POUs are installed on all outlets used for cooking and drinking. EPA has also revised §141.92(b)(1)(i) to include "classroom faucet or other outlet used for drinking" to accommodate situations such as sink units that include a faucet for hand washing and a water fountain style outlet for drinking. Some commenters requested clarification on what outlets to sample if the outlets specified in §§141.92(b)(1)(i)–(ii) are either not used for drinking or not present in the facility. The Agency notes that if a facility does not contain the type of outlet specified, another outlet typically used for consumption must be sampled, as stated in §141.92(b)(1)(v) in the final rule.

EPA has revised §141.92(c) in response to comments stating that the requirement to conduct sampling in at least 20 percent of school and 20 percent of child care facilities per year is unclear. The Agency has clarified in §141.92(c)(1) that a water system may count a refusal or non-response from an elementary school or child care facility as part of the 20 percent of facilities monitored per year during the one cycle of mandatory sampling for elementary schools and child care facilities. Please see the response to comment Section 12.3 for discussion on documenting non-responses and refusals. The Agency agrees that there may be cases where a water system may sample more than 20 percent of the elementary schools and child care facilities they serve per year and has revised §141.92(c)(2) to allow for an alternative sampling schedule to be approved by the state as long as each elementary school and child care facility identified in §141.92(a)(1) is sampled at least once during the five year period following the rule compliance date. This will help accommodate situations where a CWS wants to conduct sampling in all facilities of one type in a given year (e.g., all elementary schools in the first year and child care facilities the second year).. EPA has added a new requirement in §141.92(c)(4) that CWSs must sample in secondary schools on request during the one cycle of mandatory sampling in elementary schools and child care facilities. CWSs are not required to fulfill a request for sampling from a given secondary school more than once during this five-year period (see the response to comment Section 12.3). EPA notes that after one five-year sampling cycle, CWSs will only be required to sample in schools and child care facilities on request.

One commenter requested information on how this sampling approach aligns with environmental justice principles. EPA notes that all schools and child care facilities, regardless of socioeconomic factors, will receive outreach from their CWS and will have the opportunity to be sampled. While not required, EPA does recommend that CWSs consider a range of factors in prioritizing sampling in facilities most at risk for lead exposure (please see the response to comment Section 12.3 for further discussion). EPA is requiring CWSs conduct one cycle of mandatory sampling as proposed for elementary schools and child care facilities as these facilities serve the youngest children, who are the most vulnerable to lead exposure, and should be prioritized. EPA notes that secondary schools will be sampled on request and after the one cycle of mandatory sampling, all schools and child care facilities will be sampled by the CWS at the request of the facility. The requirements of §141.92, including mandatory and on request sampling, are intended to educate schools and child care facilities about the risks of lead in drinking water and inform them of ways to mitigate lead risks while allowing CWSs to focus resources on sampling in schools and child care facilities that request assistance. This includes facilities serving vulnerable or disadvantaged populations and facilities that are not currently testing for lead. EPA anticipates that after one sampling cycle elementary schools and child care facilities will better understand the process and benefits of lead testing and be more likely to implement their own 3Ts programs. However, facilities interested in further assistance will have the opportunity to be tested for lead by the water system on request (see the response to comment Section 12.1 for more details). The commenter further states that sampling is "not necessary for raising awareness of increasing knowledge about the risks and likelihood of the presence of lead in school drinking water" and cites several studies on the health effects of lead exposure. The Agency disagrees with the argument regarding awareness of lead in drinking water. Many schools and child care facilities currently do not sample for lead and/or are unfamiliar with the sources of lead risks in their facilities (GAO, 2018). Lead sampling is intended to raise awareness of lead risks while also encouraging schools and child care facilities to take additional voluntary actions to reduce lead risk, such as prioritizing remediation actions at outlets with the highest lead levels as recommended in the 3Ts Toolkit. The Agency acknowledges that some facilities may require additional assistance, and notes both the continued opportunity for sampling on request in §141.92(g) and resources to assist with remediation (see the response to comment Section 12.6 for details).

Sampling Protocol

Summary of Comments

Some commenters stated that the required 8-18 hour sample stagnation time proposed in §141.92(b)(1)(v)(C) implies that a facility should conduct flushing if water is stagnant for more than 18 hours and requested clarification or appropriate guidance. A few commenters questioned the required stagnation time and EPA's justification for requiring 8-18 hours. One commenter suggesting EPA allow for a maximum 48-hour stagnation time as it represents stagnation after a typical weekend, while another noted that the 3Ts states that a longer stagnation time may be appropriate if it is representative of typical building use. Alternatively, some commenters argued that it would be difficult for water systems to achieve the stated stagnation times and requested clarification on the individuals that may collect samples under §141.92(b)(1)(v)(D). A number of commenters requested modification to the rule that CWSs are responsible for assisting the facility and facilitating sample collection rather than CWSs being responsible for conducting sampling at school and child care facilities. A few commenters also noted the use of 1-L sample bottles in existing sampling programs and questioned the rationale for requiring 250-ml bottles in §141.92(b)(1)(v)(B).

Agency Response

EPA notes that commenters requested clarification on whether pre-stagnation flushing should be conducted prior to sampling due to the 18-hour stagnation limit under §141.92(b)(1)(vi)(C) for the final rule. Pre-stagnation flushing prior to sampling is not recommended as it reduces the likelihood of detecting lead levels associated with building water use (USEPA, 2018a). Furthermore, as §141.92 is intended to inform and educate schools and child care facilities about risks for lead in premise plumbing and encourage voluntary actions to reduce lead risk, sampling should be conducted during normal school operations and not after long periods of stagnation that are not typical of daily use (e.g., vacations, summer break). EPA notes that the "3Ts Flushing Best Practices" guidance in the 3Ts Toolkit offers guidelines for flushing as part of regular maintenance practices but clearly states that flushing should not be conducted prior to lead sampling (USEPA, 2018b). While some commenters expressed concern regarding the ability for water system staff to achieve the 8-18 hour stagnation time, EPA notes that appropriately trained individuals besides the CWS or the school/child care facility may collect the samples (see response to comment Section 12.3 for further discussion). To reduce potential confusion, EPA has revised §141.92(b) to include §141.92(b)(2), which specifies entities other than the water system that may conduct the required sampling. This includes the schools, child care facilities, and "other appropriately trained individuals" in addition to water systems.

EPA disagrees with comments that the 18-hour stagnation limit has not been justified. EPA uses 8-18 hours as it represents routine stagnation time in a school or child care facility and captures overnight stagnation. However, the Agency recognizes that the 3Ts states that longer stagnation can be used if it is representative of typical building use (USEPA, 2018a). The Agency is also aware that existing state and local testing requirements include stagnation times ranging from 6 to 48 hours and longer. The Agency has noted additional comments regarding the use of 1-L bottle sizes in existing programs. A sample volume of 250-ml is required under §141.92 as it is representative of the volume of water consumed per serving. The Agency has revised the requirements in §141.92(d) that allow states to issue waivers for CWSs where existing state or local sampling requirements are consistent with §141.92, to accommodate differences in the sampling protocol if the program meets stated criteria (see the response to comment Section 12.8 for further details). While one commenter expressed concern that 18-hour stagnation times would "drive lead levels above the 10 ppb proposed standard for action because the older schools have older distribution lines with lead solder," the Agency reiterates that while remediation is not required under §141.92, an 18-hour stagnation time is typical for school and child care facility water use and sampling results can be used to inform additional sampling and remediation activities independent of CWS requirements (please see the response to comment Sections 12.5 and 12.6 for further discussion).

Exemptions to Sampling and Applicability of Requirements

Summary of Comments

EPA received comments noting that there were no provisions in the proposed rule for ending recurring monitoring at schools and child care facilities. Some commenters argued that if sample results show low or non-detected lead levels that recurring testing is not necessary, although one commenter added, unless the CWS changes source water or treatment techniques. Other commenters suggested giving lower priority in a future sampling cycle to facilities that had low or non-detect levels of lead in previous sampling, or "testing-out" individual outlets or facilities. Other suggested exemptions included outlets within a facility that have been replaced with certified lead free components, facilities that do not have LSLs, and for systems with low 90th percentile lead levels or OCCT. Some comments argued that repeat testing would not provide any benefit in these cases and that a CWS should not be required to continue testing those facilities. One commenter stated that sampling in schools and child care facilities that had already sampled for lead and replaced fixtures is duplicative and unnecessary. Some commenters also questioned the exemption of facilities built after 2014, with some arguing for alternative exemption dates while others requested no exemptions due challenges in tracking and the possibility of faulty installation of fixtures.

One commenter expressed concern that samples collected at home-based child care facilities under §141.92 cannot be used for tap monitoring compliance in §141.86 and stated it would lead to "homeowner fatigue" and "erode public trust." Finally, EPA received comments requesting additional clarification regarding the applicability of §141.92 to consecutive water systems and schools and child care facilities that are regulated as public water systems, with commenters noting an apparent contradiction in the introduction to §141.92 and §141.92(a).

Agency Response

EPA disagrees with allowing for exemptions based on low or non-detected lead levels, system lead 90th percentile level, LSL status, construction dates earlier than 2014, and with comments that stated there is no benefit gained from repeat sampling. Lead levels at an outlet or within a building have been shown to vary with repeat testing, with lead levels at one outlet not necessarily characterizing lead levels at other others in the building. Therefore, exempting water systems from testing in facilities based on one instance of negative lead results from limited outlets is inappropriate. Using the lead action level as a criterion for reduced testing is also inappropriate, as the action level is used to evaluate the effectiveness of system-wide CCT and is not a health-based level. Furthermore, as noted in the response to comment Section 12.1, individual outlets (e.g., water fountains) can leach lead even when a water system has OCCT. Likewise, absence of an LSL does not necessarily indicate absence of lead risk within a building. The requirements of §141.92 are part of a targeted public education effort to educate schools and child care facilities and their users of the risks from lead in premise plumbing the importance of testing for lead in drinking water, and to help them make decisions to mitigate lead risks.

EPA has retained the proposed requirement to exempt CWSs from sampling in schools and child care facilities constructed after 2014 (consistent with Section 1417 of the SDWA), as these facilities will have been constructed with lead free plumbing components. Prior to amendment of Section 1417 of the SDWA by the Reduction of Lead in Drinking Water Act, fixtures could contain up to 8 percent of lead by weighted average and be classified as lead free (USEPA, 2020b). Allowing earlier exemption dates (such as the 1986 lead solder ban) would therefore be less protective of public health. EPA notes comments that some states, such as California, adopted standards consistent with Section 1417 of the SDWA earlier than 2014. Therefore, the Agency revised §141.92 to require CWSs to sample in facilities "constructed prior to January 1, 2014 or the date the State adopted standards that meet the definition of lead free in accordance with Section 1417 of the Safe Drinking Water Act, as amended by the Reduction of Lead in Drinking Water Act" to accommodate date differences that precede 2014 but used an equally protective standard. While one commenter expressed concern regarding faulty installation of lead free fixtures, EPA notes that replacement of drinking water outlets with lead free components alone would not meet this exemption, as older premise plumbing may contribute to lead risks within the facility. Likewise, exempting schools and child care facilities that have "no lead" but do not meet the exemption date in §141.92 is inappropriate due to the lead content previously allowed in certified lead free plumbing products. EPA notes the concern that exempting buildings built after 2014 may require additional tracking. The Agency anticipates that exempting these buildings will reduce the overall CWS burden relative to any additional tracking or data management efforts.

EPA acknowledges comments regarding the applicability of §141.92 and §141.86 to home-based child care facilities. Samples collected under §141.92 cannot be substituted for samples collected under §141.86 for compliance monitoring due to differences in sampling protocol. It is possible for a home-based child care facility to be licensed by the state and for the facility to also meet the tiering criteria for compliance monitoring in §141.86. While "homeowner fatigue" may be a potential concern at sites that are eligible to be sampled under §141.92 and are also sampled under §141.86, EPA notes that any school or child care facility may decline sampling under §141.92 and it will not impact CWS compliance with the requirements of §141.92. Furthermore, the Agency disagrees that more opportunities for tap sampling will erode public trust and notes that the accompanying public education materials provided under §141.92(a) explain the importance and purpose of sampling schools and child care facilities. EPA reiterates that the requirements of §141.92 do not apply to home-based child care facilities that are not licensed by the state. Please see the response to comment Section 9 for more information on tap sampling tiering.

EPA notes that commenters requested clarification on the applicability of §141.92 to consecutive systems. The Agency has revised §141.92 to state that CWSs "must conduct directed public education and lead monitoring to the schools and child care facilities they serve" to clarify that CWSs are required to sample in schools and child care facilities that they provide water to, regardless if they are a purchasing system or wholesale system. For example, a CWS would sample in schools and child care facilities that they provide water to, but if the CWS also provides water to another system, they would not be responsible for sampling in schools and child care facilities served by the purchaser system. The Agency further clarifies that §141.92 does not apply to any schools or child care facilities that are regulated as a public water system (e.g., NTNCWS), as they must comply with the monitoring requirements in §141.86.

EPA also received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance with the school/child care section of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

12.3 Role of Community Water Systems

EPA received comments on the requirements in §141.92(a)(1) for CWSs to "compile a list of schools and licensed child care facilities served by the system" and to use the list to provide schools and child care facilities with "information about health risks from lead in drinking water on at least an annual basis," to conduct lead sampling, and provide facilities with the 3Ts guidance in §141.92(a)(2). EPA also received comments on the requirement in §141.92(a)(3) for a CWS to document if a school or child care facility "refuses entry or otherwise declines to participate in the monitoring or education requirements of this section." EPA also received general comments on the responsibilities of CWSs under §141.92, including requests to both remove and add requirements for CWSs under this section.

Responsibilities of CWSs under §141.92

Summary of Comments

EPA received comments on the responsibilities of CWSs required under §141.92. Several commenters expressed concern regarding the financial and resource burden of fulfilling the requirements of §141.92, including lack of data management systems at the state-level. One commenter expressed the need for a longer sampling cycle due to concern that their CWS does not have the human resources necessary to do the required sampling in schools. Another commenter stated that sampling in schools and child care facilities may strain resources, increase work load, and threaten compliance with other parts of the rule. Some commenters also stated that the water system does not have authority over premise plumbing and therefore should not be required to conduct sampling in schools and child care facilities, with some stating that such sampling requirements should be placed on those entities rather than the CWS. Although one commenter stated CWSs should be required to address elevated lead levels found at schools and child care facilities and another commenter stated CWSs should install certified filters or other devices to replace affected taps. One commenter stated that recurring sampling is unnecessary and that each school and child care facility should only be sampled by the CWS once.

One commenter stated that EPA had "acknowledged its lack of legal authority to require lead testing in schools and child care facilities" due to a statement in the current 3Ts that states "there is no federal law requiring testing of drinking water in schools and child care facilities, except for schools and child care facilities that own and/or operate their own public water supply and are thus regulated under the Safe Drinking Water Act (SDWA)." Another commenter further argued that Congress never intended for water systems to be involved in school and child care sampling. The commenter argued that prior to 2016, Section 300j-24 of the SDWA contained a provision to require each state to establish a program to assist local education agencies (LEAs) in testing and remedying lead contamination in drinking water at schools under the jurisdiction of such agencies. They argued that in 2016, Congress amended the statute and removed the provision under Section 300j-24 and instituted a grant program with the WIIN Act, "thereby signaling the intent for water systems to not be responsible for testing in these facilities." They state that CWSs should only be responsible for outreach activities under §141.92(a).

Some commenters also argued that §141.92 places "full responsibility" for sampling in school and child care facilities on CWSs while others questioned if CWSs have the necessary experience to implement the requirements. They stated that the existing *Memorandum of Understanding (MOU) on Reducing Lead Levels in Drinking Water in Schools and Child Care Facilities* is a better approach as it requires cooperation across partners and argued that the requirements in §141.92 supersede these efforts.

Other commenters suggested that EPA support CWSs by collaborating with other agencies to encourage cooperation in implementing §141.92. Finally, some commenters noted that parts of the 3Ts are not addressed by §141.92 (e.g., remediation) and expressed concern that the CWS will be pressured to provide additional assistance to facilities not required by §141.92. They stated the requirement will imply that CWSs are responsible for remediation activities in schools and child care facilities. Some commenters also requested additional guidance on implementation various aspects of the requirements (e.g., sampling, data management).

Agency Response

EPA disagrees with comments that CWSs should not be required to sample in schools and child care facilities due to lack of authority over premise plumbing and that CWSs should not be financially responsible for the requirements of §141.92. The requirements of §141.92 are part of a targeted public education effort to educate schools and child care facilities and their users of the risks from lead in premise plumbing, the importance of testing for lead in drinking water, and to help them make decisions to mitigate lead risks. The requirements for CWSs to conduct sampling and public education for this vulnerable subset of customers is within EPA's authority to promulgate a treatment technique rule to "prevent known or anticipated adverse effects on the health of persons to the extent feasible." (SDWA 1412(b)(7)(A)). The fact that there is no current or previous requirement for CWSs to sample for lead in schools and child care facilities does not preclude EPA from promulgating a regulation that is within the scope of the SDWA for this purpose. EPA acknowledges CWS concerns about financial and resource burden in fulfilling the requirements of §141.92. EPA has revised §141.92 from proposal to final such that CWSs will conduct public education outreach and sampling in elementary schools and child care facilities as described in the proposed requirements for one cycle of sampling (5 years) and sample secondary schools on request. After one cycle of sampling, CWSs will offer on request sampling to all schools and child care facilities.. EPA disagrees with limiting CWS sampling to one cycle only. Lead levels have been shown to vary through repeat testing, and the results from one sampling event may not characterize conditions in the future (please see the response to comment Section 12.2 for further discussion). The 3Ts recommends recurring lead testing in schools and child care facilities to guide decisions to reduce lead risks. The Agency is requiring CWSs to conduct one cycle of sampling in elementary schools and child care facilities to emphasize the importance of lead testing to schools and child care facilities that serve the most vulnerable population. One round of sampling will provide school and child care facilities with experience and assurance in the process and benefits of managing a drinking water testing program, while maintaining the opportunity for schools and child care facilities that require additional assistance to be sampled on request (please see the response to comment Section 12.1 for details). EPA also notes comments that CWS reporting of data to the state may pose additional challenges if states lack appropriate data management systems (please see response to comment Section 14 for discussion).

The Agency further disagrees that the requirements in §141.92 are against Congressional intent. Section 1464(d) of the SDWA (authorized by the WIIN Act) created a grant program for states, territories, and tribes to fund voluntary testing of drinking water in schools and child care facilities. The requirements of §141.92 are not in conflict with Section 1464(d) of the SDWA and as noted above, it is within EPA's statutory authority to set these requirements. The requirement for CWSs to conduct sampling at schools and child care facilities provides an added measure of protection, above the other elements of the treatment technique rule, in light of the vulnerabilities of the population served and the potential variability of lead levels within the system and within a school or child care facility over time. EPA also notes that §141.92(d)(1)(iv) allows states to issue waivers to CWSs for sampling in schools and child care facilities that have been sampled by a grant program under Section 1464(d) of the SDWA (see the response to comment Section 12.8). EPA also disagrees with the comment that the Agency lacks the legal authority to require CWSs to conduct lead sampling in schools and child care facilities. The requirements of §141.92 are within the scope of the SDWA as detailed above and as such, the LCRR provides the legal authority.

EPA disagrees with commenters that the requirements in §141.92 place full responsibility for sampling in schools and child care facilities on the CWSs. The intent of §141.92 is to inform and educate targeted CWS customers and users about risks for lead in premise plumbing at schools and child care facilities. The Agency notes that the requirements in §141.92 do not constitute a comprehensive sampling program and further disagrees that §141.92 will create the perception of CWS responsibility for remediation. While EPA notes requests from commenters to require CWSs to install POUs or replace fixtures, CWSs are not responsible for conducting repair or replacement of premise plumbing. Public education and CWS sampling will encourage schools and child care facilities to take additional voluntary actions to reduce lead risk, including follow-up sampling and remediation. CWSs may choose to offer additional assistance to schools and child care facilities pursuing follow-up activities, but it is not required under §141.92. Please see the response to comment Sections 12.2 and 12.5 for more detail. EPA also disagrees with comments that CWSs lack the necessary experience to conduct school and child care lead sampling. CWSs have developed the technical capacity to do this work in operating their system and complying with drinking water standards. For example, CWSs have experience collecting tap samples and/or providing detailed instructions to consumers to collect samples, delivering results, and reporting to primacy agencies. EPA notes that CWSs are not required to recommend specific remediation strategies to schools and child care facilities under §141.92.

The Agency further disagrees with commenters who state that §141.92 supersedes or competes with the lead sampling in schools and child care facilities MOU (EPA, 2019b). The MOU was signed in 2019 by 14 federal and non-federal partners to voluntarily support and encourage schools and child care facilities to conduct comprehensive testing, remediation, and communication activities to reduce lead risks in their facilities. The requirements in §141.92 complement these efforts by providing a preliminary screen for lead risks in all schools and child care facilities and providing facility administrators with the tools and knowledge needed to inform decisions on reducing lead in their facilities. While some commenters expressed the importance of cooperation for facilitating lead reduction in schools and child care facilities, the Agency anticipates that CWS outreach and dissemination of the 3Ts and delivery of testing results will help initiate or strengthen communication between the CWS and schools and child care facilities. While not required, CWSs may choose to partner with school districts or other entities to help facilitate school and child care facility participation in sampling under §141.92. As noted by some commenters, other initiatives such as the *Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impact*s (Task Force, 2018) are important for advancing the objective of reducing childhood lead exposure from all sources and depend on cooperation among state and federal partners (see the response to comment Section 12.4). The Agency notes that these initiatives are ongoing and have been considered during the development of this rule.

EPA also received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

Requirement to Compile List of Schools and Child Care Facilities

Summary of Comments

EPA received comments that stated that developing a list of schools and child care facilities as required in §141.92(a)(1) would be challenging. A few commenters suggested that such information be provided by the primacy agency or other appropriate licensing agency. One primacy agency informed EPA that state licensing agencies can provide access to school and child care facility information if requested, but that these agencies indicated they would not be able to query information by water system service area. Another commenter noted that CWSs that are not associated with a municipality may not be able to readily access the necessary information for the inventory. One commenter suggested that schools and child care facilities should be responsible for notifying the CWS of their licensed status and to initiate sampling. Some commenters suggested different time frames for developing and maintaining an inventory of schools and a few commenters indicated it would be difficult to maintain a list of the child care facilities because these facilities frequently close. Another commenter noted that a CWS's bill paying customer may lease a building to a school or child care facility and that the CWS may not have that information. One comment stated that additional effort would be needed to identify which facilities were built after 2014 to determine facilities that could be excluded from sampling.

Agency Response

EPA disagrees with commenters who state that the list of schools and child care facilities in each water system service area should be developed by the primacy agency or another agency. While agencies may be able to provide information about school and child care locations, this information is typically available by jurisdictional boundaries and not water system service areas. Water systems have knowledge of their service areas, customers, and system connections, and are best suited to identifying the schools and child care facilities they serve. However, the Agency notes that CWSs may review customer records and request information from the primacy agency or other licensing agency as part of a good faith effort to identify schools and child care facilities that they serve as stated in §141.90(i)(1)(i). A few other commenters noted the challenge of identifying child care facilities, citing frequent opening and closure. CWSs are required to update the list of schools and child care facilities at least once every five years in accordance with §141.92(e). The Agency disagrees with providing a longer time frame to develop the initial list of schools and child care facilities (e.g., 2 years after the rule compliance date in §141.80(a)(3)). EPA notes that CWSs will have three years from rule promulgation until the compliance date to compile the list. Given that children are particularly vulnerable to lead, the Agency believes it would be inappropriate to delay implementation of school and child care lead sampling. EPA acknowledges concerns that some information may not be known to the water system (e.g., a child care facility opening and closing between facility list updates, building lease information) and reiterates that CWSs must make a good faith effort. EPA also notes that unlicensed child care facilities are not included in these provisions, due to feasibility challenges for identification. The Agency notes that any home-based child care facilities that are not included under §141.92(a)(1) will receive the lead reduction benefits of CCT, public education, and LSL removal under other provisions of the LCRR. EPA identified a need to further define elementary and secondary schools based on the mandatory sampling requirements. For details on defining elementary and secondary schools please see the response to comment Section 2.

EPA also disagrees with the suggestion that schools and child care facilities be responsible for identifying themselves to their CWS. The purpose of the list in §141.92(a)(1) is to ensure that all schools and child care facilities served by a CWS receive public education materials and are sampled for lead. Relying on schools and child care facilities to self-identify will likely result in incomplete lists resulting in fewer facilities being sampled. EPA notes that the commenter does not suggest how schools and child care facilities would be aware of the sampling opportunity or how they would know to contact their CWS.

Outreach to Schools and Child Care Facilities and Documenting Refusals

Summary of Comments

Some commenters agreed with the requirement that CWSs provide the 3Ts and other health effects information in §141.92(a)(2). However, one commenter noted that the CWS should not be responsible for developing this information, and that health effects language should be provided by state or federal agencies. A couple of commenters stated the outreach materials provided by the CWSs should be translated into languages other than English to provide equitable access. Another commenter requested more specificity in examples of what would constitute “public education” in schools. One commenter requested that EPA remove the phrase “or subsequent EPA guidance” from §141.92(a)(2)(ii) because it could “have different requirements without going through the proper rulemaking and administrative procedures, including public review and comment.”

Some commenters also stated that the statement in §141.92(a)(2)(ii) that systems shall provide “notification that the water system will be conducting sampling for lead at the facility” is “adversarial” language and does not clearly indicate that a facility may decline sampling. Furthermore, commenters noted that CWSs do not have the legal authority to enter facilities without their cooperation or consent, and in some cases, individuals may be required to undergo training prior to entering the school or child care facility. A few commenters requested that the CWS should be able to provide training in sampling and/or provide instructions and materials for sampling in lieu of system staff performing the sampling in all schools and child care facilities.

Some commenters also requested clarification on documenting refusals under §141.92(a)(3) and stated that some schools and child care facilities are unlikely to respond to outreach efforts and that failure to obtain a refusal would prevent CWSs from complying with the requirements of §141.92. They suggested that EPA clarify how many attempts a water system should make before they document a facility as refusing sampling. A few commenters further suggested that EPA allow CWSs to conduct outreach to a central office such as a school district or child care business that serves multiple facilities under §141.92(a)(2)(ii).

Agency Response

EPA acknowledges comments supporting the provisions in §141.92(a) to provide the 3Ts and information on health effects of lead to schools and child care facilities. The Agency has revised §141.92(a)(2)(i) to clarify that information on health risks should be consistent with the content of public education materials as detailed in §141.85(a). CWSs currently provide this type of information to a range of consumers. While not required, the Agency encourages water systems to work with health agencies on developing these materials. EPA disagrees with removing the phrase "or subsequent EPA guidance" from §141.92(a)(2)(ii). While the 3Ts may undergo future revisions, the 3Ts is disseminated to help inform schools and child care facilities of how to reduce their lead risks. It is important that this information be current and reflect best practices. The Agency notes that the 3Ts is guidance and §141.92 does not require the CWSs to implement the 3Ts.

EPA acknowledges requests for CWSs to provide non-English language materials to schools and child care facilities. The Agency notes that "Module 1: Communicating the 3Ts" in the 3Ts Toolkit (https://www.epa.gov/safewater/3Ts) includes examples of translations to the text "This report contains important information about your drinking water. Have someone translate it for you or speak with someone who understands it" that CWSs can use when distributing materials. Additionally, the Agency notes that CWSs required by their primacy agency for public education materials to contain a translated statement on the importance of the information under §141.85(b)(1) will have these materials readily available (see the response to comment Section 8 for further discussion on translation of public education materials).

EPA agrees with commenters who state that some schools and child care facilities may not wish to participate in testing and may not respond to outreach. The Agency does not intend for CWSs to be held in violation based on lack of elementary school and child care facility participation during the one cycle of mandatory sampling. In response, EPA has revised §141.92(a)(3) to allow a system to document a refusal or a non-response. A CWS may document a non-response if an elementary school or child care facility does not respond after "two separate good faith" attempts by the CWSs to contact the facility. The Agency has also clarified in §141.92(c)(1) that both refusals and non-responses are counted towards the required sampling in 20 percent of elementary schools and 20 percent of child care facilities per year, to ensure that CWSs can meet compliance regardless of elementary school or child care facility actions.

The Agency notes that in the final LCRR, a CWS is required to offer testing on request to secondary schools while sampling elementary schools and child care facilities during the first cycle of sampling as stated in §141.92(a)(4). After a CWS completes the first cycle of sampling, the CWS will conduct outreach to all schools and child care facilities identified in §141.92(a)(1) annually as specified in §141.92(g). However, the CWS will only conduct sampling at the request of school and child care facility that they serve, and will not be required to document refusals (see response to comment Section 14 for more details). EPA also revised §§141.92(b) and (c) to state that "samples shall be collected" to clarify that individuals other than the CWS as specified in §141.92(b)(2) may collect samples at the school and child care facility. However, EPA did not revise §141.92(a) to allow CWSs to conduct outreach to central offices in lieu of individual schools and child care facilities. Neither the CWSs nor the Agency can require an entity such as superintendent's office to disseminate the information to the schools and child care facilities within the school district. EPA is requiring outreach to individual schools and child care facilities to ensure that all facilities receive the public education and information about sampling as intended by §141.92.

EPA received requests from commenters who supported the on request alternative to allow CWSs to limit the number of schools and child care facilities that could request sampling per year. During the first sampling cycle under §141.92(c), CWSs are required to sample 20 percent of elementary schools and 20 percent of the child care facilities they serve while also offering sampling on request to secondary schools. EPA has added a provision in §141.92(c)(4) that states that if a CWS receives requests for sampling from more than 20 percent of the secondary schools that they serve, they may defer additional requests to the following year. While not required, the Agency encourages CWSs to fulfill more requests per year if able. Additionally, a CWS is not required to fulfill a request for sampling from an individual school more than once every five years. The Agency has added a similar requirement in §141.92(g)(3) for when a CWS is offering sampling on request to all schools and child care facilities they serve. In §141.92(g)(3) a CWS is not required to fulfill requests from more than 20 percent of the schools and child care facilities they serve per year and may defer additional requests to the following year. A CWS is not required to fulfill a request for sampling from each school or child care facility more than once every five years.

Additional Suggested Requirements for §141.92

Summary of Comments

EPA received suggestions for additional requirements under §141.92. A few commenters suggested that in the event of a positive lead result, the water system should conduct follow-up sampling to determine if the lead is from premise plumbing or from pipes in the CWS distribution system. A few commenters suggested that the water system should verify if the facility has an LSL by cross-referencing the school inventory with the LSL inventory required in §141.84(a), with one commenter indicating EPA could require CWSs to both prioritize lead service line replacements (LSLRs) in such locations and inform the testing schedule to ensure testing occurs after LSLR where possible. Another commenter suggested that child care facilities with children under six were particularly important to prioritize for LSLR, even above schools which are also important. Some commenters requested EPA require systems to conduct an “equity in prioritization” analysis to identify and prioritize the schools that may be at highest risk; another commenter requested EPA define which and how schools will be targeted for sampling to prevent disparities in prioritization. One commenter requested EPA clarification on whether sampling voluntarily conducted by a school or child care facility could count towards compliance or if the sampling event must be initiated by the CWS, and another suggested that EPA allow CWSs to sampling in facilities with high youth populations in lieu of schools (e.g., juvenile detention facilities, foster homes). Finally, one commenter noted that the proposal does not require CWSs to use the results and suggested that CWSs be required to integrate testing results into their system wide data to inform corrosion control decisions.

Agency Response

EPA notes requests for additional requirements under §141.92 including requiring LSL removal, follow-up sampling, prioritizing sampling according to social demographics, and integration of data into CCT decisions. Some commenters also requested information on how environmental justice issues are addressed in §141.92. EPA notes that all schools and child care facilities will receive public education and sampling under §141.92, regardless of socioeconomic status. The Agency is requiring CWSs to prioritize sampling in facilities serving young children who are most vulnerable to the effects of lead by requiring one cycle of sampling targeting elementary schools and child care facilities. EPA notes that secondary schools will receive PE materials annually and may request lead sampling from their CWS. After one cycle of sampling is complete, schools and child care facilities will continue to receive annual information on the health effects of lead and how to request sampling as required in §141.92(g). The Agency disagrees with requiring CWSs to prioritize sampling based on other specific factors. CWSs may not have access to the necessary information to conduct a prioritization analysis. While not required, EPA does encourage CWSs to prioritize sampling within the requirements of §141.92 according to known factors such as building age, student age, facilities serving disadvantaged populations, Title 1 (20 USC 6301 *et seq*.) or Head Start (42 USC 9801 *et seq.*) designations, and facilities served by LSLs. EPA recognizes that there are other types of facilities that serve children besides schools and child care facilities. However, it is not appropriate to sample these facilities in place of those identified in §141.92(a)(1) and there would likely be equity concerns in determining which schools and child care facilities to sample across CWSs. EPA also notes requests for clarification on applicability of the requirements to schools and child care facilities voluntarily conducting lead sampling. For details on the requirements for waivers issued under §141.92(d), please see the response to comment Section 12.8.

The Agency also disagrees that additional requirements be added to §141.92 for CWSs to conduct LSLR at school and child care facilities. The LCRR provides sufficient information to inform schools and child care facilities of risks from LSLs. Section 141.84(b) requires the CWS to develop LSLR plans which includes a prioritization strategy for replacing lines serving vulnerable populations such as children. A school or child care facility also has opportunities under §141.84(d)(3) to initiate replacement of an LSL serving their facility, as well as opportunities that arise under §§141.84(f -g) when a system is undergoing goal-based or mandatory LSLR (see the response to comment Section 6). Additionally, if a school or child care facility is served by an LSL, galvanized requiring replacement, or lead status unknown service line they will receive annual notification under §141.85(e) which includes information on opportunities for replacement (see the response to comment Section 8).

EPA also does not agree with requiring CWSs to conduct follow-up sampling to identify the potential source of lead (e.g., fixture, plumbing, LSL) and not sampling until after an LSL is removed. The Agency notes that a 250-ml sample volume is required because it is representative of the amount of water consumed per serving by a child. The smaller sample volume is also typically characteristic of the drinking water outlet. The 3Ts recommends follow-up sampling with other sample volumes (e.g., 125-ml, 1-L) and flush times (e.g., 30 sec., 2 min.) as appropriate to help pinpoint the sources of lead (USEPA, 2018a). However, requiring CWSs to conduct exploratory follow-up sampling would increase the number of samples and may be cost and resource prohibitive for many CWSs. Schools and child care facilities are encouraged to use the initial samples and the 3Ts provided by the CWS to pursue follow-up activities (see the response to comment Sections 12.2 and 12.5 for further discussion). EPA also notes that most large schools and child care facilities are not served by LSLs due to building size. However, if a school or child care facility does have an LSL and disturbance and/or replacement is conducted on either portion of the LSL the requirements of §141.84 apply which include provision of filters and follow-up tap sampling (please see the response to comment Section 6 for details). Finally, EPA disagrees with adding a requirement for CWSs to integrate school and child care sampling results into system-wide data to inform CCT decisions. Large buildings such as schools can have a higher potential for elevated lead levels because, even when served by a water system with well operated OCCT, there may be longer periods of stagnation due to complex premise plumbing systems and inconsistent water use patterns. The protocol for collecting samples in schools and child care facilities characterize lead at each fixture (e.g., first-draw, 250-ml volume) and are not appropriate for informing system-wide CCT decisions. It is also for these reasons that schools are not appropriate sites for lead compliance monitoring under §141.86. While not required, CWSs may assess lead results across the schools and child care facilities they serve as an additional source of information regarding system water quality.

12.4 Role of Other Agencies and Organizations

EPA received comments on the proposed requirements in §141.92 for CWSs to conduct public education and lead sampling in schools and child care facilities, including comments on requiring other entities such as health departments, education departments, and school districts to fulfill some or all of the requirements.

Responsibility of Other Entities for Select Requirements of §141.92

Summary of Comments

Many commenters requested that there be an increased role for school districts, state agencies, and other entities in achieving EPA's objective for assisting schools and child care facilities with sampling and testing for lead. Individual commenters suggested limiting water system responsibilities and allowing CWSs to use local educational departments to serve as liaisons for outreach to individual school facilities. Other commenters noted that public education activities, sample collection, and reporting requirements should be coordinated through an LEA. Some commenters suggested that local education and regulatory agencies be responsible for compiling the list of schools and child care facilities served by the water system under §141.92(a)(1).

Agency Response

EPA has retained the requirements for CWSs to be responsible, as articulated in the final regulations, for public education and sampling for lead in schools and child care facilities under §141.92. Water systems are in an excellent position to assist schools and child care facilities with sampling and testing for lead as they have developed the technical capacity to do this work in operating their system and complying with drinking water standards (see response to comment Section 12.1). The Agency disagrees with removing CWS requirements for developing the list of school and child care facilities and conducting outreach in §141.92(a). CWS service areas often differ from city or county boundaries and may not match school district boundaries. EPA anticipates that CWSs will reach out to regulatory agencies or school districts as part of a good faith effort to identify schools and child care facilities that they serve as required in §141.92(a)(1) and §141.90(i)(1)(i). Please see the response to comment Section 12.3 for further discussion. The Agency also acknowledges comments that LEAs may be helpful partners in encouraging school and child care facility participation in sampling under §141.92. However, the Agency is retaining the requirement for CWSs to conduct outreach and sampling requirements with the individual schools and child care facilities identified in §141.92(a)(1). The Agency does not have the authority to require LEAs to distribute the required information about sampling and public education materials under the SDWA. All schools and child care facilities must be identified and contacted to meet the intent of §141.92 to inform and educate targeted CWS customers and users about risks for lead in premise plumbing at schools and child care facilities. However, while not required, CWSs may conduct additional outreach to LEAs to help increase school and child care facility engagement.

Alternative Regulatory Approaches for Lead Sampling in Schools and Child Care Facilities

Summary of Comments

Some of the commenters requested that school districts, rather than water systems, should be responsible for the requirements of §141.92 and state that regulations be set between school districts / business owners and EPA or other state or federal agencies. Suggestions included state or federal health or education departments, or the agencies that provide certification for schools and child care facilities to operate.

Some commenters stated that lead sampling could be required as part of agency requirements for state licensing and that an inspection of the building(s) by a licensed building inspector for LSL, fixtures, and lead solder could become a requirement for licensing. Another commenter suggested that licensing agencies are in the best position to enforce corrective action, and that facilities with lead and copper issues could be prevented from being licensed. One commenter suggested recurring sampling as described in §141.92 be a requirement for license renewal. Similarly, a few commenters specifically suggested that child care facilities not associated with schools be excluded from §141.92 and be addressed via permitting agencies. One commenter cited existing state requirements (e.g., California) which require lead sampling as part of licensure. Other commenters requested that primacy agencies develop approaches for lead sampling in schools and child care facilities, including replacing §141.92 with a special primacy requirement under §142.16.

Agency Response

EPA does not agree that implementation of the requirements of §141.92 be conducted at the state level managed by state agencies (e.g., departments of health or education) and coordinated through school districts. EPA notes that the Agency does not have the authority under the SDWA to require state level health or education departments to implement lead testing requirements in schools and child care facilities. The Agency has provided its rationale, above, as to why CWSs are the appropriate entity to implement §141.92. The Agency is aware of some existing state and local level programs for lead testing in schools and child care facilities and notes that these existing programs are primarily administered by public health and environmental agencies (Cradock et al., 2019). Furthermore, EPA disagrees with commenters that lead sampling in schools and child care facilities would be more effective if spearheaded by the Department of Education (Education) or Department of Health and Human Services (HHS). According to the GAO EPA has primarily led efforts to support school lead testing rather than Education (GAO, 2018). EPA notes that the Education and HHS are signatories to the 2019 *Memorandum of Understanding (MOU) on Reducing Lead Levels in Schools and Child Care Facilities* with other federal partners and organizations (USEPA, 2019a). The signatories to the MOU agree to encourage schools and child care facilities to take actions to address lead in their facilities. This includes testing for lead in drinking water, disseminating results, and taking corrective actions. EPA intends for the requirements to complement these efforts and does not replace ongoing initiatives to address lead risks in schools and child care facilities.

One commenter questioned if local or state health departments would shut down facilities or require remediation activities upon reporting of elevated lead results. EPA notes that §141.92 does not require school or child care facilities, or other entities, to take specific actions in response to sampling results (see response to comment Sections 12.5 and 12.6 for more information). EPA notes that some commenters requested that lead sampling of schools and child care facilities be included as part of requirements for licensure and/or through building inspection. These requests are outside of the scope of the LCRR. The Agency acknowledges that some child care facilities that are not associated with school sites may be subject to lead sampling as part of state licensing procedures, but does not agree that these facilities should be removed from the purview of §141.92. The Agency notes that implementation efficiencies can be gained by having CWSs responsible for monitoring all child care facilities they serve, rather than splitting responsibilities for child care facilities associated with school sites from those that are not. However, to avoid duplication of effort, §141.92(d) was clarified and revised to allow states to provide CWSs with full or partial exemptions from the requirements of §141.92 conditional on specified criteria (see the response to comment Section 12.8).

EPA disagrees with the commenter who suggested the Agency replace the requirements of §141.92 with a special primacy requirement under §142.16 such that "state primacy agencies develop approaches to ensure schools and daycare facilities monitor for lead and remediation when elevated lead levels are elevated." Currently, there are many schools and child care facilities that are not subject to existing state or local requirements and have not been sampled for lead. With §141.92, EPA has set a baseline of standards for sampling with the intent to inform and educate targeted CWS customers and users about risks for lead at schools and child care facilities and encourage them to take voluntary actions to reduce lead risk. The requirements in §141.92 ensure a consistent approach to school and child care sampling across states. However, EPA notes that the requirements of §141.92 do not preclude states from developing and implementing lead sampling requirements for schools and child care facilities that meet or exceed the requirements in §141.92, as indicated in §141.92(d).

Collaboration with Federal Agencies and Non-government Organizations

Summary of Comments

Some commenters also requested that EPA work with other federal agencies as part of the President's Task Force on Environmental Health Risks and Safety Risks to Children which produced *The Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts*. Commenters stated the importance of cooperation with other federal agencies such as Education and HHS citing their oversight of schools and child care facilities and that clear delineation of responsibilities helps leverage resources at the state level. A few commenters noted the need for guidance and assistance and requested EPA partner with stakeholder organizations and education associations to develop such guidance. One commenter also asserted that the responsibility for health information delivery is placed solely with CWSs and noted that information should be EPA approved and developed in consultation with appropriate experts and stakeholders.

Agency Response

EPA notes that some of the commenters requested that the Agency work with other federal partners as part of the President's Task Force on Environmental Health Risks and Safety Risks to Children (Task Force) which produced *The Federal Action Plan to Reduce Childhood Lead Exposures and Associated Health Impacts* (the Action Plan). The Task Force is comprised of 17 federal departments and offices including the Education, HHS, and the Department of Housing and Urban Development (HUD), which co-chaired the development of the Action Plan with EPA. To reduce exposure to lead through drinking water, the Action Plan highlights several key actions, including EPA's commitment to assisting schools and child care facilities with the 3Ts approach (Training, Testing and Taking Action) for lead in drinking water (Task Force, 2018). The Agency notes that the activities in the Action Plan are ongoing and were considered during deliberations in the development of this rule.

Finally, EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. Likewise, EPA has clarified that health information provided to schools and child care facilities under §141.92(a)(2)(i) is to be consistent with the information required under §141.85(a) which is approved by primacy agencies and is not the sole responsibility of the CWS. EPA also notes that state and local health departments will receive school sampling results under §141.92(f) and health information under §141.85(i)(3) and may voluntarily choose to pursue additional initiatives to assist consumers in reducing lead risks.

12.5 Lack of Threshold for Remediation

EPA received many comments about the absence of an action level in the proposed requirements for monitoring for lead in schools and child care facilities in §141.92. EPA also received comments requesting that EPA require remediation actions in schools and child care facilities with elevated lead levels and issue additional guidance to assist schools and child care facilities.

Summary of Comments

Many of the commenters requested that EPA require schools and child care facilities to take remediation actions if sampling shows elevated lead levels and suggested potential action levels. Suggestions included 1 µg/L (noted as being consistent with recommendations of the American Academy of Pediatrics), 5 µg/L, 10 µg/L (noted as being consistent with the World Health Organization's Provisional Guideline value), "as low as feasible," and action levels from state and local testing requirements ranging from 1 to 20 µg/L (e.g., Illinois, City of San Francisco). One commenter suggested consideration of a 90th percentile calculation specifically for schools and child care facilities along with "find-and-fix actions" if the 90th percentile value exceeds the trigger level (10 µg/L). Another stated that schools and child care facilities should be required to provide potable water if outlets are disconnected due to elevated lead levels. Several commenters stated that EPA should include "clear guidance" on an acceptable level of lead in drinking water for schools and child care facilities, and suggested that the 3Ts be updated to include an action level and/or specific recommendations for actions at different lead levels. A few of the commenters noted that when EPA updated the 3Ts in October 2018, the Agency removed the action level of 20 µg/L used in the previous version and further stated that there is no safe level of lead. They also argued that the lack of an action level in the 3Ts "is problematic and creates inconsistencies in the data collected by existing state programs." One commenter further stated that the requirements provide "little to no actionable information" by not requiring actions based on sampling results.

A few commenters also requested that EPA establish a lead monitoring and remediation protocol that is at least as stringent as current state level programs. Other commenters noted that it may be challenging for school and child care facilities to identify appropriate action levels and address lead risks due to lack of resources. One commenter expressed concern that without an action level, EPA is sending a message to school leaders that their drinking water is safe if lead levels are below the federal action level of 15 µg/L. A few commenters further stated that limited results may be misleading or could be misinterpreted. Finally, another commenter expressed concern that the 3Ts guidance may send misleading information to schools and child care facilities, citing existing sampling programs that do not always follow the 3Ts.

Agency Response

EPA does not agree with the commenters who requested that §141.92 include a requirement for remediation actions by water systems, schools, or child care facilities if results show elevated lead levels. Under the SDWA, EPA is authorized to establish National Primary Drinking Water Regulations (NPDWRs) that are legally enforceable standards that apply to public water systems as defined in §141.2. The Agency notes that most school and child care facilities are not public water systems and EPA does not have the authority to mandate that remediation actions be taken by those facilities, including requiring disconnection or replacement of drinking water outlets and/or provision of alternative drinking water sources. However, EPA disagrees that the requirements will not produce "actionable information" in the absence of requirements for remediation. The public education and lead sampling requirements of §141.92 are intended to help educate and inform schools and child care facilities of the health risks of lead, the importance of testing for lead in drinking water, and to encourage them to take voluntary actions to reduce lead risk. EPA developed the 3Ts to provide tools and technical materials for schools, child care facilities, states, tribes, territories and drinking water systems to implement voluntary lead reduction programs (USEPA, 2018a). For more information about the 3Ts Toolkit see response to comment Section 12.6. EPA notes that schools and child care facilities that are regulated as public water systems are exempt from §141.92 but are subject to the other requirements of the rule.

By distributing the 3Ts (or subsequent Agency guidance), a CWS would initiate or contribute to active communication with schools and child care facilities, which are critical customers that serve a vulnerable population. The managers of these facilities have established lines of communication with the occupants of these buildings (and their parents or guardians) and have control over routine maintenance and plumbing materials that may need to be addressed. Schools and child care facilities can use both the sampling results and the 3Ts to make decisions regarding follow-up testing, testing additional outlets, and remediation actions (see the response to comment Section 12.6 for more detail). EPA suggests that schools and child care facilities are best situated to make decisions in the context of their community needs and resources.

EPA also does not agree that §141.92 should include an action level for use at schools and child care facilities, as water systems are not required to conduct remediation activities as part of these requirements. As noted by commenters, there are a variety of thresholds recommended by organizations and the Agency acknowledges that thresholds vary across state and local testing programs. While the 3Ts does not specify a remediation level for lead, it recommends that schools and child care facilities reduce their lead levels to the lowest levels possible. The 3Ts includes resources to help schools and child care facilities to pinpoint potential lead sources and to reduce their lead levels, including examples of remediation actions taken in response to different lead levels. While not required in §141.92, EPA encourages schools and child care facilities to prioritize remediation efforts based on the highest lead sample results as recommended in the 3Ts.

EPA also does not agree with including a 90th percentile calculation specifically for schools and child care facilities along with find-and-fix actions if the 90th percentile value exceeds an action level. The Agency notes that the 90th percentile calculation for lead is used in tap compliance monitoring to evaluate system-wide CCT effectiveness. The commenter did not provide justification for why a 90th percentile calculation specifically for schools and child care facilities would provide more appropriate information about lead risks in premise plumbing at schools and child care facilities within its distribution system than the approach in §141.92. Furthermore, the Agency disagrees that find-and-fix requirements should apply to schools and child care facilities. The requirements in §141.84 include steps to identify and remediate the source of elevated lead levels, including CCT adjustments. EPA notes that customers are responsible for voluntary replacement of premise plumbing under find-and-fix. Large buildings such as schools can have a higher potential for elevated lead levels because, even when served by a water system with well operated OCCT, there may be longer periods of stagnation due to complex premise plumbing systems and inconsistent water use patterns. In such situations, there may not be technical improvements that can be made to the OCCT. However, schools and child care facilities can use public education material and lead sampling results to mitigate lead risks, including taking actions to address elevated lead levels such as such as replacement of fixtures or other remediation actions. EPA further acknowledges concerns regarding facility resources to interpret results in the absence of an action level and to take remediation actions. EPA notes that there are various resources available to assist schools and child care facilities in addressing lead in drinking water (see the response to comment Section 12.6).

The Agency also notes concerns from commenters who reported that the 3Ts are not always followed in existing sampling programs. However, EPA disagrees that the lack of an action level sets up “schools and child care facilities for failure,” that a school administrator would believe their water is safe if they are provided with a “passing grade on federal lead test,” and that results will be misinterpreted. The requirements of §141.92 are part of a targeted public education effort to educate schools and child care facilities and their users of the risks from lead in premise plumbing, the importance of testing for lead in drinking water, and to help them make decisions to mitigate lead risks. The Agency notes that analytical results are required to be provided to the facility under §141.92(f) but that results are not presented against a federal “pass/fail” standard. EPA notes that the action level for lead is used to evaluate the effectiveness of system-wide CCT and is not used in the requirements under §141.92. While the 3Ts does not specify an action level for schools and child care facilities, the guidance states that there “is no safe level of lead for children” and encourages schools and child care facilities to reduce lead levels to the lowest levels possible. In response to the commenter who stated that some facilities may not follow the 3Ts, the Agency notes that the 3Ts is guidance and not enforceable, as opposed to the sampling protocol in §141.92(b) which is a requirement. However, EPA expects that CWS dissemination of public education material and sampling under §141.92 will contribute to both increased familiarity with the 3Ts and will assist facilities in taking steps to reduce lead risks. Furthermore, EPA along with federal and non-federal partners are collaborating to continue to develop and update tools in the toolkit, such as template letters for schools to communicate about the program and sample results (please also see the response to comment Section 12.6). Finally, one commenter requested that EPA align its requirements in §141.92 with the 3Ts but did not identify specific requirements in §141.92 that should be changed based on information in the 3Ts (please see the response to comment Section 12.2 for discussion on sampling protocol and the 3Ts).

12.6 Resources for Remediation of Lead in Schools

EPA received comments on the proposed requirement in §141.92(f)(1) for CWSs to provide information about remediation options to schools and child care facilities with sampling results. EPA also received comments on resource limitations for remediation of lead in schools and child care facilities.

Requirement for Water Systems to Provide Remediation Information to Schools and Child Care Facilities

Summary of Comments

EPA received several comments requesting additional guidance regarding remediation of lead in schools and child care facilities. EPA also received some comments requesting clarification on what type of information about remediation options meets the requirement of §141.92(f)(1), with some commenters stating that the 3Ts contains this information. Other commenters noted that the requirement for providing information about remediation options was insufficient and requested that additional funding and support for remediation (e.g., trainings, webinars, workshops) be provided to schools and child care facilities. One commenter suggested requiring information about both short- and long-term remediation options.

Conversely, a few commenters did not support requiring the CWS to provide information about remediation options, stating that the state should make information available to school and child care facilities on request. Another commenter stated that a CWS may be subject to financial liability if a school or child care facility implements a remediation option and saw no reduction in lead levels, while another commenter stated the CWS would be responsible for replacing all lead-bearing premise plumbing.

Agency Response

EPA developed the 3Ts to provide tools and technical materials for schools, child care facilities, states, tribes, territories and drinking water systems to implement voluntary lead reduction programs (USEPA, 2018a). The toolkit is a collection of resources that include communication and recordkeeping templates, educational and technical factsheets, checklists, instructions and a web-based step-by-step seven module format. The implementation approach of the tools is (1) TRAINING to raise awareness of the 3Ts program and the potential causes and health effects of lead in drinking water, (2) TESTING drinking water in schools and child care facilities to identify potential lead problems, and (3) TAKING ACTION to reduce lead in drinking water. In an effort to continue to prioritize efforts to reduce lead exposure to children, EPA along with 14 federal and non-federal partners signed in 2019 the *Memorandum of Understanding (MOU) on Reducing Lead Levels in Drinking Water in Schools and Child Care Facilities* (USEPA, 2019a). The MOU partners are collaborating to continue to develop and update tools in the toolkit, such as template letters for schools to communicate about the program and sample results.

EPA does not agree that it should remove the requirement in §141.92(f)(1) for CWSs to provide information about remediation options to schools and child care facilities. The requirement in §141.92(f)(1) is necessary to meet EPA's intent for a CWS to provide public education on lead in drinking water to the schools and child care facilities it serves. The Agency has clarified that remediation information shall come from the 3Ts (USEPA, 2018a) or subsequent EPA guidance, which includes a variety of immediate and long-term actions schools and child care facilities can take to address lead risks in their facilities. The Agency disagrees that directing school and child care facilities to remediation options in the 3Ts will subject CWSs to liability issues. The CWS is not required to recommend a specific remediation action and the Agency is not aware of any instances of liability claim issues as a result of a school or child care facility implementing a remediation option as described in the 3Ts. The Agency also notes that the commenter did not provide information to support concerns regarding liability issues. While not required, EPA encourages water systems to voluntarily offer additional technical support to schools and child care facilities as resources allow to help them reduce lead levels. CWSs are not required by §141.92 to replace any premise plumbing or school infrastructure.

Additionally, the Agency does not agree with the commenters who stated that providing remediation information from the 3Ts under §141.92(f)(1) is insufficient. The 3Ts provides detailed information on interpreting lead results and implementing short- and long-term remediation options. Such options include disconnection of fixtures, signage, flushing, installation of POU devices, provision of bottled water, and replacement of affected outlets with lead free fixtures. The GAO indicated in a 2018 report that 60 percent of school districts were not familiar with the 3Ts, but for those that were, 68 percent reported finding the guidance helpful in reducing lead risks in their facilities (GAO, 2018). EPA notes that facility managers should work closely with maintenance staff and plumbers who may make repairs so that the chosen remediation options will sufficiently remove lead from the water and to understand the benefits and considerations associated with each option.

Potential Resource Limitations

Summary of Comments

Commenters noted that schools and child care facilities are responsible for making decisions regarding follow-up or remediation actions in response to lead sampling results, and expressed concerns regarding lack of financial resources. Several commenters requested increased federal funding for lead remediation in schools and child care facilities, noting that resources may be particularly limited in small and rural school districts. A few commenters also stated that there are often limitations on raising local funds for capital improvements to address lead risks. The commenters requested that EPA work with other federal agencies and Congress to secure federal appropriations for lead remediation in public schools and water infrastructure. EPA also received a comment regarding lack of federal funding for testing and remediation in schools that control their own water supply (e.g., groundwater source), stating that these facilities would be subject to the requirements of §141.92.

Agency Response

EPA acknowledges commenter concerns regarding the availability of funding for lead remediation in schools and child care facilities. Additional resources are available to help school and child care facilities in these efforts. EPA has included a companion document to the 3Ts: “Potential Funding Sources for Reducing Lead in Drinking Water in Schools and Child Care Facilities” (USEPA, 2019b) in the 3Ts and identifies potential funding sources for lead remediation and water quality-related projects. At this time, the guide lists 4 federal programs, 79 state programs, and 115 foundations/companies providing various funding opportunities that might help schools and child care facilities that lack resources to effectuate lead remediation. Additionally, on February 19, 2020, EPA announced the availability of $39.9 million in grant funding under Section 1459(B) of the SDWA, which included $22.8 in funding for lead remediation in schools and child care facilities under the *Reduction of Children's Exposure to Lead in Drinking Water at Schools and Child Care Facilities* National Priority Area (Fiscal Year (FY) 18 - FY 20 funds). The Request for Application (RFA) made funding available to eligible applicants for projects in disadvantaged communities under the affordability criteria defined in Section 1452(d)(3) of the SDWA. Eligible applicants such as states and municipalities were encouraged to build workplans to incorporate funding for remediation in schools and child care facilities. Additionally, nonprofit organizations serving a public water system, water systems serving an area governed by an Indian Tribe, CWSs, and NTNCWSs were eligible to apply. Requests that EPA work with other federal agencies and Congress to secure federal appropriations for lead remediation in schools and water infrastructure, and that there be an increased level of federal funding for remediating lead found in schools, are outside of the scope of this regulatory action.

Finally, EPA recognizes comments regarding the applicability of §141.92 to schools and child care facilities that are regulated as public water systems. The Agency has clarified in the introduction to §141.92, that the requirements of §141.92 do not apply to schools and child care facilities that are regulated as public water systems. Instead, these facilities are subject to the monitoring requirements under §141.86. Additional information about the applicability of §141.92 is provided in the response to comment Sections 12.2 and 12.3.

12.7 Results of School and Child Care Sampling

The Agency received comments on the proposed requirement in §141.92(f) that states CWSs must provide analytical results from lead monitoring in schools and child care facilities to the school or child care facility (along with information about remediation options), the local and state health department, and the primacy agency no later than 30 days after receipt of results.

Summary of Comments

Some commenters supported the requirements in §141.92(f) but suggested that results be made available sooner than 30 days after receipt of results (e.g., 24 hours, 7 days, 14 days). Some commenters noted that there is no requirement for schools and child care facilities to share the results with staff, parents, guardians, and other building staff. They requested that EPA add requirements for the CWS and/or states to make the results of school and child care facility testing available to the public to ensure building occupants are aware of any lead risks. A few commenters suggested public notification when results show elevated lead levels (e.g., exceeding 15 µg/L). One commenter also stated that results be accessible in languages spoken by the CWS's customers, particularly if the system serves more than 3,300 people. Conversely, one commenter stated results would be subject to Freedom of Information Act (FOIA) requirements and "could become a publicity nightmare" because it may blur "the distinction of whether the school or the water system is responsible for the water within the school's premise plumbing." Other commenters questioned how schools and child care facilities should communicate lead results and remediation options to building occupants, with one commenter noting that school and child care facilities may not know how to interpret results.

One commenter stated that their state regulations require reporting of school and child care lead testing results on a public website and argue that the requirements in §141.92(f) for reporting results to the primacy agency would result in the additional reporting of thousands of sample results, placing an undue burden on the system. Another commenter requested clarification on what is required of the CWS and primacy agency after receiving results.

Agency Response

EPA disagrees with commenters who requested that results be provided to schools and child care facilities sooner than 30 days. Providing results within 30 days is consistent with the notification of results for tap sampling under §141.86 and is appropriate for the CWS to fulfill its role in assisting schools and child care facilities with sampling and testing for lead. Additionally, EPA notes that §141.92(f)(1) states that results should be provided "as soon as practicable" and that 30 days is the maximum length of time for providing results. Therefore, EPA has retained the requirement in §141.92(f)(1) for the CWS to provide the sampling results to schools and child care facilities no later than 30 days after receipt. For consistency across other reporting requirements, EPA has revised §§141.92(f)(2) such that the CWS reports all results to local and state health departments as well as to the primacy agency as part of annual reporting detailed in §141.90(i) (see the response to comment Section 14 for more information). EPA has also indicated in §141.92(g) that when testing is offered on request, the CWS must fulfill the requirements of §141.92(f) for the schools and child care facilities that request sampling.

EPA does not agree with revising §141.92(f) to require water systems or the state to make the results of school and child care facility sampling available to the public. Requiring the CWS and/or the state to make results publicly available would likely lead to public inquiries regarding results and remediation activities. Neither CWSs nor state agencies are responsible for remediation activities or follow-up actions and they are not positioned to answer questions from the public on any actions that a school or child care facility manager may elect to pursue after receiving results. Furthermore, schools and child care facilities may elect to implement their own 3Ts programs and would not necessarily report these activities or results to the water system or state agencies resulting in outdated information on water system or agency websites. While not required, EPA encourages CWSs, the primacy agency, and health agencies to use the school sampling results. As resources allow, a system or agency may choose to analyze trends in lead sampling results to assess the need for additional resources or support.

The Agency also disagrees with requiring a public notice procedure for school and child care facilities. Public notification requirements under §141.201 are for system-level lead exceedances and are provided to all water system customers. School and child care facilities are water system customers and therefore receive the public notices and public education materials as specified under §§141.201 and 141.85. However, it is not feasible for the CWS to identify all consumers within schools and child care facilities and distribute results or other information to those individuals. Furthermore, while EPA acknowledges that sampling results may be subject to FOIA requirements, the Agency does not agree with comments that this would "become a publicity nightmare" because it could blur "the distinction of whether the school or the water system is responsible for the water within the school's premise plumbing." The requirements in §141.92(f) clearly detail that the CWS is responsible for providing results to the school and care facility and not to conduct remediation activities. While not required, the Agency encourages school and child care facilities to share public education materials, sampling results, and information about follow-up activities with building occupants and stakeholders as recommended in the 3Ts (see response to comment Section 12.6 for more information). This may include providing information in languages spoken by the users of these facilities, parents, and guardians.

While one commenter stated that schools and child care facilities are not necessarily forthcoming about results or may not understand them, the Agency anticipates that the dissemination of the 3Ts will increase understanding of lead risks in schools and child care facilities and the importance of communicating sampling results and follow-up actions. The Agency notes requests for additional guidance to facilitate these efforts. The 3Ts is a collection of resources that include communication and recordkeeping templates, educational and technical factsheets, checklists, instructions and a web-based step-by-step seven module format (USEPA, 2018a). As noted in the response to comment Section 12.6, EPA is collaborating with 14 federal and non-federal partners to develop and update tools in the toolkit, such as template letters for schools to communicate about the program and sample results (USEPA, 2019a). The 3Ts Toolkit resources can be found at https://www.epa.gov/safewater/3Ts.

EPA acknowledges that several jurisdictions (e.g., select states and cities) require public reporting of lead sampling results including parental notification. The requirements of §141.92 do not preclude states and cities from incorporating such requirements in state or local law or regulations. EPA notes commenter confusion regarding reporting requirements in §141.92(f)(2) for schools and child care facilities subject to local or state-level lead sampling requirements. It is not the Agency's intention for a CWS to report sampling results to the state that are collected outside of the requirements of §141.92. The Agency has clarified in §141.92(d) that a state may provide a full or partial waiver to CWSs for the requirements of §141.92 when there are existing lead sampling requirements that meet specified conditions (see the response to comment Section 12.8).

12.8 Waivers for Alternative Sampling Programs

EPA received comments on the proposed requirement in §141.92(d) that allows a state to provide CWSs a written waiver for §141.92 where local or state law or regulations requires schools and child care facilities to be tested in a way that is consistent with the requirements described in §141.92.

Summary of Comments

EPA received many comments on the alternative school and child care lead sampling programs in §141.92(d). Commenters noted an inconsistency between the preamble in the November 2019 notice that described the state providing waivers to CWSs where existing school and child care sampling requirements are at least as stringent as §141.92, and the proposed requirement that stated "the water system may execute that program [existing state or local regulations] to comply with the requirements of this section," implying a different mechanism. One commenter also noted that the preamble described partial waivers and requested that §141.92(d) be revised to include both full and partial waivers. A few commenters also requested that EPA consider schools that are conducting monitoring themselves as part of facility or school district policy. A few commenters requested EPA provide clarity on the requirements for a waiver.

Some commenters expressed concern that the requirements in §141.92 would result in duplicative testing efforts and encouraged EPA to accommodate the sampling protocols of existing state and local programs, stating that programs using different stagnation times or sample volumes should not be excluded if they require sampling more outlets, sampling more frequently, and include remediation activities. A few commenters described specific state programs (e.g., California, Minnesota) and requested that waivers be issued for these programs. Conversely, EPA also received a comment that waivers should only be granted under more stringent criteria (e.g., 5 µg/L action level, required remediation, public reporting of results).

A few commenters noted that §141.92(d) does not specify the effective length of the waiver. EPA received suggestions for both permanent waivers and short renewal periods. A few commenters also requested that EPA consider how it could recognize WIIN Act resources that have already been dedicated to such efforts as part of §141.92 requirements, and asked if facilities tested using WIIN Act resources within a five year testing period would be required to also be tested by the water system.

Finally, a few commenters expressed concerns that the provision of §141.92(d) would not address the lack of standardized approaches across states (e.g., some state programs are voluntary, only require one time testing with no follow-up or remediation required) and that some states with more stringent requirements for school and child care sampling may "loosen their efforts and enforcement."

Agency Response

EPA notes that many commenters supported the proposed provision allowing a state or primacy agency to waive school and child care facility sampling requirements for individual CWSs to avoid duplication of effort. The Agency has retained this provision in the final rule but recognizes inconsistencies between the proposed requirements in §141.92(d) and the preamble of the November 2019 notice regarding CWS requirements and partial waivers. In response, the Agency has clarified the conditions under which a state may exempt water systems from the requirements of §141.92. The Agency also clarifies that §141.92(d) is intended to exempt CWSs from the requirements of §141.92 as applicable. During the one round of mandatory sampling, a state may issue a CWS a written waiver if there is a state or local program to sample for lead in drinking water at elementary schools or child care facilities that meets the requirements of this rule. This also may include elementary schools or child care facilities that are sampling for lead through facility or district policy. A CWS will still be required to offer sampling to secondary schools during the first cycle of sampling if there is no state or local program that meets the requirements of this rule. When CWSs are offering sampling on request in accordance with §141.92(a)(4) and §141.92(g), a state may also issue waivers for voluntary sampling programs that meet the requirements of §141.92(d) as stated in §141.92(g)(4).

If a program is limited to a subset of schools and child care facilities defined in §141.92(a)(1), a state may issue a partial waiver. For example, if a state has a required program for testing lead in drinking water in both elementary and secondary public schools but not in other types of schools or child care facilities, then a CWS serving only public schools can receive a full waiver for the duration of the program. If a CWSs serves both public and non-public schools and child care facilities, then the CWS would be required to fulfill the requirements of §141.92 at the non-public schools and child care facilities and could receive a partial waiver to acknowledge that the CWS is not responsible for sampling in public schools. When a CWS is required to offer sampling on request, a state may also issue waivers for existing voluntary programs. For example, if a state agency offers testing to all public schools when requested, the state could grant a partial waiver such that a CWS would not be required to offer sampling to public secondary schools in its service area during the time the CWS is conducting mandatory sampling in elementary schools and child care facilities. When the CWS is offering sampling on request to all schools and child care facilities, a state could then grant a waiver such that the CWS would not be required to offer sampling to the elementary and secondary public schools in its service area for the duration of the voluntary program. EPA acknowledges that existing programs often require sampling of more outlets, remediation, and other elements consistent with the 3Ts, and that sampling protocol (e.g., sample size, stagnation time, and number of samples) often varies from the requirements in §141.92(b). In response, §141.92(d)(1) has been revised to specify elements that must be met in order to be eligible for a waiver. A CWS may be granted a waiver if a program meets the requirements of §141.92 as stated in §141.92(d)(1)(i). Additionally, under §141.92(d)(1)(ii), if the sampling meets the final rule requirements, with the exception of stagnation time and sample volume, a wavier may be granted if remediation actions are required as part of the program (replacement of fixtures, disconnection of fixtures, and installation of POU devices). Likewise, programs with less frequent sampling (e.g., every six years) that sample more outlets and require remediation, may meet the requirements for a waiver under §141.92(d)(1)(iii). The Agency does not believe it is appropriate to allow shorter stagnation times and larger sample volumes unless paired with other activities as that protocol has the potential to underestimate lead levels compared to the protocol in §141.92(b)(1)(vi). Similarly, less frequent monitoring on its own would not be as protective as the requirements in §141.92.

Some mandatory and voluntary programs are or have previously been funded, wholly or in part, under grant programs for school and child care facility lead testing established by the WIIN Act. Therefore, waivers may also be granted if sampling is conducted in accordance with a grant awarded under Section 1464(d) of the SDWA in accordance with §141.92(d)(1)(iv). The Agency also acknowledges a potential lack of clarity in §141.92(d) regarding the length of waivers. In the final rule, §141.92(d)(2) has been added to specify that a waiver may not exceed the duration of a mandatory or voluntary sampling program, upon which a CWS will fulfill the requirements of §141.92 as specified.

EPA disagrees with comments that waivers under §141.92(d) should only be granted to programs that require sampling of all outlets, remediation at specific levels (e.g., 5 µg/L), and public availability of results as these requirements exceed those provided in §141.92. Please see the response to comment Sections 12.2, 12.5, and 12.7 for further discussion of these topics. The Agency also disagrees with "grandfathering" the results of prior sampling, as the sampling may not comport with the minimum requirements set by §141.92. Furthermore, while some schools and child care facilities may have been sampled in the past, lead levels at one outlet do not necessarily characterize those at another and results may vary at an individual outlet over time due to changing conditions. However, under §141.92(d), if an existing program meets the stated requirements and is ongoing, the state may grant individual CWSs waivers as described above.

EPA is aware that there is variability in approaches across existing state-level school and child care sampling programs. However, the Agency provides a standardized approach in §141.92(b)(1)(vi) and has identified the smallest set of activities that must be required for a state to issue a waiver for mandatory or on request testing under §141.92(d) or §141.92(g), respectively. The Agency notes that the proposed rule does not preclude a state from enacting laws or regulations that require additional activities to further address lead in schools and child care facilities. Furthermore, the Agency did not request that a state or locality with existing requirements that are more rigorous than §141.92 loosen their efforts and enforcement. Instead, §141.92(d) has been changed to accommodate existing efforts and avoid duplication of efforts. The Agency suggests that the public education and sampling requirements in §141.92 are sufficient to inform and educate targeted CWS customers on the importance of sampling for lead in drinking water in schools and child care facilities and help them make decisions to mitigate lead risks.

EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

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13 Find-and-Fix

EPA requested comment on several aspects of find-and-fix. EPA asked for feedback on general issues related to find-and-fix. In addition, commenters were asked to present any alternatives to find-and-fix. EPA requested comment on Site Assessment (Follow-Up Tap Sampling) as well as how find-and-fix addresses issues related to water quality parameter (WQP) sampling, corrosion control treatment (CCT) and distribution system fixes. EPA requested additional comment on any issues that may be raised with respect to the responsibilities of the homeowner or the water system. Finally, EPA requested comment on the proposed schedule in the revisions for and "fixes" to be done by the water system.

EPA received many comments on the proposed requirements for find-and-fix in § 141.82(j),. EPA received comments both in support and opposition to the proposed provisions. EPA received comments regarding CCT adjustments, follow-up tap sample collection and WQP monitoring, as well as homeowner and water system responsibilities.

13.1 General Comments

Summary of Comments

Some commenters have asked for clarification of certain aspects of the regulation. Several commenters have requested a clearer definition of what is being "fixed." More specifically, one of the commenters wanted more explanation on the phrase "perform needed action." Meanwhile, another commenter wanted the regulation to include minimum criteria on what would be included in a find-and-fix assessment. Other issues for clarification included: (1) if find-and-fix only applies to Tier 1 sample results, (2) if find-and-fix is only triggered by tap samples collected for compliance purposes, and (3) what find-and-fix actions are warranted in case of an ALE or TLE exceedance.

A few commenters mentioned issues relating to state primacy and regulatory agencies. One commenter called for guidance on "find-and-fix approaches" such as what to do if: (1) there is an exceedance in the action or trigger level, and (2) the lead issues associated with certain sample WQP sites are resolved. A couple other commenters recommended that language in the find-and-fix section should clearly let agencies set guidelines for how to address the "localized issues" when there is an exceedance. Another commenter also addressed state regulatory agencies in that find-and-fix should mention the lead corrosion expertise that is provided by these agencies to aid in carrying out find-and-fix in a "scientifically sound manner." One commenter suggested a template that can be used to report find-and-fix related actions to the primacy agency. Conversely, a commenter advised against making states responsible for recordkeeping of find-and-fix actions that happen within their borders.

Several commenters have suggested eliminating the find-and-fix provisions. A couple commenters have mentioned that the find-and-fix revisions would increase workload or are burdensome. One commenter mentioned that find-and-fix follow-up sampling requirements may overlap with 90th percentile trigger level or action level exceedances. Another commenter states that find-and-fix should not be included in the Lead and Copper Rule revisions (LCRR) due to the extra burden it will place on small and medium utilities that have fewer resources and that single sample exceedances do not always correlate with 90th percentile exceedances.

A couple commenters recommended moving find-and-fix to another section of the LCRR. One commenter suggested moving find-and-fix from § 141.82(j) to either § 141.81 or § 141.86 in the final rule since systems "are only prompted to review § 141.82 after being triggered into [optimal corrosion control treatment]OCCT, which is outlined in § 141.81." Another commenter suggested moving the proposed provisions to §141.85.

A few commenters raise the possibility that any lead source investigation resulting from an exceedance may be inconclusive. A couple commenters specify that there should be language in the find-and-fix section that addresses this type of scenario. Another comment mentions a scenario in which there is an elevated lead sample that is “non-repeatable”, which would most likely be unable to be solved.

One significant issue related to find-and-fix is whether the find-and-fix process is triggered by sampling conducted by the water system that is either voluntary or required but in response to customer-requests. Commenters that mentioned these types of tap samples advised against using those samples to trigger the find-and-fix process. Two commenters added that the use of voluntary or required customer-requested samples would disincentivize utilities from offering free sampling services to customers due to the added burden of find-and-fix. Another commenter adds that the addition of voluntary/customer-requested sampling to routine sampling would result in a large number of sampling sites to maintain, which would put a strain on resources.

One of the commenters mentioned that find-and-fix is not practical to carry out, is unclear in delineating water system responsibilities, recommends EPA “develops a health-based number,” and focuses more on CCT than educating the customer on in-home lead mitigation. The other mentions a lack of a specific “fix.” Some commenters suggested that Primacy Agencies should set guidelines for how to address localized issues.

Agency Response

EPA agrees with commenters that recommended clear delineation of the water system’s primacy agencies’ responsibilities, and has clarified that the water system must submit sampling results and recommendations to the state. Where CCT is being modified, the state is required (§141.82(j)(4)-(7)) to monitor or keep track of any system’s progress. EPA determined it is important that find-and-fix follow up and corrective actions be specified in the rule to assure consistent steps to evaluate elevated levels of lead. EPA made several revisions in the final rule to clearly state the steps water systems must take and oversight requirements for states. EPA will work with states and stakeholders to assure technical guidance is available to inform the implementation of find-and-fix actions.

The Agency does not agree that the find-and-fix requirements should be eliminated. Identifying sources of lead in drinking water is a critical component to mitigating lead and improving public health protection. Also, a system may not exceed the lead AL, but can still have 10 percent of tap samples above 15 µg/L and it is important to understand if it is a localized problem or identifies water quality issues in the distribution system. EPA did, however, in response to commenters’ concerns that more clarity was needed, revise the proposed requirements in the final rule to provide a step-wise process by which water systems can access individual sites, evaluate water quality at the site, and provide a recommendation for action the water system can take. See response to comment Sections 13.2 and 13.3 for a discussion of the changes made in response to comments for alternative approaches to the find-and-fix and to the site assessment process. In addition, EPA decided to keep find-and-fix in §141.82 as opposed to §141.86 since it is just lead and copper tap sampling and does not address WQP monitoring nor any assessment of CCT and since it is limited to the sites in the testing program, there is already a good idea about the lead source at the site. Section 141.85 focuses on public education and not lead and copper tap sampling, WQP sampling or corrosion control treatment assessment, and therefore only addresses site assessment. Section 141.81 addresses the timing for completion of steps as systems optimize or re-optimize CCT whereas find-and-fix has an assessment to see if optimization/re-optimization is even necessary.

EPA also clarifies that in the case of an individual tap sample exceeding 10 µg/L (the trigger level), no find-and-fix actions are required. However, in the case of a tap sample above 15 µg/L, EPA restates that the Site Assessment (follow-up tap sampling), and Corrosion Control Treatment Assessment sampling must occur. The results are then evaluated to determine the possible source and subsequently propose a “fix” whether it be optimization of CCT, localized treatment, other distribution system actions, no action taken, etc. This “fix” should then be documented and submitted to the primacy agency for approval or specification of a different approach. If state-approved treatment recommendation requires installation of OCCT, the water system must follow the schedule outlined in §141.82(j)(5)-(7), concerning optimization and follow-up sampling post “fix.” Systems in the process of optimizing or re-optimizing OCCT under §141.82(a) – (f) do not need to submit a recommendation for find-and-fix, since they are in the process of revising their CCT. Systems with multiple sites above the lead action level may be able to combine find-and-fix recommendations for sites that would be covered by the fix – localized CCT adjustment or flushing in an area of the distribution system that covers multiple sites with action level exceedances. If the source of the action level exceedance is in-home and outside of the jurisdiction of the water system, then the water system must document the finding in their “recommendation to the state (§141.82(j)(3).” See also the response to comment Section 13.5. In this case, the place where the exceedance occurs stays in the sampling pool, until the owner (or the water system) addresses the source of the exceedance and the site no longer meets the tiering criteria.

The Agency agrees with commenters that find-and-fix only applies to required tap sampling for compliance under §141.86 and not voluntary sampling and has revised the final rule accordingly. The LCRR does not require water systems to conduct find-and-fix activities for tap sampling they perform voluntarily although water systems may choose to conduct find-and-fix as a part of their voluntary tap sampling program. EPA disagrees with the commenter that there is overlap between the Site Assessment samples and the 90th percentile. The LCRR excludes the find-and-fix Site Assessment samples from the 90th percentile calculation.

EPA does not believe that a new health-based level for lead is necessary to prompt find-and-fix activities. EPA has established a health based MCLG for lead of zero and established an action level of 15 µg/L based on treatment feasibility.

13.2 Recommended Alternatives to Find-and-Fix

Summary of Comments

Several commenters recommended simplification of the current find-and-fix section to a three-step process called Sample Site Assessment. The commenters recommended the following three steps:

- Step 1 - Keep Step 1 of the find-and-fix section (§141.82(j)(1). The proposed Step 1 in the LCRR is the Corrosion Control Treatment (CCT) Assessment where the water system takes a WQP sample at a sampling point in the distribution system near the ALE (§141.82(j)(1)). However, Step 1 would also require the water system and the customer to identify on-site corrective actions.
- Step 2 – The water system should be required to offer additional educational and sampling materials. The customer should also receive assistance in identifying lead service lines (LSLs). In the event of an exceedance, follow-up tap sampling should also be offered to neighboring

homes with similar characteristics. Nevertheless, internal fixes should not be carried out by utilities.

- Step 3 – The activities carried out in Steps 1 and 2 should be documented and the results and documentation should be provided to the state within 3 months.

Commenters suggested simplifying because: (1) the existing find-and-fix section exposes states and utilities to more liabilities and (2) reevaluation of CCT should not be determined on the basis of one tap sample greater than the lead action level. One commenter describes another three-step process, where the utility: (1) determines if the sample was collected properly, offers to re-test, and provides education materials on lead mitigation; (2) checks WQP sites for irregularities and addresses any CCT issues that may arise; and (3) sends documentation of activities to the state.

Alternatively, other commenters recommended different revisions which include:

- Each exceedance should trigger follow-up testing at the same site as the exceedance and a site nearby in the same pressure area.
- Based on the results of the exceedance and follow-up sample, the water system would then determine if there are any on-site sources of lead or there is a site-specific remedy.
- If during a round of monitoring, there is a pattern of exceedances, then the water system would consider optimizing its CCT.

According to one commenter, CCT is not always the best “fix” for a tap sample site that is greater than the lead action level or trigger level. This commenter also suggests that the state agency must be able to “review and approve” and lead mitigation actions.

There were two commenters that suggested changing “find-and-fix” to “Follow-Up Sampling.” A commenter suggests the requirements should be placed in the regulation section for public education rather than in the requirements for CCT. The commenter suggested: (1) that one tap sample exceedance should not trigger a re-evaluation of CCT, (2) that follow-up tap sampling should focus more on mitigating site-specific lead issues and (3) that sampling from “nearby structures be eliminated from the rule.”

Another commenter suggests an overhaul of the rule that would include the following steps:

- Schedule and carry out a follow-up tap sample, while providing the customer with information on lead and its mitigation.
- Help the customer with “initial remediation steps.”
- Determine the materials that make up the home’s plumbing.
- If there is an LSL, conduct more follow-up sampling.
- Document if there is a refusal and send any reports to the state at the end of the monitoring period.
- Gather all results and “include with the CCT evaluation.”

- If there is a section of the distribution system that is lacking monitoring, the water system can relocate an existing WQP sampling site.

Commenters also gave specific recommendations for modifying find-and-fix. One commenter suggested a find-and-fix procedure that ensures quick communication of results and assistance to the owner in determining the causes of lead concentration exceedances. Recommendations included: (1) instructions on follow-up sampling logistics or sampling by a trained professional, (2) testing on lead and other corrosion-related WQPs, gathering of information on plumbing materials and water use patterns, (3) timely provision of results to customers, (4) and the keeping of gathered data by the water system to aid in any future review of system wide corrosion control issues. Meanwhile, another commenter added that there should be: (1) a list of follow-up sampling procedures provided by EPA, (2) an update for the follow-up samples in the Safe Drinking Water Information System (SDWIS), and (3) that the primacy agency should not be responsible for reviewing corrective actions. Conversely, a different commenter suggests that: (1) post-notification residents should be educated about lead mitigation and provided point-of-use (POU) lead filters; (2) the water system should determine the source of lead at the home; (3) there should be a full lead service line replacement (LSLR), if there is an LSL; and (4) there should be more public education about lead.

Several comments suggested that find-and-fix have a more site-specific focus. One comment suggests that the focus of this rule should be narrowed down to a single property and not the whole system. The commenter also recommended, as did others, that find-and-fix be moved out of the CCT section of the regulations. Two other commenters suggested the focus should be on LSLR. The latter commenter cited that 50-75 percent of lead exceedances are due to LSLs. Another commenter pointed out the lack of solutions in the rule and that the rule should allow for more choice in solutions.

Agency Response

EPA considered all comments on the find-and-fix provisions and has determined some modification to the steps proposed are appropriate for the final rule. These modifications include renaming the WQP monitoring and follow-up tap sampling to Corrosion Control Treatment Assessment and Site Assessment to more accurately convey their purpose. These two steps are critical to identifying the source of lead in drinking water, if possible, and evaluating water quality in the distribution system. However, the agency does not agree that additional requirements need be included for Site Assessment regarding the tap sampling protocol that should be used, due to the vast differences in LSLs and plumbing configurations in homes and buildings that would be sampled.

EPA reiterates that the purpose of find-and-fix is to identify or “fix” distribution system and corrosion control issues that might be responsible for elevated lead in drinking water; however, the find-and-fix provision in the final rule does not require the water system to conduct LSLR. Other provisions in the final rule may require LSLR. While a water system is not required to conduct LSLR as a result of find-and-fix, water systems may use the information from find-and-fix follow-up tap sampling to prioritize LSLRs. Similarly, the find-and-fix provisions do not require water systems to replace interior plumbing materials in the locations where elevated lead levels are found.

As noted above, in response to comments recommending a title change and an overhaul of find-and-fix provisions, EPA agrees and has renamed some steps and modified find-and-fix requirements to clarify and to convey the Agency intent. Step 1, which was previously referred to as “Water Quality Parameter

Sampling", is now referred to as "Corrosion Control Treatment Assessment." Step 2 or "Follow-Up Tap Sampling" has been renamed "Site Assessment." These names are more representative of the reasons that these samples are collected. Further, the Agency has decided to maintain the original eight steps in the final rule in order to determine the source of the lead, if possible, and then determine if there is any systematic "fix" (i.e., OCCT, spot flushing).

13.3 Tap Sampling Site Assessment

Summary of Comments

A couple of commenters asked for clarification or modification of language in the regulation. One commenter recommends adding the word "lead" so that §141.82(j)(2) reads: "Water systems shall collect a follow-up lead sample at any tap sample site that exceeds the lead action level…" The same commenter also asked for more clarification in the regulatory language on what should happen if the result of follow-up tap sample is also above the action level.

A couple of commenters brought up issues related to the location of follow-up tap sampling. One commenter questioned the value of doing follow-up tap sampling at a site near the site where the exceedance occurred due to possible site-specific variations, even in places there the "structural characteristics" are similar. Another commenter recommended that follow-up tap sampling should be done by the water system, as opposed to the customer and should be used to engage the customer on lead sources and lead mitigation.

A few commenters touched on what to do if there is a refusal or lack of response after the water system has offered a follow-up tap sample. All commenters suggested that the choice of an alternate site for follow-up tap sampling in the case of a refusal or lack of response may miss certain site-specific lead sources such as fixtures. As a solution, one commenter proposed that water systems document that they made "best efforts to enter and sample the property."

A few commenters brought up the issue of what should be done when a sample site might not have a follow-up sample greater than the action level, or the issue has been resolved. One commenter has asked if a tap sampling site should be removed if the customer rejects a follow-up sample. Another commenter recommended that the rule contain instructions on whether the sampling site should be maintained in the case that follow-up sampling shows that the lead source is an in-house fixture (i.e., faucet). Another commenter has suggested that the follow-up tap sample include a verification sample.

A couple of commenters noted the specific sampling procedure of the follow-up sample. One commenter suggested that the rule language concerning follow-up tap samples is "too vague." The same commenter recommends EPA list "pre-established tap sample collection procedures and volumes" for targeted lead detection. Another commenter mentioned that a follow-up tap sample is not enough to confirm an exceedance. Another commenter expressed a preference for "having waterworks collect the second sample using the same procedures as the first," for a more "direct comparison." The commenter was concerned that "giv[ing] waterworks leeway" in sample collection could lead to instances where a "sample will mask a high lead level and would lead the customer to believe there was no risk associated with their water."

There are a couple commenters that raise concerns with the follow-up tap sampling timeline. One commenter mentioned that the regulation is unclear if the deadline for follow-up tap sampling is 30 days after the time the first sample was taken or from the time the laboratory detected the high results. Another commenter recommends the timeline be shortened to 14 days. A third commenter stated that if the follow-up tap sample is a confirmation sample then “collecting it 30 days from receipt of results of the first sample may be too late.” If the sample is “a test to see if changes altering CCT in the area have eliminated the issue,” then “EPA should extend the follow-up monitoring to 60 days from obtaining the original sample result.”

Agency Response

The LCRR requires a two-pronged sampling approach to determine the possible cause of a tap sample greater than 15 µg/L. Site Assessment sampling determines if the cause of the elevated level of lead is due to a specific source of lead and to educate the consumer. Site Assessment sampling must be completed within 30 days. The 30-day timeline takes into account the logistics of coordinating tap sampling with the customer. Results from both CCT Assessment and Site Assessment samples should aid the water system and the customer in determining if the cause of the elevated lead concentration is due to site-specific or systemic issues.

EPA agrees that situations may occur when a customer refuses or is non-responsive to the water system’s request to collect a follow-up tap sample and obtaining an alternative similar site may not be possible or appropriate. EPA agrees that sampling at a different site in the vicinity will not help assess the lead source at the site that was above 15 µg/L, so the final rule does not require systems to do this. EPA notes there is no obligation to conduct follow-up tap sampling at an alternative site nearby with similar characteristics and allows water systems to provide documentation to the state, explaining why it was unable to collect a follow-up sample in the event of refusal or non-response. In response to concerns that were raised regarding follow-up tap sampling in case of refusal or lack of response, the Agency has modified find-and-fix to more clearly state that in the case of lack of response or refusal of a follow-up tap sample, the water system must provide the state with the appropriate documentation of the refusal or lack of response.

In response to comments about replacing tap sampling sites following find-and-fix activities, EPA notes sites can be removed from the tap sampling pool if they have been remediated and no longer meet the tiering criteria. For example, when an LSL has been replaced at a single-family residence, then the site no longer meets the Tier 1 criteria and should be replaced with a site that meets the Tier 1 criteria. Sites that continue to meet the tiering criteria should be retained in the sampling pool.

In response to comments addressing sampling issues, the Agency has decided to maintain flexibility for the tap sampling protocol for collecting the follow-up sample. The agency does not agree that additional requirements need be included for Site Assessment with regard to the tap sampling protocol that should be used, due to the vast differences in LSLs and plumbing configurations in homes and buildings that would be sampled. Water systems may use the protocol they determine to be the best method for understanding the source of lead in drinking water at a particular site.

In response to comments on the follow-up tap sampling timeline, the Agency has determined that the 30-day timeline for collecting the follow-up tap sample is feasible. In order to collect a follow-up tap sample, the water system would need to coordinate with the customer on an appropriate time for sample collection. Circumstances, such as the customer’s limited availability, may present challenges to collecting a tap sample. Therefore, 30 days should be ample time to resolve any issues with the customer prior to follow-up tap sample collection. If the water system is unable to carry out follow-up tap sampling (i.e., the customer refuses a follow-up tap sample or there is a lack of response), the water system is responsible for documenting the reason for not carrying out the sampling.

13.4 Recommendations for CCT and Distribution System Fixes

Summary of Comments

A significant number of commenters expressed concerns that a single elevated lead tap sample could trigger a system-wide corrosion control installation or re-optimization. One commenter stated that requiring public notification for the entire utility if one lead sample is over the action limit and requiring the installation of corrosion control equipment for the entire utility if the cause of a sample exceedance is listed as corrosive water in one home, is excessive. Others commented that Corrosion Control Treatment Assessment in § 141.82(j)(1) is unwarranted, inappropriate, or a disproportionate response which could result in expensive and time-consuming distribution system evaluations. Many commented that corrosion control adjustments should only be made in response to data demonstrating that current corrosion control is deficient throughout the distribution system, and not in response to a small number of samples. Another commenter suggested "individual sample results over the action level should only require a check that treatment was operating properly and achieving its optimum water quality parameters: systems should determine that there were no treatment upsets and that each parameter was within the state approved limits." A couple of commenters maintain that any optimization or review of CCT should be through trend analysis and not based on a one-time sample result. Commenters also brought up issues related to determining the in-home sources of lead after a tap sample is found to be greater than the action level. Another commenter suggests that solutions to single exceedances focus more on in-home actions (education about lead in the home) and water distribution system actions (i.e., flushing, nitrification monitoring). These recommendations are supported by the localized nature of the WQP site results, which was mentioned by a different commenter.

One commenter requested clarity on § 141.82(j)(4), where "[t]he State shall approve the treatment recommendation [from § 141.82(j)(3)] or specify a different approach." The commenter requested, "via rule or guidance, what 'different approaches' [in § 141.82(j)(4)] would be appropriate at a single location where treatment changes will not correct the issue," noting that only "certain actions (such as treatment changes and service line replacements) can be taken by the supply." Another commenter suggested including a flushing program as an option for reducing elevated lead concentrations and provided anecdotal data illustrating this approach's potential for reducing the presence of lead at individual sites.

A couple commenters expressed concern that additional WQP sites that would be added with every single tap sample greater than the lead action level of 15 µg/L. One commenter mentioned that the addition of a new WQP monitoring site would be an extra burden and each system would have a unique number of WQP monitoring sites to "meet compliance." Meanwhile, another commenter called the addition of a WQP site and an investigation into the CCT after a single exceedance "irresponsible." One commenter suggested instead to "track compliance with this section and others based on when the State is notified of the sample result." Another commenter suggested improving the SDWIS database so that primacy agencies keep track of the number of water quality monitoring sites.

Agency Response

The find-and-fix provision does not require CCT installation or re-optimization in response to an individual tap sample exceedance of 15 µg/L. It requires water systems to engage in the process of taking a follow-up tap sample to help the water system determine the potential source of lead contamination (e.g., premise plumbing, LSL) and a WQP sample to help determine if CCT is optimized, if additional WQP sites are needed, and/or WQPs set by the state are being met. In addition to the follow-up tap sample and the WQP sampling, the water system must evaluate the results of the monitoring to determine whether distribution system actions are necessary. CCT adjustment is one of the possible distribution actions identified in § 141.82(j)(3), but it may not be necessary to address every exceedance. If the water system does not have CCT and is required to install it, then as per § 141.82(j)(5), the water system "must follow the schedule in § 141.81(e)."

In response to comments, EPA made several modifications to the find-and-fix requirements to clarify the steps and actions water systems must take to comply. There is nothing in the final find-and-fix provision of the final rule that requires systems to "fix" premise pluming or conduct LSLR. The final rule requires water systems to include in their recommendation to the state the cause of the elevated lead level if known, their recommended distribution system or CCT action, or justification for not recommending any adjustment of CCT or other distribution system actions. The state has six months to approve the system's recommendation or specify a different approach. In the case the water system takes CCT or distribution actions, the water system has 12 months to complete the state-approved approach. Afterwards, the water system would need to conduct the necessary WQP and follow-up tap sampling (See § 141.82(j)(6)-(8)). EPA has determined that in some instances the localized elevated levels of lead may indicate that an adjustment to CCT may be needed to assure optimized corrosion control throughout the distribution system; therefore, revisions to CCT are among the actions that systems should consider when preparing their recommendations following a find-and-fix. Further, the final rule emphasizes localized distribution system management as the likely fix. Distribution system mitigation strategies could include flushing or other strategies to improve water quality management.

In response to comments regarding the addition of WQP sites, the final rule establishes a cap of twice the number of the minimum WQP sampling sites that are specified in the previous LCR (§141.87(a)(2)). If the number of sites exceeds this cap, then the state has the discretion to "switch out" these sites. EPA also agrees with commenters who suggested there needs to be a process whereby additional WQP sites can be removed. Therefore, the final rule allows removal of WQP sites during the CCT evaluation conducted during the sanitary survey.

13.5 Water System and Homeowner Responsibilities

Summary of Comments

A significant number of commenters suggested that find-and-fix should focus more on in-home lead sources, mitigation, and engagement with customers. Meanwhile, another clearly states that "The focus in the final rule should be lead service line removal and filter provision for immediately lead risk reduction." Many commenters view find-and-fix as a way to "engage" the owner on the sources of lead contamination and avail them of any possible lead mitigation strategies. One commenter stated that the proposal would "be invaluable if sampling error, non-representative plumbing features, and/or other discrepancies were found to be the root cause(s) of one or more elevated results." Commenters have expressed concern that the find-and-fix section of the LCRR deals with issues that are outside of the jurisdiction of the water system. Two commenters stated that exceedances may be due to in-home issues such as fixtures and piping. Several commenters mentioned that water systems cannot “fix” issues that are on private property. Another commenter adds that “Public water system operators and samplers are not necessarily certified plumbers and may not be familiar with household plumbing.” Nevertheless, one comment recommends that the water system determine if there are any site-specific issues that may be responsible for the exceedance.

Commenters have highlighted certain responsibility issues that could be raised due to find-and-fix requirements, if the source of lead is in-home. Commenters stated that water systems are not responsible for entering private homes to fix site specific lead issues. A couple of commenters request more clarity in terms of defining the responsibilities of a water system with respect to lead issues that may be in the home. Other comments recommend including clearer regulatory text that exempts water systems from having to enter private residences to fix site-specific lead issues. One commenter raises the issue that the preamble text could be misinterpreted as requiring water systems to “make corrections to private plumbing.” This commenter recommends more clear language. A couple commenters ask for regulatory language that clearly exempts the water system from mitigating elevated lead levels if the source is found to be onsite. One commenter requested clarification on situations where the corrective action is LSLR but the owner refuses to replace their portion of the LSL. Another suggests incentives to customers to address onsite issues related to the lead exceedance. A couple commenters recommended specific changes in the regulatory text.

Agency Response

The Agency does not agree with commenters who suggest that find-and-fix should have its primary focus on in-home causes of elevated lead. The find-and-fix provision in the LCRR requires uses a two-pronged approach to evaluate the potential causes of elevated lead to assess lead sources at the site and to evaluate the water quality in the distribution system to determine if actions within the distribution system are needed, such as spot flush or CCT re-assessment. EPA points out that Site Assessment coupled with the corrosion control assessment, can be used to help determine the cause of the lead exceedance. EPA determined that conducting the follow-up tap sampling provides the opportunity for a water system to discuss potential in-home lead remediation if needed, but also requires the water system to evaluate water quality in the distribution system to identify any potential distribution system maintenance or other actions to improve water quality.

EPA agrees that the LCRR should not make it the responsibility of a water system to replace premise plumbing. The final rule clarifies that the water system must document to the state the cause of the elevated lead level, if known. EPA notes that water systems should make customers at the tap sample site aware when there are sources of lead in premise plumbing so they will be able to make informed decisions about how best to mitigate lead contamination that is not addressed by system actions such as CCT.

13.6 Schedule for Fix

Summary of Comments

One commenter recommended shortening the timeframe for corrective actions under find-and-fix. Another commented that a 30-day timeframe for “resolving” lead issues with the customer is "reasonable." Meanwhile, a third commenter would like for the regulation to clarify how find-and-fix is implemented when the water system has already had a system-wide lead action level exceedance and is currently "in the process of installing, optimizing, or re-optimizing treatment."

Agency Response

EPA concluded that 30 days is feasible for water systems to collect the follow-up tap sample. EPA determined that a 12-month timeframe allows the water system and the state time to carry out the distribution system "fix" of a CCT adjustment if needed. This is followed by another 12-month period to conduct testing to determine if the recommended fix successfully resulted in a reduction in lead concentration. In the case of a tap sample greater than 15 µg/L occurring when the water system is optimizing CCT, the results from WQP and follow-up tap sampling may inform CCT or other water system actions.

14 System Reporting to Primacy Agency

EPA received many comments related to the proposed water system reporting requirements in §141.90. EPA received comments on reporting requirements for: tap sampling and water quality parameter (WQP) monitoring results, lead service line (LSL) inventories, lead service line replacement (LSLR) activities, trigger level exceedance (TLE) notification, schools and child care sampling, public education (PE) and customer notification of tap sample results, and find-and-fix. EPA also received numerous comments on the burden associated with the new reporting requirements of the Lead and Copper Rule Revisions (LCRR).

14.1 General Comments

Summary of Comments

EPA received comments stating that the amount of information required to be reported to the state primacy agency under the Lead and Copper Rule (LCR) provides a significant burden to both utilities and to states. Previous audits of state data reporting have discovered inaccuracies in national data. In order to resolve this issue, EPA has invested in data management systems such as the Safe Drinking Water Information System (SDWIS), the Compliance Monitoring Data Portal (CMDP), and SDWIS Prime, with the goal of allowing utilities to report data to a system that is shared by the states and EPA. However, currently SDWIS Prime is under review and is not available to states and utilities. As there are early implementation requirements, these data systems must be deployed and available for use at the time the rule is promulgated. Commenters supportive of the LCRR emphasized that in order for the data in these systems to be complete, there must be a federal requirement mandating the direct reporting to these systems. Other commenters noted that since there is no currently operating central data reporting system, EPA must invest additional resources to develop and make these systems available. They assert that if the software development effort is placed on individual states, this would represent a significant cost and personnel burden. One commenter encouraged EPA to consider a separate rule that would enable community water systems (CWSs) to submit compliance information directly to EPA. Another commenter stated that electronic reporting is critical to address data gaps, data quality, and underreporting and suggests a centralized shared data system is necessary. The commenter asserts that without a federal rule requiring direct electronic reporting to a shared system, universal electronic reporting is impossible. A commenter recommended that EPA be clear about exactly what information is expected to be tracked and what information is needed for compliance determinations (i.e., what will result in a reporting violation) and clarity is needed on who is responsible for tracking and maintaining records for the various components of the rule.

One commenter asks that EPA remove added language from § 141.31(d), stating that the public notification (PN) to the Administrator within 24 hours should apply only to Subpart 1 and not all Tier 1 PNs. They state it is confusing to have a PN requirement to be submitted within 10 days under (d)(1), but within 24 hours under (d)(2).

Some commenters suggested that requiring annual reporting or certification to the state may be burdensome for utilities and suggest that utilities maintain their own records of compliance activities that could then be audited by states. Another commenter suggested that EPA consider a separate rule that would allow utilities to report compliance information directly to EPA in order to reduce the burden on primacy agencies. Another commenter expressed concern that small and medium water systems do not have monitoring, reporting or recordkeeping requirements for optimal corrosion control treatment (OCCT), stating they can monitor less frequently but should not be exempt.

Other commenters noted that systems without laboratory capacity of their own would rely on state or private labs to conduct their compliance analyses, which could result in reporting delays. In addition, additional sampling, analysis and reporting requirements under the proposed revisions could present a burden to small systems and require primacy agencies to hire additional staff. Additional commenters recommended streamlining due dates for LCRR reporting requirements. Another commenter emphasized the importance of clarifying the required precision of reporting 90th percentile values for the determination of action level exceedances (ALEs) and noted the potential burden of requiring the 90th percentile value reporting for systems of all sizes, rather than just those serving populations above 3,300 persons.

Agency Response

In response to the comment on § 141.31(d), EPA is maintaining the language for (d)(1) and (d)(2) as they correctly explain separate requirements. Under (d)(1), the water system must certify it completed PN requirements under Subpart Q (Public Notification of Drinking Water Violations). This certification must be submitted within 10 days of completing the notifications required under that subpart; whereas (d)(2) describes the requirement under the Water Infrastructure Improvements for the Nation (WIIN) Act (USEPA, 2016) to notify the Administrator and the state no later than 24 hours after Tier 1 Notice for an ALE.

EPA agrees that data management systems are needed and intends to support the data management needs of primacy agencies for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR. EPA will work closely with state program and information technology staff on LCRR database needs and on overall SDWIS modernization. In January 2020, EPA formed the SDWIS Modernization Board with representatives from state information management programs and from state drinking water programs, with the Environmental Council of States (ECOS) and the Association of State Drinking Water Administrators (ASDWA) providing logistical support to the Board. The Board provided input into the SDWIS Modernization Alternatives Analysis and option selection. Following option selection, EPA will continue to work with the Board on SDWIS development and will engage with states in the development and testing of the SDWIS Modernization data system. EPA intends to provide LCRR Data Entry Instructions (DEIs) by Fall 2021. The LCRR DEIs will provide detailed guidance to primacy agencies regarding the data requirements for LCRR monitoring, record keeping, and reporting. EPA disagrees with commenters who wrote that there should be a direct federal reporting requirement for data related to this regulation. States with primacy for enforcing this regulation need the data from the water systems to review, approve and enforce the requirements in accordance with their primacy agreements. Where EPA is the primacy agency, these data should come directly to EPA. However, in other situations, EPA has established state reporting requirements to obtain the data needed from primacy agencies to fulfill the Agency's oversight role in enforcing this regulation.

EPA does not agree with commenters that wrote that systems should only be required to maintain records and not required to report information to the state. The reporting requirements are intended to provide states with the information that they need to review, approve and enforce the regulation and assure effective public health protection. EPA acknowledges the comment that there will be additional burden on small systems and states to report and assess this information, which is necessary to assure effective oversight of the rule and has assured clarity and consistency of reporting requirements. EPA has updated the various reporting requirements for each section of the rule from reporting of tap and WQP monitoring to reporting the testing in schools and child care facilities. In section § 141.90, EPA has outlined the specific information that water systems must track and report to the state for each section of the rule. Failure to meet any of these reporting requirements, results in a reporting violation. These reporting requirements are for the water system to report to the state; thus, the water system is responsible for tracking and submitting the applicable information on time. For recordkeeping requirements see §§ 141.91 and 142.14 of the final rule and response to comment Section 15. EPA has considered the additional burdens of reporting to states when developing the final rule. The dates and requirements have been streamlined where possible to ensure systems are reporting the most crucial lead in drinking water information to the state. In response to the comment about utilities maintaining their own records for compliance in lieu of reporting these activities to the state, EPA disagrees because it's imperative that states have information on water system compliance to ensure public health and safety. EPA has only included the most crucial activities for reporting to the state so as to reduce the burden on the water system.

Regarding the comment that small and medium water systems do not have reporting requirements for optimized corrosion control treatment (CCT), EPA would like to clarify that all systems have reporting requirements for OCCT, with the exception of certain small systems with a compliance flexibility option. EPA determined that OCCT data are important for effective implementation and state oversight as CCT is a critical component of the treatment technique. Therefore, EPA has maintained the proposed CCT reporting requirements in the final rule. Specifically, systems serving 50,000 or fewer people have to demonstrate they already have OCCT, provide their recommendation if they are required to optimize or evaluate the effectiveness of their OCCT, or are required to install OCCT. Another commenter is correct in noting that, according to the minor revisions to the LCR published in 2000 (USEPA, 2000), systems serving 3,300 or fewer persons were only required to report their lead and copper 90th percentile values if they exceeded the action level (AL). EPA is requiring water systems to report the 90th percentile regardless of their size and the value in this final rule. It is important for this information to be reported as it determines other requirements of the rule which will reduce lead and copper levels. It also provides full transparency of lead 90th percentile levels to consumers that are interested in understanding lead in their water system through SDWIS data. EPA does not believe reporting this value creates an undue burden as many systems currently report all 90th percentiles regardless of system size. In response to commenters expressing concern on the reporting burden for small systems, CWSs that are serving a population of 10,000 or fewer people can exercise small system compliance flexibilities and have only one reporting requirement if they are utilizing either the point-of-use (POU) option or the replacement of lead-bearing plumbing option. If utilizing a different option such as LSLR or CCT, they must meet the reporting requirements under that section.

14.2 Report Tap Sampling and WQP Monitoring

Summary of Comments

Commenters noted that there was a significant and “unproductive” reporting burden created by the amount of information required by the proposed LCRR for lead testing and that this information currently must be reported manually. A commenter asserted that the data submission of the LCRR will quickly overwhelm states’ ability to process the information provided. A commenter requested clarification if customer-requested sampling results must be reported to the state. Another commenter expressed concern that the 90th percentile values must be reported before the end of the four-month monitoring period and requested that utilities be allowed the full monitoring period prior to calculating 90th percentile values. Another commenter asked that the monitoring period date for systems on reduced monitoring be confirmed as November 30th and the sampling period end date be confirmed as September 30th. Another commenter suggested the deletion of the paragraph requiring systems to report that they sampled at a different location than the location in the previous monitoring period. The commenter argues that the LSL inventory and tap sampling plans should already contain an additional number of sampling sites in each tier to prepare for these instances. Another commenter concurred with EPA’s proposal to include reporting of the tap sampling protocol to the state.

Agency Response

In response to these comments, EPA has modified this section of the rule to provide more clarity to water systems and states. There were several instances where the rule has been revised to correct references that were noted by commenters. For example, commenters expressed concerned that the proposed language would require water systems to submit data to states that calculate the 90th percentile before the end of the tap sampling period, thus truncating the amount of time to collect tap samples. This was not EPA’s intent, so EPA has modified the rule to ensure that all water systems have the entire tap sampling period to collect tap samples.

In response to comments about the burden to states, EPA does not believe the amount of reporting will overwhelm the states’ ability to process the information. Because of new requirements in the LCRR such as testing in schools and child care facilities, overall there are more reporting requirements. However, there is a larger burden up-front, with requirements by the compliance date of the rule, with less reporting burden after. For example, the service line inventory is a critical component to the LCRR, and many other components of the rule rely on it. This is something that needs to be developed within 3 years of rule promulgation, as well as the service line replacement plan. Once these plans are in place, there are only updates required thereafter. In addition, the state may not need to be processing the reported information instantly. For instance, much of the reported information could be collected by the state for the record and only reviewed when necessary, such as during SDWIS reporting to EPA, etc.

Compared to the previous rule, the LCRR has not significantly increased the amount of information reporting required.

In response to comments about customer-requested samples, results from sampling taken upon customer request is not required to be submitted to the state. EPA disagrees that data submission requirements will overwhelm a state's ability to process information. See response to comments Section 14.0 for a discussion of how EPA has streamlined reporting requirements and EPA's work with states on a data system that can assist states in processing compliance data. EPA recognizes the varying burdens for different sized water systems and has taken these into account when developing reporting requirements for this final rule.

EPA disagrees with the commenter that requested removal of paragraph § 141.90(a)(1)(v), which requires systems to note if they sampled at a different site from the previous tap sampling monitoring period. This requires water systems to include an explanation on why the tap sampling site(s) changed. EPA recommends that water systems include extra tap sampling sites in their tap sampling plans for each applicable tier to have a list in case a customer refuses sampling, does not respond, or other issues arise with re-sampling at the same site. However, it is still important for the state to have the information when sites change and an understanding why. This will prevent systems from sampling at different sites more frequently which results in incomparable data points and intentionally sampling at lower-risk sites without having to notify the state.

14.3 Lead Service Line (LSL) Inventory and Lead Service Line replacement (LSLR)

Summary of Comments

One commenter felt they would be "uniquely burdened" by the reporting requirements for LSL inventory and replacements, as they have a large number of service lines listed as "unknown." They argue that documenting and requesting approval to designate "unknown" lines to "non-lead" will be burdensome. Another commenter asked for clarification that once a utility has certified that there are no LSLs in their inventory, there should not be any requirement for further reporting, as new LSLs are not permitted to be installed.

One commenter suggested that requirement of reporting LSL inventories to SDWIS, as recommended by the Governmental Accountability Office (GAO), is counterproductive, as SDWIS is not currently equipped to accept these inventories, and water systems currently provide their inventories to the communities they serve. They argue that inventories provided directly to consumers by water systems will be more up to date than inventories posted by the state or in SDWIS.

One commenter indicates that the proposal appears to require that consumers who have lead samples collected after an LSLR be notified with their results after three business days. They recommend keeping the same reporting timeframe as the initial tap samples. This commenter suggests that a certification statement be considered proof of customer notice, rather than requiring a mailed notice postmarked within three business days.

Multiple commenters recommended that EPA develop an online portal for LSL inventory tracking and requested that SDWIS be upgraded to manage implementation of this rule by the time that the final rule is promulgated. Another commenter suggested that funding, training and technical assistance programs should be used to help encourage water systems to self-report LSL inventories.

One commenter requested clarification of how inventory verification will impact LSLR violations. They cite the example of a system failing to meet its target of required annual percentage of LSLRs and ask if that violation would be rescinded if they later discover that they had fewer LSLs than had been previously thought. One commenter believes that it is not necessary to resubmit LSLR plans after an ALE, since there is a requirement to provide the LSL inventory and LSLR plan on the compliance date and updated inventories annually anyway. Another commenter asked for a requirement that LSLR plans be submitted to the state regardless of sampling results. A commenter recommended that for small systems that choose to replace all lead-bearing material, EPA should consider requiring certification that removal has been completed within one year.

One commenter noted references to a non-existent paragraph, and requests that the reference be checked and revised as necessary. Another commenter requests a wording change from "the annual letter" to the "annual certification." Several commenters provided suggested regulatory text to improve clarity of the final LCRR. One commenter presented specific revisions to a number of paragraphs in the reporting regulations.

Another commenter requests that the LCR provide for the development of standard operating procedures (SOPs) for LSLR and PE, including recordkeeping. One commenter states that the proposed LCRR requires water systems to annually certify their goal-based rate for LSLR and request EPA provide examples of this type of certification.

Agency Response

In response to comments, EPA has restructured reporting requirements of the final rule and modified these requirements as necessary. EPA understands how the new requirements will increase activities performed by the water system and communication with the state and has reduced burden wherever possible. In response to the comment that systems with large numbers of LSLs would be unduly burdened by the reporting requirements, EPA disagrees that these requirements present an undue burden. Information about the numbers of LSLs is important to understand the sources of lead in drinking water and to inform decisions on monitoring and LSLR requirements. EPA further notes that water systems are not required to submit documentation for changing the status of LSL nor is the water system required to obtain state approval of the LSL inventory under the final rule.

EPA has modified the requirement in the proposal to send an updated LSL inventory and replacement plan when an ALE occurs. As noted by commenters, water systems will be submitting these annually (or triennially) regardless of sampling results. The Agency agrees and thus has removed this requirement from the final rule.

After consideration of comments, EPA decided to maintain the requirement for certification by the water system that customers were provided tap sampling results after an LSLR within 3 or 30 business days of receipt of results, depending on the value of the result. Customers with results greater than 15 µg/L must be sent results within three days of obtaining results and all other results must be sent within 30 days. This is intended to demonstrate compliance with requirements to provide notification to individuals of the tap sampling results within 3 or 30 calendar days depending on the individual tap sample result.

EPA agreed that clarification was needed regarding updates to the LSL inventory and potential violations. Water systems must create inventories containing information on known LSLs, galvanized requiring replacement, and lead status unknown service lines. It is possible that systems will identify more LSLs when previously “unknown” service lines are verified to be lead, and it is also possible that some of the LSLs from the initial inventory will later be verified as not LSLs. The number of service lines applied to the LSLR rate can be updated every year taking into account the number of unknown service lines discovered to be made of lead, so LSLR burden should be reduced as service line verifications are conducted. Violations for failure to meet LSLR requirements where the inventory has changed will be addressed on a case by case basis.

EPA agrees with revisions to provide more clarity suggested by commenters, such as changing the “annual letter” to a “certification.” EPA has taken many of these into account in preparing the final rule. EPA streamlined provisions by linking the LSL inventory and replacement reporting to the tap sampling monitoring schedules. In addition, those systems that no longer have LSLs, galvanized service lines requiring replacement or lead status unknown service lines, are not required to continue reporting their LSL inventory or replacement plans. However, if a system later discovers one of these lines that was missed, it must begin reporting again. The water system must not only report known LSLs, but also galvanized lines requiring replacement, and lead status unknown service lines. These inventory updates are important to ensure water systems are aware of the locations of LSLs for purposes of tap sampling and LSLR. In the final rule, reporting of LSL inventory and replacements must occur regardless of the water system’s 90th percentile lead level. These updates occur annually or triennially for those on a triennial tap sampling monitoring schedule.

EPA agrees with commenters that data management systems will be important to effectively implement the LCRR and is working to update SDWIS Prime to be equipped for new lead and copper reporting requirements. EPA intends to support the data management needs of primacy agencies for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR. EPA will work closely with state program and information technology staff on LCRR database needs and on overall SDWIS modernization. In January 2020, EPA formed the SDWIS Modernization Board with representatives from state information management programs and from state drinking water programs, with ECOS and ASDWA providing logistical support to the Board. The Board provided input into the SDWIS Modernization Alternatives Analysis and option selection. Following option selection, EPA will continue to work with the Board on SDWIS development and will engage with states in the development and testing of the SDWIS Modernization data system.

EPA intends to provide LCRR DEIs by Fall 2021. The LCRR DEIs will provide detailed guidance to primacy agencies regarding the data requirements for LCRR monitoring, record keeping, and reporting. Further, the Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

In response to comments, EPA agrees it is not necessary for a water system to submit its LSL inventory and LSLR plan at the time of a lead ALE as the state will already have this information beginning three years after final rule promulgation, and has thus removed this requirement. EPA agrees with the commenter that the LSLR plan should not be submitted based upon sampling results. The final rule requires all systems with LSLs to submit an LSLR plan within three years of promulgation irrespective of tap sampling results. The system also must update the inventory thereafter, to reflect information on the number of LSLs that have been replaced or lead status unknown lines that have been evaluated and determined to be lead or not LSLs. These updates must be submitted on the same schedule as the tap sampling monitoring periods, but no more frequently than annually.

EPA agrees that SOPs or guidance is needed for the LCRR. EPA received several comments requesting Agency guidance on implementation of the revised rule. EPA understands this is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

14.4 Reporting Tap Sampling and Trigger Level Exceedance (TLE) Notification

Summary of Comments

Commenters have requested that EPA retain the current requirement that systems report the lead and copper results to the state within 10 days after the end of the monitoring period, rather than before the end of the monitoring period. They assert that this requirement would force states to shorten their own review time in order to make sure 90th percentile values have been calculated correctly by systems or labs. They also suggest that requiring states to notify systems in writing of their 90th percentile value is burdensome on the states. One commenter emphasizes the importance of collaboration between the states and EPA to ensure common understanding of what is required of water systems as a result of the lower, 10 ppb lead trigger level (TL).

Agency Response

EPA agrees with some commenters and has modified the final rule to allow water systems to report tap sampling results to states who are calculating the 90th percentile, within 10 days after the end of the applicable tap sampling period. This is consistent with reporting for systems that calculate their own 90th percentile. In addition, EPA has modified reporting requirements from the proposal to ensure effective use of water system and state resources. EPA disagrees with the comment describing water systems submitting their 90th percentile to be burdensome. This is an important reporting provision because it ensures that states have compliance information from tap sampling which helps to determine other requirements of the LCRR. For example, CCT and LSLR are requirements depending on the lead and copper levels from tap sampling. Because there is no safe level of lead, it's necessary for states to be monitoring levels in all systems, including those below and above the lead trigger and ALs.

14.5 School and Child Care Sampling and Public Education (PE) Reporting

Summary of Comments

One commenter reported that among the "burdensome" reporting requirements in the proposed LCRR are the requirements that water systems submit data relating to the number of schools and child care facilities tested, as well as document which schools and child care facilities have refused to be tested. Another commenter suggests that rather than requiring that this information be reported to the primacy agency, these records could be maintained locally by the water system and reviewed by the state upon request. Several commenters suggested tracking non-responses as well as direct refusals from schools and child care facilities, in order to track outreach attempts by the water utility. One commenter noted that the proposed regulation allows schools and child care facilities to refuse entry or decline to allow water systems to conduct testing or PE efforts.

Several commenters sought clarification about the requirements for reporting the analytical results from school and child care sampling, including whether these results should be reported in the same format as tap sample results used for 90th percentile calculations, and if the results from schools and child care facilities will be reported to EPA along with 90th percentile results. They also ask how EPA will make sure that data management systems do not co-mingle the LCRR compliance samples and the school/child care facility sample results.

Another commenter suggests the schools that have previously tested below the TL, or test below during current sampling be excluded from annual reporting and certification requirements. They recommend that systems that do not possess LSLs in their inventory not be subject to these annual requirements. A different commenter suggested requiring CWSs to have a voluntary lead testing in schools and child care facilities program, and submit an annual report on the program to the state.

One commenter recommends that EPA or states provide standardized forms or other materials to ensure that water systems are meeting the notification requirements under this rule. This commenter also mentioned that it would not make sense to make repeated attempts to contact facilities that refused to participate. Therefore, they argue that it is not necessary to provide the number of attempts to gain entry for sampling that were declined.

One commenter noted that the proposed rule requires water systems to report results to the primacy agency but suggests flexibility to report school and child care facility results to a different agency, such as the state Department of Education, which oversees such facilities.

Some commenters noted that since data are reported to the primacy agency, there does not need to be a separate certification for completion of this requirement, arguing that submission of the data should be sufficient to fulfill the requirement. Several commenters suggest a specific regulatory text revisions. Another commenter suggests a voluntary testing program and submittal of an annual report to the state with various information.

Another commenter mentions that the sampling requirements for schools and child care facilities will be difficult to track because primacy agencies do not know how many facilities are in the area. One commenter asks for clarification on how to demonstrate the water system has completed its annual requirements and include language indicating these certifications go to the state.

One commenter states that the added requirements in this section will be an additional burden and EPA needs to have a plan for how these samples will be tracked and reported with tools developed for this. One commenter is concerned about potential “loopholes” for schools and child care facilities that can decline testing, urging EPA to require the names of all those facilities that refused to be posted publicly, with an explanation from the board of education why they refused sampling. Another commenter notes that the rule is silent after the reporting of these results and doesn’t explain actions for the water system and state after reporting.

Another commenter states that the annual reporting for school and child care facility testing results is redundant, arguing that once a site “passes” this verifies that lead and copper are not issues.

Agency Response

EPA maintains that reporting associated with the school and child care testing program and PE provisions is an important part of the rule for public health protection. See response to comment Section 12 for responses about the school and child care sampling requirements.

EPA disagrees with the comment proposing that instead of reporting the information in the proposal on school and child care facilities, the water system could maintain these records for state review upon request. Without these requirements in reporting, there is no way for EPA or the state to ensure these records are being maintained; thus, annual reporting has remained in the final rule. EPA has also maintained the reporting requirement of non-responses and refusals in the final rule. However, this includes listing the number of schools that refused and information on the number of attempts that were declined by the facility (which could be a non-response).

EPA has modified some aspects of reporting of this section to decrease the burden on water systems and to streamline communication. EPA has modified reporting requirements in this section to be consistent with changes in the schools and child care sampling and education provisions in the final rule. For systems encountering elementary schools and child cares that are non-responsive or decline testing in the first 5 years of sampling, EPA has required the system to certify it has made good faith attempts to identify facilities in the distribution system including the number of facilities that have refused sampling. The water system will also submit information on outreach attempts to non-responsive facilities and the analytical results from the testing. For any secondary schools sampled on-request and elementary and child care facilities sampled on-request after the first five years, the water system must submit the number of schools and child care facilities in the system, the number of those sampled and the analytical results from the sampling. In response to comments about whether the results are included in the 90th percentile calculation, the final rule further clarifies that the analytical results for the school and child care testing program is separate from those conducted for compliance tap sampling. EPA will work with states to ensure these sampling results are reported and tracked accordingly.

EPA has also made editorial improvements to the rule to clarify some requirements, as suggested by commenters (e.g., changing "annually on July 1" to "annually by July 1"). For most requirements, the water system must only list the number of facilities, such as the number of facilities that refused testing, the total number of facilities in the distribution system, and the number of facilities tested that year.

The final rule maintains the requirement to report test results to the schools, child care facilities, state and local health agencies, and the state. Water systems may want to submit these results to the Department of Education or other interested groups and agencies, but that is not required by the rule. EPA believes the submission of the certification to the state rather than having the files available for inspection by the state is necessary to ensure compliance with the schools and child care sampling provision of the rule. Since this is part of an annual submission containing all certifications required by the rule, EPA does not believe this is overly burdensome for water systems.

EPA disagrees that schools and child care facilities that have results below the TL should be excluded from testing and reporting requirements. Because there is no safe level of lead, it is important to report all results to the state, regardless of the value. EPA also disagrees with the suggestion that water systems that do not have LSLs should be exempt from school child care testing and reporting. Testing and reporting enables facilities and the community to determine if there is a lead problem, regardless of source, and to take steps to address these concerns. There are other sources of lead in school and child care facilities including meters, taps, faucets, fixtures and galvanized service lines to name a few. By exempting facilities that do not have LSLs from the requirements to test and report, elevated lead levels from other sources could be missed. Therefore, EPA has not modified the rule to permit exemptions from the testing and reporting requirements under these conditions. The final rule does allow the state to waive requirements for a CWSs if there is an existing comparable sampling program in place.

As stated before, EPA is working on updating data management systems to enable the tracking and reporting of various LCR requirements, including those under school and child care sampling and PE. The Agency is aware of the importance of keeping these sampling data separate from those under compliance tap monitoring and will make efforts to ensure their separate reporting so as not to comingle any results. EPA intends to support the data management needs of primacy agencies for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR. EPA will work closely with state program and information technology staff on LCRR database needs and on overall SDWIS modernization. In January 2020, EPA formed the SDWIS Modernization Board with state representatives from ECOS and ASDWA, which provided input into the SDWIS Modernization Alternatives Analysis. EPA will continue to work with the Board on SDWIS development and will engage with states in the development and testing of the SDWIS Modernization data system. EPA intends to provide LCRR DEIs. The LCRR DEIs will provide detailed guidance to primacy agencies regarding the data requirements for LCRR monitoring, record keeping, and reporting. It is expected that these updates will streamline data reporting which will make the annual reports less burdensome. In addition, it will make certain that the data regarding school and child care testing is not commingled with other results.

EPA disagrees with commenters who are opposed to making two repeated attempts to contact a facility. The Agency believes the water system should make the best "good-faith" effort when contacting facilities. EPA considers a facility to be "non-responsive" after two attempts of contact result in no response; however, two attempts is not an official requirement in the final rule. EPA disagrees with including a requirement in the rule that water systems publicly identify facilities that have not responded to the water systems good faith efforts. The Agency believes this to be an extraneous burden to the water system.

EPA disagrees that reporting results for sampling at school and child care facilities is redundant. The commenter states that a low or "passing" lead or copper value would indicate there isn't a problem at the facility. This line of thinking is problematic and potentially dangerous. There is variability in lead results from tap sampling due to the size of the building and thus variability in stagnation, the type of lead release, plumbing configuration, etc. Therefore, deeming a home or site as safe after one test result could create a false sense of security. It is imperative that these facilities are testing at 20% of child care facilities and elementary schools in the first round to monitor the levels closely at these sites.

EPA will not be providing standardized forms for notification and reporting requirements under school and child care facility testing reporting. There are relatively few requirements, which are simple, and water systems and states have the flexibility on the format in which these will be reported. EPA is also not requiring systems to go into facilities that have refused sampling like the commenter explains. The proposed requirement on "information pertaining to attempts to gain entry" has been removed from the final rule.

A commenter states that EPA is silent after the reporting requirements, not mentioning actions the water system must take following reporting of results. The reporting for all LCRR sections is in § 141.90. For more information on recommended or required actions for school and child care sampling and education, see response to comment Section 12.0 or § 141.92 of the final rule.

14.6 Find-and-Fix Reporting

Summary of Comments

One commenter recommended that the primacy agency receive the actual observed data from follow-up tap samples taken during the find-and-fix period. Another commenter noted that follow-up investigations involve multiple reports from multiple experts, including plumbing and sanitary engineers, as well as electricians. Requiring this information to be provided to the primacy agency as well as non-compliance from homeowners would be a significant burden and present a potential privacy concern for homeowners, especially including non-responses. An additional commenter expressed concern that reporting associated with the find-and-fix provisions are not clearly defined in the proposed LCRR and suggested that utilities include find-and-fix activities in their monthly operating reports or submit one annual find-and fix report.

Commenters suggested that the summaries of find-and-fix investigations should be kept at the water utility and made available to state upon request. Another commenter suggested that only submitting recommendations for installing CCT or optimizing existing CCT should be reported to the primacy agency, and other records be maintained at the utility and made available upon request by the state. Another commenter recommended that SDWIS be modified to accept find-and-fix records.

One commenter requested that utilities be provided a specific template for the find-and-fix provisions of the rule to help reporting required information to the primacy agency. Another commenter suggested that the reporting of results from find-and-fix investigations be limited to the one report to prevent multiple submissions of the same information.

A commenter suggested allowing utilities to record the number of attempted contacts, rather than requiring homeowners to explicitly refuse to let the water system troubleshoot. Another commenter expressed concerns on reporting mitigation of find-and-fix every time to the state, stating that often it is a problem with the customer.

Agency Response

See response to comment Section 13 for a discussion of the responses to comments on the find-and-fix requirements. In response to the comment on the state receiving the actual observed data from the find-and-fix assessment, this is already a part of the reporting requirement under § 141.90(g), in that the previous rule requires systems to report additional tap, WQP and source water monitoring data.

After careful review of the concerns of commenters listed above, EPA is maintaining most of the reporting requirements proposed for find-and-fix because they are not overly burdensome. This includes information on non-responses and refusals, if there are any, as EPA feels it is important to report this information to prevent water systems from sampling at lower-risk sites. EPA has considered any redundancy in reporting for find-and-fix related to WQP monitoring and corrosion control assessment monitoring and has streamlined these aspects of the final rule where possible.

See response to comment Section 13 for a discussion of how EPA has responded to comments on the find-and-fix sampling requirements. EPA requires systems to report the results of their find-and-fix assessments within six months and encourages water systems to include find-and-fix data in their recommendations for both follow up tap samples and WQP monitoring samples as suggested by commenters.

EPA disagrees with a comment about including find-and-fix sites in the tap sampling site plan under §141.90(a) because the water system will not know which sites may result in elevated lead levels so will not be able to locate the follow-up sites prior to the monitoring period, when the sample site plan is due. Also see response to comment Section 13.

In response to a comment about only submitting information on find-and-fix related to recommendations for installing or optimizing CCT, EPA does not require this type of information for find-and-fix, but only requires sampling and PE information. In response to comments on SDWIS capability for find-and-fix requirements, these will be taken into consideration in the development of updates and upgrades to SDWIS Prime. EPA will not be providing utilities a template for find-and-fix reporting but will work to develop helpful guidance on these provisions overall for successful implementation. EPA understands that some of the fixes may not be able to be completed on behalf of the water system, if the customer has control over it. Therefore, EPA is not requiring this information to be reported to the state.

14.7 Burden of Reporting Requirements

Summary of Comments

Several commenters expressed that they felt the reporting requirements under the proposed LCRR were unnecessarily burdensome for a number of reasons, including:

- The volume of information that would need to be documented and reported.
- Some of the information that utilities may be required to submit, they may not legally be able to obtain, although they may be liable for failing to submit such information.
- The frequency and specificity of the required data reporting are beyond what EPA indicated was necessary under its Information Collection Request (ICR), and data collection and management may place a burden that extends beyond the start of rule implementation due to ongoing data collection and reporting requirements.
- EPA does not possess a currently deployed data management system that is capable of handling the required information.
- That utilities submit an annual report that compiles information previously submitted to states, such as state-approved template communication materials that are redundant.
- The lack of standardized reporting requirements for samples from find-and fix, customer requests, and lower-tiered sample sites, may lead to inaccurate compliance determinations.

- Requirements for annual recertifications may add little value, though failure to submit or delayed submission may result in violations that erode public confidence, as the public may not distinguish violations related to reporting vs. violations based on ALEs.
- Burdens of compliance with the new national rule may have disproportionate effects on small systems or systems in disadvantages communities.

A number of commenters expressed concern that these burdens would put a financial strain on both water systems and states, in terms of both implementation as well as staffing and administrative costs.

Suggestions for revisions to the rule to reduce the reporting burden included:

- Assisting water systems with developing SOPs for LSLR and PE and providing technical and staffing support.
- Replacing a requirement that utilities document refusal to participate in LSLR, or school or child care sampling with a provision in SOPs for documentation of efforts to engage homeowners, schools, or child care facilities.
- Using existing opportunities (such as the sanitary survey process) to assess LCR compliance.
- Streamlining reporting requirements to eliminate instances where the same information may need to be reported in multiple places or more than once.
- Allowing self-certification and online data reporting.
- Storing certain types of information locally at utilities, which would be made available to primacy agencies upon request.

Agency Response

Reporting is important to allow the primacy agency to effectively oversee implementation of the LCRR and to ensure water systems are complying with requirements. Effective implementation is necessary to achieve the improved public health protections of the LCRR. Where possible, dates for submission of reporting have been streamlined and reporting for separate provisions of the rule have been combined to increase efficiency and reduce administrative burdens. For example, EPA has revised the requirements for submission of the updated LSL inventory to coincide with the systems tap sampling reporting requirements. See response to comment Section 5.0 for a discussion of the LSL inventory.

In response to the comment on the LCRR requiring water systems to report information they may not be legally able to obtain, because this comment lacks specificity on which requirements it is referring to, EPA cannot provide a specific response. EPA can only assure that the information water systems are required to report do not have legal barriers. In cases where customers and affected populations refuse or do not respond, there are methods of reporting this also. Another commenter mentioned there is a lack of standardized reporting requirements for sampling from find-and-fix activities, customer requests and lower-tiered sampling sites that can lead to inaccurate compliance determinations. This commenter is referring to sections § 141.90(g) and § 141.86(e), which require systems to submit the following to the state but not include them in the 90th percentile: any extra lower-tiered sampling sites, customer-requested samples, and find-and-fix samples. These are the sampling results for each site, the lead and copper levels, source water monitoring data and WQPs that are required to be submitted.

EPA disagrees with the commenter that the stated annual submissions may add little value but could result in unnecessary violations. Continuing to submit updates after the initial submission will ensure public health protection in the case lead or copper levels become a concern. Without consistent reporting, these issues could go unnoticed and, in some instances, could result in systems not taking needed action.

In response to a comment on the burdens of compliance being disproportionate to small systems and systems in disadvantaged communities, EPA has included in this final rule flexibility options for CWSs serving 10,000 or fewer people and all NTNCWSs (also see response to comment Section 7) which reduces the burdens of maintaining compliance. In addition, for requirements such as LSLR and other activities under the LCRR to promote lead reduction in drinking water, there are various ways disadvantaged communities may obtain funding such as through the WIIN Act grants.

EPA agrees that data management will be critical for effective implementation of the LCRR. EPA intends to support the data management needs of primacy agencies for the LCRR through the SDWIS Modernization development project, and to have a product available for state use by the compliance date of the LCRR. EPA will work closely with state program and information technology staff on LCRR database needs and on overall SDWIS modernization. In January 2020, EPA formed the SDWIS Modernization Board with representatives from state information management programs and from state drinking water programs, with ECOS and ASDWA providing logistical support to the Board. The Board provided input into the SDWIS Modernization Alternatives Analysis and option selection. Following option selection, EPA will continue to work with the Board on SDWIS development and will engage with states in the development and testing of the SDWIS Modernization data system. EPA intends to provide LCRR DEIs by Fall 2021. The LCRR DEIs will provide detailed guidance to primacy agencies regarding the data requirements for LCRR monitoring, record keeping, and reporting.

There were various suggestions to reduce burden in the LCRR including: assisting systems in developing SOPs and providing support, replacing reporting of refusals with an SOP provision for documenting efforts to engage homeowners, etc., using sanitary surveys and existing opportunities to assess compliance and streamlining the reporting to prevent dual efforts. EPA has considered all of these suggestions and has implemented them where helpful. EPA will be providing guidance and training for important sections of the rule but will not be developing SOPs with water systems. This would not prove to be an efficient effort given the large number of water systems in the country and the variability among them. EPA has retained in the final rule the requirement for reporting refusals from schools and child care facilities. Systems must also report if the tap sampling sites changed from the previous monitoring period. EPA believes these requirements are a better indicator than a provision in an SOP about what is going on at the system-level when sites change. Otherwise, it may be possible to choose lower-risk sites when high risk sites are available. Thus, this is an effort to prevent that oversight. EPA has made efforts to streamline requirements in other areas, such as assessing CCT and WQP during sanitary surveys to assess compliance and providing LSL updates from the water system on the same schedule as the tap sampling frequency.

In response to the suggestion on storing certain types of information locally until the state requests it, EPA disagrees. For some of the reported information this could make sense; however, there would be no way to ensure water systems are tracking and maintaining the correct information. EPA has refrained from requiring reporting for many different provisions and has kept only the most essential so as not to create an undue burden.

References

United States. Water Infrastructure Improvements for the Nation Act. 2016. Public Law 114-322, 130 Stat. 1628 (Dec. 16, 2016). https://www.congress.gov/bill/114th-congress/senate-bill/612.

United States Environmental Protection Agency (USEPA). 2000. National Primary Drinking Water Regulations for Lead and Copper. Federal Register 65(8):1950. January 12, 2000. https://www.govinfo.gov/content/pkg/FR-2000-01-12/pdf/00-3.pdf.

15 State Implementation and Enforcement

In the proposed rule, EPA requested comments on state implementation and enforcement provisions under § 142.14 through § 142.16 and § 142.19. Specifically, EPA requested comment on the complexity of the regulatory requirements that result from targeting different actions for different types of water systems and challenges states and water systems will encounter. EPA also sought comment on ways it can improve the ability of state or Federal government to enforce this rule and improve the ability of state or Federal government to assist water systems with compliance.

In addition, EPA requested comment on the utility of states maintaining records of water system actions related to find-and-fix.

15.1 State Implementation and Enforcement

Summary of Comments

EPA received many comments regarding the proposed rule's overall burden to states. Commenters noted that the complexity and additional requirements of the proposed rule would require many more transactions between states and water systems, as well as the necessity for states to provide technical and informational assistance to water systems. Commenters noted that states face competing priorities and underfunding, and that increased state burden could redirect funding from compliance assistance. Commenters expressed concern that the proposed rule could create more violations or require the state to expend too many resources to know whether a system is in violation, especially compared to a maximum contaminant level (MCL) rule. EPA also received one comment stating that timeframes designated in the rule requirements were infeasible to states, although the commenter did not specify which timelines were infeasible. One commenter suggested that EPA consult with and ensure states have a clear understanding of new costs of the new rule provisions. One commenter suggested that EPA allow primacy agencies to utilize existing regulatory tools such as sanitary surveys to verify certifications and ensure compliance. Another commenter called for the state requirements to be simplified and reduced. Commenters believed that training and technical assistance to states were needed, especially for matters relating to corrosion control treatment (CCT). One commenter requested that a federal funding mechanism should be considered for primacy agencies so that they may adequately develop the resources and staffing to effectively administer the rule. At current funding levels, a commenter suggested that their state may be required to surrender primacy. One commenter requested that EPA take a more "generous" approach to estimating the cost to states.

A commenter stated that to ensure consistent nationwide implementation and continuation of the lead reduction momentum, states' flexibility in approving alternative compliance criteria and waivers should be limited as much as possible.

EPA received many comments about data management. Commenters claimed that the proposed rule increased data management and recordkeeping demands. Commenters said that upgrades to state and federal databases were needed. With a more complicated rule, commenters were concerned that reporting and monitoring violations could occur which would be very significant and a draw on state resources while eroding public confidence.

Many commenters requested guidance and technical assistance for the final rule. A commenter suggested the final rule should provide more clarity on how the primacy agency should be evaluating the completeness and level of effort of these inventories.

One commenter suggested that states take the lead on initiatives such as outreach and education for health care agencies, outreach and education for schools and child care facilities, and obtaining technical expertise in CCT to allow for support in making CCT designations.

Agency Response

EPA consulted with primacy agencies several times through the development of the final Lead and Copper Rule (LCR), including a federalism consultation and the opportunity to provide comments on the rule proposal. Additionally, the National Drinking Water Advisory Council workgroup membership included state representation.

EPA has estimated the costs to states to implement and enforce the final Lead and Copper Rule Revisions (LCRR). See "Economic Analysis for the Final Lead and Copper Rule Revisions" or "Final LCRR EA" (USEPA, 2020). While the estimate shows that the final rule costs to states will increase relative to the previous rule, EPA believes the implementation and enforcement requirements are still feasible. The cost increases result in part from new rule provisions and associated data management, such as the lead service line (LSL) inventory, tap and water quality parameter (WQP) testing, and school sampling, which are critical components of the final rule. EPA has attempted to streamline implementation to the extent possible, such as using sanitary surveys as opportunities to review a system's CCT. In addition, many state actions are targeted at water systems with higher lead levels, such as overseeing goal and mandatory lead service line replacement (LSLR) programs as well as supervising CCT decisions. Implementation of the new LCRR requirements facilitate inventorying of LSLs and increase LSLR, introduce sampling at schools and childcare facilities, and strengthen public education is a worthwhile investment that will advance public health protection relative to the previous rule. These benefits are monetized and presented in the Final Rule EA (USEPA, 2020. Furthermore, improved oversight and compliance assistance should result from these additional transactions between states and water systems. EPA notes that states can use a range of tools and resources to effectively protect public health through implementation of the Public Water System Supervision (PWSS) Program. Congress appropriates funding each year for the PWSS Program grants which support state, territorial and tribal primacy agencies in executing their primary enforcement authority under the Safe Drinking Water Act (SDWA). Funding is allocated to primacy agencies, per SDWA §1443, "on the basis of population, geographical area, [and] number of public water systems," taking into account data from EPA's Drinking Water Infrastructure Needs Survey and Assessment. Under the SDWA, states may set aside up to approximately 31 percent of their Drinking Water State Revolving Fund (DWSRF) capitalization grant to fund state programs and third parties to provide assistance and build the capacity of drinking water systems and ensure the delivery of safe drinking water. DWSRF set-asides can be used, for example, for providing technical assistance to systems of all sizes, provide technical assistance and training for small systems, and support state drinking water program activities.

EPA recognizes the balance between ensuring consistent nationwide implementation and reducing the administrative burden for implementing the rule, and the competing need for alternative compliance criteria and waivers that provide flexibility. EPA has set uniform requirements such as the LSLR plan and inventory requirements that apply to all water systems irrespective of size or 90th percentile level. However, because of the unique circumstances among water systems due to variability in source water characteristics, the number of LSLs, and other factors that affect the feasibility for systems to reduce drinking water lead exposure, the LCRR provides flexibility to states and water systems for actions such as the goal-based LSLR program where the water system and state are in the best position to determine what appropriate LSLR rate. Additionally EPA recognizes that small drinking water systems collectively are limited in their technical, managerial and financial capacity to implement multiple treatment technique actions and the LCRR allows flexibilities for these systems to work with the state to identify the most appropriate treatment technique action to reduce drinking water lead exposure.

For response to comments about how the state burden was calculated, please see response to comment Section 16.

EPA is providing primacy agencies with LCRR data management capabilities in the short-term through a new Safe Drinking Water Information System (SDWIS) State module and in the longer term through the SDWIS Modernization system project. The SDWIS Modernization system will be the long term replacement for the SDWIS State data system that most state programs use.

EPA worked with states to form the SDWIS Modernization Board in January 2020. The Board provided input into the third party led SDWIS Modernization Alternatives Analysis through the end of June 2020, and in July 2020 made recommendations to EPA. Following the recommendation, EPA is investigating the best method for developing the data system, with method selection and development initiation expected in late 2020 / early 2021. Following system development, EPA will then provide assistance to states in their adoption of the new system. Like SDWIS State, the SDWIS Modernization system will include functions for managing drinking water regulations and for ensuring data quality, as well as the ability to connect the system to locally-run applications, such as the Drinking Water Watch (DWW) application running on a state server.

EPA is intending to provide LCRR Data Entry Instructions (DEIs). The LCRR DEIs will provide detailed guidance to Primacy Agencies regarding the LCRR monitoring, record keeping, and reporting requirements.

EPA understands that rule guidance is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

In response to a comment suggesting that states take the lead on “initiatives such as outreach and education for health care agencies, outreach and education for schools and child care facilities, and obtaining technical expertise in corrosion control treatment to allow for support in making corrosion control treatment designations,” EPA applauds any state initiative to reduces lead in drinking water. The final LCRR, however, focuses on actions water systems are required to take, and state requirements are limited to those necessary to implement and enforce the final rule. For information regarding development of LSL inventories and system reporting, see response to comment Sections 5 and 14. For discussion regarding costs to primacy agencies, see response to comment Section 16.

In response to the comment suggesting that the proposed rule created infeasible timelines for the states, EPA has reviewed the proposed rule and made revisions as appropriate for the final LCRR. For example, EPA has amended a timing discrepancy that clarifies states have six months to review the goal LSLR rate recommended by water systems. Other state timeframes EPA has reviewed but decided not to amend. For example, while some states requested a year to review water systems’ inventories, EPA determined that would create significant delays for final rule implementation, and did not incorporate those commenters’ suggestions. For more information about this provision, please see response to comment Section 5.

15.2 General and Special Primacy Requirements

Summary of Comments

Commenters noted the increase of burden associated with the rule requirements, specifically mentioning the requirements to update tap sampling plans to adhere to new sample tiering and to review inventories. Some commenters said that it could be challenging for states to execute the many requirements between the time they have primacy and the rule compliance dates, such as review of the inventory, LSLR plans and school sampling. Some commenters sought an extension to the deadline to adopt the final LCR provisions, such as the LSLR plan’s goal LSLR rate which may require discussion and negotiation between the state and system. One commenter said that the proposed special primacy requirements contained very little detail, and that EPA should work with states to develop them.

Commenters pointed out the numerous “State may” clauses that will require states to develop additional requirements or policies, demanding extensive effort. Some commenters suggested developing national criteria for certain rule provisions, such as inventory methods and goal LSLR rates, rather than give each state the authority to develop their own criteria.

Commenters pointed out that monitoring and reporting violations are the most common, and with increased requirements, more violations can be expected than occur under the previous rule. Commenters raised reporting and data management concerns about the proposed rule, calling for EPA to improve SDWIS.

One commenter said that given ongoing state actions to reduce lead in drinking water, primacy states should be given a waiver from the rule, even if the state rule requirements differ from the federal LCR.

One commenter suggested there should be a time limit for EPA to review and supersede a state-set goal LSLR rate under § 142.19. One commenter agreed that EPA should have the authority to designate mandatory LSLR rates in addition to goal LSLR rates, while another believed that a federal goal rate should be set in the final rule.

A commenter suggested that the concept of the trigger level was too prescriptive, and that states should, in collaboration with EPA, have the latitude to work with water systems when their 90th percentile lead results are trending upwards, without the regulatory mandates of the proposed rule to guide how to respond.

One commenter recommended that the final rule provide flexibility so states may require additional information from and actions by the water system, such as submitting plans and specifications; WQPs; a follow-up corrosion control study and report; changing treatment; additional monitoring; and any other applicable requirements, to be determined by the state. The commenter pointed out that some state drinking water programs cannot be more stringent than Federal regulations and/or may adopt rules by reference, so the proposed LCRR limits the ability of some states to require additional information and actions from water systems that can help the state evaluate the water systems' circumstances and make determinations for appropriate actions when there are source or treatment changes.

Commenters also requested more detail and raised concerns about the proposed approach to conduct CCT reviews during sanitary surveys, noting that a CCT review is more specialized and will need dedicated staff to conduct the review. One commenter agreed with this approach and suggested additional language be added requiring a CCT evaluation when water systems are proposing changes in treatment that may impact water corrosivity, given that the previous rule requires review and approval from the state for changes only after CCT has been optimized. One commenter requested EPA release guidance for conducting these reviews and consider mandating this review only for systems whose 90th percentile lead levels are above 5 ppb, and they should not be mandated as a part of the sanitary surveys. This approach, the commenter claimed, would reduce implementation costs while maintaining the benefits.

One commenter suggested that the primacy requirements for find-and-fix and goal-based LSLR be removed. One commenter suggested that the term "find-and-fix" be changed to "site investigation."

One commenter said that EPA should designate acceptable inventorying methods, rather than the final rule include a primacy requirement that states can require water systems to review any resource, information, or identification method.

One commenter said that the proposed school sampling program is not scientifically defensible and does not provide public health protection. One commenter recommended EPA provide flexibility to allow entities other than community water systems (CWSs) (e.g., school district or childcare facility) to implement testing requirements imposed on schools or licensed childcares by local or state laws or regulations.

Commenters asked for additional training and guidance, in various rule areas. These requests extended to the topic of enforcement in various rule areas, such as the inventory, LSLR, and tap sampling pools, reviewing CCT during sanitary surveys, and reviewing changes in source water/treatment. A commenter requested guidance to be published one or two years before the rule requirements become effective.

Agency Response

EPA acknowledges that rule flexibilities can offer implementation benefits but may also increase state burden compared to a more prescriptive rule. For the final rule, EPA has identified areas where the Agency can be more prescriptive, and has left flexibilities for states where appropriate. For example, EPA provided a high level of prescription in the records that need to be searched for the initial inventory under §141.84(a)(3). States may, but are not compelled to, require or provide additional records or material identification methods or techniques. EPA is also prescriptive regarding the risk mitigation measures that must be taken following an LSL disturbance as well as the public education language that must be conveyed to consumers. Prescription in these areas is appropriate because it ensures uniform risk mitigation standards are in place, and that clear and consistent public health messaging is communicated to consumers about lead in drinking water, regardless of where they live.

Some examples in the final rule where states are granted significant discretion are LSLR rates. The final rule increases state discretion by not including the proposed requirement under § 141.19 to allow EPA to set alternative goal rates. Although some commenters requested EPA be more prescriptive about goal rates, EPA identified this as an area where more state discretion was appropriate given that states have a better understanding about the number of LSLR individual systems can manage, and states may also have varying LSLR priorities which are reflected in their prescribed goal LSLR rates. For more information see response to comment Section 6.7. EPA is also not adopting commenter suggestions to allow the Agency to set an alternative mandatory LSLR rate for individual water systems. The rule prescribes a national minimum rate of 3 percent and maintains the previous rule requirement that states under § 141.84(g)(9) must set alternative mandatory LSLR rates when feasible. Because setting an alternative LSLR rate requires detailed information about a system and close involvement by the regulatory authority, states are in a better position to make a judgment about the feasibility for individual systems to replace more than 3 percent of LSLs annually. Allowing EPA to override a state's decision about alternative mandatory LSLR rates could create additional uncertainty in implementing the final rule requirements. For more information, see response to comment Section 6.8.

In response to the comment requesting a state waiver from the LCR, EPA notes that, under SDWA Section 1413, in order to maintain primary enforcement authority or "primacy," state programs must be no less stringent than the federal program; as a result, a state may revise its program in a manner different than this rule so long as the resulting rule is no less stringent than this rule. However, many states choose to incorporate the federal drinking water standards by reference to reduce the transaction costs that can result in trying to compare a state program to a very different federal program to determine stringency.

EPA agrees that the final rule should allow the flexibility for states to require additional information from and actions by the water system, such as the commenter suggestion of "submitting plans and specifications; WQPs; a follow-up corrosion control study and report; changing treatment; additional monitoring; and any other applicable requirements, to be determined by the state." The final rule includes new language in § 141.90(a)(3) which allows states to "require the system to take actions before or after the addition of a new source or long-term treatment change to ensure the system will operate and maintain optimal corrosion control treatment such as increased water quality parameter monitoring or re-evaluation of corrosion control treatment such as additional water quality parameter monitoring, additional lead or copper tap sampling, and re-evaluation of corrosion control treatment. This will allow states to request this additional information that could be needed to evaluate new sources or treatment decisions, even where a state drinking water program cannot be more stringent than the Federal regulation or the state rule is adopted by reference.

For the final rule, EPA is not extending the timeline to adopt the final LCR provisions because it would cause significant delays in final rule implementation. While a commenter specifically mentioned the LSLR plan as requiring discussion and negotiation, EPA notes that while the LSLR plans must be submitted before the rule compliance date, the goal LSLR rate is the only provision within the plan that requires specific approval or designation of an alternative rate, for which states have six months after the compliance date.

EPA has not used the alternative name of "site investigation" to replace the term "find-and-fix" in the final rule because a site investigation could refer to many other activities, such as investigation of service line material. The term "find-and-fix" is more descriptive and specific to the requirements under that provision and was suggested by stakeholders during consultations

For EPA's response to comments about the trigger level, please see response to comment Section 3.

In response to comments about using sanitary surveys for CCT review, please see response to comment Section 4.9.

In response to a comment, EPA added regulatory text for water systems to assess service line materials using any resource, information, or identification method *as provided* or required by the state. This will allow states to compel water systems into these actions without requiring the state to pass a different version of the LCR. For more information about determining service line materials in the final rule, please refer to response to comment Section 5.4.

For EPA's response to a comment suggesting inventories should be reported in an online EPA portal, please see response to comment Section 5.6.

Because the final rule does not authorize EPA to review and supersede a state-set goal LSLR rate under §142.19, comments about the timing of this requirement are moot. Please see response to comment Section 6 for more information about goal LSLR rates. EPA notes that water systems must report LSLR activities to the state even if they are below the lead action level, such as certification of compliance with customer-initiated LSLR.

For EPA's response to comments about states implementing school testing programs, please see response to comment Section12.8. For response to comments about who must conduct the schools and child care sampling, please see response to comment Section 12.3.

For more information about implementation, enforcement, and primacy requirements, including SDWIS please see response to comment Section 15.1.

EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. EPA understands that training or guidance pertaining to provisions due at or before the final rule compliance date should be released in a timely manner so they can be used by states and water systems to comply with these provisions.

15.3 State Recordkeeping Requirements

Summary of Comments

Commenters highlighted the numerous "exchanges" between the water systems and the state, noting the paperwork demands for the systems to complete and for the states to track. A commenter believed that increased recordkeeping requirements would not lead to public health benefits. Commenters thought the increased tracking burden will make it difficult to issue violations.

A commenter said that state databases are currently unable to handle the proposed additional rule requirements. EPA received many comments stating that the proposed find-and-fix recordkeeping requirements are not practical, requiring significant resources and benefitting a limited number of customers. A commenter suggested these records be kept by the water systems and be available for review by the state, such as during the sanitary survey. Another commenter said that school sampling will also be difficult to track, given that states do not know how many schools or child care facilities are in the CWSs' service areas, and that states may have different licensing requirements for child care facilities which the commenter said should be clarified.

A commenter suggested that two additional recordkeeping requirements be introduced for LSLR plans under § 141.84(b) and compliance sampling pools under § 141.86(a).

One commenter noted that the recordkeeping requirement related to evaluation of source water or treatment changes, as well as LSL inventories, are important requirements and should be retained in the final rule.

One commenter suggested EPA include a requirement that states maintain records of LSLR plans and inventories.

A commenter highlighted an error made in the reg text under § 142.14(d)(8)(viii).

Agency Response

Recordkeeping in the final LCRR is essential for determining water system compliance, aiding implementation, and ensuring public health protection. Retaining records of, for example, inventories, tap sample tiering pools, goal and mandatory LSLR rates, and optimal corrosion control treatment (OCCT) designations are necessary for tracking compliance and ensuring effective implementation. EPA acknowledges that the final LCRR increases state burden in areas such as recordkeeping, and this is, in part, due to the introduction of new rule provisions, such as the LSL inventory, LSLR plan, and school sampling. These new rule provisions will improve public health, and recordkeeping is an essential part of ensuring these provisions are executed correctly. Despite cost increases in this area, the Agency disagrees that the added burden makes implementation infeasible. For more information about state burden in the final rule, please see response to comment Section 15.1 and the final LCRR Economic Analysis (USEPA, 2020).

EPA added two additional recordkeeping requirements for LSLR plans under § 141.84(b) and compliance sampling pools under § 141.86(a) to ensure that the state maintains this information critical to compliance with the final rule. EPA agrees that inventories should be kept as records too, noting that this requirement was included in the proposal. EPA updated the text in § 142.14(d)(8)(xx) to reflect that in the final rule, inventory updates are not required annually for systems on reduced monitoring.

Maintaining records for inventories is critical for enforcement of LSLR, tap sampling, and other requirements in the final rule.

Regarding the comment about the difficulty of tracking school sampling, the final rule does not include a new requirement for the state to maintain records of school sampling. The state must, however, define a school or childcare facility under § 142.16, and CWSs are required under § 141.92(a) to compile a list of the applicable schools and child care facilities they serve and must update and submit that list to the state at least once every five years under § 141.92(e). The state is then responsible for ensuring that the CWS certifies compliance with the requirements as specified under § 141.90(i). While the state is not required to maintain a database of schools and child care facilities and associated results, they must retain the reports and the lists in accordance with § 141.91. These requirements will ensure that records of school testing compliance are retained without the burden of managing significant amounts of data.

The final rule retains recordkeeping requirement related to evaluation of source water or treatment changes. EPA agrees with the commenter who expressed support for these proposed requirements. Records of source water or treatment changes is important for states to maintain given the potential for such changes to impact CCT and optimal water quality parameters (OWQPs), for example.

Due to the burden of such requirements, EPA has not included state recordkeeping requirements for find-and-fix.

EPA has amended the error under §142.14(d)(8)(viii) regarding faster LSLR rates set by the state.

15.4 State Reporting Requirements

Summary of Comments

Commenters highlighted the increased burden associated with the proposed rule's increased state reporting requirements. Commenters noted that previous rule violations are not adequately reported, and said that the burdens added by the proposed rule without additional resources would result in even worse reporting. Many commenters highlighted the need for federal data management and reporting systems with the functionality to handle the new reporting requirements, without which states would be required to build their own systems at great expense. Commenters noted specific areas that require improved data management in SDWIS such as CCT, WQP monitoring, find-and-fix, tap sampling, and other areas. A commenter recommended that within six months of the final rule publication, EPA assess the capability of SDWIS to manage LCRR implementation and to release a schedule of planned system upgrades. One commenter said that EPA's data management system should be completed within six months prior to the rule effective date.

Commenters requested that EPA publish rule implementation guidance and DEIs, as well as provide training on effective data management strategies for implementing the final LCRR, including the use of existing or newly developed functionality in SDWIS for managing the rule.

Agency Response

EPA acknowledges that burden to states, including reporting requirements, will increase in the final LCRR. EPA has determined that the state reporting burden is feasible and will improve implementation, enforcement, and public health protection of the final rule. Reporting will be streamlined through a new SDWIS State module and longer term through the SDWIS Modernization system project, which EPA is providing to primacy agencies. The SDWIS Modernization system will be the long-term replacement for the SDWIS State data system that most state programs use. For more information about state burden in the final rule, please see response to comment Section 15.1 and the final LCRR EA (USEPA, 2020). For EPA's response regarding the development of SDWIS PRIME, please see response to comment Section 15.1.

Regarding requests for implication guidance and training for SDWIS, EPA understands that rule guidance is a critical component to ensure the rule's effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

References

United States Environmental Protection Agency (USEPA). 2020. Economic Analysis for the Final Lead and Copper Rule Revisions.

16 Economic Analysis

EPA requested comment on the five drivers of costs identified in the "Economic Analysis for the Proposed Lead and Copper Rule Revisions" or "Proposed LCRR EA" (USEPA, 2019a) that include: (1) the existing number of lead service lines (LSLs) in public water systems (PWSs), 2) the number of PWSs above the lead action level of 15 µg/L or lead trigger level of 10 µg/L under the current and proposed monitoring requirements, (3) the cost of installing and optimizing corrosion control treatment (CCT), (4) the effectiveness of CCT in mitigating lead concentrations; and (5) the cost of lead service line replacement (LSLR). EPA also requested comment on the assumptions regarding labor required to comply with the proposed rule, and solicited comment and peer reviewed information on the evidence relevant to quantifying the incremental contribution of blood lead concentrations (BLL) to cardiovascular disease (CVD) (and associated mortality) relative to other predictors such as diet, exercise, and genetics that may be useful in a future benefits analysis.

Section 16 provides a summary of public comments received on EPA's economic cost and benefits analysis and the Agency's responses that includes revisions to the cost benefit analysis in response to these comments. It is further organized into 26 numbered subsections.

16.1 General Comments

Summary of Comments

Two commenters indicated the economic and benefits analysis was complicated and lacked transparency. One commenter noted the complexity made it difficult to verify the assumptions used and the resulting calculations. The other commenter noted that the economic analysis needed to be carefully validated. Both commenters asked for the rule and the economic analysis to be simplified.

Agency Response

EPA agrees with commenters that the analysis is complex however the Agency has provided extensive information about the data and methodology used to assure transparency. The final rule includes multiple compliance actions (e.g., LSLR, CCT installation or re-optimization, find-and-fix, public education) triggered by individual and combined lead tap sampling results. The complexity of this treatment technique also means there are many more required inputs for the estimation of total compliance costs then is the case for a maximum contaminant level (MCL)-based rulemaking. In response to the comments, EPA made several changes to the "Economic Analysis for the Final Lead and Copper Rule Revisions," hereafter referred to as the "Final LCRR EA" to improve transparency and make it easier for readers to verify assumptions and resulting calculations (USEPA, 2020a). EPA added new PWS and Primacy Agency exhibits in Chapter 5 and Appendix B that shows each activity for which EPA developed cost estimates, organized by major rule component (e.g., implementation and administrations, sampling costs) and subcomponent (e.g., lead tap monitoring). Each activity is lettered in these exhibits and throughout Chapter 5 and Appendix B for easy reference. In addition, EPA added unit cost summary tables for each major rule component and included detailed assumptions and exhibits from the Excel derivation files in Chapter 5 and Appendix B. EPA also made the data variables in the Agency's national cost model, the SafeWater Lead and Copper Rule (LCR) model, a unique font so they are easy to find and track throughout the document.

EPA has also utilized new data, to the extent possible given the quality of data provided in public comments and new data sources developed post proposal, to validate the final rule economic assumptions and results and/or to better characterize uncertainty in the estimated values. Some examples of new information sources incorporated into EPA's cost model and analyses include:

- State data that identify systems with and without LSLs. See "Number of Systems with LSLs" within the response to comment Section 16.2.
- States that incur the cost of analytical services. See "Need to Re-evaluate the Cost Analysis" within the response to comment Section 16.3.
- Studies on states with existing lead in school testing programs. See "Waivers" within the response to comment Section 16.3.2.2.
- Michigan first liter and fifth liter lead compliance data. See "Estimated Number of LSL Replacements" within the response to comment Section 16.3.4.
- Data from a cost model developed by the Association of State Drinking Water Administrators (ASDWA) that estimates the cost to primacy agencies to implement the LCRR, as proposed. See "ASDWA CoSTS Model for Estimating Primacy Agency Workload" within the response to comment Section 16.3.6.

EPA has also simplified where possible rule requirements in the final rule; for example the synchronization of many of the system data reporting requirements, the elimination of the need for systems to revise the LSLR plans, the reduction in the frequency of LSL inventory updates, and the streamlining of the lead testing program for schools and child cares.

16.2 Baseline Universe of Systems: Major Data Sources and Affected Entities

Several commenters provided information on LSL inventory information, trigger level exceedance (TLE) and action level exceedance (ALE) data, rule complexity, and data accuracy. EPA summarizes and addresses these comments below by topic.

Number of Systems with LSLs

Summary of Comments

Four states provided information about the number or percentage of systems in their states with LSLs to help EPA better estimate costs. Indiana stated that in response to an LSL Inventory Questionnaire that was sent to all community water systems (CWSs) in 2016, with 66 percent (513 of 779) of CWSs reporting, 132 systems reported service lines with lead portions. Colorado reported that 5 percent of water systems in the state have identified as having LSLs. Wisconsin indicated that, in 2018, 132 municipal water systems reported a minimum of 195,000 LSLs, and this number is expected to rise as stricter reporting policies and procedures are put in place. Nevada reported that the state has no documented LSLs in PWSs.

Agency Response

EPA thanks these state commenters for including data on the number of LSLs in their comments. Because the presence or absence of LSLs is an important factor in determining the likelihood a system's lead 90th percentile level will exceed the trigger level of 10 µg/L or action level of 15 µg/L or an individual tap sample will exceed 15 µg/L, EPA needed to collect and use tap sampling information from systems with known LSL status. LSL information is not available in the federal version of the Safe Drinking Water Information System (SDWIS/Fed); therefore, EPA used system-specific data provided by states or available from their websites as detailed in the Chapter 4, Section 4.3.5.1 of the Final LCRR EA (USEPA, 2020a) and the file, "Derivation of State LSL Status_Final Rule.xlsx." For the proposed rule, these states included Indiana and Wisconsin among others. For the final rule, EPA expanded the universe of systems with known LSL status to include more current information for Wisconsin based on new data posted to their website and all systems in Nevada based on the state's public comment that no systems have LSLs. EPA was unable to use the information provided by Colorado because it did not include system-specific information.

Colorado also supplied a minimum estimate of 195,000 LSLs in the state. The data was too narrow in scope for EPA to adjust this methodology for estimating existing LSLs at a national level. For the number of LSLs at LSL systems, EPA continued to use in the two Final LCRR EA surveys of LSLs. The first survey is the 1988 Lead Information Survey (LIS) by American Water Works Association (AWWA), which included systems, in a wide range of sizes, from all nine EPA regions. The second data source combined results of two surveys, the AWWA 2011 and 2013 surveys of LSL occurrence. The surveys included responses from all states, were equally representative of surface and ground water systems, and represented a wide range of system sizes. See Chapter 4, Sections 4.2.5 and 4.2.6 of the Final LCRR EA for more information.

Trigger Level and Action Level Exceedance Data

Summary of Comments

Several commenters responded to EPA's request for data on the number or percentage of systems that exceed the lead action level or would exceed the new lead trigger level but not the action level, i.e., have a TLE as follows:

- Connecticut Department of Public Health estimated that up to 20 PWSs may exceed the new trigger level but not the action level each compliance period.

- North Dakota Department of Environmental Quality reported that 6 percent of PWSs (19 PWSs) in the state sampled in 2017, 2018, and 2019 had exceedances of the proposed trigger level and half of these (3.0 percent) did not exceed the action level.
- The State of Wisconsin reported during 2016 through 2019, 26 publicly owned and 17 privately owned CWSs and 56 non-transient non-community water systems (NTNCWSs) exceeded the lead action level and for the same time period, an additional 28 public and 11 private CWSs and 43 NTNCWSs would have exceeded the lead trigger level but not the action level.
- Indiana Department of Environmental Management indicated that, 106 of 779 CWSs (13.6 percent) and 34 of 583 NTNCWSs (5.8 percent) had results between the trigger level and the action level for lead within the past three years; 94 CWSs (12 percent) and 52 NTNCWSs (8.9 percent) had levels above the lead action level during the past three years; and 63 CWSs (8 percent) and 39 NTNCWSs (6.7 percent) had a copper ALE during the past three years.
- Nevada Division of Environmental Protection reported that ALEs in 2009-2019 varied from zero to seven per year in Nevada, while exceedances of the proposed trigger level but not the action level would have varied from two to eight per year.
- Colorado Department of Public Health and Environment indicated very few of the systems identified as having LSLs (i.e., 5 percent of systems) are over the proposed trigger level, but this may change with the targeting of LSL samples sites only.
- Ohio EPA provided a table detailing five years from 2015 – 2019 of 90th percentile data that indicated a range of 16 to 18 systems had lead ALEs each year and 16 to 32 would have had a TLE.

Agency Response

EPA appreciates the compliance data from Connecticut, North Dakota, Indiana, Nevada, Colorado, and Ohio. Due to the aggregation level of the data, EPA could not directly use the information in the estimation of LSL and non-LSL system TLE and ALE percentages. The Agency did use the information as a rough check on the magnitude of the ALEs and TLEs estimated for the final LCRR. The values provided by states are similar to EPA's estimates of the percent of systems that exceed the trigger level (0 to 12 percent) and the action level (2 to 9 percent) under baseline conditions (i.e., before LCRR implementation). The high and low values are based on the lowest 90th percentile lead value reported to SDWIS/Fed for all 50 states from 2007 to 2015; the "low estimate" is based on the lowest, non-zero, 90th percentile lead value reported to SDWIS/Fed from 2007 to 2015, likewise, the "high estimate" is based on the highest 90th percentile lead value reported to SDWIS/Fed from 2007 to 2015. For the economic analysis, EPA used a subset of systems with known LSL status to acknowledge that systems with LSLs are more likely to exceed the trigger and action level as opposed to systems without LSLs. Final values for the baseline conditions for systems with and without LSLs are in Exhibit 4-19, Section 4.3.5.1 of the Final LCRR EA (USEPA, 2020a). Also see Section 4.2.1.4 for a discussion of EPA's verification of SDWIS/Fed data.

Rule Complexity and Economic Analysis

Summary of Comments

One commenter stated that "it seems unlikely that EPA's analysis accurately sets the stage for fully understanding the cost of state implementation of the proposed rule," and pointed specifically at the prevalence of small systems subject to the existing LCR, the complexity of the proposed rule, and the fact that a significant percentage (13 percent) of systems already struggle to comply with monitoring and reporting provisions of the existing rule. The commenter emphasized the limited capacity of small systems (many of which do not have CCT in place) and noted that small systems comprise the majority of existing LCR treatment technique and monitoring and reporting violations. In addition, the commenter cited that states must interact with approximately 67,700 water systems (most of which serve fewer than 10,000 people) in order to "assure reliable compliance status." The commenter implied that cost of state implementation in the Proposed LCRR EA does not adequately consider the state of compliance with the existing LCR, particularly for systems serving fewer than 10,000 people, and additional state workload associated with monitoring and determining system compliance for new treatment technique requirements and other complexities related to monitoring and reporting in the proposed rule (USEPA, 2019a).

Agency Response

See "ASDWA CoSTS Model for Estimating Primacy Agency Workload" in the response to comment Section 16.3.6 that details how EPA increased its costs estimate, from the proposed to final rule analyses, for primacy agencies to implement and oversee the final rule requirements.

Data Limitations and Uncertainty

Summary of Comments

One commenter thought that it would be irresponsible to make decisions based on the existing economic analysis, given the acknowledged uncertainty about model inputs and the very small sample sizes involved. This commenter indicated that "the first step in revising the LCR should be to first receive completed inventory from CWSs across the nation within a three-year time frame. Included in this inventory could be CCT status and actual costs of LSL replacements. This will give the EPA a more accurate snapshot of the current LSL situation nationwide."

Agency Response

EPA acknowledges the limitations of the LSL inventory data in Chapter 4, Section 4.3.4 of the Final LCRR EA but does not agree with the commenter that the revisions to the LCR requirements must wait for the collection of additional data. The Agency in its estimation of the costs and benefits of the final rule developed two values for the number of LSL systems and the number of LSLs present in those systems that allow for the *estimation* of both "low" and "high" scenarios impacts of the costs and benefits associated with the rule requirements. These values represent the bounds of cost and benefit values given the uncertainty associated with the amount and distribution of LSLs as well as other factors. Therefore, the Agency and stakeholders have an understanding of the range of impacts that are associated with the uncertainty in the base data used for the analysis allowing them to assess the impacts on governments, systems, and individuals related to the final LCRR.

The uncertainty range for LSLs is based on two studies, the first being from the economic analyses for the 1991 LCR, where EPA used results from the 1988 LIS conducted by AWWA to develop the LSL inventory for CWSs (USEPA, 1991). The second is based on a new estimate of LSLs presented in Cornwell et al. (2016) based on AWWA surveys conducted in 2011 and 2013. In order to capture the uncertainty associated with LSL inputs EPA developed low and high model inputs that correspond to two key parameters related to the LSL inventory: (1) the percent of systems with LSLs, and (2) the percent of service connections that are lead within systems that are known to have LSLs. The derivation of these input variables for the low cost scenario, which assumed 6,286,963 LSLs distributed nationwide, is described in detail in Chapter 4, Section 4.3.4.1 based on data from Cornwall et al. (2016). EPA used data the 1991 Regulatory Impact Assessment (RIA) (USEPA, 1991) to generate the high cost scenario estimate of these LSL inventory parameters. The RIA assumed that 10,274,845 LSLs existed nationwide in 1988. Based on this initial number, EPA adjusted the value to 9,239,141 for the year 2024. This adjustment is also described in Chapter 4, Section 4.3.4.1.

The collection of inventory data as required in the final LCRR will help improve the accuracy of future cost analyses.

Corrosion Control Treatment

Summary of Comments

One commenter recommended that EPA review the economic impacts of the elimination of calcium carbonate at affected water systems.

Agency Response

EPA disagrees with the commenter that is it necessary to specifically evaluate calcium carbonate in the cost estimates. Under the final LCRR the Agency is not requiring those that are deemed optimized with this CCT to switch to another type of treatment. Primacy Agencies still have the authority to designate the necessary water quality parameters to allow these systems to maintain this treatment as optimal corrosion control unless the system exceeds the lead trigger level or action level. Because those systems currently using calcium carbonate are allowed to continue its use the incremental cost moving forward would be equal to zero. Further, EPA does not anticipate that many systems use calcium carbonate stabilization for CCT because as noted in EPA's 2016 "Optimal Corrosion Control Treatment Recommendations Document" (USEPA, 2016), newer research has shown that calcium carbonate films only rarely form on lead and copper pipe and are not considered an effective form of corrosion control.

EPA is eliminating calcium carbonate stabilization as a CCT option for the CCT study conducted to determine the appropriate CCT for new installations and re-optimization but the costs of the study and the resulting implementation of the CCT selection are captured in the cost estimates of the final LCRR.

In response to the request for comment about the effectiveness of CCT, the Agency received general comments that CCT is very effective with caveats. The State of Colorado indicated that, the water in the distribution system must be used on a regular basis, and sampling should be required to check on proper operation of CCT. The Agency agrees with commenters that CCT can be effective in reducing drinking water lead levels (WLL) if carefully operated and monitored. The Agency did not receive any comments on how to improve the estimates of the effectiveness of CCT from the proposed economic analysis and is therefore maintaining the same assumptions used in the proposed rule analysis.

16.3 Cost Analysis

EPA received comments pertaining to the need for the Agency to re-evaluate the cost analysis, the timeframe for implementing the rule, and the impact on small systems. EPA addressed each of these topics in more detail below.

Need to Re-evaluate the Cost Analysis

Summary of Comments

Several commenters indicated the cost analysis should be re-evaluated and cited reasons that included EPA's reliance on small samples to produce national cost estimates and the fact that cost estimates are low and did not seem to include all costs associated with a given requirement. For example, one commenter indicated that EPA underestimated the impact of school and child care requirements. One water system commenter estimated that the cost to implement the LCRR will be approximately five times the cost to implement the previous LCR, with school sampling, and additional reporting and documentation being the driving factors. Another water system commenter estimated that his water system will need to hire nine full-time equivalents (FTEs), plus one field crew and two supervisors, and acquire associated office space, vehicles, and computers, exclusive of what is needed to meet the requirements, as proposed for sampling of school and child care facilities. A commenter from a different water system estimated that implementation will require several million dollars per year regardless of whether any lead action level is exceeded. This commenter added that the required sampling, reporting and documentation will increase costs to water systems with significant costs associated with inventory, school sampling, and locating galvanized pipes. One commenter stated that EPA should incorporate opportunity costs into the economic analysis because these costs capturing "social benefits foregone," are needed to accurately characterize the costs and benefits of the rule, and are the preferred measure of benefits and costs based on EPA's guidance.

Agency Response

Based on comments on the proposed rule analysis the Agency has added additional data and modified the use of existing data to re-evaluate the national costs for the final LCRR. EPA is using the best available data to estimate the costs and benefits of the final rule. As described in response to comment Section 16.2, EPA updated the universe of systems with known LSL status for the final rule. Regarding the comment that the estimates are low and incomplete, EPA revised several of the cost input in SafeWater LCR and added new inputs based on public comment as follows:

- Included Michigan's first and fifth liter compliance data in the economic analysis (See Chapter 4, Sections 4.2.7, 4.3.5.1, and 4.3.5.2).
- Revised the initial start-up activity burden and ongoing technical assistance burden for Primacy Agencies based on ASDWA's 2020 Costs of State Transactions Study (CoSTS). (See response to comment Section 16.3.6, "ASDWA CoSTS Model for Estimating Primacy Agency Workload.")
- Increased the burden for systems with LSLs to obtain a sampling pool comprised of 100 percent of households with LSLs.
- Added burden for PWSs and primacy agencies to confer on initial lead monitoring data to determine a system's status under the LCRR.

- Assigned analytical-related burden and costs for lead analyses to six states and burden to update the lead tap sampling instructions to reflect the final rule requirements to seven states that perform these activities in lieu of the system.
- Revised the approach for estimating the number of schools and child cares to include more current studies and data sources; to develop state-specific estimates that include facilities located in the District of Columbia (DC), territories, and Navajo Nations; and to develop state specific estimates based on the population served in each state, territory, and the Navajo Nations. See response to comment Section 16.3.2.2, "Number of Schools and Child Cares" for additional information.
- Increased burden for CWSs to contact school or child care to determine and finalize its sampling schedule, to discuss sampling results, and added burden for them to provide detailed discussion of any high lead sample results and the "3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities: A Training, Testing, and Taking Action Approach," or "3Ts" (USEPA, 2018).
- Revised the likelihood a system will complete its initial LSL inventory in advance of the rule to limit it to states that include the identification of galvanized service lines, DC, and 5 percent of systems in other states under the LCRR.
- Increased the burden for systems to develop an LSL inventory under the LCRR.
- Changed the estimate for Primacy Agencies to review the initial LSL inventory under the LCRR for systems with and without LSLs.
- Revised the estimates for LSLR to consider more current information. Also included system replacement costs incurred when customers initiates replacement of their portion of the LSL.
- Included pitcher filter costs associated with disturbances of LSLs that are associated with water system work other than LSLR.

Regarding the comments on school and child care testing requirements, see response to comment Section 16.3.2.2 for a discussion of the revisions to EPA's analysis that pertains to the number of schools and states that can waive the program requirements for CWSs and how EPA modified the requirements in the final rule to reduce the burden to water systems to implement this program. Also see Chapter 3, Section 3.11 of the Final LCRR EA (USEPA, 2020a) for a detailed discussion of the public education and sampling requirements at schools and child cares.

In response to the generalized comment of EPA's cost estimate being low and not including all costs for given actions, the cost analysis of the final rule is as accurate as possible based on the best data available to the Agency. EPA has included all cost components to the requirements analyzed where sufficient data exist taking into account all actionable public comments (those comments containing enough specific information to allow its use in the cost modeling framework). EPA does acknowledge uncertainty in the cost estimates based on the availability of data. The uncertainties associated with individual datapoints are documented throughout Chapters 4 and 5 of the Final LCRR EA. Also see sections in Chapter 4, titled "Discussion of Data Limitations and Uncertainty" for specific discussions of the impacts of uncertainty from specific costing inputs or assumptions. EPA developed low and high cost scenarios to represent bounds on cost estimates which represent the impact of uncertainty on the major cost drivers in the rule analysis. See Chapter 5, Section 5.2.4 for a discussion of the uncertainty associated with the low and high cost scenarios.

Regarding the comment indicating that opportunity costs were not incorporated into the economic analysis resulting in inaccurate estimates of social costs, EPA disagrees with the comment that it did not properly estimate the cost of the LCRR. The commenter correctly points out that when conducting an economic analysis of a proposed regulation it is important to consider the opportunity costs imposed upon society by the regulation. EPA also agrees that using only direct compliance costs as a measure of opportunity costs can lead to an underestimate of costs, but not in the case of the LCRR. In a competitive market where demand for goods are price sensitive (i.e., elastic demand elasticity), the increased cost of production associated with a regulation would cause suppliers to reduce the amount of product they are willing to sell at a given price (i.e., upward shift in the supply curve) and this would result in an increase in the equilibrium price for the good in the market. Facing this higher price, consumers would choose to purchase less of the product. In this case, both consumers and producers incur a welfare loss (e.g., a decrease in consumer and producer surplus, respectively). The sum of the decrease in consumer and producer surplus is the opportunity cost of the regulation. However, water supply is not a competitive market; it is almost exclusively a regulated monopoly. In addition, potable water has a highly inelastic demand -- customers' consumption of water does not change much when the price of water changes (Metaxas and Charalambous, 2005). Because they are regulated monopolies, water suppliers can pass the increased cost of production, resulting from the regulation, to their customers, through an increase in price. Furthermore, consumers are unlikely to decrease the quantity of water consumed due to the higher price. In this case, there will be a change in the price of water -- equal to the increase production costs due to the regulation -- but little change in the quantity of water produced and consumed. In addition, since water utilities can fully recover cost through rate adjustments, alternative investment opportunities are not crowded out. Therefore, the direct cost of compliance, as estimated by EPA, is a sound estimate of the opportunity costs of the proposed and final LCRR.

Timeframe for Implementing the Rule

Summary of Comments

One commenter argued that three years will not be long enough to make all the necessary changes (including hiring) to come into compliance with all of the new and competing requirements in the proposed rule.

Agency Response

While EPA acknowledges that a review of existing records specified in §141.84(a)(3) may require significant effort for some water systems, the Agency disagrees that three years is inadequate. See EPA's response to comment Section 5.

Small Systems

Summary of Comments

One commenter stated that provisions of the rule will be particularly burdensome to small systems: in particular, the cost of LSLR, the cost of providing water pitchers and/or filters to customers for 3 months to locations that have experienced an LSLR, and the cost of public outreach informing customers annually that they are served by an LSL or a service line of unknown material.

Agency Response

EPA recognizes that many small water systems have limited resources and technical capabilities and implementing the regulatory requirements of the final LCRR will be challenging. In recognition, EPA has sought to reduce the burden of the LCRR requirements to a substantial fraction of small systems (i.e., more than 91 percent of CWSs and 100 percent of NTNCWSs). The final LCRR provides flexibility for small CWSs serving 10,000 and fewer people and all NTNCWSs to select from among CCT, LSLR, provision and maintenance of point-of-use (POU) devices, or replacement of lead-bearing materials as the compliance response to a lead ALE. EPA has promulgated this small system flexibility because the Agency agrees that small water systems serving 10,000 or fewer persons and NTNCWSs typically do not have the capacity to implement multiple measures simultaneously such as CCT and LSLR programs. EPA has concluded that these small systems can work with their state to identify the most cost-effective measure from this list of affordable and feasible compliance options depending on the characteristics of the small system including the number of service connections, the number of LSLs and the technical capacity of the system's operators. See response to comment Section 7 for more discussion of small system flexibility. With these flexibilities EPA found in its Regulatory Flexibility Act (RFA) analysis that under the final LCRR, the number of small PWSs serving 10,000 or fewer people that is also the small system size threshold used in the RFA analysis, which is defined in the Safe Drinking Water Act (SDWA) and confirmed, in consultation with the Small Business Administration, in the Agency's Consumer Confidence Report regulation, 63 FR 44524; USEPA, 1998) that will experience estimated annual costs of more than one percent of revenues ranges from 37,885 to 40,940 and the number of small CWSs that will have estimated annual costs exceeding three percent of revenues ranges from 21,860 to 25,466.

16.3.1 SafeWater LCR National Cost Model

Summary of Comments

EPA received a number of comments related to the treatment of capital and operations and maintenance (O&M) costs in the SafeWater LCR model. These include comments on when capital and O&M costs should be applied during the period of analysis. A commenter suggested that capital costs should be "loaded upfront" and not annualized to better represent the costs to systems. Another commenter suggested the annualization of O&M costs over the 35-year period of analysis. A third commenter provided a number of points on the appropriate social discount rate to use for estimating the present value and the annualized costs of the rule. The commenter pointed to the use of a 3 percent or lower social discount rate based on the intergenerational impacts of the LCRR, the fact that substantial public funding is available from the federal government and that costs are primarily born by public utilities and individual households indicating that this regulation primarily affects consumption as opposed to displacing private capital expenditure, and that newer data are available based on current economic conditions that would reduce the 3 and 7 percent estimates for discount rates. The commenter also suggested clarifying which discount rates (the social rates or system cost of capital) are being used in different analyses. EPA also received comments on the underlying data for estimating the cost of capital used to estimate the annual economic impact to PWSs and households. The concerns included both the age of the data and the limited sample size.

EPA received a comment that capital costs should be "loaded up front" and not annualized. Another, comment stated that "EPA should also convert operation and maintenance costs over the (35) year period to present worth to get a complete cost of compliance picture."

Agency Response

These comments seem to take issue with using annualized costs as a means to evaluate the cost of the rule and EPA disagrees with these comments. In determining the annual cost of the rule, EPA used a 35-year time horizon and, for each PWS and primacy agency impacted, EPA determined the capital and O&M costs they would incur in each of the 35 years. Since the timing of costs differ from the timing of benefits, EPA calculated the present value of costs and benefits, and then annualized the present values, so social costs and benefits could be compared on an annualized basis. To do this, EPA used two alternative social discount rates, 3 percent and 7 percent. These rates, required by OMB's Circular A-4 (OMB, 2003), provide a range for the social discount rate which is uncertain. Regarding the comment that EPA should consider the 3 percent or lower discount rate as representative of the social discount rate, EPA has provided costs and benefits based on the 3 percent discount rate to allow the Agency and stakeholders to assess impacts based on this time preference. However, there is uncertainty in the estimate of the discount rate given long term potential privatization of PWSs, and the potential for inflation over the next 35 years (the period of analysis). Therefore, it is appropriate to provide the 7 percent value to capture the potential uncertainty in long term time preferences. In considering the impacts of the regulatory requirements of the final LCRR, EPA considered both perspectives regarding the appropriate social discount rate.

There was some confusion regarding how EPA discounted costs when estimating the economic impact to PWSs or the households they serve. In these cases, instead of using a social discount rate (3 or 7 percent), EPA used an estimate of the cost of capital faced by PWSs as this better reflects their true financing cost. So, whenever a cost per PWS, cost per household, or cost-revenue ratio is presented in the LCRR economic analysis, the cost of capital was used for discounting.

One comment pointed out the cost of capital estimates used by EPA to estimate economic impacts seemed to be inconsistent, as the rates by system size and ownership seemed to fluctuate without a pattern. EPA agrees with this comment. EPA used data reported by CWSs in the 2006 Community Water System Survey (CWSS) to calculate these cost of capital estimates (USEPA, 2009). The questionnaire asked systems how they funded "major capital improvements, repairs, and expansions" during the past five years, including the percentage of capital expenses funded from different sources, the associated interest rate paid, and the average loan period. EPA used the CWSS data to calculate the overall weighted average interest rate (across all funding sources and loan periods) for each size/ownership category, weighted by the percentage of funding from each source and using sampling weights. EPA also calculated the weighted average interest rates across five loan timeframes (<5 years, 5-15 years, 15-30 years, ≥30 years, and unknown), and across the categories of public and private borrowing. The CWSS collected data on interest rates only for public and private borrowing. Therefore, EPA made assumptions for the other funding sources. EPA assumed that there is no cost of capital for grants and for Principal Repayment Forgiveness under the Drinking Water State Revolving Fund (DWSRF). For capital improvements financed by equity or other funds from private investors, EPA assumed an average interest rate of 9 percent based on several examples of the allowable cost of equity for public utility. Unfortunately, while EPA used the best available data to calculate the cost of capital by system size and ownership, the 2006 CWSS had a small return sample size for the questions addressing financing. This was the cause of the seeming randomness in rates across system sizes and ownerships. In addition, the data are rather dated.

It is EPA's intention to update and improve the robustness of the cost of capital estimates when the next survey is conducted. Until that time these data represent the most up to data values available obtained directly from the regulated entities.

16.3.2 National Sampling Cost

Summary of Comments

A commenter from the City of Rochester expressed concern about the significant burden and cost of the rule as proposed. The commenter noted that the additional workload for the new sampling costs associated with tap sampling, school and child care facilities, at locations where LSLs have been replaced or disturbed, and requested by customers after being notified they have LSLs will require an additional 2,000 hours of staff time, and increase the water system's sample volume by more than 3,000 percent. The commenter added that this estimate is in addition to increased staff time for LSLR and the new reporting requirements of the rule.

Agency Response

EPA acknowledges that some systems may see a large increase in the frequency of sampling and/or the number of samples taken due to the requirements to offer consumers follow up sampling after completion of any full or partial LSLR, the changed eligibility requirements for reduced monitoring, and follow-up tap sampling at any site that exceeds 15 µg/L under find-and-fix requirements. In addition, CWSs with a large number of schools and child cares that are not eligible for a waiver will also experience an increase in the required number of samples. The average system will not see such significant increases in the number of samples taken. Under the final rule, EPA has taken steps to reduce the sampling burden on systems. EPA has modified the lead in drinking water testing program at schools and child cares in response to public comment. EPA has expanded the criteria that allow a Primacy Agency to waive this testing program for water systems. In addition, EPA is requiring CWSs to sample only at elementary schools and child cares that request testing after completing one five-year cycle of testing and only at secondary schools that request testing. See topic area 16.3.2.2 for additional detail on these changes. In addition, the sampling requirement associated with LSLR will decrease over time as systems replace LSLs. Further, the final LCRR does not require systems to sample LSL locations that have been disturbed due to water system work other than LSLR. Also, the final rule does not require systems to pay for customer-requested sampling in instances where an LSL had not been replaced.

16.3.2.1 Lead Tap Sample Monitoring

EPA received input on lead tap sample monitoring from four commenters related to sampling plans, tap sampling costs, and recruiting customer to collect samples. EPA addressed these comments by topic.

Sampling Plans

Summary of Comments

One commenter stated that the proposed rule effectively requires every water system subject to the rule to submit a revised sampling plan and argued that EPA must acknowledge and account for this burden in its cost-benefit analysis.

Agency Response

EPA agrees with the commenter that the estimated costs for the LCRR need to account for the development and submission of tap sampling plans by all PWSs to the primacy agency and included in the cost model for the final LCRR burden for the development, revision, and submission of the systems sampling plan to the primacy agency. This burden is 3 hours per sampling period for systems with and without LSLs. For the LCRR, systems with LSL will have a greater burden associated with the requirement to sample from LSL location; therefore, the cost model also includes an estimated upfront burden for these systems to contact homes to establish an initial tap sampling pool that contain all LSLs sites. This burden ranges from 5 to 100 hours based on system size. Most systems without LSLs will not need to update their initial sampling pool because they are subject to less restrictive sampling criteria regarding the age of the copper and lead solder sites under the LCRR. Specifically, these systems no longer need to prioritize sampling at sites with copper pipes and lead solder installed after 1982. Because non-LSL systems can meet the requirements of the LCRR with their current sampling pool, EPA did not include a burden to update their initial sampling pool. However, EPA assumed all CWSs would have some change in their sampling locations from one monitoring period to the next and included an annual burden of 3 hours to report this change to the primacy agency.

Tap Sampling Costs

Summary of Comments

One commenter stated that EPA's estimate of $21.58 per sample analysis is inconsistent with the cost charged by the North Dakota state lab of $45 per sample that is exclusive of shipping or transporting samples to the lab.

Agency Response

EPA did not alter the unit tap sampling analysis cost in response to this comment. The Agency could not determine if the lab costs provided by the commenter included both lead and copper. EPA's commercial laboratory estimate of $21.58 includes the cost for a lead analysis only based on quotes received from six laboratories, as documented in the file, "Derivation of Lead Analytical Burden and Costs_Final Rule.xlsx." These estimates are inclusive of shipping and bottle costs. Based on discussions with laboratories, all CWSs serving 100,000 or fewer people and all NTNCWSs are assumed to use a commercial laboratory. Only CWSs serving more than 100,000 people are assumed to conduct in-house analyses. In addition, EPA also obtained estimates from these six laboratories and an additional seventh laboratory for both lead and copper analyses. The quotes ranged from $26 to $58 and averaged $40.50.

This price range data leads EPA to believe that the commenter's $45 price quote is inclusive of both lead and copper testing. The EPA cost estimates represent incremental cost that result from the LCR revisions. Therefore, EPA did not provide the cost for copper analyses in the economic analyses because the requirements for copper remain unchanged and the incremental costs for the copper requirements under the final LCRR would be $0.

Recruiting Customers to Collect Samples

Summary of Comments

The Colorado Department of Public Health and Environment indicated that based on recent experiences in conducting a statewide review of the appropriateness of system sampling site locations, recruiting household volunteers for a sampling pool will likely take significantly longer than estimated because systems may be unaware of their service line materials. Additionally, with the new LCRR requirements that are projected to remove LSLs at greater rates, households will be rotated out of the sampling pool as their pipes are replaced necessitating higher rates of recruitment for new household sampling sites. The burden estimates for recruiting sample site participation for the proposal were based on an assessment of the recruitment time required under the previous rule requirements.

One commenter stated that the burden of collecting samples is borne by customers with LSLs or copper piping with lead/tin solder. This commenter believes that the cost of analysis should be well-known to EPA since utilities have been conducting sampling and analysis since 1992.

Agency Response

EPA agrees the average burden under the new LCRR will likely be greater for systems with LSLs, given the additional site requirements for tap sampling in systems with LSLs and the higher rotation in the sampling pool due to increased rates of LSLR. For the final LCRR analysis, EPA doubled its estimate of the burden for a system with LSLs to recruit a household volunteer. EPA assumes these systems will need to contact four customers by phone for every one needed sample at an average of 15 minutes per contact or 1 hour in total. The model also assumes that 75 percent of systems will offer cost incentives ranging from $10 to $100.

The cost analysis of the LCRR is an assessment of the incremental cost of the new requirements of the regulation. In the case of assessing the incremental unit cost, to the customer, based on the changes in lead tap sampling protocol under the LCRR, fifth liter sampling does require the customer conducting the sampling to collect five liters of water (at one time) instead of a single liter but this is a de minimus burden compared to the larger sampling burden. All other activities required of the customer sampler have not changed. Therefore, EPA has determined the incremental unit cost to the customers of the tap sampling requirements is zero.

16.3.2.2 School Sampling

A number of commenters provided input on the school sampling cost analysis for the proposed LCRR. The comments covered a number of topics including: costs to water systems, grandfathering, the estimated number of schools and child cares, the number of sample to be taken at each facility, some of EPA's burden assumptions, and costs to schools and child cares. EPA addressed these comments in groups below.

Costs to Water Systems

Summary of Comments

Several water systems commented on the cost of school and child care testing requirements. One indicated that the school testing requirements of all schools every five years may be unaffordable. At estimated costs of between $1,300 and $3,800 per school, this water system expects that a single round of sampling at all school sites and child care facilities in the service area will cost approximately one million dollars. Another said that the 5-year rotating schedule of school and day care testing requirements would impose new costs of $200,000 to $300,000 per year, which would increase service rates without any real reduction in lead to customers. The Texas Commission on Environmental Quality pointed out that Texas PWSs will be required to sample approximately 25,000 schools and child cares. Another indicated that larger systems will likely need to hire additional staff or hire contract support to implement rule provisions, and the costs incurred will not only be payroll costs but also overhead (for office space, vehicles, computers, etc.).

Agency Response

EPA acknowledges that the school and child care testing program will be expensive for some CWSs and has modified requirements in the final rule to help reduce costs. The final rule requires CWSs to conduct sampling at 20 percent of elementary schools and child cares annually during the first five years under the mandatory program phase of the rule. After that, CWSs are only required to conduct sampling annually at up to 20 percent of elementary schools and child cares that request sampling under the "on request" phase. EPA also modified the final rule to allow CWSs to count schools and child cares that are non-responsive to outreach efforts and that refuse sampling toward the required annual 20 percent under the mandatory program phase. The rule further requires CWSs to only conduct sampling annually at up to 20 percent of secondary schools that request sampling under the "on request" program. Under the proposed rule, the mandatory testing phase had also applied to secondary schools. Finally, EPA expanded the waiver eligibility requirements that allow primacy agencies to waive the testing and outreach program for systems as detailed in the response to comment in subsection "Waivers" below.

EPA disagrees with commenter's cost estimates of $1,300 to $3,800 per school. In the Final LCRR EA (USEPA, 2020a), EPA estimated the per system cost for one round of sampling (including labor and additional costs for planning, travel, sample collection and analysis, providing public education, providing and discussing sample results with tested facilities, and providing an annual report to the primacy agency) to be about $275 to $935 per school and about $210 and $865 per child care depending on the system size and the need for the CWS to spend additional time consulting with facilities that have high lead results. These costs do not include additional office space or computers but do include vehicle O&M costs to travel to the school or child care. See details on the unit cost assumptions in Chapter 5, Section 5.3.2.5 of the Final LCRR EA (USEPA, 2020a). In addition, EPA inflated the water system hourly wage rates by 1.4 to account for benefits (see Chapter 4, Section 4.3.10.1 in the Final LCRR EA). In the final LCRR, CWSs will incur costs per elementary school and child care in the first five years and will only be required to sample if requested by the elementary school or child care thereafter (assumed to be 5 percent of these facilities). EPA also assumes 5 percent of secondary schools will request sampling and that CWSs will incur costs associated with these requests. EPA recognizes that some states and CWSs will incur greater costs than others due to the varying distribution of schools and child cares in each state. For example, in the Final LCRR EA, EPA estimated that there are

64,674 elementary schools and child cares in Texas that would need to be tested. This number was estimated using the method described in the subsection "Number of Schools and Child Cares." EPA acknowledges that this requirement will impact more systems in larger states, such as Texas, and EPA has provided more flexibility in the final rule by switching to an on request program after 5 years and expanding the waiver eligibility requirements (as described in the next subsection) to help reduce these costs. The rationale for including the school and child care testing and outreach requirements in the final LCRR is described in the preamble to the final rule (USEPA, 2020b) and response to comment Section 12.

Waivers

Summary of Comments

With regard to the waiver provisions for sampling at child cares and schools: One commenter examined state-level child care lead testing requirements and concluded that Connecticut, Maine, North Carolina, and Vermont should be considered eligible for waivers in the economic analysis, and that Oklahoma should be excluded (because its lead testing requirements for child cares only apply to private water supplies—the commenter noted that Nebraska and Texas have similar requirements). Further, the commenter indicated that some CWSs will be eligible for partial waivers even in states that do not meet the waiver requirements. The commenter concluded that EPA has underestimated the percentage of CWSs nationwide that will be eligible for a waiver of sampling requirements at child cares, and therefore overestimated sampling costs. The same commenter has not tracked school requirements in detail, but thought it is likely that there are similar errors there too, resulting in an overestimation of costs. The commenter referred EPA to the January 2019 Harvard report on testing in schools, which includes factsheets for each state (https://www.hsph.harvard.edu/prc/projects/early-adopters/), as well as a report by 120 Water Audit (https://120wateraudit.com/resources/cost-analysis-reducing-lead-in-school-and-childcare-facility-drinking-water/).

Agency Response

EPA has re-evaluated states with equivalent programs for child cares and schools that can qualify for waivers considering the information provided in the two sources recommended by the commenter and to account for changes to the final LCRR. EPA revised the waiver eligibility requirements in the final LCRR to include:

- States that have received Water Infrastructure Improvements for the Nations (WIIN) Act grants,
- States that may not meet all sampling requirements but require remediation, and
- A category for states with equivalent programs for public schools only that would be eligible for a partial waiver.

These final rule requirements are summarized in Chapter 3, Section 3.11.1.2 of the Final LCRR EA (USEPA, 2020a).

For child cares, EPA determined that seven states (California, Connecticut, New Hampshire, New Jersey, North Carolina, Oregon, and Vermont) and DC are expected to be eligible for a waiver for the mandatory program and on request program). An additional six states (New Mexico, Oklahoma, Rhode Island, Utah, Virginia, and Washington) are expected to qualify for the on request program only. EPA did not consider

Maine to be eligible for a child care testing waiver because the state only required one sample and the testing protocol was unknown.

For school waivers, EPA evaluated states for both full and partial waivers. CWSs in states that are expected to be eligible for full waivers had mandatory and/or on request testing programs that applied to both public and private schools. CWSs in states that are expected to be eligible for partial waivers had testing programs that applied to public schools only. EPA determined that four states (Maryland, Minnesota, New Hampshire, and Vermont) are expected to be eligible to grant a full waiver for the mandatory and on request programs. Five states (Montana, New Jersey, New York, Oregon, and Pennsylvania) and DC are expected to qualify to grant a partial waiver for the mandatory and on request programs. Four states (Maine, Michigan, New Mexico, and North Dakota) are expected to qualify to grant a full waiver for the on request program only, and seven states (Colorado, Idaho, Indiana, Massachusetts, Oklahoma, Utah, and Virginia) are expected to qualify to grant a partial waiver for the on request program only. Under the final LCRR, individual CWSs may be eligible for and be granted waivers by the primacy agency. EPA conducted this analysis of waiver eligibility on a state level that may have overestimated costs in those instances and in instances where a state has targeted sampling at a subset of schools. A summary of the waiver eligibility analysis and data limitations and uncertainties can be found in Chapter 4, Section 4.3.9.2 of the Final LCRR EA (USEPA, 2020a). The estimated costs for CWSs can be found in Chapter 5, Section 5.3.2.6, Exhibits 5-52 and 5-53 of the Final LCRR EA.

Number of Schools and Child Cares

Summary of Comments

Several commenters questioned EPA's estimates of the number of schools and child cares. A commenter indicated that EPA's assumption, in the proposed rule analysis, that the 126,529 schools and 767,373 child cares are proportionally distributed across the nation's inventory of CWSs is incorrect, and that the burden of sampling at these facilities will primarily be borne by medium and large CWSs. Another commenter offered perspective on the estimated burden on PWSs to meet prescribed school and child care center testing targets. Based on data gathered from five members, the association concluded that there is a very wide variability in the number of schools and child cares per system, and that EPA's estimates are consistently too low. The estimated number of schools served by systems in the 100,000 to 1 million customer size category in particular appears to be problematic. A commenter asserted that depending on what definitions are used for schools and child cares (e.g., licensed versus unlicensed child cares, in-home daycares, home schools, etc.), the costs could be underestimated.

A commenter questioned EPA's estimate that 98,000 public school buildings are not regulated under the SDWA and may not be tested for lead in drinking water. This commenter reported that 98,000 is the total number of all public school facilities in the United States, according to National Center for Education Statistics (NCES), and stated that some proportion of those 98,000 are in fact NTNCWSs in their own right. In addition, there are about 34,000 more private schools (as of 2015-16) in the United States, some of which may be NTNCWSs. The commenter recommended EPA work with state education and health agencies to get an accurate accounting of public and private schools that are NTNCWSs or reliant on outside CWSs.

Agency Response

EPA acknowledges that the Agency does not have information on the exact number of schools or child cares by CWS size and has therefore had to make simplifying assumptions that can introduce some level of error into the analysis. EPA also agrees that there can be a wide variation in the number of schools and child cares across systems and regionally. In an effort to further refine its assumed distribution of schools and child cares across water systems and reduce that error, EPA collected new data from a number of sources. EPA refined its estimate by providing the number of schools and child cares by state and including information for territories, the Navajo Nation, and other tribal water systems and for public and private schools. EPA continued to use data collected by the NCES but utilized state and public/private data breakouts updated to 2015 – 2016 and supplemented that data with information on tribal public schools managed by the Bureau of Indian Affairs. For child cares, EPA updated the information to use 2017 information from the Census Bureau, Bureau of Labor Statistics, and Region Track versus the 2014 data used at proposal. EPA calculated the average number of each type of school and average number of child cares per population served for each state, territory, and the Navajo Nation. This state-level data is more regionally specific than used in the analysis for the proposed rule, which used a national average. See the "Derivation of School_Child Care Inputs_Final Rule.xlsx" for a detailed explanation of how EPA developed the universe of schools and child cares for the final rule. The total national level costs calculated for the school and child care facility sampling program are not impacted by the distribution of the facilities across CWSs. Uncertainty in the distribution only affects assessment of the impact on individual systems. The Agency updated the Final LCRR EA to acknowledge that the number of child cares may be overestimated because Census Region Track data includes home facilities that may be unlicensed. EPA also revised the discussion of data limitations and uncertainties in Chapter 4, Section 4.3.9.1 of the Final LCRR EA (USEPA, 2020a) to indicate that because of the simplifying assumptions on the distribution of schools per water system size, there is uncertainty in the impacts estimated by CWS size categories but that the national cost estimates should be accurate.

To address commenters concerns about the uncertainty in the types of child cares and schools covered by the LCRR, the Agency has made clarifying changes to the definitions of both types of facilities (See §141.2 of USEPA, 2020b)). The clarified definitions reduce the uncertainty in the sampling costs estimates asserted by a commenter.

EPA agrees with the commenter that CWSs are not required to test at schools or child cares that are NTNCWSs. These NTNCWSs are subject to the tap sampling requirements for drinking water systems under the final LCRR, which are separate from the school testing requirements. Therefore, EPA identified the number of NTNCWSs classified as schools using 2016 SDWIS/Fed inventory data, current through June 30, 2016. NTNCWSs with "SC" for schools designated in the Primary Service Area field were counted as schools for a total of 5,655 NTNCWSs. To determine which NTNCWSs classified as schools were public and which were private, the Owner Type field in SDWIS/Fed was used. NTNCWSs classified as schools with Owner Type "Private" were counted as private schools for a total of 2,023 NTNCWSs, and all other Owner Types were counted as public schools for a total of 3,632 NTNCWSs. The numbers of NTNCWSs classified as public schools and those classified as private schools were subtracted from the total number of public schools and total number of private schools, respectively.

For the proposed LCRR, EPA estimated that 94,277 public schools and 32,253 private schools are not classified as NTNCWSs and would need to be tested by CWSs. These numbers were derived from 2013-

2014 NCES data and adjusted to account for schools that are NTNCWSs. For the final LCRR, EPA updated its estimates for the total number of public and private schools to more accurately capture the number of schools in the United States. This approach is described above. For the final rule, the adjusted numbers of public and private schools that are not classified as NTNCWSs and are subject to testing by CWSs are 96,282 public schools and 30,951 private schools and include DC, United States territories, and the Navajo Nation.

Number of Samples

Summary of Comments

A commenter indicated that a testing program at schools and child cares will require more sampling per year than the previous LCR. Another stated that EPA did not provide a rationale for proposing a small number of samples per facility given that the main driver of costs is not the sampling itself but the up-front effort (identifying the facilities, coordinating sampling schedule and logistics, travel, conducting facility walk-throughs, etc.). A third commenter stated that while the proposed number of samples at child cares (i.e., 2 samples) is realistic, EPA has underestimated the number of outlets at schools (i.e., 5 samples) and therefore the costs associated with both sampling and remediation at schools.

Agency Response

EPA agrees that required sampling by CWSs will increase as a result of the testing at schools and child cares. As discussed in the Agency responses in “Costs to Water Systems” and “Waivers” above EPA has expanded the waiver criteria and is limiting the mandatory testing phase to elementary schools and child cares during the first 5 years of rule implementation. Regarding the comment that the number of samples is insufficient, see Section J of of final rule Federal Register Notice (USEPA, 2020b) and response to comment Section 12 for the purpose and scope of the lead in drinking water testing and public education at schools and child cares. EPA agrees with the commenter that the number of outlets for some schools will be higher than five (the required number of samples per school). Estimates based on the International Plumbing Code requirements indicate the number may range from 4 to 259 taps depending on the size of the school (see “Derivation of POU Inputs_Final Rule.xlsx”, worksheet “School_Avg Taps” for additional detail). However, the exact number of samples taken is secondary to the goals of the program. Again, see Section J of final rule Federal Register Notice (USEPA, 2020b) and response to comment Section 12. The sampling requirements are not a replacement for comprehensive testing as detailed in the 3Ts (USEPA, 2018). Thus, EPA has retained the requirement for CWSs to collect five samples from schools and two samples from child cares at outlets typically used for consumption.

Burden Estimates Used in Cost Model

Summary of Comments

One commenter thought that EPA’s estimate of 30 minutes of coordination with a facility prior to conducting a walkthrough (15 minutes for establishing sampling schedule and 15 minutes for coordinating logistics) is unrealistic. The CWS may need to contact a school or a child care operation (that may have few resources and little prior experience in this area) several times before even getting a response, given that the facilities themselves are not legally obligated under the federal rule to participate. The commenter added that EPA also does not account for the time it would take a CWS to document and report, under the proposed rule § 141.92(d)(2), that a facility is not responsive or declines to participate. This commenter thought that EPA's estimated 3 minutes per facility to provide testing results is not adequate to ensure that facilities will receive the support they need to understand their testing results and remediation options. Another commenter agreed that the estimated time for coordinating with facilities is too low, since child cares have little incentive to participate and CWSs may end up doing much of the work.

Agency Response

EPA agrees with the commenter that additional time may be needed to contact the school and child cares. Thus, the Agency has increased the burden for systems to contact schools and child cares to establish their sampling schedule from 0.25 hours to an average burden of 0.5 hours per school and 1 hour per child care. These new values are based on the system's contacting each school twice and each child care four times at an average of 15 minutes per contact. EPA did not modify the burden to coordinate with the school or child care because the system has already established contact and determined a schedule with the facility. The cost model does not include time for the system to document that a facility is not responsive or declines to participate because the Agency assumes 100 percent participation for all elementary schools and child cares. The cost of documenting non-responses or refusals per location would be less than the sampling cost so EPA is being conservative in its cost estimates for these requirements of the LCRR. EPA agrees that school and child cares may need to discuss the sampling results with the water system and has also revised the cost model to include on average an additional hour for systems to discuss the results with schools and child cares. EPA has also included an additional 5 hours for those facilities with one or more high lead samples to provide time for the system to explain the relevant portions of the 3Ts (USEPA, 2018) and to address any follow-up questions that the school or child care might have after the initial discussion.

Costs to Schools and Child Cares

Summary of Comments

One commenter stated the economic analysis does not take into account the additional costs that sampling at schools and child cares will impose on those facilities and believes those costs will be significant. The commenter also questioned the utility of sampling in schools, as there is no clear linkage to remediation by schools or child cares. The LCRR will not require remediation, and the economic analysis does not include remediation costs. The commenter recommended two resources as a starting point for estimating such costs: Sanborn and Carpenter, 2018, A Progress Report on Efforts to Address Lead by Public School Districts, Journal AWWA; and Massachusetts Department of Environmental Protection, 2018, Lead Contamination Control Act (LCCA) Program for Schools. The commenter also recommended drawing on information available from the Department of Education about school infrastructure, itemized in the comment.

Agency Response

The intent of the public education and sampling program at schools and child cares is to inform and educate targeted CWS customers and users about risks for lead at schools and child cares since large buildings, such as schools, can have higher potential for elevated lead levels due to complex premise plumbing and inconsistent water use patterns. Public education and water system sampling will provide schools and child cares with assurance in the process and benefits of managing a drinking water testing program and the information necessary for them to take actions to reduce lead risk. See "Costs to Water

Systems" in response to comment Section 16.3.2.2, and Section 12 for additional information on the purpose of the school and child care sampling program. The cost model includes costs for the regulated community (i.e., water systems and the primacy agencies who oversee implementation of the regulation). It does not include costs for schools and child cares that are not PWSs because EPA does not regulate these entities and thus, the Agency cannot include requirements for remediation in the regulation.

16.3.3 Corrosion Control Treatment Cost

EPA received a number of comments related to the cost and effectiveness of CCT. The Nevada Department of Environmental Protection (NDEP) provided study, design, installation, and O&M costs data from three PWSs that had recently installed alternative types of CCT. Another commenter provided estimated costs for lead solubility studies, scale analysis, batch harvested pipe studies, and harvested pipe flow through studies. Multiple other commenters provided the costs associated with a pipe loop, pilot-scale testing, and other corrosion control studies for water systems, as reported by water systems. One commenter also requested that EPA review the economic impacts for water systems which currently use pH adjustment as a CCT. Multiple commenters also spoke to the effectiveness of CCT, indicating that in their experience CCT can be effective but that this is dependent on system and water use characteristics.

Find-and-Fix

Summary of Comments

EPA also received comments on the costs included for the find-and-fix provision and the characterization of source water and treatment changes, including comments suggesting that the economic analysis does not appropriately characterize current state practices or the proposed rule requirements. One commenter indicated that find-and-fix installation is the largest portion of the national annual corrosion control technology costs and suggested that the proposed process should be revised with stakeholder input. Another commenter suggested that the find-and-fix provision would put undue pressure on households and PWSs to conduct remedial actions. A third commenter stated that the find-and-fix cost assumptions in the cost analysis mischaracterize the regulatory requirements in the following way: by not accounting for small or medium sized systems without optimized corrosion control, by including a grace period for a year of monitoring before taking action, by assuming corrective action will only occur at one entry point (EP), and by assuming corrective action will only require pH adjustment. The commenter also suggests that the data assumptions used to determine which systems will experience a new source water and which will make a change in treatment are limited to source water changes reported in SDWIS and do not reflect changes in recent years to primacy agency practices, EPA training for primacy agency staff, and oversight by EPA regional offices. The commenter suggests the economic analysis underestimates the impact of the rule provisions related to a change in source or treatment water. Finally, a commenter also suggested that there is a public health risk associated with the period of transition from one corrosion control strategy to another and the proposed rule requirements could result in a large number of systems implementing CCT changes at once producing higher risk levels due of insufficient primacy agency oversight and associated increases in costs that should be considered.

Agency Response

In the proposed LCRR EA, for cost modelling purposes, EPA developed a set of “typical” find-and-fix actions a PWS would take in response to a tap sample above the lead action level (USEPA, 2019a). There seems to be some confusion among commenters about how these typical actions were used in the cost analysis. Given the site specific nature of the type of the water quality issues the find-and-fix requirements are designed to address, this set of typical actions was not meant to be an exhaustive list of all potential actions a PWS might take, but rather illustrative of the range of potential actions that would address issues in the distribution system if earlier targeted efforts (CCT installation or re-optimization) were not sufficient to avoid samples above the ALE. The three typical steps for the proposed rule analysis were: (1) investigate the cause and consult with the homeowner; (2) increase the pH level at the one EP that was experiencing samples above the action level; and (3) if the PWS had more than one EP, increase the pH at all remaining EPs.

EPA does agree with the comment that the range of activities accessed in the proposal was likely too narrow and focused too heavily on pH adjustment. Therefore, in the Final LCRR EA, EPA added flushing of the distribution system to the list of typical actions that PWS may take in response to the find-and-fix requirements (USEPA, 2020a). So, EPA’s final rule economic analysis assumes the following find-and-fix steps will be taken: (1) investigate the cause and consult with the homeowner; (2) one time flush of the distribution system near the sampling locations to reduce water age; (3) increase the pH level at the one EP that was experiencing samples above the action level; and (4) if the PWS had more than one EP, increase the pH at all remaining Eps (USEPA, 2020a).

EPA disagrees with the comment that the assumed sequence of find-and-fix steps implies that primacy agencies will not require systems to take action following the first year of monitoring with individual lead observations above 15 µg/L, a period of grace that is not included in the regulatory requirement, and that PWSs would only have to modify pH at only one EP. As discussed above, the modeling assumptions used in the economic analysis are designed to capture what EPA assumes to be an average sequence of find-and-fix follow-up actions that is designed to estimate cost on the national scale. Individual systems and primacy agencies are required under the rule to assess each sample site and take water quality parameter samples at or near the location of the tap sample above 15 ppb. System’s actions to remediate the high lead tap sample should not be driven by EPA costing assumptions. Because of the complicated nature of tap sampling under the LCRR, EPA made the modeling assumption that the first year where an individual tap sample was above 15 µg/L would result in the system investigating the sample results and making a determination that no additional intervention was needed.

Finally, EPA disagrees with the comment that the find-and-fix rule requirement allows water system personnel to walk away if property owners decline to remediate. There are many actions that PWSs can, and must take, that do not require homeowner consent or coordination. Systems must collect water quality samples at or close to the high tap sample locations that will allow the system to make determinations about water quality in the distribution system close to the location of interest and, if necessary, to take actions such as flushing or changing CCT to remediate the issue. See response to comment Section 13 for additional detail on find-and-fix requirements. EPA also disagrees with the comment that states that the economic analysis should include remediation costs that go beyond the rule requirements. Primacy agencies or PWSs may choose to take actions that are beyond the scope of the federal requirements. Neither the costs, nor benefits, of such actions should be attributable to the rule.

CCT Installation and Operation and Maintenance Costs

Summary of Comments

NDEP in its detailed comments on the proposed LCRR provided cost information from systems that had recently installed CCTs. Among the three systems identified by them, System K (serving 1,040 people) has installed a Zinc Orthophosphate Feed System. System B (NTNC, serving 32 people) installed a soda ash process in 2017 and calcite in 2019. System N (serving 40 people) installed a tank and aeration process earlier in 2019.

Agency Response

EPA did a comparison of the costs provided by NDEP for system K with costs (low/mid/high cost options) from the Agency's Work Breakdown Structure (WBS) Zinc Orthophosphate model (which allows for the examination of costs in more detail (e.g., engineering and direct capital, separate from total capital)) and with the cost curves (low/mid/high cost options), which were developed for the proposed rule for installing new CCT for a small ground water system. The cost curves estimate total capital and annual O&M costs in 2016 dollars. The results of this analysis can be found in the bulleted conclusions and table below. EPA did not develop WBS models for the soda ash, calcite, or aeration processes.

EPA concludes that:

- Itemized capital estimates from the WBS phosphate model are very similar to the capital cost items identified by system K.
- EPA's mid- and high-cost unit estimates for phosphate CCT are likely conservative inputs for the LCR national cost modeling.
- System K didn't provide information on the phosphate dose, so it's difficult to compare the O&M costs given the high sensitivity of O&M costs to feed dosage. The Agency assumed a dosage of 3.2 mg/L as phosphate (PO_4). EPA also assumed the flow rate reported by NDEP is average flow and that design flow is twice the average flow. O&M costs are definitely conservative inputs in the LCR national cost modeling.
- Although system K didn't report the total capital cost estimate, the total of reported capital cost items ($30,000) is very much within both the WBS model and LCR cost curves range of low to high cost capital estimates.

Comparison of Zinc Orthophosphate Treatment Costs

Source of Cost Estimate	Year	Flow (gpm)	Design Flow (MGD)	Average Flow (MGD)	CCT Study Costs	Engineering Cost to Design & Submit	Initial Installation Costs Labor & Material	Engineering + Direct Capital Cost	Total Capital Cost	Anticipated O&M Costs Labor & Material (per year)
Reported in Nevada Comments for PWS K	2018	155	0.4464	0.2232	$70,000	$5,000	$10,000	$15,000	not reported	$1,200
Cost Curve Output: Low Cost	2017	155	0.4464	0.2232	not included	included in total capital	included in total capital	included in total capital	$22,465	$6,732
Cost Curve Output: Mid Cost	2017	155	0.4464	0.2232	not included	included in total capital	included in total capital	included in total capital	$27,687	$6,732
Cost Curve Output: High Cost	2017	155	0.4464	0.2232	not included	included in total capital	included in total capital	included in total capital	$41,595	$6,732
PO4 Model Output: Low Cost	2018	155	0.4464	0.2232	not included	$2,785	$11,131	$13,916	$23,596	$7,641
PO4 Model Output: Mid Cost	2018	155	0.4464	0.2232	not included	$3,632	$15,367	$18,999	$30,409	$7,641
PO4 Model Output: High Cost	2018	155	0.4464	0.2232	not included	$4,426	$19,338	$23,765	$37,538	$7,641

Changes in Source Water or Treatment Technology

Summary of Comments

A commenter asserted that EPA underestimated the number of PWSs that will have to evaluate their CCT due to a change in source water or treatment technology because EPA's estimate only includes source water changes that are correctly added to SDWIS and does not reflect changes in primacy agency practice post-Flint, subsequent EPA training for state primacy agency staff, and oversight by EPA regional offices.

Agency Response

EPA disagrees that it underestimated the number of PWSs that would have to evaluate their CCT due to a source water addition or long-term technology change. EPA recognizes that SDWIS data can, in certain cases, under or over report PWS activities. However, it is the best available national dataset to estimate the percentage of PWSs with source water or technology changes. Since EPA has limited its analysis to the requirements of the previous and final LCRR rules, not primacy agency practices that may exceed the national standards, EPA believes its final rule estimates of the number of systems that experience source water additions or long-term treatment changes is a credible estimate.

16.3.4 LSL Inventory and Replacement Cost

Several commenters critiqued EPA's cost model and the assumptions that went into developing the LSL inventory, number of replacements, LSLR costs, and pitcher filter costs and applicability. Others offered input on LSLR costs and included cost data based on their own experience. Another identified areas that required further clarification in the economic analysis regarding LSLR modeling assumptions. EPA addressed each of these comment topics separately.

LSL Inventory

Summary of Comments

A commenter stated that accurate inventories must be developed before other costs can be reliably forecast. Another commenter agreed with EPA that systems that are compliant with the proposed inventory requirements prior to the final rule should not be included in either the calculation of rule benefits or costs associated with those requirements. However, the commenter indicated that the cost model should take into account (1) the time it will take systems with LSL inventories to determine that they are up to date and ready for distribution, and (2) the likelihood that some existing LSL inventories do not satisfy all rule requirements, like accounting for galvanized pipe and defined unknown material. Another commenter indicated that EPA overestimated the extent to which existing efforts to develop LSL inventories will satisfy the new requirements.

Other commenters disagreed with EPA's cost estimates for establishing inventories based on the use of limited data, certain assumptions, or omission of required steps to complete the inventory. One commenter thought EPA's estimates were flawed because they are based on only three sources and these sources report wide ranges and are not necessarily representative. The commenter added that most systems do not have in-house personnel available to conduct inventories, and that contracting the work out costs more than doing it in-house. Another thought EPA was unrealistic to assume that ascertaining service line materials after the initial records-based research is conducted would require a single person-hour per service line. One commenter said that EPA omitted costs associated with digging and then discovery that no lead is present and no replacement is required. This commenter pointed out that in Flint, only 15 percent of excavations conducted by one contractor resulted in line replacements. One commenter stated that the cost for their water system to determine to verify if the estimated 0.5 percent of service lines of unknown material would costs from $1.1 to $1.3 million. The commenter added that the estimated cost to verify the customer portion of these service lines to be $19 to $21 million, which would not be feasible and would be "highly disruptive to our customers."

Agency Response

Regarding the comment about developing an accurate inventory before assessing the cost of the rule, EPA acknowledges the limitations of the LSL inventory data in Chapter 4, Section 4.3.4 of the Final LCRR EA (USEPA, 2020a). Also see "Data Limitations and Uncertainty" in the response to comment Section 16.2, for the Agency's discussion of the development of a "low" and "high" estimate of the number of systems with LSLs and number of LSLs that represent the bounds of cost and benefit values given the uncertainty associated with the amount and distribution of LSLs as well as other factors. EPA agrees with the commenter that the cost model should take into account that some systems with LSL inventories would need to do additional work to correctly account for galvanized pipe. Therefore, EPA updated the likelihood a system would complete its inventory in advance of the rule to only include those states that require the identification of galvanized service lines (Illinois, Michigan, and Wisconsin), as well as DC. EPA's revised approach greatly reduced the likelihood estimates from the proposed rule. Specifically, for CWSs, EPA estimated 9.5 to 14.5 percent of CWSs depending on system size would complete their inventory for the proposed rule compared to 0 to 5.1 percent for the final rule. For NTNCWSs, the estimate for the proposed rule ranged from 5 to 26.8 percent compared to 5 to 13.6 percent for the final rule. EPA also revised the likelihood that a system without LSLs would submit a complete inventory in advance of the rule to include only those in Illinois, Michigan, Wisconsin, and DC; and all systems in

American Samoa, Guam, Hawaii, and Nevada because none have LSLs. This resulted in a decrease in the estimated percentage from the proposed rule estimate of 18.1 to 32.6 percent compared to 12.1 to 20.9 percent for CWSs for the final rule. For NTNCWSs, the percentages decreased from 5 to 26.8 percent from the proposed rule to 5 to 13.6 percent in the final rule. In the Final LCRR EA (USEPA, 2020a), EPA also included a burden of 1 hour for all systems with LSLs to report updated inventory information to their primacy agency annually or triennially. In addition, as part of the public outreach and public education costs, EPA included burden for CWSs with LSL to establish a way for the public to access information on LSL locations of 5 to 10 hours based on system size and for all systems to maintain a process for the public to access lead health information, LSL locations, and tap sample results of 2 to 12 hours based on system size and LSL status.

A commenter stated that the cost model should take into account the recurring costs that will be incurred by PWSs to maintain and update their LSL inventories over time. EPA agrees with the commenter. Included in the cost model is a burden of 1 hour for systems to submit annual or triennial LSL inventory updates to the primacy agency. EPA assumed a relatively small burden because the time to maintain and update the LSL inventory information is accounted for under the LCRR requirement that system make their LSL information publicly available. See Chapter 5 of the Final LCRR EA, Section 5.3.6.2 (SafeWater LCR model data variables: “hrs_pub_access_op” and “hrs maint_lsl_op”) (USEPA, 2020a). Also, those systems subject to the goal-based or mandatory LSLR programs must provide a separate detailed annual report to their primacy agency (SafeWater LCR data variables “hrs_report_lcr_op”) that is described in Section 5.3.4.4 of the Final LCRR EA.

One commenter noted that the rule allows Primacy Agencies to establish different inventory requirements under their special primacy conditions, but EPA does not address the cost that will be incurred when water systems that have compiled inventories according to federal requirements need to make changes and possibly gather additional information to satisfy state-specific requirements or any benefits associated with this requirement. The cost estimates provided for the LCRR are designed to estimate the impact of the federal requirements mandated in the rulemaking. Therefore, EPA’s cost estimates do not include potential actions states may take in the future. Also see the response to comment Section 15.1.

EPA agrees that the estimated burden for systems to complete the initial LSL inventory is based on few data points; however, two of the three data points are state estimates (from Indiana and Ohio) and represent multiple systems. One commenter provided an additional estimate but did not specify what types of activities are included in the estimate; therefore, EPA could not compare the estimate to those in the SafeWater LCR model nor use the estimate in the development of the average implementation cost. To develop the inventory, the LCRR requires systems to review existing records and use other information or methods required by the primacy agency. It does not require field verification. EPA recognizes variability in the level of effort to develop the initial inventory depending on the form of existing records (paper vs. electronically) and inventory work prior to the rule. EPA acknowledges that some systems will face higher inventory development costs than the average values used in the SafeWater LCR model but EPA asserts that on average the data EPA has collected are representative of the burden to systems.

Although not included in the inventory development costs EPA did include field verification costs as part of the LSLR ancillary cost estimates. The Agency assumed systems would confirm whether or not a service line is lead prior to replacement and included the following activities in the cost model:

- Contact the customer and travel to the site of 1.69 hours to 1.97 hours at a cost of $10.67 to $14.45 per service line.
- Inspect and test the lines to confirm they are lead, either through visual confirmation at a burden of 1 to 2 hours per site or through field testing at a range of $109 to $328 per site. EPA assumed 50 percent of service lines would be visually tested and the remaining 50 percent would require field testing. The Agency assumed all inspected service lines would be lead and be replaced.

See "Derivation of LSLR Ancillary Costs_Final Rule.xlsx" for additional detail.

Estimated Number of LSL Replacements

Summary of Comments

One commenter suggested that EPA has underestimated the number of LSLRs that will be triggered by the LCRR. This commenter stated that EPA's analysis of the likelihood of a lead ALE and TLE assumed a dependency on system size and draws from SDWIS and information from Slabaugh et al. (2015). The commenter added that the assumption that systems without corrosion control will be less likely to exceed either the trigger level or action level, while reasonable, is not consistent with the rule construct emphasizing the use of orthophosphate as the corrosion control strategy water systems must employ to successfully manage lead levels. The commenter cited the following estimated increase in the number of replacements from Appendix C of the proposed LCRR EA (USEPA, 2019a) over the 35-year period of analysis: 205,452 to 261,701 full LSLRs; 214,000 to 350,000 customer-initiated replacements; and 149,200 full replacements due to the availability of DWSRF program loans and subsidies to fund customer-side LSLR. Furthermore, this commenter said that the economic analysis should include the following costs to be consistent with the LCRR: costs associated with establishing a program to respond to customer requests for LSLR; and costs associated with customer requests for LSLR at systems that are operating below the lead trigger level.

Agency Response

EPA agrees with the commenter in so far as the estimation of the percentage of systems expected to be at or below the lead trigger level, exceed the trigger level but not the action level, and exceed the action level (which drives the estimated number of LSLRs) could be improved given new data made available through public comment and additional research post proposal. For the final rule, EPA revised its approach for estimating the percentage of systems in these three classifications. Specifically, EPA expanded the universe of systems with known LSL status from 3,870 to 4,424 based on information available from state websites and public comment, as described in "Number of Systems with LSLs" under response to comment Section 16.2. EPA also used data from the State of Michigan to estimate the impact on the lead 90th percentile levels that are based on fifth liter vs first liter samples under the final LCRR for LSL systems. EPA applied the ratios of fifth liter 90th percentile values to first liter lead 90th percentile values from 133 systems in Michigan to 90th percentile values for an expanded universe of systems with known LSL status to estimate the likelihood of systems falling into one of three lead classifications. EPA recognizes the uncertainty introduced in using data from a single state that may not represent the values on a national level. However, the Michigan data represent actual compliance monitoring data collected recently from all systems within the state, as opposed to using historical sampling data from a smaller subset of systems that may have had lead issues (i.e., "profile" data from five systems that was used for the proposed LCRR). The resulting change in the percentage of systems in each of these three lead 90th percentile classifications is shown below for the proposed rule and final LCRR for systems with and without LSLs. In the proposed LCRR, EPA provided estimates of CWSs in each lead 90th percentile category by systems size and CCT status. However, some systems' size/CCT status categories had very few systems (e.g., there is only one system serving more than 50,000 people with no CCT. Upon further review of the data, EPA determined there were insufficient data to allow the estimates to be stratified by CCT stratum. For the Final LCRR EA, EPA presented the data stratified by LSL status only (USEPA, 2020a). This final rule approach is consistent with the request from the commenter. EPA provides additional detail in the file, Derivation of Initial P90 Categorization_Baseline_Final Rule.xlsx."

Percent of CWSs with No TLE or ALE, a TLE, and ALE

Category	Proposed Rule		Final Rule	
	No LSLs	LSLs	No LSLs	LSLs
Low Estimate				
No TLE/ALE (P90 ≤10 µg/L)	**92%**	**98%**	**97%**	**89%**
TLE (10 µg/L < P90 ≤ 15 µg/L)	**6%**	**0%**	**0%**	**5%**
ALE (P90 > 15 µg/L)	**2%**	**2%**	**2%**	**6%**
High Estimate				
No TLE/ALE (P90 ≤10 µg/L)	**87%**	**39%**	**87%**	**58%**
TLE (10 µg/L < P90 ≤ 15 µg/L)	**7%**	**23%**	**7%**	**12%**
ALE (P90 > 15 µg/L)	**6%**	**38%**	**6%**	**30%**

Acronyms: ALE = action level exceedance; CWS = community water system; LSL = lead service line; P90 = lead 90th percentile level; TLE = trigger level exceedance.

The change in the estimated percentage of systems with a TLE or ALE impacts the estimated incremental number of full LSLRs that range from 330,228 to 429,174. See Exhibit C.1 in Appendix C of the Final LCRR EA (USEPA, 2020a). EPA agrees with the commenter that the cost of customer initiated LSLR should be estimated. EPA applied its LSLR utility side replacement cost estimates to an estimated percent of LSLs that would be replaced through customer-initiated replacement using a rate of 0.05 percent based on DC Water's experience with its customer-initiated program from 2009 – 2013 as provided in Figure 7 of the 2020 report titled Lead Pipes and Environmental Justice: A Study of Lead Pipe Replacement in Washington, DC (Environmental Defense Fund and American University School of Public Affairs, 2020). This percentage of customer initiated replacements is used to determine the number of system replacements in systems without a TLE or ALE. EPA assumes that customer initiated replacements count toward the mandatory or goal-based LSLR program when systems exceed the lead trigger level or action level. See Chapter 5, Section 5.3.4 of the Final LCRR EA for additional information on how EPA derived this percentage. Also see in the Final LCRR EA, Chapter 4, Section 4.3.5.1 for EPA's approach for estimating the percentage of systems with no TLE or ALE, a TLE, or an ALE.

LSLR Cost Estimate

Summary of Comments

A commenter stated that EPA's economic analysis underestimates the cost of replacing an LSL. The commenter proposed a way of building up costs (updating figures from the 2011 AWWA survey used by EPA to 2016 dollars and adding field inspection costs) that results in cost estimates that are higher than EPA's estimates by $1,222 to $2,751 per LSL. The commenter proposed that EPA's LSLR cost estimates ought to include costs associated with project management, construction management, public relations and (if not already present) site restoration. The commenter also pointed out that the 2011 AWWA survey did not include replacement of galvanized service lines when downstream of lead, and that neither did the Cornwell et al. (2016) study. Replacing galvanized lines as well as lead lines would change some partial replacements to full replacements, and it might also require the use of different pipe replacement techniques, which would affect mobilization costs. The commenter stated that the cost estimates, based on a 2011 AWWA survey, should be updated with newer information, including information provided to EPA during the 2018 federalism consultation. Another commenter pointed out that in some communities LSLR costs may be inflated due to high demand and lack of qualified contractors. One commenter indicated that LSLR costs are likely to vary considerably in different regions of the country and different jurisdictions. The commenter added that the size of the community and the size of the budget and staff of the responsible agency are important sources of variation in the rate of replacements that can be performed annually.

Several commenters offered input on costs based on their own experience and other data, for comparison with the results of the SafeWater LCR model. One commenter suggested that taking into account uncertainty associated with subsurface conditions, the estimated cost of a full LSLR should be in the range of $7,500 to $15,000 per location. Another stated that the customer owns the entire service line and replacement of the service line can average $7500. Another commenter said that LSLR units costs are in line with the high end of the range of costs projected by EPA. Another commenter indicated that due to a cold climate and deeply buried pipes in Iowa, every LSLR there would cost "in the multiple thousands of dollars at a minimum, and up to more than $10,000 dollars each in the more urban areas." Three systems provided actual costs: (1) costs of $4,000 to $5,000 for replacement plus $11,500 or more for traffic control and street repair if needed; (2) $6,500 to $9,500; and (3) $4,500 to $5,000. A major driver of cost is whether the main is located on the same side of the street as the house or whether it is necessary to tear up the road. Another commenter reported that in Wisconsin, unit costs are about $5,000 for a private LSLR and $8,000 for full LSLR, on average, with surface restoration costs being the most important source of variability in costs. Another commenter stated that costs are higher in dense, urban areas and that in New York City, LSLR unit costs can often exceed $20,000. Another indicated that Flint, Michigan's administrative costs were $760 per service line and suggested using an estimate of $6,700 per line based on an AWWA investigation of 14 CWSs.

Two utility commenters felt that working on privately owned service lines would be difficult. One commenter that does not own any part of the service line indicated that such a requirement will be difficult to enforce, and that funding will need to be made available to property owners to incentivize them to replace service lines. The other said that even with incentives that brought homeowner costs down to between $2,000 to $5,000 with an average cost of $3,000 per private-side LSLR, and in some cases down to no out-of-pocket costs, one program found that only 37 percent of customers responded. "The utility cannot force the homeowner to replace the line. This rule has the potential to place the burden on the PWS for these costs. In turn, this will cost all ratepayers in the system. It could also set a precedent for future, currently unforeseen, issues on the customer's side."

Agency Response

EPA agrees with the commenters that new information has become available, since the time of proposal, that would provide better estimates of LSLR unit costs for the final rule analysis. In the analysis of the proposed rule EPA had developed a dataset of 24 utility reported estimates of LSLR costs. EPA evaluated this dataset along the other replacement cost survey information and selected the AWWA 2011 survey as the primary source of data for LSLR unit cost estimates for the proposed rule. Since proposal, EPA has identified cost data in news reports, press releases, and utility websites that has allowed the Agency to expand the data collected during the proposed rule analysis. The search found additional cost estimates from 63 utilities. EPA then selected only the subset of data values that represent reported actual replacement costs from pilot studies and/or recent or on-going LSLR projects. This resultant dataset provides costs estimates across full, customer-side, and system-side replacements from 38 systems, which represent costs and practices from 2016 to 2020 (only two cost values from the proposal dataset remain in the revised dataset). The cost information in the updated dataset are variable in the reported replacement costs covered by the various programs, but a number of the data sources specifically indicate they include surface restoration cost. Therefore, the cost analysis for the final rule includes surface restoration. Many utility estimates are from states that experience cold climates, such as Wisconsin (12 utilities), Michigan (5 utilities), and South Dakota (1 utility) and would include costs for replacing deeply buried lines. Moreover, many utilities including Boston, MA; Cincinnati, OH; Milwaukee, WI; and Memphis, TN are urban areas and therefore total costs likely include traffic control and street repair. EPA did not find costs related specifically to replacement of galvanized service lines in the literature but expects these costs to be similar to LSLRs.

For the final rule, the estimated mean costs for utility-side, customer-side, and full LSLR have increased by 122, 26, and 13 percent, respectively, using the newly developed data as compared with the AWWA 2011 values used for proposal. Also, EPA used the 25th and 75th percentile values from the new dataset in the low and high cost scenarios, respectively. All utility-side, customer-side, and full LSLR unit costs under both the low and high cost scenarios are larger than those used in the proposed rule analysis except for full replacement in the high cost scenario. See Appendix A of the Final LCRR EA (USEPA, 2020a) for additional detail on EPA's methodology and final unit costs for each type of LSLR.

In the cost model for the LCRR EPA applies the full LSLR cost to systems under a mandatory replacement program, where systems are required to fully replace a rolling 2 year average of 3% per year using a baseline number of LSLs equal to the number of LSLs and galvanized requiring replacement service lines at the time the system first exceeds the lead trigger or action level plus the number of unknowns at the beginning of each year of the system's LSLR program, to conservatively estimate the impact to PWSs in the models. But there is no requirement in the final LCRR that states systems must pay for private side LSLR. In fact the rule allows systems to be in compliance with LSLR regulatory requirements even is the mandatory rate cannot be met due to lack of homeowner participation if they can certify they have made two good faith attempts to reach all customers served by an LSL or galvanized requiring replacement that resulted in a signed or verbal refusal or non-response. Also see response to comment Section 6.

Pitcher Filter Costs

Summary of Comments

Three commenters discussed the cost of pitcher filters. One commenter said that the cost per filter should include not only the base cost and the estimated shipping cost, but also the cost of 3 months of replacement filters. Further, filter costs should be included not only in connection with line replacements (and in other limited circumstances) but also with disturbances resulting from meter maintenance and replacement and from service line failures involving lead or galvanized pipe. Each commenter said that EPA's economic analysis should be revised to specifically account for the current cost of pitcher filters, the cost of implementing a pitcher filter tracking and maintenance system. Two of the commenters added that the economic analysis should also consider the likely rise in the price of pitcher filters with the necessary American National Standards Institute (ANSI) standards for lead removal after implementation of the proposed revisions to the LCR, when the demand for qualified pitcher filters will likely exceed the available supply.

Agency Response

EPA updated the cost analysis to also include the cost of pitcher filters that would be distributed to households impacted by water system related work that does not involve LSLRs. EPA assumed that 5.9 percent of households will be impacted annually by water-related work based on the estimated life of water meters provided by Massachusetts Water Resources Authority.

EPA also revised its estimate for pitcher filters used in the proposed rule. The original estimate of $39.98 was inclusive of a $6.00 shipping costs. EPA had assumed that no additional replacement cartridges would be needed because those cartridges supplied with the purchase of the pitcher filter were sufficient to last 3 months, which was the filtration time required under the proposed rule. In the Final LCRR EA, EPA has revised the estimate to $44 and clearly states in Chapter 5, Section 5.3.4.4 the costs including shipping and 6 months of replacement filters (SafeWater LCR data variable: "cost_filter_hh") (USEPA, 2020a). Six months of replacement filters is required under the final LCRR.

Regarding the comment that because of the LCRR pitcher filter requirements demand will exceed the supply resulting in filter price increases, EPA estimated the average annual number of filters that systems would provide after an LSL has been replaced or disturbed to be 21,871 to 35,836 filters per year. Based on a GMP Research Industry publication, "Get the Lead Out", more than 3.9 million pitcher filters were manufactured in 2013 (GMP Research Inc., 2014). This indicates the increased annual demand for pitcher filters under the LCRR would represent 0.01 percent of total annual sales. EPA recognizes that this estimate includes pitcher filters that are not certified for lead removal. On the other hand, this estimate of total production is from 2014 and does not account for the likely increase in the manufacture of pitcher filters that are certified in response to increased public awareness regarding lead in drinking water due to publicized system lead issues like what occurred in Flint, Michigan. The Agency is aware of eight manufacturers that make pitcher filters that are certified to remove lead. EPA does not anticipate that the final rule will impact the pricing of pitcher filters.

Need for Clarity Regarding LSL Replacement Rates

Summary of Comments

EPA received a comment that it was not clear that "EPA analyzed the rule provisions as presented in the proposal preamble as required by SDWA." Specifically, the comment stated that the description of LSLR rates applied in the economic analysis is not clear.

The commenter stated that "there is an embedded assumption that lead levels will below the action level within 3 years for small community water systems and noncommunity water systems."

The commenter also stated "the timeframe for triggered replacement to be complete was not specified, except as shown in flow charts. The analysis description implies the same assumptions are used as for lead service line replacement as for the find-and-fix analysis."

Agency Response

EPA would like to provide some clarity on each point provided by the commenter. First, under the LCRR, if a small CWS (defined as one that serves 10,000 or fewer people) or NTNCWS has an ALE, they may choose LSLR, instead of CCT or POU, as a compliance approach. In this case, they must replace all of their LSLs within 15 years. The SafeWater LCR model assumes that the system replaces 7 percent of their baseline number of LSLs each year until all LSLs are removed in year 15. EPA has made an assumption, for costing purposes that given the changes to the compliance tap sampling requirements, these small systems that select LSLR will have to replace all of their LSLs before they will no longer exceed the lead action level. Non-small CWSs with an ALE must replace a rolling 2 year average of 3% per year using a baseline number of LSLs equal to the number of LSLs and galvanized requiring replacement service lines at the time the system first exceeds the lead trigger or action level plus the number of unknowns at the beginning of each year of the system's LSLR program. A water system that has an ALE must conduct the mandatory LSLR program until the water system's 90th percentile lead levels are at or below the action level for 2 years (4 consecutive 6-month monitoring periods) and the cumulative number of LSLs replaced by the system is greater than or equal to its average annual replacement rate times the number of years that elapsed between the system's first ALE and the date on which the system's 90th percentile lead levels are at or below the action level for 2 years. However, non-small CWSs with an ALE would also have to install or re-optimize their CCT in response to an ALE, and EPA assumes that two years (or four 6-month monitoring periods) after CCT is installed or re-optimized, these PWSs will no longer have to conduct LSLR. Therefore, non-small CWSs will only have to conduct LSLRs until they achieve compliance through CCT.

Regarding the comment on EPA's assumption that lead levels will be below the action level within 3 years for small CWSs and NTNCWSs, EPA disagrees with this comment as this assumption is not made when costing the LSLR requirements of the final LCRR (see paragraph above). However, EPA does make a 3-year replacement assumption for all PWSs under the previous LCR, or baseline analysis. This 3-year assumption means that in the baseline analysis any system that is projected to exceed that action level will only remain above the action level for three years so LSLR will only occur for those three years. This assumption is valid under the existing compliance tap sampling requirements that include fewer samples from households with LSLs. EPA conducted a review of SDWIS/Fed data that shows that under the previous LCR, PWSs on average replaced LSLs for three years before qualifying to stop replacements by no longer exceeding the lead action level for two consecutive 6-month monitoring periods (see Chapter 4, Section 4.3.4.3 of the Final LCRR EA (USEPA, 2020a)).

EPA clarifies that it does not specify a timeframe for triggered replacement to be complete as the timeline will differ by PWS since it is a goal-based program, and the goals, and actual LSLR rates, will vary by PWS. Instead, EPA tracked each model-PWS's lead concentration. Once a model-PWS no longer exceeds the trigger level for two consecutive annual monitoring periods it will stop LSLRs. EPA disagrees that "the analysis description implies the same assumptions are used as for lead service line replacement as for the find-and-fix analysis." This is not the case. Goal-based LSLR is a consequence of a TLE based upon the system's 90th percentile lead level and the find-and-fix requirements are a consequence of single tap water samples above 15 µg/L.

Finally, the commenter stated, "the flowcharts and description of p_lsl_replaced_vol_pct describing the goal-based replacement rate analysis are not consistent." There seems to be some confusion about how the goal-based LSLR goals and replacement rates were modelled. EPA assumed that each model-PWS would be given an annual replacement goal of 2 percent of the baseline number of LSLs. EPA then assigned, each year, an actual replacement rate to each model-PWS that ranged from 1 to 5 percent, with a most likely value of 2.5 percent. Each year of analysis, EPA compares the model-PWS's goal to its actual replacement rate to determine if it met its goal. If it does not meet its goal the model-PWS is required to conduct additional LSLR-related outreach.

For the Final LCRR EA, EPA revised the text and flowcharts to try to make the cost modelling associated with LSLR more transparent (USEPA, 2020a). For example, EPA made the conditions for household-requested LSLR explicit in the text and flowcharts.

16.3.5 PWS Implementation and Administration Costs

Summary of Comments

One commenter pointed out that the proposed rule will require a substantial amount of tracking and follow-up activity, and water authorities will need to add staff in their field operations, compliance, and support sections. This commenter stated that the true costs of implementation are "extremely difficult to estimate." Two commenters provided estimates for the increased expected cost to their water system to implement the proposed rule requirements. One added that these increased costs would be incurred by water systems and their customers.

Agency Response

EPA agrees with the that implementation burden can vary greatly depending on the regulatory requirements that system must implement based on the 90th percentile lead tap sample results. There is uncertainty in the number of systems that will experience TLEs and ALEs as a result of the new sampling requirements over time. Therefore, the Agency estimated low and high cost scenarios based in part on different rates of TLEs and ALEs, to capture the uncertainty associated the 90th percentile tap sampling values moving forward under the new rule sampling requirements. This modeling procedure also provides a range of estimated implementation costs that capture the uncertainty in implementation costs produced by the cost major driver for this category of cost. In the final rule cost analysis EPA has also added or increased unit burden estimates to better capture the costs to systems of implementing final rule requirements, including additional burden for:

- LSL systems to obtain household volunteers and to report lead tap and 90th percentile levels and inventory updates annually or triennially.
- All systems to confer with their primacy agency on their initial lead tap monitoring data and status under the LCRR.
- All CWSs to develop lead outreach materials for schools and child care facilities and contact schools and child cares to finalize their sampling schedule, provide sampling results, and follow-up with those that have high lead values.
- Small CWSs serving 10,000 or fewer people and all NTNCWSs to provide their small system flexibility recommendation.
- Systems to collect a WQP distribution system sample and for some to conduct flushing in response to a single sample above 15 µg/L.

EPA also increased the initial and ongoing administrative primacy agency burden (refer to "Primacy Agency Cost" in response to comment Section 16.3.6, for additional detail). With the resulting changes, the estimated national incremental costs for the final rule are $160,571,000 to $335,481,000 using a 3 percent discount rate and $167,333,000 to $372,460,000 at a 7 percent discount rate compared to the proposed rule costs of $131,987,000 to $269,989,000 at a 3 percent discount rate and $130,104,000 to $286,219,000 at a 7 percent discount rate.

EPA acknowledges the commenters that stated that costs for compliance would increase as a result of the LCRR. EPA has considered these increased costs as described above and has also considered the benefits. The incremental benefits for the final rule are $223,344,000 to $645,276,000 at a 3 percent discount rate and $39,353,000 to $119,102,000 at a 7 percent discount rate compared to $211,081,000 to $521,159,000 at a 3 percent discount rate and $36,612,000 to $97,459,000 at a 7 percent discount rate under the proposed rule. In addition to the benefits monetized in the final rule analysis for reductions in lead exposure, there are several other benefits that are not quantified and that are discussed in Chapter 6, Section 6.6 of the Final LCRR EA (USEPA, 2020a). Examples of non-quantified benefits that reduce lead exposure to children and adults include additional measures individuals will take to minimize exposure to lead due to additional lead public education requirements and reduced exposure to individuals who reside in homes without LSLs.

Regarding the comments about additional needed resources to implement the final rule, see response to comment Section 17.2 for additional discussion on funding assistance.

EPA was unable to verify the cost estimates for the implementation of the proposed rule provided by two commenters due to insufficient data on the characteristics of the systems. These characteristics form the basis of the cost estimate and would have allowed for a comparison with the EPA cost analysis.

EPA acknowledges that because of the public ownership of a significant number of PWSs, the public commissions and boards that often oversee water rate setting for privately-owned water systems, and in general the geographic monopoly water system have within their respective service areas the majority of the incremental costs of the LCRR will eventually fall on the customers of the system. Some costs to customers may be mitigated through the use of federal and state funding, as well as, private PWSs not passing along their costs but absorbing some of the cost of compliance.

16.3.6 Primacy Agency Cost

ASDWA and other individual states discussed ASDWA's estimates for the increase in primacy agency workload to implement the requirements of the LCRR, as proposed. These commenters also discussed specific areas that included data management, state analytical services, and state decisions pertaining to optimal corrosion control treatment (OCCT). In addition, some states provided estimates on additional required staff to implement the LCRR and concerns for how such increases would be funded. Each of these topic areas are discussed below.

ASDWA CoSTS Model for Estimating Primacy Agency Workload

Summary of Comments

ASDWA summarized its estimates from its 2018 CoSTS model. The 2018 CoSTS model was submitted as part of ASDWA's federalism comments and estimates the number of hours that a primacy agency will require to oversee the LCRR as proposed during the first five years of rule implementation (ASDWA, 2018). It includes the burden to primacy agencies for tracking, technical assistance, follow-up with systems, and initiation of needed enforcement actions, as applicable for the following areas:

- Regulatory start-up;
- LSL inventories, replacement plans, and replacements;
- Tap sampling;
- TLEs and ALEs;
- CCT, including water quality parameter monitoring;
- Sampling site assessment (called find-and-fix in the proposed LCRR);
- Small system flexibility;
- Change in source or treatment, and source water monitoring and treatment;
- Public education and transparency;
- Lead testing in schools and child care facilities; and
- SDWIS, data tracking, and primacy agency reporting.

The 2018 CoSTS model projected that the increase in primacy agencies' workload from the anticipated revisions to the LCR would be in the range of 3.8 million to 5.0 million staff hours in the first five years of implementation, or 760,000 to 1,000,000 staff hours annually. When translated to dollars, the costs of states' staff time for the LCRR would be in the range of 72 percent to 95 percent of current funding for the Public Water Supply Supervision (PWSS) program. Multiple commenters including ASDWA and several states that provided input into the CoSTS model noted that the ASDWA study was updated to reflect the proposed revisions to the regulation and urged EPA to consider this updated model. A commenter urged EPA to work with ASDWA, states, and other stakeholders to develop the economic analysis and information collection request (ICR) for the final rule and to ensure that the final rule is grounded in real fiscal impacts at the state and local level. A different commenter indicated that EPA's economic analysis vastly underestimates the costs for each primacy agency and cited the annualized cost of $15,965,008 or per state cost of $319,300 per state for the implementation and ongoing administration from the economic analysis for the proposed rule (USEPA, 2019a). This commenter stated that the analysis does not properly distinguish between start-up costs and ongoing costs and does not clearly account for the range of start-up costs. Another commenter indicated that based on recent work with systems on LCR sample site verification, systems costs are also underestimated.

In a later submission during the comment period, ASDWA provided the revised version of CoSTS and provided an explanation of the changes (ASDWA, 2020a). ASDWA noted that the updated 2020 CoSTS model projects an increase in the national total cost for states to implement the proposed LCRR in its first five years to be approximately 835,000 staff hours annually, over and above the ongoing implementation of the previous LCR. ASDWA indicated that the additional staff hours are a factor of 12 greater than the annual hours (380,830 staff hours) for ongoing LCR implementation. ASDWA further stated that the proposed LCRR alone will require 47 percent of current PWSS funding. Another commenter repeated these ASDWA figures. Several other commenters stated that according to ASDWA, the annual state burden will be 790,000 hours more than the previous LCR implementation.

ASDWA indicated that if EPA makes certain recommended changes to the LCRR (coded separately and discussed elsewhere), the Agency could reduce the complexity of the rule and the state burden could be reduced by approximately 12 percent to 735,000 staff hours annually in the first five years of adoption and implementation of the LCRR. ASDWA noted that their recommended changes to the LCRR reduce the estimated state burden from approximately $50 million annually to approximately $43 million annually. Another commenter requested that if EPA elected to simplify some of the LCRR requirements that the Agency work with ASDWA to make the necessary adjustment to CoSTS.

Agency Response

EPA carefully evaluated the information and assumptions in the 2020 version of the CoSTS model (ASDWA, 2020a) and used a subset of the information from the CoSTS model to assist in the development of revised state burden estimates for the cost analysis of the final rule. Chapter 5 of the Final LCRR EA has been revised for the final rule to provides detail on the information EPA used from the CoSTS model in the adjustment of primacy agency cost variables (USEPA, 2020a). EPA revised cost estimates for a number of state activities including: administrative activities, technical assistance, review of LSLR plans and LSL inventories, approval of systems' LSLR goals, review and approval of tap sampling site plans, review of school and child care testing programs, review of annual reports on school and child care testing programs, and review and approval of small system flexibility recommendations. EPA also added a new one-time cost element for both primacy agencies and PWSs to initially confer on the system's 90th percentile status and new requirements under the LCRR based on the system's first two 6-month monitoring periods under the revised tap sampling requirements of the LCRR. These increases in burden to states resulted in higher estimated incremental annualized costs for the final rule of $19,707,000 to $22,216,000 when compared to the burden estimates used in the analysis of the proposed rule of $14,998,000 to $15,681,000.

Data Management

Summary of Comments

A commenter stated that EPA's cost analysis does not adequately capture costs to states associated with data management, including the cost of updating core data systems and the cost of updating interfacing applications. An expansion of the functionality of SDWIS/State may require coordination with a contractor and centralized information technology (IT) staff outside the drinking water program (e.g., use of an interfacing application that generates templates or presents a public view of SDWIS data). The commenter pointed out that many state drinking water programs already face problems of limited IT capacity, consolidation of IT resources at the department level, and state-imposed restrictions on their ability to develop and modify data systems.

The commenter also asked for clarification about EPA's assumptions regarding data management costs, which are listed as 520 staff hours per state to modify existing systems, with no provision for outside contractors. And the commenter questioned if EPA is planning to update SDWIS and the 520 state staff hours are for additional modifications to interfacing state applications. The commenter recommended that EPA perform the necessary modifications, if possible, to reduce the burden imposed on states. If, on the other hand, the entire burden of data system updates will fall to states, the commenter recommended increasing the estimate of burden in the economic analysis to 2080 hours at an hourly rate of $57.24, or $119,059 per state based on its initial estimate. The commenter indicated that this estimate is in line with past rules like the Ground Water Rule (GWR). The commenter also recommended that EPA increase the PWSS grant accordingly, or offer alternative funding sources to allow states to "effectively manage the database support needed for the increased rule burden." Based on its 2020 updated to CoSTS, the commenter indicated the required hours to modify a state data management system would require 3,700 hours per primacy agency (ASDWA, 2020a). This is based on numbers from the Revised Total Coliform Rule. The commenter also reported that a few states gave an estimate of $150,000 for contracting work on data management system modifications to track LCRR. One such state indicated that it would need to hire a contractor to develop a software solution at the state level if EPA does not update SDWIS/State to track data related to LCRR requirements. Other commenters reiterated concerns about data management costs and asked EPA to clarify and/or revise upward the cost estimate and to commit to an EPA update of SDWIS/State.

Agency Response

EPA agrees that the Agency's prior estimate for modifying the data systems was too low and revised it based on the 2020 version of the CoSTS model (ASDWA, 2020a). EPA increased the estimated burden for the final rule to 740 hours per year per primacy agency during Years 1 through 5 of the 35-year analysis period versus a one-time burden of 520 years per primacy agency in Year 1 for the proposed rule.

Regarding comments on EPA's plans for SDWIS/State, the Agency is intending to provide states with LCRR data management capabilities through the SDWIS Modernization system development project. EPA is intending to engage with states in the development and testing of the SDWIS Modernization data system. EPA will then provide assistance to states in their adoption of the new system. The system will include functions for ensuring data quality as well as for primacy agencies to be able to connect the system to locally run applications, such as the Drinking Water Application running on a state server.

State Analytical Services

Summary of Comments

A commenter stated that EPA's economic analysis does not reflect costs borne by many states that provide analytical services for all required safe drinking water compliance sampling and encouraged EPA to update the cost analysis accordingly.

Agency Response

EPA received clarification from ASDWA regarding which states pay for analytical services (ASDWA, 2020b). Based on this information, EPA revised the cost estimate for the final rule to assign lead analytical costs and some of the reporting costs to Arkansas, Louisiana, Mississippi, Missouri, and South Carolina. EPA also assigned the one-time cost to update the sampling instructions to these states and to North Carolina.

Summary of Comments

A commenter indicated that the proposed LCRR will increase technical assistance costs, instrument maintenance costs, the frequency with which inductively coupled plasma mass spectrometry (ICP-MS) instruments will need to be replaced, administrative costs, sample shipping costs, lab certification costs, and more. The commenter stated that additional resources will need to be provided to state labs to implement the LCRR, and provided cost estimates. The commenter asked EPA to consider the increased burden on state laboratories in the final LCRR.

Agency Response

EPA was unable to verify the cost estimates provided by the commenter because they did not include information on the number of samples.

OCCT Tracking and Recommendation Reviews

Summary of Comments

A commenter indicated that EPA may not have accounted for the tracking of OCCT status for each system and the OCCT recommendation reviews of systems with TLEs. They noted that 24 systems in their state would have a TLE. The commenter added that the majority of the large system designations are from the 1990s, and records of these designation decisions may not include all of the information specified in the proposed rule requirements and current EPA guidance.

Agency Response

EPA disagrees with the commenter that EPA may not have accounted for tracking of OCCT status and recommendations for systems with TLEs. The Agency has developed estimates of both the primacy agency monitoring of OCCT status and the review of OCCT system recommendations for TLEs. EPA includes in the final LCRR cost analysis a burden to review water quality data with systems that have CCT during a sanitary survey of 2 to 5 hours based on system size. EPA also has included an annual burden of 1,560 hours per primacy agency, which is 560 hours higher than the previous rule, to report additional information that includes the OCCT status of all water systems, and the parameters that define the optimization. For the final LCRR, EPA used a conservative cost modeling assumption that all systems must conduct a study prior to installing or re-optimizing CCT and that the primacy agency would not base its OCCT decision on a recommendation. Primacy agencies are assumed to incur a burden of 10 to 24 hours per CCT installation study for systems without LSLs and 12.5 to 30 hours for those with LSLs based on system size. For the re-optimization study, EPA assumed primacy agencies would incur a burden of 10 to 40 hours per study conducted by systems without LSLs and 12.5 to 50 hours for those with LSLs. These estimates are based on responses from North Carolina to a 2016 questionnaire provided by ASDWA. A copy of this questionnaire and the state's responses are available in the docket under EPA-HQ-OW-2017-0300 at https://www.regulations.gov. For additional detail, see Chapter 5, Sections 5.4.3.1 and 5.4.3.2 in the Final LCRR EA (USEPA, 2020a).

State Staffing Needs and Resources

Summary of Comments

Several commenters from primacy agencies provided state-specific resource estimates to implement the LCRR as proposed and several expressed concerns on how the programs would be funded as follows:

- Based on the revised ASDWA CoSTS model, the Virginia Department of Health (VDH) estimated that it would need to hire an additional 11 FTE staff to implement the LCRR as proposed. VDH faces constraints on hiring that would require action by the Governor's office or the state legislature to change, even if additional funding were available from EPA to cover the new positions. VDH recommended that EPA recognize the extremely large increase to state burden and work to simplify the LCRR to reduce the implementation cost.
- The Colorado Department of Public Health and Environment estimated that it will need to hire at least 6 additional full-time staff to implement the proposed rule.
- New Mexico Environment Department believed that the proposed LCRR would require tripling or quadrupling the staff resources devoted to LCR implementation.
- The Texas Commission on Environmental Quality preliminarily estimates indicated that the costs of additional staffing and data management to implement the rule as proposed would be $3.8 million for Texas.

A commenter argued that with flat federal funding for the Public Water System Supervision (PWSS) program and increased workloads due in part to activity related to non-regulated contaminants like per- and polyfluoroalkyl substances (PFAS) and Legionella, states have limited capacity to take on the additional requirements associated with the LCRR.

Agency Response

EPA's cost model doesn't track FTE as an output, but the additional costs of employment such as health care and retirement benefits are accounted for in the Agency's estimated labor rate. An explanation of the calculations and data used to derive this labor rate was added to Chapter 4, Section 4.3.10.2 of the Final LCRR EA (USEPA, 2020a). Also see response to comment Section 17.2 for additional discussion on funding assistance.

16.3.7 Ecological Impacts and Cost of Added Phosphate

Summary of Comments

EPA received comments suggesting that the proposed rule does not adequately address water systems' need to operate under multiple regulatory frameworks and mischaracterizes the importance of wastewater treatment impacts in CCT option selection. Multiple commenters pointed to the interrelationship between the SDWA and the Clean Water Act, and how corrosion control strategies have implications for water systems efforts to comply with both regulatory programs. One commenter suggested that the economic analysis assumptions related to phosphorous is at odds with EPA's current practices of holding point dischargers responsible for substantial nutrient reduction accomplished under Total Maximum Daily Loads. Another commenter suggested that the proposed rule does not speak to or consider wastewater treatment impacts.

One commenter cited EPA's use of a linear extrapolation of the 2007 – 2016 growth in National Pollutant Discharge Elimination System (NPDES) permitted facilities with phosphorus effluent limitations to estimate the total number of facilities with discharge limits after 35 years and argued that a step change in the number of facilities may result as nutrient criteria are adopted across the nation leading to a cascade of permits including phosphorus limits. Another commenter recommended that the EPA consider funding approaches that will help wastewater facilities address the potential NPDES issues.

EPA also received comments expressing concern with the environmental and economic costs associated with the use of phosphorous and orthophosphate CCT. Commenters suggested that the emphasis on orthophosphate could lead to increased costs to states as orthophosphate usage can cause many unintended downstream effects and that EPA underestimated the cost of nutrient removal required by phosphate-based CCT. Commenters also suggested that the cost of phosphorous removal per pound is underestimated and offered alternative unit costs, while also suggesting that it is impractical to standardize a single unit cost for removal of phosphorus. Commenters indicated that the estimated unit cost of removal does not consider the added infrastructure capital costs that may be needed to expand capacity to treat the phosphorous.

Other commenters suggested that a more in-depth discussion of the ecological and cost impacts of zinc should be included in the analysis. Another commenter suggested that EPA should discuss the differing ecological ramifications between total phosphorus and dissolved orthophosphate given that the dissolved orthophosphate is more readily bioavailable, potentially leading to more severe impacts than total phosphorus loading. The commenter also requested that EPA discuss how the proposed rule may exacerbate the depletion of phosphate-rich mineral deposits leading to increased cost for fertilizer production and concomitant food costs.

Finally, one commenter suggested that the economic analysis consider the cost for installation of on-site treatment systems by customers for removal of phosphorous at levels above what can be tolerated by sensitive consumers such as aquariums, home health requirements, and some manufacturing processes.

Agency Response

Regarding the comment that EPA mischaracterizes the importance of wastewater treatment impacts in CCT option selection, see the response to comment Section 4 regarding the requirement to evaluate orthophosphate addition.

As noted in the economic analysis for the proposed and final LCRR, EPA recognizes that the use of orthophosphate as a CCT will create additional burden on some wastewater treatment plants (WWTPs) and will result in additional phosphorous loadings into receiving waters. In developing its national cost estimate of the proposed and final rule, EPA used a mass-balance model to estimate the amount of additional phosphorous that would reach WWTPs. EPA then calculated the amount of phosphorous that WWTPs would need to remove to maintain compliance with existing or future discharge limits. EPA estimates that the annual cost of additional phosphorous removal nationwide will range from $1.1M to $1.8M at a 3 percent discount rate, and $1.5M to $2.6M at a 7 percent discount rate. Based on this analysis, EPA disagrees with comments that the use of orthophosphate as a CCT will likely result in large cost increases to WWTPs. EPA also disagrees with the comment that the Agency's economic analysis "argues that the Agency's continued pressure on point source dischargers of nutrients is ineffectual or does not exist, so phosphate used for corrosion control is a de minimus contribution to nutrient loadings." In fact, as discussed above, EPA's analysis of the cost to WTPPs assumes WWTPs will remove enough phosphorous to remain compliant with their existing or future discharge limits. See Section 5.5 of the Final LCRR EA for a discussion of how EPA estimated the increased phosphorous loadings that will be removed by WWTPs (USEPA, 2020a).

EPA received several comments that its estimate of the cost of phosphorous removal is too low, and some commenters (City of Loveland, CO; National Association of Clean Water Agencies; and the Colorado Department of Public Health and Environment) provided information on the costs of phosphorous removal. EPA reviewed the cost information provided but was unable to use these data because they were too location specific and/or not enough detail was provided to use them in a national-level model. In addition, data from the Colorado Department of Public Health and Environment included both additional phosphorous treatment costs and economic impacts associated with impaired waterbodies. This may be double counting costs as the nutrient load from the WWTP should not decrease the water quality of the receiving water if the additional phosphorous is removed. However, EPA does agree with comments that EPA's estimate of the cost per pound to remove phosphorous may underestimate the true costs if WWTPs need to expand their treatment process capacity (e.g., incur capital costs). EPA acknowledged this limitation in its economic analysis.

EPA also estimated the amount of additional phosphorous that will reach receiving waters. The mass-balance model predicts that the additional use of orthophosphate as a CCT will increase anthropological loadings of phosphorous by less than 1 percent. Therefore, EPA disagrees with the comments that the final LCRR will result in widespread negative ecological impacts such as algae blooms. At the same time, EPA does recognize that its analysis, which was conducted at the national level, may obscure significant localized ecological impacts of additional phosphorous loadings. EPA agrees with comments received that the use of orthophosphate as a CCT may require, in some settings, additional nutrient management practices in order to meet water quality standards, and if these standards are not met, negative ecological impacts may occur. In the economic analysis of the proposed and final LCRR, EPA provided a qualitative description of the ecological impacts associated with nutrient pollution, especially eutrophication (USEPA, 2019a; 2020a). In addition, EPA, in its mass-balance model, accounted for water that would be lost due to leakage and outdoor use (e.g., lawn watering). EPA agrees that its estimate of incremental loadings of phosphorous did not account for these sources and therefore EPA may have underestimated the actual incremental phosphorous loadings.

EPA agrees with a comment that, zinc, a component of zinc orthophosphate, a corrosion inhibitor, must also be managed by a WWTP, particularly with respect to the contribution to biosolids. While EPA's analysis did not directly consider the impact of zinc on bio-solid management costs, the Agency's economic analysis did include the incremental cost of bio-solid management in general. EPA's analysis of WWTP costs underestimates total cost because it does not account for the treatment of zinc. EPA acknowledges this issue in the Chapter 5, Section 5.5 of the Final LCRR EA (USEPA, 2020a).

EPA agrees with the commenter that indicated orthophosphate is more readily bioavailable. Not all forms of phosphorus are utilized to the same degree or at the same rate by plants and microbial communities. Dissolved inorganic phosphate (orthophosphates) are immediately bioavailable in the aquatic environment for algal uptake, and it is indeed this bioavailable phosphorus that affects the algal production in the aquatic environment in combination with other nutrients (e.g., nitrogen), light, and temperature. However, total phosphorous load is the important long-term factor for aquatic health. While a significant amount of phosphorus can enter water bodies in an immediately unavailable form, there is the potential for this unavailable phosphorus to undergo physical or chemical cycling process that may convert it (all or partially) to the readily bioavailable form of phosphorus, orthophosphate. For example, the decomposition of organic matter by microbial activities can result in mineralization of organic phosphates to orthophosphate. Likewise, polyphosphates are unstable and will eventually convert to orthophosphate and become available for plant uptake. As stated in Chapter 5, Section 5.5. of the Final LCRR EA, the ecological impacts of increased phosphorous loadings are highly localized; total phosphorus loadings will depend on the amount and timing of the releases, characteristics of the receiving water body, effluent discharge rate, existing total phosphorus levels, and weather and climate conditions (USEPA, 2020a). Unfortunately, detailed spatially explicit information on effluents and on receiving water bodies does not exist in a form suitable for this analysis. Therefore, EPA could not quantify the potential ecological impacts of the rule. Instead, EPA developed approximate, national-level total phosphorous loading estimates, and evaluated the significance of the loadings compared to other phosphorous sources in the terrestrial ecosystem.

Regarding the impact of the rule on the use of phosphate resources and cost of phosphate products, the quantity of phosphorous used at drinking water treatment plants is not a direct output of the SafeWater LCR model. However, in year 35 of the high cost scenario, the model estimates that the incremental increase in phosphorus reaching WWTPs would reach 1.74 million pounds per year. In the underlying mass balance model used to produce this estimate, the percentage of phosphorus used in drinking water treatment that reaches the WWTP varies on a system-by-system basis, but ranges from approximately 55 to 65 percent. Assuming the worst case for all systems (only 55 percent for all systems), the incremental phosphorus use due to the rule in Year 35 of the high cost scenario would be approximately 3.17 million pounds per year. Based on mole fractions, this incremental increase in phosphorus converts to an incremental increase of 7.3 million pounds per year (or 3,650 tons per year) of phosphorus pentoxide (P_2O_5). In comparison, the United States Geological Survey (USGS) (2020) estimates total United States usage of P_2O_5, including in phosphoric acid, fertilizer, and other products, is 4.0 to 4.5 million tons per year. Therefore, at the upper bound, the incremental increase attributable to the rule constitutes less than 0.1 percent of annual United States consumption. This small increase is unlikely to significantly impact the cost of phosphate products or the rate of depletion of phosphate resources.

EPA also acknowledges in Chapter 5, Section 5.5 that insufficient data exists to allow for the estimation of the additional water treatment costs to reduce phosphate levels in finished drinking water that customers of a PWS may choose to incur. The Agency therefore did not include these costs in the economic analysis which may result in an underestimate of total cost of CCT.

16.3.8 National Cost Estimates

Summary of Comments

EPA received a comment related to the difficulty in evaluating the cost of the rule due to the variability among PWS compliance scenarios, specifically the size, type of water system, presence of LSLs, and existing corrosion controls. EPA also received a comment on the compliance rate assumed during the analysis, suggesting that EPA's assumption of 100 percent compliance will lead to an overestimate of costs.

Agency Response

EPA agrees with the comment that the proposed and final LCRR requirements will impact PWSs very differently depending on the presence of LSLs, corrosion control in place, and system size and type. The analysis prepared by EPA incorporated data and assumptions on existing PWS conditions and provided expected cost estimates by system size, type, and ownership. The SafeWater LCR model incorporated data on system variability in developing the estimated cost of compliance. EPA also developed low and high cost scenarios in order to bracket uncertainty associated with the five LCRR-specific variables that have the largest impact on estimated costs. See Chapter 5, Section 5.2.4 of the Final LCRR EA for a discussion of the uncertainty associated with the low and high cost scenarios (USEPA, 2020a).

EPA disagrees with the comment that EPA has assumed full compliance with the proposed LCRR resulting in an overestimate of costs. A regulatory cost analysis is designed to capture the potential expected cost of the imposed regulatory requirements. To capture these expected costs EPA has assumed, in its cost analysis, that primacy agencies would enforce the requirements of both the previous LCR and proposed LCRR, so that if a PWS does exceed the action level, they will be required to take corrective action including installing or re-optimizing CCT and/or LSLR. This valid assumption has led to significant estimated costs associated with ALEs under the previous rule and significant costs for TLEs and ALEs under the proposed and final LCRR. A commenter, in their example of LSL inventory requirements, suggests that because some primacy agencies did not require PWSs to conduct LSL inventories under the previous LCR, there is no reason to expect PWSs to comply with the mandatory requirement under the proposed LCRR. This is an inappropriate comparison. The requirement under the previous rule was that systems were to conduct a materials evaluation only to identify enough sample locations for tap monitoring. This previous rule requirement is very different from the inventory requirement in the proposed and final rule. The LCRR requires systems to prepare an initial inventory in three years that may include lead status unknown lines and continue to update their initial inventory regularly.

16.4 Benefits Analysis

Summary of Comments

One commenter, commended the EPA for providing comprehensive assessment of costs and benefits of the proposed revisions to the LCR, as well as a thorough investigation into the potential effects of the rule on BLL and intelligence quotient (IQ). Healthy Babies Bright Futures (HBBF) notes that 1 in 26 homes they have tested have WLL above the current EPA action limit of 15 µg/L, and that 1 in 8 homes exceeds the Canadian action limit of 5 µg/L. They emphasize the urgency of reducing WLL in drinking water.

Agency Response

EPA thanks the commenters for their comments. The data provided by HBBF was too limited to use for rulemaking purposes but is helpful context.

16.4.1 Drinking Water Lead Exposures: Concentration Data and Modeling

EPA received comments regarding the lead concentration dataset and modeling approach used in benefits estimation. These comments included comments on WLL estimation methods, including the selection of the underlying concentration data, the approach to developing a predictive model for water concentration at the tap based on those data, and the suitability of Stochastic Human Exposure and Dose Simulation-Integrated Exposure Uptake Biokinetic (SHEDS-IEUBK) model for applying estimates from the predictive model to BLL.

Water Lead Level (WLL) Estimation Method

Summary of Comments

The EPA Science Advisory Board (SAB) provided scientific review of the methods discussed in Section 6.2 of the Final LCRR EA for estimating WLL (USEPA, 2020c). They noted that the use of a random effects model (described as a "linear mixed effects" or "LME" model elsewhere in this document), was appropriate for the available dataset. They suggested clarification and elaboration on several points, including:

- The description of the profile liter term through further explanation of the variability of WLL when water is first drawn from a tap after a stagnation period.
- Considerations of knot placement for spline analysis of the profile liter term.
- Given that the random components of the model (city, site, and sampling event) account for a large portion of the overall variance, and that city and site specific differences may exist, SAB questioned whether city- or site-specific variation in the effects of LSL or CCT had been considered in model design.
- Whether city- or site- specific covariates that could provide insight into "environmental justice" considerations had been considered for inclusion into the WLL model.
- Elaboration on the choice of the "reduced spline model" for the main analysis though the most complex model appeared to perform better in model fit statistics.

Agency Response

The EPA response to the issues raised by the SAB follows.

- EPA has edited Section 6.2.1.1 of the Final LCRR EA to clarify the definition of the profile liter term (USEPA, 2020a).

- EPA considered several knot placement strategies during the initial model design period. These were fitted only to assess whether the conceptually-driven knot placement based on typical tap volume, plumbing volume, and length of service line produced results similar to other knot positions, such as knot chosen by quantile position. As these models were not intended to be used for final predictions, they were not included in model comparisons. Footnote 3 in Section 6.2 of the Final LCRR EA contains a basic description of one such model, and Appendix F has been expanded to illustrate the process.

- EPA has added text in Section 6.2.2 of the Final LCRR EA to discuss this point. During the initial model design period, EPA attempted to fit models that accounted for random variation in parameters related to event, site, and city. This would have allowed the EPA to incorporate variation such as differences in length of a service line among sites, or city-specific features that could change the effectiveness of CCT implementation. However, the dataset did not support such comparisons. Fitting models with random slopes that allow effect sizes to vary among sites or cities requires sufficient variation to fit individual slopes for most of the sites or cities. For instance, EPA considered a model with a random slope to describe differences in CCT effectiveness in different cities. A strong dataset for such a comparison would contain multiple CCT conditions for all cities in the dataset. If a city has only one CCT condition, there is no way to individually estimate the effect of CCT for that city. The effect of CCT for that city can only be estimated in comparison to other cities. This dataset did not contain enough instances of before and after implementation, improvement, or degradation of CCT to fit individual by-city effect sizes, and thus to estimate variation in effectiveness of CCT changes across cities. Similar issues were found with models intended to fit different splines for cumulative sample volume (profile liter) in different sites. Fitting a differently shaped curve for each site would be useful to account for differences in home plumbing and service line lengths, but many sites did not have enough sequential profile liter samples to perform this comparison.

- Examining differences in intercept or effectiveness of intervention across cities would be useful for environmental justice analysis. However, the dataset included relatively few cities, and they were not chosen based on economic charateristics, demographic makeup, or size. As such, EPA does not consider such an analysis to be feasible at this time.

- EPA has added text under Section 6.2.2 of the Final LCRR EA to better describe the reasoning behind this decision to use the “reduced spline model.” Although the full model described the data best of all, it appeared to over-fit study-specific features and produced predictions that were likely unrealistic. The full model projected a gradual rise in lead concentration after the service line peak for some intervention combinations, which is unlikely to be realistic. In addition, for homes with no LSLs, the full model produced predictions of relatively high lead concentrations in homes with representative CCT, and relatively low concentrations in homes with no CCT. Again, this is unlikely to represent the true effects of that intervention. Therefore, the simpler model was selected for simulation.

Suitability of SHEDS-IEUBK and WLL Dataset

Summary of Comments

The commenter notes that results from economic analysis are uncertain but agrees that physiologically based pharmacokinetic (PBPK) model used in the benefits analysis, SHEDS-IEUBK, is appropriate for predicting BLL from drinking water exposure. However, the commenter notes that the modeled outputs at the upper BLL percentiles are very sensitive to small changes in WLL inputs, meaning that small errors in geometric mean WLL or geometric standard deviation (GSD) may be magnified in BLL estimates. The commenter's key points regarding the inputs to this model are that the variability distribution in WLL exposure among individuals is not clearly defined, that the model assumes all water intake for each individual is at the concentration in the home, and that the co-occurrence of other sources of lead is not well established.

The commenter discusses independent analysis of LCR compliance data for 90th percentile lead levels, which resulted in a population-weighted 90th percentile lead level of 2.74 µg/L. Additionally, a commenter notes concerns regarding unquantified costs for individuals who do not have elevated BLL, who may be concerned by receiving communications about lead or experience other, undefined, consequences of the management of lead in drinking water.

Agency Response

EPA agrees that SHEDS-IEUBK is appropriate for predicting BLL from drinking water exposure for children aged 0-7. However, EPA does not agree with the characterization that the model is excessively sensitive to small differences in inputs. Stanek et al. 2020 presents a comprehensive sensitivity analysis to examine BLL output behavior in response to changes in inputs for geometric mean and GSD of WLL. This analysis compared BLL outputs from estimates used for the primary Final Rule EA (LSL Yes:No CCT Geometric Mean = 18.08, GSD = 3.78) to estimates from a bounding exercise with inputs based on expert assessment of realistic ranges from the United States EPA Office of Research and Development (bounding: Geometric mean = 17.89 ug/L GSD = 3.56). This analysis showed 95th percentile for the two inputs differed by 0.05 ug/dL (Final Rule EA = 11.44 µg/dL and bounding = 11.49 ug/dL); the 99th percentile differed by 2.58 µg/dL (Final Rule EA =18.45 ug/dL and bounding =15.87 µg/dL). This level of sensitivity in BLL outputs was also addressed in Appendix G of the Final LCRR EA (USEPA, 2020a).

EPA recognizes that the SHEDS-IEUBK model makes simplifications to exposure scenarios that may not fully represent the range of variability in exposure scenarios experienced by the United States population. However, the commenter's characterization of a single water concentration and exposure for individuals over the course of a whole life time is not entirely accurate. SHEDS-IEUBK models a single person and day of BLL using daily tap water consumption through direct and indirect routes while excluding bottled water intake. Within the SHEDS-Multimedia model, for any individual on a given day, time activity diaries are randomly drawn from the Consolidated Human Activity Database (CHAD) and information about drinking water intake is randomly selected from the National Health and Nutrition Examination Survey (NHANES) data pool, for matching socioeconomic characteristics and body energy related variables. Total drinking water consumed for a given day is multiplied by a WLL concentration randomly selected from the Monte Carlo simulation (Stanek et al., 2020; Zartarian et al., 2017). As the commenter notes, tap water intake that may occur outside of the home, such as in pre-schools or schools, is not included. However, as it is uncertain whether tap water ingested outside of the home would be higher or lower in concentration than tap water in the home, it is also uncertain whether this would more often lead to under- or over-estimation of BLL. CCT benefits should apply to entire city water-systems and are likely to improve WLLs in offices and schools as well, whereas LSL removal is localized to residence. Simulations did not vary lead exposure through dust, soil, and inhalation across intervention categories (Stanek et al., 2020). In general, although SHEDS-IEUBK simplifies exposure scenarios, the simplification is carried out in the same manner for individuals in each of the intervention categories, and is unlikely to bias results toward an over- or under- estimate of benefits but increases uncertainty.

EPA disagrees that the lead levels observed in historical compliance data indicate an overestimate of benefits. Historical LCR compliance sampling in most areas contained only data for the first-draw liter after stagnation and were often collected from locations that do not have LSL or other risk factors for elevated lead concentrations. As such, historical lead 90th percentile compliance data could under-estimate rather than over-estimate potential exposure at the tap for those locations. Therefore, EPA used central tendencies for more detailed studies with more realistic sampling methods than historical compliance data to produce estimates of exposure.

EPA also disagrees with the characterization that the final LCRR poses excessive unquantified costs to individuals without elevated BLL. The final LCRR requires targeted notification of consumers at risk of elevated lead exposure through drinking water. Notifications allow consumers that do not have elevated BLL at the time of notification to avoid elevated lead exposure through drinking water that could cause elevated BLL.

WLL Dataset Sample Size Differences

Summary of Comments

One commenter stated that the data used for WLL analysis:

- Contained many more samples for some cities than others, complicating analysis of intervention effects, particularly for CCT improvements,
- Contained relatively few samples and systems relevant to estimates of the effects of CCT,
- Did not provide enough information for examination of the effects of specific CCT methodologies (i.e., high-dose orthophosphate) or unexpected corrosion control (lead IV),
- Dontained potentially inaccurate assessments of CCT level and mechanism of action in some cities (Flint, MI and Providence, RI), and
- Lacked clarity in the description of CCT data selection and assignment for Flint, MI.

This commenter expressed the following concerns regarding the approach to the analysis and modeling based on the dataset:

- The use of a pooled dataset and mixed-effects modeling rather than two-step meta-analysis of results aggregated within individual studies, and
- The use of the peak predicted concentration estimates in simulating exposure rather than total mass of lead released over a sequential profile.

Agency Response

EPA agrees with the commenter that the data are unbalanced, with many more samples from some cities and sites than others, and with unequal numbers of locations and samples for different intervention categories. EPA agrees that Flint, MI and Washington, DC represent a larger portion of the overall dataset then other locations. However, EPA does not agree that the use of these data produced biased estimates. In part to normalize the contributions of systems with relatively many or few samples in the fitted output, EPA employed LME models with nested random effects for sampling events within sites, within cities. A two-step meta-analytical approach based on study-level summary statistics may also have been reasonable. However, aggregating study-level data before analysis greatly limits power and reduces the level of detail available for comparisons. LME provided a more straightforward and powerful method for estimating the variability among systems, sites, and sampling events while statistically controlling for different sampling procedures through the inclusion of terms for cumulative volume ("Profile Liter"). Although analyzing new data from a large, balanced study would improve reliability of results, LME limits the impact of unbalanced data. In particular, predictions of random intercepts are weighted by inverse group-level variance as well as by sample size. This reduces the impact of number of samples or locations alone on the level of pooling (Bates, 2010 and Bolker et al., 2009). Additionally, LME allows for the assessment of panel data to compare before and after results in the same locations for LSL and CCT optimization where data are available, while not requiring that all locations have both before and after measurements for comparisons. Text has been added under Section 6.2.2 of the Final LCRR EA to provide a more descriptive justification for the approach (USEPA, 2020a).

EPA disagrees with the commenter that the data do not support estimation of CCT implementation effects on WLL concentrations. While only four cities within the dataset included data from before and after CCT improvements, the fitted effects found for corrosion control are largely driven by comparisons among cities with no corrosion control and cities with representative corrosion control. LME allows for the assessment of panel data to compare before and after results for LSL and CCT optimization where data are available, while not requiring that all locations have both before and after measurements for comparisons. Both points allow estimation of effects of CCT optimization on WLL from the available data, in absence of a large study designed to assess CCT optimization techniques specifically.

EPA acknowledges that the benefits assessment profile dataset does not allow for a detailed assessment of the effectiveness of specific types of CCT technology (e.g., orthophosphate or lead IV) and the resultant chemical scaling within the distribution system. However, the dataset does allow estimation of average changes in lead concentrations when shifting between varying broad categories of CCT. This generalized data allows the Agency to estimate national scale benefits for the regulatory policies being considered under the rulemaking. Because detailed comparisons of particular technologies were not feasible with these data, EPA categorized represented systems as having "Representative," "Partial," or "None" (i.e., no CCT) based on available information regarding pH, orthophosphate levels, and other available water quality information. The EPA benefits model tracks systems implementing CCT changes as a result of rule requirements and changes the concentration of lead modeled people are exposed to in those systems. Because EPA uses this generalized modeling approach tracking broad category changes, there is uncertainty in the estimated national benefits associated with CCT changes. This uncertainty is acknowledged in the Final LCRR EA (USEPA, 2020a).

The commenter goes on to specifically assert that data from Flint, Michigan and Washington, DC is insufficient to support "high" dose orthophosphate as a successful CCT. This characterization of the economic analysis is inaccurate. Although the LME results in the primary benefits analysis demonstrate a relationship between CCT characterized as "Representative" and lower WLLs, multiple factors, including orthophosphate dose and pH, were considered in the determination of whether CCT was "Representative" in each system. As such, data from Flint and Washington were not the only means of justifying the final rule requirement that corrosion control studies be required to evaluate multiple options for corrosion control, including 1 and 3 mg/L PO_4. Other information, including studies from the United Kingdom, where most systems are dosed with orthophosphate at levels 2-3 times that in the United States (Hayes and Hydes, 2010), contributed to the development of requirements for corrosion control studies. In addition, EPA does not agree that the PO_4 dosage in Flint constitutes "high" dose orthophosphate. 3 mg/L PO_4 doses for CCT optimization is at the low end of the range of concentrations used in the United Kingom (UK) (Hayes and Hydes, 2010).

EPA also does not require the use of orthophosphate as the only CCT technology, only that a study of the effectiveness of different types of CCT must include consideration of orthophosphate. The commenter discusses lead IV as a possible primary controlling mechanism for lead in the Flint, Michigan water system as a counterpoint to the potential effectiveness of orthophosphate as CCT in that system. Although lead IV is present in pipe scale in Flint, its presence and formation cannot be reliably predicted from water quality and CCT implementation factors (Tully et al., 2019), and it is therefore not relevant to the requirement for testing orthophosphate in CCT studies. For additional discussion in regard to the inclusion of orthophosphate in the CCT study requirements, see response to comment Section 4.3.

Public comment on the proposed rule analysis resulted in the following changes for the final rule analysis. Several city water systems were re-categorized as "Partial" rather than "Representative." Providence was updated to a categorization of "Partial" CCT based on the commenter's concern. That change also applied to Cranston, RI, a city that receives its water from the Providence water system. Additionally, a system in Halifax, Nova Scotia, was identified by a journal reviewer as being optimized for factors other than lead concentration. As such, this system was also re-categorized as "Partial." The model was re-fit with the changes. These changes have been made to all exhibits and text containing the data, summary statistics, results of the fitted model, and resulting simulations and estimated BLL. The updates to the data had little effect on the simulated lead concentrations or BLLs estimated by the model.

EPA agrees with the commenter that the Agency's description of the coding of Flint CCT data was ambiguous in the proposed rule materials. Therefore, EPA added a footnote to Section 6.2, and a longer description to Appendix F of the Final LCRR EA to better describe this characterization (USEPA, 2020a). In short, Flint sample data from January to July of 2016 were categorized as having "Partial" CCT and samples from November and December 2016 were considered "Representative."

Although the comment discusses issues with the use of the peak concentration for exposure estimation, the peak concentration was not used in simulations. Rather, simulations were run at the model intercept, set at the mean profile liter in the original dataset, which was well-supported by the underlying dataset. This point corresponded approximately to the fifth liter in a sampling series and is representative of a liter of water drawn at approximately 30 seconds of flushing. The peak of predicted concentrations for locations with LSL occurred slightly before this point. EPA also did not fit models to estimate highest possible concentration peaks, as doing so would have required adjustment for LSL volume and plumbing volume by site (Lytle et al., 2019), for which insufficient data were available. The WALSC was not used in this analysis for several reasons. First, not all sites in all studies included in the primary benefits analysis contained complete profiles representing the first draw and LSL-related concentration increases through decline and stabilization of lead concentrations. As such, limiting the analysis to locations with this full profile would have greatly reduced the available data. Additionally, as flushing sufficient to avoid exposure to water that has stagnated in LSL may be uncommon consumer behavior (Riblet et al., 2019), this was deemed an inappropriate measure of exposure for benefits estimation. EPA has added text in Appendix F.3 of the Final LCRR EA to clarify this estimate (USEPA, 2020a).

WLL Dataset Selection, Cleaning, and Model Performance

Summary of Comments

The commenter notes concerns regarding the data used for water concentration modeling, including data selection and assignment to LSL and CCT categories. The commenter suggests that use of splines and log-transformation on a reduced dataset may obscure model performance.

Agency Response

EPA conducted extensive review of the sampling data collected from the 15 water systems included in the profile liter dataset. Chapter 6, Section 6.2 and Appendix F have been updated in the Final LCRR EA (USEPA, 2020a) to better describe data selection, validation of LSL status using notes in the original data sets, and CCT categorization for the profile liter dataset. The full dataset meeting preliminary selection criteria that was available to EPA for this analysis is present in the docket, with a field describing whether each record was included in the analysis. In general, data were removed from the analysis if there was no data for important parameters, such as LSL status (unlike national level data on the location of LSLs these data were compiled from studies with detailed information on LSL status providing a high level of accuracy for LSL status), or information regarding cumulative volume after stagnation at which samples were collected. For locations where LSLRs had occurred and determination of timing in relationship to sampling was feasible, the last sample taken after LSLR was selected for analysis, to avoid short-term increases in lead concentration that may occur after replacement which are managed through the use of filters and flushing protocols.

Since proposal, EPA has updated CCT categories for three city water systems in response to AWWA comments, and in response to comments from a peer reviewer during submission of a manuscript related to this work (Stanek et al., 2020). Specifically, data were re-categorized from ”Representative” to “Partial” to reflect input regarding city water systems for Cincinnati before 2006, Providence, and Halifax. These changes slightly decreased differences among interventions in simulated water lead concentrations and related BLLs (see Section 6.2 and Appendix F.1 of the Final LCRR EA), decreasing benefits slightly (see Section 6.4 of the Final LCRR EA).

EPA does not agree that log-transformation obscures model performance in this case. Lead concentrations at the tap show a censored, right-skewed distribution. EPA opted for log-transformation of lead concentrations rather than employing more complex methods, such as Bayesian techniques, or lower-power non-parametric methods, to manage the skewed data distribution. The geometric mean, which is a more appropriate measure of central tendency for lead concentration at the tap than the arithmetic mean, is equal to the arithmetic mean of log-transformed values after back-transformation to the original scale.

EPA disagrees with the commenter that the use of a spline transformation is inappropriate and obscures data patterns. The use of a spline transformation for cumulative sample volume (Profile Liter) was indicated by the availability of lead concentrations for samples taken at different points in the sampling series after stagnation. The effect of the cumulative volume drawn from a tap after stagnation on WLL is non-linear. While EPA could have selected just one or two points in the sampling series, such as the first liter, the fifth liter, and/or the peak lead concentration for each given location, doing so would have greatly reduced the number of samples and locations available for analysis, and would have obscured variability present in the full dataset. Appendix F.3 of the Final LCRR EA has been updated to provide additional detail on the choice of spline function and additional comparisons to support that the placement of inflection points reflected the underlying data variation in a reasonable manner.

Data Availability for Non-LSL Locations

Summary of Comments

Multiple commenters, including North Dakota Department of Environmental Quality, City of Aurora, Colorado Water Utility Council, and City of Golden, responded to EPA's request for additional information regarding the effects of CCT on lead concentrations in locations without LSL stating that they agreed the data were limited, but that they had no additional data to add. Commenters noted that LSLs are not the only source of lead in drinking water, and that other plumbing components such as lead solder and fixtures, can contribute to elevated lead levels. One commenter also noted the difficulty of fully distinguishing non-LSL locations due to historical patch jobs and other issues that could hide the presence of an LSL. One commenter requested guidance on how to best sample and track impacts of CCT in non-LSL locations. Multiple comments raised concerns regarding the development of benefits estimates and CCT optimization requirements based on the limitations of the existing data.

Agency Response

EPA agrees that LSLs are not the only source of lead that can contribute to elevated concentrations at the tap. However, where present LSLs are the largest source of lead in drinking water (Sandvig et al., 2008). EPA received additional data from the AWWA during the comment period pertaining to State of Michigan LCR 2019 compliance tap sampling. This dataset contains 12,960 samples collected from homes, businesses, and other buildings in 630 water systems from January to October of 2019.

The Michigan 2019 compliance data allowed some comparisons on non-LSL locations in systems with and without CCT, based on available drinking water inventories. The analysis of those data has been added to Appendix F, Section F.4 of the Final LCRR EA (USEPA, 2020a), and supports a conclusion that the presence of CCT at non-LSL locations can reduce lead in drinking water concentrations. Because the comparisons are necessarily across differing water systems rather than comparisons of before/after CCT optimization, EPA acknowledges that the current data still limit accurate analysis of the non-LSL household benefits of optimizing CCT and therefore could not be used with high certainty in the primary quantified assessment of benefits for the final LCRR. EPA finds that the information based on the Michigan data in Appendix F and the sensitivity analyses in Appendix G of the Final LCRR EA do provide useful information for decision making, demonstrating the potential for significant benefits resulting from the reduction of water corrosivity at households without LSLs. The sensitivity analysis in Appendix

G assigned benefits to CCT in non-LSL location using the range of geometric mean WLL for non-LSL locations in the original, un-simulated, dataset. EPA estimated that the final LCRR will produce improvements in CCT at between 8 and 17 million households.

In response to the commenter asking for guidance on how to best sample and track impacts of CCT in non-LSL locations, EPA has determined that the first draw sampling methodology is an effective sampling technique to identify lead corrosion from taps, solder, pipes and fittings within the home. EPA requires this sampling method under the Final LCRR at all non-LSL sample locations. The final rule's tiering requirements for non-LSL tap sampling still prioritize those locations with the highest risk for elevated levels of lead namely, copper pipes with lead solder installed before the effective date of the state's lead ban. In addition, the Agency intends to develop implementation guidance targeting the areas of the rule that are most likely to support compliance. EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency.

EPA disagrees with commenters that have indicated that insufficient information exists for the development of benefits estimates and regulatory requirements associated with CCT. As described in Chapter 6 of the Final LCRR EA, EPA has quantified and monetized benefits associated with CCT changes at LSL households using 18,039 samples collected from 1,638 homes in 15 cities representing 14 city water systems across the United States and Canada (see Section 6.2 of the Final LCRR EA). These data were used to fit a LME model with explicit statistical controls for sampling methods (through the 'Profile liter' term), city, site, and sampling event timing; that model was used to simulate concentrations for samples in cities, sites, and sampling events not in the original dataset. EPA has also characterized these through sensitivity analysis (Appendix G of the Final LCRR EA), and has determined a set of non-quantified benefits associated with the regulatory changes associated with CCT. Non-quantified benefits of improved CCT optimization and monitoring for elevated lead concentrations for occupants in homes that do not have LSL (Section 6.6 of the Final LCRR EA), and estimate that over the 35-year period of analysis, between 8 (low-cost) and 17 (high-cost) million homes may see reductions in tap water lead concentrations. This substantial assessment of the benefits associated with various levels of CCT implementation along with the estimated costs and engineering assessment of the CCT technology has provided sufficient information to the Agency to set regulatory CCT requirements.

Post-Flint Voluntary State Actions and WLL Dataset Limitations

Summary of Comments

Several commenters, expressed concerns regarding accounting of costs and benefits considering both non-compliance and voluntary state actions to reduce WLL. A commenter cited the CoSTs study, and EPA has assumed that the commenter refers to discussions in ASDWA Costs of States' Transactions Study (CoSTS) (USEPA, 2020a) regarding incorporations of voluntary post-Flint state actions in baseline benefits calculations. One of these commenters also discussed additional concerns regarding the dataset used for WLL estimation and reporting of results.

A commenter discusses data limitations in EPA's WLL profile dataset with respect to geographic coverage and the number of city water systems. They also critique excess precision in results reporting.

This same commenter discusses potential issues with double-counting of benefits: applying benefits obtained under a current rule to projected benefits under a revised rule. This commenter interprets the inclusion of WLL data from Flint Michigan, and DC during periods in which these systems were non-compliant with the Current LCR as evidence of such "double-counting."

A second commenter cites the ASDWA's CoSTS to discuss the argument that voluntary state actions post-Flint shouldn't be incorporated in baseline benefits analysis, as some states must match federal regulations exactly.

Agency Response

EPA used lead concentration data from samples collected in 14 city water systems to support the estimate of central tendency and variance in lead concentration for each intervention category. The Final LCRR EA discusses potential issues with this approach, including limited geographic coverage that could encompass diverse source water chemistry and infrastructures. EPA used all available data meeting inclusion criteria, described further in response comments regarding limited data from AWWA, Indiana Department of Environmental Management, North Dakota Department of Environmental Quality, City of Aurora, and City of Golden. EPA disagrees that precision presented in the Proposed LCRR EA (USEPA, 2019a) and Final LCRR EA (USEPA, 2020a) represent "excess precision." The presented results are intermediate to the longer modeling process for BLL, and no policy action is required based on these results in isolation. EPA reported geometric means of simulated values to several digits of precision to better represent how those intermediate outputs were incorporated in the BLL modeling. Rounding to lower precision is inappropriate for intermediate steps of an analysis. This provides detail in intermediate steps such that they could be reproduced more readily. Also included are simulated GSDs and a plot showing broad intervals around the simulated values to avoid misleading readers regarding the known variability present in the estimation. EPA also discussed the uncertainty regarding generalizability in the text. No changes were made to the Final LCRR EA based on this comment.

EPA disagrees with the comment that the economic analysis is double counting, or inflating, the benefits of the final LCRR by assuming non-compliance with the previous LCR and full compliance with the revised LCRR. In fact, to avoid doing so, EPA assumes full compliance under both the previous LCR and the final LCRR. EPA has not included any additional non-LCR required actions by states in the baseline previous LCR cost or benefit values. Therefore, when EPA calculates the incremental benefits, by subtracting the benefits of the previous LCR, from the benefits of the final LCRR, only the benefits associated with the changes in requirements under the LCRR are included in the benefit estimate. In addition, EPA is not justifying the final LCRR based on compliance issues with the previous LCR.

Comparing values across the rules would not be appropriate given the changes in benefit estimation methodology over the time period.

The use of data from cities like Flint and Washington, as well as the 13 other cites, is appropriate in determining baseline and post intervention WLLs that represent combinations of LSL and CCT status. The LSL and CCT status of individual samples in the dataset are the relevant predictors of WLL. Compliance with regulatory requirements is not considered in the subpart of the benefits analysis. Later the Safewater LCR model predicts the interventions that will result in reductions in WLLs based on data sources outlined in Chapters 4 and 5 of the Final LCRR EA and a methodology provided in Chapter 5 and Appendix B of the Final LCRR EA (USEPA, 2020a).

EPA disagrees that compliance with previous regulations is relevant to estimating the effects of LSL presence or CCT optimization on WLL. EPA acknowledges that physical factors other than LSL, CCT, or position in sampling series (“Profile Liter”) may affect WLL. To address these unknown effects of location, timing and water quality, EPA used a LME model that controlled for other effects of city water system, site, and sampling event through the inclusion of random effects.

EPA disagrees that premise plumbing is the primary source of lead in drinking water for locations with LSL and disagrees that the choice of the “fifth liter” necessarily overestimates benefits. As the commenter notes, sources of lead in municipal drinking water are not homogeneously distributed along the water mains, service lines, and premise plumbing to the consumers’ taps. Therefore, the concentration of lead at the tap will continuously vary in a nonlinear fashion; this will differ by address, city water system, and time/date of water use and may include both dissolved and particulate lead. Most past studies of BLL in relationship to water have included samples, such as fully flushed or first-draw samples, that may not be representative of real world exposures, and therefore, may have underestimated potential contributions of water to BLL elevations (Stanek et al., 2020). However, due to limited data regarding water usage in relationship to common sampling protocols, EPA did not consider the effects of human usage patterns. The use of the “fifth liter” was primarily driven by support for that point along the sampling series in the underlying data, and although it is close to the modeled peak lead concentration, does not represent the actual peak of either the fitted model, or the underlying data. Appendix F.3 of the Final LCRR EA has been added to clarify this choice in simulated WLL and BLL.

90th Percentile in WLL Estimation

Summary of Comments

A commenter stated that use of the 90^{th} percentile lead concentrations is inappropriate for calculating the central tendency of lead concentrations.

Agency Response

EPA agrees that the use of 90^{th} percentile lead concentrations would be inappropriate for estimated central tendency lead concentration values. The Agency did not use 90^{th} percentile lead concentrations to calculate central tendencies of lead concentrations in the proposed or final rule analyses. Real-world study data rather than the 90^{th} percentile risk management metrics were used to fit models describing potential effects of intervention and to simulate the geometric mean of WLL for exposure simulations. Additional information regarding data source and cleaning have been added in Appendix F.1 of the Final LCRR EA (USEPA, 2020a). Lead 90^{th} percentile data were used for estimation of how many exceedances would occur under the previous rule and the LCRR. These are directly relevant to the cost of implementing the rule and have been retained.

16.4.2 Assignment of Lead Concentrations to Populations in Baseline and Tracking Concentration Changes in SafeWater

Sampling Tier Design for Geographic Diversity and Lead Concentrations at Non-LSL Locations

Summary of Comments

> Overall, the commenter stated that sampling and managing CCT to reduce lead concentrations at locations with LSLs may limit optimization of CCT for the entire service area. The commenter stated that LSLs serve a small portion of housing stock in most water systems, that lead solder,

galvanized lines impacted by LSLs, and brass fixtures can also increase lead concentrations. To support this point, the commenter presented the results of an analysis of Michigan water sampling data, where using first draw sample data they contended that in water systems with both LSL and non-LSL locations, the highest lead concentrations were found in non-LSL locations approximately 25 percent of the time.

The commenter states that requiring geographic representativeness for other water quality parameters along with lead sampling may not be possible for some water systems due to the location and extent of LSL housing stock, and stated that compliance samples should be collected in locations that coincide with water quality parameter modeling. The commenter suggested that sampling and managing water primarily to reduce lead in locations with LSL may result in decisions that do not adequately address lead release at locations without LSLs and that do not adequately manage other metals, longevity of infrastructure, or aesthetic interest. The commenter also states that larger multi-family structures are less likely to be serviced by LSLs, and that in some areas, vulnerable populations, including low-income and non-white populations, may be clustered in newer low-income housing or larger multi-family structures that experience non-LSL lead contributions to WLL. The commenter criticizes the decision to not consider the benefit of managing lead levels in homes without LSLs.

The commenter recommended tap sample pool tiering revision to avoid weighting compliance data towards portions of water systems with LSLs, as well as more holistic guidance regarding CCT optimization that considers factors other than lead. The commenter recommended revision of tap sampling tiers to diversify samples for geographic area, water quality parameter measurement locations, and non-LSL sites.

Agency Response

EPA agrees that locations without LSL can experience significant lead release from solder, brass, and other plumbing components, and that locations without LSLs constitute the majority of housing stock in most water systems. However, where present, LSLs represent the largest contributor to lead in tap water (Sandvig et al., 2008; Kaplan, 2017). EPA used the data provided by AWWA for the state of Michigan's 2019 compliance sampling to investigate several questions, including the potential benefits of CCT improvements for non-LSL households (AWWA, 2020). This analysis is presented in Appendix F, Section F.4 and Appendix G, Section G.1 of the Final LCRR EA (USEPA, 2020a). Based on multiple sensitivity analyses, EPA estimated that the final LCRR will produce improvements in CCT at between 8 and 17 million households without LSLs. Although EPA had insufficient data to quantify national benefits to the non-LSL households in its primary analysis the Agency considered the unquantified benefits to these households in its decision making process.

EPA examined the commenter's analysis of the Michigan 2019 data, especially as it related to systems that had both LSL and non-LSL locations where non-LSL locations showed the highest lead concentrations. EPA disagrees with the commenter that the use of first draw data alone is the appropriate metric for drawing a comparison between WLLs in homes with and without LSLs. The State of Michigan's LCR (Michigan Department of Environment, Great Lakes, and Energy (2019) require system with LSL to collect a 1st and 5th liter sample from those lines therefore the presence of 5th liter samples indicates the presence of an LSLs at the sampled location. After data cleaning as detailed in

Appendix F, Section F.4 of the Final LCRR EA (USEPA, 2020a), the Michigan 2019 sampling data contained 47 cities for which there are both homes with and without fifth liter samples. One of those cities had no lead detected in any sample. Addresses from the Michigan 2019 data without inferred LSLs represent the maximum lead concentration in 8 of 47 cities. Of those addresses, only three locations had lead concentrations exceeding 10 µg/L, and the highest concentration was 78 µg/L. In contrast, in the 38 water systems where locations with inferred LSL presence had the highest concentrations, 29 of the locations had lead concentrations exceeding 10 µg/L. The highest concentration was 590 µg/L, in a fifth liter sample. The corresponding 90th percentile calculations for the first and fifth liters for the Michigan 2019 dataset can be found in "Derivation of Initial P90 Categorization_Final Rule.xlsx." In general, this comparison supports the importance of prioritizing locations with LSLs in compliance sampling tiers.

EPA disagrees that tap sampling tiers focused on LSL locations are likely to result in increased risk of lead exposure from other sources. EPA's tap sample tiering requirements are designed to look first at the locations with the highest potential for lead release. LSLs have the highest potential (Sandvig et al., 2008; Kaplan, 2017). In the absence of sufficient LSL sampling locations samples must be taken from the lead solder sites which have the next highest likelihood of increased WLL. EPA's revised sampling tiers ensure priority is given to the highest-risk sources of lead while allowing for flexibility in water systems without sufficient numbers of LSLs in any given tier, or with a substantial fraction of multi-family residences in the structure inventory. See response to comment Section 9.0.

EPA requires installation of CCT when the lead 90th percentile value exceeds 15 ug/L and CCT re-optimization when the 90th percentile value exceeds 10 ug/L. EPA has demonstrated in its analysis that under the new LSL focused sampling requirements that more systems will be compelled to take corrective actions to lower lead levels through increased use of CCT and re-optimization of existing CCT. CCT is designed to reduce corrosion of lead throughout a water system and in general the chemical reactions that bind lead to the distribution system source material work as well at locations with lead solder and high lead brass as it does in LSLs. Non-LSL systems will still sample from locations that have the greatest risk for high WLLs and are still required to take corrective action by installing or re-optimized CCT to reduce corrosion.

Benefit Timing for LSLR and CCT Optimization

Summary of Comments

A commenter discussed multiple points regarding the timing of modeled benefits and expected lags in benefits under the Proposed LCRR. First, the commenter discussed assumptions that LSLR, whether partial, or full, will result in immediate and permanent reductions in WLL and concerns regarding lags in effectiveness as well as overall effectiveness of LSLR, noting that it is unclear how much of the lead in tap water comes from LSLs. The commenter characterizes the primary Proposed LCRR EA analysis as having assumed that 100 percent of lead in drinking water comes from LSLs (USEPA, 2019a).

The commenter cites the USEPA SAB's finding that studies of LSLR have been too short to fully assess reductions in WLLs, and that partial LSLRs may result in longer-lasting and more severe elevations in lead concentration (USEPA, 2011).

Additionally, the commenter notes that effects of CCT optimization will not be immediate. The commenter notes that POU use is unlikely to be perfect as assumed in the model. Finally, the commenter discusses details of the immediacy of reductions in BLL in response to both LSLR and CCT implementation, along with effects of averaging BLL over individual lifetimes to estimate the benefit of the rule over time and contends that inaccuracies here will result in an overestimate of IQ benefits.

Agency Response

EPA disagrees that it is necessary to incorporate a lag in benefits after LSLR. Short-term effects of LSLR are managed through the distribution of pitcher filters to affected residences and post-replacement testing to ensure WLL have decreased. This limits exposure to lead from short-term spikes after LSLR. The final rule contains text requiring six months of cartridges and instructions to help consumers maintain the filters and use them consistently. The Final LCRR EA accounts for the costs of these pitcher filters. Additionally, although LSLRs have been known to cause short-term increases in lead concentration, new high pressure flushing methods can help to minimize these, though this method may not be suitable for all locations (WRF, 2018). Text has been added in Section 6.3 of the Final LCRR EA to note the possibility of imperfect use of pitcher filters and other POU devices (USEPA, 2020a). Also see response to comment Section 6.

EPA does not agree that there is great uncertainty in how much LSLs contribute to WLL or in how much LSLR will lower WLL. The benefits analysis was based on real-world data from locations with LSLs. Many of the sites sampled that did not have LSLs had undergone LSLR. In some cases, both before and after samples were included for residences, for multiple types of replacement, including full and partial. The "after" LSLR values in the dataset come from 212 households and the sample time post replacement generally ranges in time after the LSLR from 1 month to multiple years, where those times are known. WLL reductions attributed to LSLR in the primary benefits analysis are, in general, directly related to LSL presence/absence rather than changes in other plumbing components. Appendix F.1 in the Final LCRR EA has been updated to better describe the data selection and cleaning process.

EPA did consider the EPA SAB's comments regarding partial LSLs in developing both the economic analysis and the proposed and final rule. Because partial replacements may be necessary for emergency maintenance, they cannot be banned, and, partial LSLRs can reduce lead concentrations at the tap (see Final LCRR EA Section 6.2). However, as the commenter notes, partial LSLRs introduce risk for increased lead in drinking water due to disturbance of the remaining LSL. Because of this risk, partial LSLRs do not count towards the LSLR goal rate or mandatory LSLR rate in the final LCRR. Therefore, only the impact of full replacements and the total removal of preexisting partial LSLs are assessed in the benefits analysis. Also see response to comment Section 6. No changes have been made to the economic analysis for the final rule in response to this comment.

EPA does not agree with the commenter's characterization that the benefits analysis assumes 100 percent of lead in drinking water comes from LSLs. Although the primary benefits analysis lacked data for characterizing reductions in lead due to CCT improvements in locations without LSLs, locations without LSLs were not modeled as having no lead in drinking water, but as having a distribution of lead concentrations, centered around 0.82 µg/L for all CCT categories. Additional sensitivity analysis presented in Appendix G of the Final LCRR EA shows the additional benefits that may be expected under improved CCT in non-LSL locations. See response to comment Section 16.4.1 regarding locations without LSLs.

EPA agrees with the comment that there will be a delay in the reduction of lead concentrations throughout the distribution system after CCT is re-optimized. Under the revised analysis for the final LCRR, EPA included a 2-year lag between the installation of CCT and the accrual of benefits associated with these reduced lead concentrations. EPA does not agree that there will be a significant lag between the implementation of POU devices and lower lead concentrations being consumed. POU devices are designed to meet the filtration standard at the time of installation. Therefore, EPA does not include a lag between POU implementation, and the benefits associated with lower lead concentrations in the water consumed. No changes have been made to the Final LCRR EA on the basis of this comment.

EPA does not agree with the comment that benefits are overestimated due to the timing of reductions in BLLs in relationship to the rule implementation. The lag in benefits is implemented through lifetime averaging of individual BLLs at age 7, which, for individuals born before rule implementation, incorporates yearly BLL from both before and after rule implementation. It is possible that the time it takes for children to reach a new equilibrium BLL concentration after a reduction in WLL will result in a brief time lag, but we expect this to be small. The half-life of lead in blood is approximately 20 to 30 days, and changes in lead exposure result in a new quasi-steady state BLL in approximately 75 to 100 days (USEPA, 2013). This comment is further addressed under response to comment Section 16.4.6 SafeWater Calculation of Benefits and Monetized Results." No changes have been made to the Final LCRR EA on the basis of this comment.

EPA indicates in the primary benefits analysis that uncertainty exists in the data and it may not be representative of all situations. However, this is the largest best available real-world dataset compiled to examine the effects of LSL removal and CCT optimization that EPA is aware of. Generally, EPA acknowledges that in some areas, such as in the timing of benefits relative to intervention, benefits may be overestimated. However, other commenters, including the SAB, have noted that benefits may have been greatly underestimated in other areas.

16.4.3 Estimation of Blood Lead Level (BLL) Changes in Children

Natural Resources Defense Council (NRDC) discussed concern for underestimating exposure when using water lead concentrations representative of first draw samples to estimate BLLs through SHEDS-IEUBK. The SAB also requested additional details on the role of biological variability in the relationship between lead intake and BLLs, as well as additional blood lead distributional information. Each of these topic areas are discussed below.

Selection of Water Lead Concentrations for BLL Modeling

Summary of Comments

A commenter expressed concern regarding underestimation of exposure that could occur through using concentrations representative of first draw samples to estimate BLL through SHEDS-IEUBK modeling. The commenter notes that first-draw samples are almost always lower in lead concentration than samples drawn later in a sampling series. As such, they contend that the use of first liter samples would underestimate exposure in LSL locations, and thus benefits related to both CCT optimization and LSL removal. The commenter recommended use of a more dynamic model to estimate exposure that accounts for the fluctuation in lead concentration that occurs after stagnation and notes that sampling methodologies relying on first-liter draws after stagnation will have similar underestimates of exposure.

Agency Response

EPA corrects the commenter on the mistaken impression that lead exposure estimates are based solely on collected first liter WLL. EPA used the geometric mean and GSD for the simulated lead concentration at the mean value for cumulative sample volume (Profile Liter) for input into the SHEDS-IEUBK model for BLL comparisons, and to estimate benefits. Real-world exposure studies that capture the similarity of sampling profile to typical water usage patterns are uncommon (but see Riblet et al., 2019). Therefore, the choice of cumulative volume position in the sampling series for BLL simulation was indicated largely by strong representation in the underlying data. See Chapter 6, Section 6.2 and Appendix F.3 of the Final LCRR EA (USEPA, 2020a). Appendix F.3 has been added to the Final LCRR EA to better describe the simulated WLL relationship to the sampling series after stagnation.

Further, based on additional information received during public comment, the final rule contains a requirement that at homes with LSLs, fifth liter samples will be collected after water has sat stagnant for a minimum of 6 hours. Only the first liter will be required for locations without LSLs. The inclusion of fifth liter samples in the required sampling protocol for locations with LSLs is expected to increase the number of systems with LSLs that would exceed the lead trigger level and action level (see Chapter 4, Section 4.3.5 of the Final LCRR EA).

Biological Variability

Summary of Comments

The SAB requested additional details that explain the role that biological variability plays in the relationship between lead intake and BLLs in the analysis done by EPA.

Agency Response

EPA agrees with the SAB that further explanation is needed in the economic analysis pertaining to how biological variability in the relationship between lead intake and BLLs is handled in the analyses. In its basic coupled form, SHEDS-IEUBK only represents exposure variability and does not consider biological variability associated with inter-individual differences in the relationship between lead exposure and blood lead. Uncoupled IEUBK applies a GSD of 1.6 to outputs to account for biological variability and measurement error, but because the IEUBK component of SHEDS-IEUBK has been reduced to deterministic regression equations, EPA was unable to apply this GSD to account for biological variability in our outputs. To account for this biological variability, EPA applied a biological variance correction factor of 0.185 for 1- to <2-year-olds and 0.176 for 2- to <7-year-olds to the predicted blood lead variance estimated by the SHEDS-IEUBK model. These biological variance correction factors are consistent with what was used in the Zartarian et al. (2017) analysis and adjust the variance of the blood lead distribution so that the GSDs match those of NHANES data from 2009-2014. Additional details about the calculation of these biological variance correction factors can be found in Zartarian et al. (2017). In response to these comments, EPA has added additional clarification of these biological variance correction factors to Chapter 6 of the Final LCRR EA (USEPA, 2020a).

Blood Lead Distribution

Summary of Comments

The SAB expressed interest in seeing additional information related to the BLL distribution, paying particular attention to the proportion of children estimated to have BLLs above 5 µg/dL.

Agency Response

EPA agrees that additional blood lead distributional information from the SHEDS-IEUBK model could be added to the economic analysis for the purposes of providing useful information on the scope of impacts across the modeled population. In response to these comments, EPA has added additional blood lead distributional information to Appendix G of the Final LCRR EA (USEPA, 2020a). Exhibit G.1, Exhibit G.2, Exhibit G.3, and Exhibit G.4 present 25th, 75th, 95th, and 99th percentile coupled SHEDS-IEUBK BLL estimates for each year of life up to age 7 for each LSL and CCT scenario, as well as an average lifetime BLL assuming a child lived in the corresponding LSL/CCT scenario for their entire life. To facilitate comparison with the 5 µg/dL level of blood lead, lifetime average BLLs above 5 µg/dL are in bold lettering in each of these exhibits. Lifetime average BLLs in these exhibits start to exceed 5 µg/dL in the 95th percentile exhibit, and only in the LSL/no CCT and LSL/partial CCT scenarios.

16.4.4 WLL Reductions through Avoided IQ Point Loss

Summary of Comments

EPA received comments from the SAB requesting the Agency clarify choices and decisions for the functions and metrics used to quantify avoided IQ loss associated with the reduction in WLLs. Generally, the commenters provide citations from the literature that strengthens the evidence for a relationship between blood lead and IQ loss, and in particular, a steeper slope in the relationship between blood lead and IQ loss at lower BLLs. Additionally, the SAB requested more discussion on the choice of the specific function used to estimate IQ loss based on blood lead, and the choice of lifetime vs. concurrent blood lead.

Agency Response

EPA will continue to use lifetime average blood lead changes (over the period of birth to age 7) to estimate benefits of the rule, with the concentration-response function based on Crump et al. (2013). Additional language was added in Chapter 6 (see Section 6.4 of the Final LCRR EA) to discuss the implication of this choice for benefits, and a sensitivity analysis was run using concentration-response functions based on Kirrane and Patel (2014).

Generally, the commenters provide citations from the literature that strengthen the evidence for a relationship between blood lead and IQ loss, and in particular, a steeper slope in the relationship between blood lead and IQ loss at lower BLLs. EPA has added additional language in Chapter 6 of the Final LCRR EA describing how the choice of the beta estimate from Crump et al. (2013) to both the concurrent metric from that study and the lifetime and concurrent beta estimates from Lanphear et al. (2005).

The choice to use Crump et al. (2013) was made to minimize the issues with over estimating the predicted IQ loss at the lowest levels of lead exposures (< 1 ug/dL). Crump et al. (2013) added 1 to the BLLs before making the log transformation to ensure that the log-linear function held at lower concentrations of lead. The other papers did not make such a transformation, and their lower level estimates were difficult to interpret (as log of zero is undefined). However, the Lanphear results addressed this issue through the National Ambient Air Quality Standards with a low-dose linearization. Results based on the corrected Lanphear betas are presented in Appendix G, Section G.5 (Exhibits G.14 through G.17 of the Final LCRR EA), both with and without low-dose linearization, and do result in higher benefits estimates.

As stated in Appendix G:

> *Both of the alternative concentration-response functions [from Lanphear et al (2005)] result in higher benefits than those calculated using the concentration-response function from Crump et al. (2013) in Chapter 6. As can be seen below, use of the low-dose linearization slightly decreases national annual benefits as compared to use of the log-linear function with the same slope but without a low-dose linearization. Specifically, using the alternative concentration-response function increases the benefits by 50% and 54% with and without the low-dose linearization assuming a 3% discount rate, and 50% and 54% with and without the low-dose linearization assuming a 7% discount rate, compared to the high cost estimate Crump et al. (2013) based estimates presented in Chapter 6.*

Table 1 displays the estimated slope coefficients, or beta estimates, and R^2 values for the Lanphear (2005), Kirrane and Patel (2014), and Crump et al. (2013) studies all of which examined data from the same cohort. Crump et al. (2013) used data from Lanphear (2005) to calculate beta values and R^2 for lifetime and concurrent exposure; all other analyses performed and the resulting R^2 estimates are quite similar. Crump et al (2013) further tested to identify which BLL measure best described the data and did not find a statistical difference in the significance of the lifetime and concurrent BLL explanatory variables. They performed sensitivity analysis where 72 "influential points" were removed from the dataset without a clear explanation. Upon exclusion of these 72 data points the researchers found that the lifetime BLL explanatory variable was no longer significant in a model that also includes the other four BLL measures. The exclusion of these 72 data points without justification appears to support the conclusion that the authors are making. However, without these exclusions, the choice between lifetime and concurrent exposure is not driven by statistics but becomes situational. Table 7 shows the coefficient for lifetime is nearly the same as in Table 6 of Crump et al., (2013) where it is the sole measure (-5.34 versus -5.32). However, the coefficient for concurrent is much smaller in Table 7 then in Table 6 (-2.18 versus -4.42). This provides evidence for lifetime as the stronger predictor. Additionally, the paper states "Taken at face value, use of concurrent BPb [blood lead level] to describe the exposure response implies that the effect of BPb upon IQ is reversible, as zero concurrent BPb would indicate zero effect of BPb upon IQ, regardless of the past history of exposure. This seems unlikely to be true" (Crump et al., 2013 p. 797)."

Table 1. Comparison of Coefficients[a] based on the Lanphear et al. (2005) Dataset

BLL Variable	Kirrane and Patel (2014)		Lanphear (2019) erratum		Crump et al. (2013) Reanalysis ln(BLL)		Crump et al. (2013) Independent Analysis ln(BLL+1)	
	β (95% CI)	R^2	β (95% CI)	$R^{2\,b}$	β (95% CI)	R^2	β (95% CI)	R^2
Early	-2.21 (-3.38, -1.04)	0.643	-2.21 (-3.38, -1.04)	n/a	-2.21 (-3.38, -1.03)	0.643	-2.46 (-3.81, -1.10)	0.659
Peak	-2.86 (-4.10, -1.61)	0.640	-2.86 (-4.10, -1.61)	n/a	-2.86 (-4.10, -1.61)	0.640	-2.48 (-3.83, -1.14)	0.656
Lifetime	-3.14 (-4.39, -1.88)	0.641	-3.25 (-4.51, -1.99)	n/a	-3.19 (-4.45, -1.94)	0.641	-3.25 (-4.66, -1.83)	0.659
Concurrent	-2.65 (-3.69, -1.61)	0.641	-2.65 (-3.69, -1.61)	Reported as highest	-2.65 (-3.69, -1.61)	0.641	-3.32 (-4.55, -2.08)	0.653

[a] Coefficients were adjusted for site, birth weight, mother's education, mother's IQ, & HOME inventory score.
[b] R^2 not reported in Lanphear et al. (2019) however the paper reported concurrent was the largest R^2
Source: Table 2 and Table 5, Crump et al. (2013), Table 4 from Lanphear et. al (2019) Erratum.

Budtz-Jørgensen et al. (2013) reanalyzed the Lanphear et al. (2005) data using additional statistical methods and a benchmark dose (BMD) approach. The BMD is the dose that leads to a specified benchmark response (BMR). Budtz-Jørgensen et al. (2013) chose a BMR of 1 IQ point and performed benchmark analyses using log-linear, linear and piecewise linear (with cut points of 7.5 and 10 µg/dL). They found a similar BMD using both the lifetime and concurrent measures of blood lead. Consistent with the results of the original Lanphear et al. (2005) analysis, Budtz-Jørgensen et al. (2013) concluded that the log-linear model provided the best fit for the data. Budtz-Jørgensen et al. (2013) also confirmed the conclusions of Lanphear et al. (2005) regarding robustness of the model (i.e., model results did not change when each study site was excluded from the analysis in turn) and choice of concurrent BLL as the measurement showing an association to IQ loss. The authors compared logarithmic models of concurrent blood lead and lifetime blood lead and identified that the BMD was associated with a loss of 1 IQ point were 0.354 and 0.355 µg/dL, respectively. Additional language has been added to the IQ section emphasizing that Budtz-Jørgensen et al. (2013) findings support the relationship between blood lead and IQ loss.

To investigate the effects of assumptions made in their initial model, Budtz-Jørgensen et al. (2013) used additional statistical techniques to model the relationship between concurrent BLL and IQ. First, the authors examined two alternate models: an extension of the logarithmic model and the Hill model. In the logarithmic extension, Budtz-Jørgensen et al. (2013) investigated the effects of adding a number other than 1 to the log function of the dose in order to avoid an infinite response at a dose of zero. The Hill model represented an alternative specification for the shape of the dose-response curve, as compared with the original logarithmic shape. In addition, Budtz-Jørgensen et al. (2013) used a hybrid approach to estimate the BMD; in this approach, the BMR represents a specified increase in risk of an adverse effect. Budtz-Jørgensen et al. (2013) set the BMR as a 1, 2.5, or 5 percent increase in having an IQ score in the lowest 5 percent of the population. Lastly, Budtz-Jørgensen et al. (2013) investigated the effects of more fully accounting for variability between studies by considering differences in the standard deviation of IQ between studies, adding interaction terms between study site and covariates, and adding interaction terms between study and lead concentration.

The constant derived to avoid an infinite response in the logarithmic model at zero dose was 0.806, which did not produce significantly different benchmark results than adding 1. The Hill model resulted in a slightly better fit than the logarithmic model but provided a more uncertain estimate and thus a lower BMD level. The alternate benchmark analyses using a 1 percent increase in risk of an adverse response (i.e., IQ score in lowest 5 percent of the population) produced identical BMD and benchmark dose lower bound (BMDL) that is the lower 95 percent confidence limit of the BMD, as use of a 1 point loss in IQ. Benchmark results also remained similar when more fully accounting for differences between studies.

The SAB cited two studies, Jusko et al (2008)[3] and Min et al. (2009), which use more recent BLLs than those used in the Crump and Lanphear analyses. Both manuscripts mentioned by the SAB successfully identified deficits in IQ at a lower BLL than Crump et al, (2013), who used the data published by Lanphear et al. in 2005. Min et al. (2009) only examines concurrent exposure, and the authors identify that at age 4 there is a decrease of 0.77 IQ points for every 1 µg/dL increase in BLL. In Min et al (2009), the dose-response relationship between concurrent BLL and Performance IQ at 4 years showed a steep slope at lower levels (up to 7 µg/dL) but did not reach significance. Jusko et al. (2008) concluded that lifetime average of BLLs between 5-9.9 µg/dL caused a decrease of 4.9 IQ points whereas the concurrent exposure correlated with a decrease of 3.7 points for levels between 5-9.9 µg/dL. Additionally, the authors demonstrated that the slope of the blood-lead IQ relationship was steeper at lower levels of lead exposure where IQ decreased by 1.2, 0.32, and 0.15 points per 1-µg/dL increase in peak blood lead over the range of 2.1–10 µg/dL, 10–20 µg/dL, and 20–30 µg/dL, respectively. In both the studies, the steeper slopes at lower BLL without log transformation showed increased deficits; this reinforces the fact that reducing lead levels in lower ranges of average BLL has a significant impact on preventing IQ loss.

The Crump et al. (2013) study includes data from nearly 1200 participants, whereas both the newer studies have about 275 participants. EPA agrees with the commenter that the two studies cited lend additional evidence in support of the measurable IQ impacts occurring with changes in BLLs below 10 ug/dL. The information provided in these two papers has been added to Appendix J of the Final LCRR EA where appropriate (USEPA, 2020a). However, EPA will continue to rely on the more robust analyses based on significantly larger numbers of data points by Crump and Lanphear to support the primary economic analysis for final LCRR.

[3] It should be noted this cohort was also included in Lanphear et al. (2005).

The cross-sectional studies by Kordas et al. (2005) and Evens et al. (2015), cited by the SAB, did not test IQ directly. Kordas et al used a battery of 14 cognitive tests that examined different aspects of executive functions, which showed steeper slopes for tests on math, memory and a picture vocabulary test. The second study, Evens et al. (2015), utilized a standardized test that focused on examining critical and quantitative reasoning abilities, which were shown to be influenced by lead levels even below 5 µg/dL. Recently, a study by Mohn et al. (2014) with 250 healthy participants showed a direct relationship between cognitive domains and IQ. This study points to a direct correlation between IQ as examined by the Wechsler's Scale of Intelligence and seven cognitive domains that include speed of processing, attention/vigilance, working memory, verbal learning, visual learning, reasoning/problem solving. Collectively, these studies provide evidence of decreases in these cognitive domains due to increased BLL; they also show a correlation between IQ and the cognitive domains. EPA has added a summary of the supporting evidence from these studies to Appendix J of the Final LCRR EA.

To continue, lifetime BLLs take into account all exposures up until the time the BLL is quantified. This includes exposure to lead during early childhood from drinking water where the child is more susceptible to greater IQ loss. Lifetime exposure also captures the variability of exposure over the timeframe of childhood. Concurrent exposure, on the other hand, takes into account only the year before the tests are done and can miss the higher BLLs at younger ages. Overall lifetime exposure is a better metric to summarize blood lead to identify IQ loss. This reasoning is supported by studies by Jusko et al. (2008). Jusko et al. identify that lifetime average of BLLs between 5-9.9 µg/dL caused a decrease of 4.9 points whereas the concurrent exposure showed a decrease of 3.7 points for levels between 5-9.9 µg/dL.

Table 2. Data used in the Lanphear et al (2005) analysis from other studies

	Lanphear et al. (2005) Contributing Datasets							Additional Studies	
	Bellinger et al. 1992	**Dietrich et al. 1993**	**Ernhart et al. 1989**	**Schnaas et al. 2000**	**Baghurst et al. 1992**	**Canfield et al. 2003**[a]	**Wasser-man et al. 1997**	**Jusko et al. 2008**[a,b]	**Min et al. 2009**[b]
Location of Cohort	Boston, MA	Cincinnati, OH	Cleveland, OH	Mexico City, Mexico	Port Pirie, Australia	Rochester NY	Yugoslav-ia	Rochester NY	Cleveland, OH
Number of participants									
Study's total n	116	253	260	112	494	240	261	194	278
n used by Lanphear et al. (2005)[a]	116	221	160	99	324	182	231	N/A	N/A
Years Partici-pants Born	1979-1981	1979-1984	1981-1982	1987-1992	1979-1982	1994-1995	1994-1995	1994-1995	1994-1996
Years Partici-pants Recruited	1979-1981	1979-1984	1981-1982	1987-1992	1979-1982	1996-1997 (at 24-30 mo)	Initiated in 1985	1996-1997 (at 24-30 mo)	1994-1996
Years Blood Collected[c]	1979-1991	1979-1990	1981-1985	1987-1997	1979-1989	1994-2000	1990-1994	1994-2001	1998-2000
Partici-pant age when postnatal BLL measured	birth; 6, 12, 18, 24, 57 mo; 10 yo	10 days from neonat; quarterly intervals until 5 yo; 66, 72, and 78 mo	6 mo; 2 and 3 yo	every 6 months from 6-54 mo	birth; 6 and 15 mo; annually from 2-7 yo	6, 12, 18, 24 mo; 3, 4, 5, 6 yo	6 month intervals from birth - 7 yo	6, 12, 18, 24 mo; 3, 4, 5, 6 yo	4 yo
Blood Lead Levels[d]: median (5th-95th) ug/dl or mean ± SD									
Concurr-ent	5.4 (0.8-12.7)	7.5 (3.5-20.0)	14.2 (7.0-28.5)	7.0 (3.0-16.5)	13 (6.0-24.0)	4.0 (1.5-12.0)	15.9 (4.7-47.8)	5.0 ± 3.3	Average BLL at 4 years old: 7.0 ug/dl (SD= 4.1; range 1.3-23.8)
Peak	12.0 (5.4-27.0)	17.9 (9.0-38.0)	18.0 (9.0-34.0)	15.0 (6.0-40.0)	27.0 (15.0-46.0)	9.0 (3.5-23.3)	23.8 (7.6-61.5)	11.4 ± 7.3	
Early	8.1 (3.3-18.0)	12.0 (6.6-26.6)	13.4 (7.9-24.8)	11.4 (4.3-26.8)	20.5 (11.0-33.3)	5.8 (2.4-13.1)	14.1 (4.3-44.0)	7.1 ±3.9	
Lifetime	7.6 (3.6-15.2)	11.7 (5.8-24.9)	14.5 (8.1-25.3)	10.6 (4.5-21.3)	18.6 (10.8-30.2)	5.5 (2.4-12.8)	15.8 (5.6-49.3)	7.2 ± 4.1	
Age at IQ test (years)	10	6.5	4.8	4.5 and 5	7	3 and 5	5 and 7	6	4, 9 & 11
Intelli-gence Assess-ment Used[e]	WISC-R; K-TEA	WISC-R	WPPSI; S-B adminis-tered to 2 mentally challenged children	General Cognitivie Index of MSCA	WISC-R	S-B, fourth edition	WPPSI-R; WISC-III	WPPSI-R	Abbreviat-ed WPPSI-R; entire WISC-IV

Notes:

a: Canfield et al (2003) and Jusko et al (2008) utilized participants from the same dust-control study cohort established by Lanphear et al in 1999. The analyses and endpoints (age at IQ test) were handled differently; these two studies are therefore reported separately.

b: Study not included in Lanphear et al (2005) analysis.

c: Extrapolated from years of participant recruitment and age at sample collection

d:Values taken from Lanphear et al (2005) Table 2 for all studies except Jusko et al (2008) and Min et al (2009)

e: Abbreviations are as follows: Wechsler Intelligence Scale for Children (WISC) Revised (-R); Kaufman Test of Educational Achievement (K-TEA); Wechsler Preschool and Primary Scales of Intelligence (WPPSI); Stanford-Binet Intelligence Scale (S-B); McCarthy Scales of Children's Abilities (MSCA).

16.4.5 Valuation of IQ Point Loss

Summary of Comments

EPA received a number of comments related to how the LCRR estimated the value of an IQ point for use in the benefits assessment. These comments included suggestions of alternative methods for calculating the value of an IQ point, whether EPA should be valuing incremental changes in IQ at all, whether the IQ valuation method captures willingness-to-pay, and whether the IQ point valuation differed between the LCRR and other recent proposed rulemakings that used avoided IQ loss as the basis for benefits estimation.

EPA received a comment suggesting the use of the Gould (2009) estimate of $17,815, in 2006 dollars, as the value of an IQ point.

EPA received a comment asserting that the IQ benefit calculation in the LCRR Economic Analysis is inherently different from the calculation presented in the Lead Dust Standard (USEPA, 2019b) and the Proposed National Primary Drinking Water Regulation (NPDWR) for Perchlorate Economic Analyses (USEPA, 2019c).

Agency Response

Regarding the comment suggesting use of the Gould value of an IQ point, there are no details in the Gould (2009) paper about how this estimate of the value of an IQ point was developed. Thus, EPA is continuing to use the value of an IQ point described in Section 6.4.4 and further described in Appendix K of the Final LCRR EA (USEPA, 2020a), which is based on a peer-reviewed methodology developed by Salkever (1995), and is also consistent with the value of an IQ point used in the Lead Dust Standard (USEPA, 2019b) and the Proposed NPDWR for Perchlorate (USEPA, 2019c). It is worth noting that EPA does include a sensitivity analysis in Appendix G of the Final LCRR EA using an alternative value of an IQ point as calculated in Lin et al. (2018).

There was also a suggestion that EPA ignored the impacts of future real earnings growth in the estimation of the value of an IQ point. However, EPA disagrees with this assertion, as EPA assumed an annual growth rate of 1 percent, which is consistent with long term historical averages. This choice of real earnings growth rate for the calculation of the value of an IQ point is outlined in Section K.8.2 of Appendix K of the Final LCRR EA. EPA also disagrees with the suggestion that it should additionally include potential resulting multiplier impacts of increased future earnings on gross domestic product (GDP) in its IQ valuation estimation. The current method for estimating the value of an IQ point has been previously used as part of both the Lead Dust Standard and the Proposed NPDWR for Perchlorate. Thus, to remain consistency, EPA has opted to continue to use this method for estimating the value of an IQ point without the GDP to earnings multiplier. The current value of an IQ point does not include a willingness to pay (WTP) estimate. Ideally, EPA would use estimates of WTP to value all changes in cognitive function experienced by children in response to changes in lead exposure. However, EPA is unaware of robust, peer-reviewed estimates of WTP to avoid children's cognitive function decrements, so it relies on avoided lifetime earnings decrements as a proxy for WTP. EPA conducts a health risk reduction and cost analysis (HRRCA) when proposing any NPDWR, as required in Section 1412(b)(3)(C)(i) and (ii) of the SDWA. The HRCCA is used by EPA at proposal to determine, as required by SDWA Section 1412(b)(4)(C) "whether the benefits … justify, or do not justify, the costs." It may also be used if EPA proposes to use its authority under SDWA Section 1412(b)(6) to establish an MCL or treatment technique that "maximizes health risk reduction benefits at a cost that is justified by the benefits." 1412(b)(3)(C)(iii) of the SDWA says "[t]he Administrator may identify valid approaches for the measurement and valuation of benefits … including approaches to identify consumer WTP for reductions in health risks from drinking water contaminants." In this rulemaking, EPA exercised this discretion to determine which valid benefits assessment methods to use when conducting a HRRCA for this regulation. In determining not to conduct an original WTP study for this rulemaking, EPA considered the time and resources that would be required to conduct the study specifically focused on the removal of lead hazards from drinking water as compared to other valid approaches for assessment of benefits. The Agency chose to focus its limited analytical resources on the assessment of the change in lifetime earnings associated with changes in IQ accruing from reductions in drinking water lead exposure to infants and young children, being a subpopulation at significant risk, as this approach is a valid and adequate proxy for WTP for rulemaking purposes and requires fewer resources than conducting an original WTP study.

EPA disagrees with the assertion that small changes in IQ should not have an economic value when aggregated at the population level. As mentioned in Appendix K, "[b]ecause the literature finds support for a continuous relationship between IQ and earnings, it is possible to quantify the impacts of even very small IQ changes." This quantification is supported by the SAB recommendation that "the characterization of IQ point loss by the summation of fractional IQ points over the entire population of children is considered defensible and appropriate." Additionally, EPA disagrees with the assertion that the magnitude of IQ changes for the LCRR has an effect on the continuous slope of the relationship between lifetime earnings and IQ. The relationship between lifetime earnings and IQ remains consistent regardless of the magnitude of changes in IQ, as larger changes are reflected by larger movements along the same curve as smaller changes.

EPA disagrees with this assertion that EPA used a different calculation for LCRR than the calculation presented in the Lead Dust Standard (USEPA, 2019b) and the Proposed NPDWR for Perchlorate Economic Analyses (USEPA, 2019c). The value of an IQ point that is used in the Proposed LCRR Economic Analysis (USEPA, 2019) was calculated in a consistent manner with that of the Proposed NPDWR for

Perchlorate and the Lead Dust Standard[4]. The unit values per IQ point presented in the economic analysis appear slightly different due to differences in the age at which children were assumed to accrue benefits in the analysis, as well as the year to which the values were inflated. As mentioned in Section 6.4.4 of the Final LCRR EA, benefits for the LCRR are assumed to accrue at age seven and therefore the value of an IQ point is discounted back to age seven in the LCRR analysis. This results in a slightly higher estimate for the value of an IQ point for that age, than the values used in the economic analyses for the Perchlorate Rule (USEPA, 2019c) and the Lead Dust Standard (USEPA, 2019b), which are discounted to age zero and age three, respectively. The assumption about the age at which benefits accrue has no effect on the calculation of the present value of IQ gains resulting from the rule. Additionally, the Perchlorate Rule economic analysis presents values of an IQ point in 2017 dollars, while the LCRR uses 2016 dollars. This explains the discrepancy between the values presented in the Perchlorate HRRCA Exhibit B-7, which are inflated to 2017 dollars, and the values presented in the corresponding Exhibit K.7 for the Final LCRR EA, which are inflated to 2016 dollars.

It should also be noted, and is described in Section 6.4.5 of the Final LCRR EA, that the benefits in the LCRR are further discounted back to year one of the analysis (providing the net present value) and annualized within the SafeWater LCR model. This discounting means that the value of a prevented IQ point loss related to reductions in drinking water lead concentrations in the first year of the analysis is worth more than the same prevented IQ point loss if it would occur in the third year of the analysis, which in turn has a greater value than if the prevented IQ loss accrued in the fifth year of the analysis. The only year of the analysis that uses the full value of an IQ point as specified in Section 6.4.4 is the first year, and each subsequent year is discounted further based on the assumed annual discount rate, either 3 or 7 percent. This discounting to the first year of the analysis is also performed in the economic analysis for the Perchlorate Rule, as in both rules the costs and benefits vary from year to year and are annualized. This discounting is not performed in the Lead Dust Standard, as the costs and benefits are assumed to remain constant from year to year, and as such the Final LCRR EA only presents annual costs and benefits, as opposed to total costs and benefits over a specified time period that are subsequently annualized. The method of discounting used in the LCRR and Perchlorate analyses leads to a difference in the final value of an IQ point that is applied in the calculation of the total benefits from avoided IQ loss. This type of discounting does not affect the unit value of an IQ point presented in the Final LCRR EA.

16.4.6 SafeWater Calculation of Benefits and Monetized Results

Summary of Comments

EPA received multiple comments on the LCRR related to how EPA estimated the number of children that benefit from the proposed rule revisions. Specifically, there were questions as to how EPA accounted for the possibility that many homes that would be subject to changes in WLLs would not have any children living in them.

[4] Section 6.4.4 of the Proposed LCRR EA mentioned that lifetime earnings are estimated using American Community Survey (ACS) single-year samples from 2008 to 2016, when this should have read 2008 to 2017. This is consistent with the value of an IQ point analyses presented in the Perchlorate Rule and Lead Dust Standard and has been corrected in the Final LCRR EA.

Agency Response

EPA disagrees with the suggestion that benefits are overstated due to the notion of the existence of homes with no children, as the number of children benefiting from the rule revisions are calculated as a proportion of the PWS population, rather than as a function of the number of homes with children served by the PWS. The following response describes in more detail the methods by which benefits are calculated in the LCRR, paying specific attention to how the number of children affected by each water lead change is calculated. This information is also found in Chapter 6 of the Final LCRR EA.

IQ benefits are estimated based on LSLRs, installation of POU, and installation and re-optimization of CCT that occur over the 35-year period of analysis. EPA captures benefits in the analysis when children turn 7 years of age; therefore, it is necessary to estimate the number of 7-year-olds that are served by each PWS. That estimated number of 7-year-olds represents the pool of potential individuals for which IQ benefits may be quantified in any single year of the 35-year period of analysis. Based on United States Census demographic data from 2010, 1.34 percent of the total United States population turns seven in any given year (US Census Bureau, 2013). EPA assumes for modeling purposes that the percentage of individuals 7 years old is constant across PWSs and constant across households with and without LSLs. The population served by each PWS is also assumed to remain constant over the analysis period; therefore, the number of 7-year-olds in each PWS for each year of the analysis remains constant and is 1.34 percent of the current population served by each PWS.

EPA does not assume that all homes with replaced LSLs have children living in the home. Rather, EPA assumes that the proportion of 7-year-olds living in the homes that are undergoing a LSLR is equal to the proportion of the United States population that is 7 years old. This assumption takes care of the need to model the movement of children in and out of homes in the community, as the proportion of the population in these age groups is assumed to remain constant. In other words, if there are 1,000 households being served by a PWS that underwent a change in lead concentration, approximately 1.34 percent of the population in those households would get a benefit annually, regardless of which specific home being served by the PWS they lived in. The accrued benefit for those children who are served by a PWS that has undergone a change is then a function of changes in the average lifetime BLL of the children due to the change in lead concentration, and the subsequent avoided IQ loss.

For each year t in the analysis, the SafeWater LCR model determines for each model-PWS if changes to CCT status, LSLR, or installation of POU devices occur based on the requirements of the LCRR and the model-PWS's 90th percentile water lead value. SafeWater LCR then assigns to the fraction of the 7-year-old population affected by the CCT, POU, and/or LSLR a drinking water lead concentration change. This concentration change is assigned by comparing the CCT, POU, and LSLR status in year t to the baseline lead concentration status in year t-1 for the affected fraction of the system's population (see Exhibit 6-13 or Exhibit 6-14 in Chapter 6 of the Final LCRR EA for the set of possible concentration changes based on a low-cost and high-cost scenario, respectively). This concentration change is also associated with a resulting change in lifetime average BLL (derived from annual blood leads estimated from the SHEDS-IEUBK model; see Exhibit-6-24 in the Final LCRR EA). SafeWater LCR calculates these lifetime average BLLs by summing together annual BLLs from age 0 through age 6 years and dividing by 7. The SafeWater LCR model assesses the impact of the CCT, POU, and LSLR status changes on lifetime average BLLs by estimating both a lifetime average BLL assuming the new water lead scenario in year t, and a lifetime average BLL assuming the previous water lead scenario in year t. These lifetime average BLLs can be thought of as pre- and post-rule BLLs for a representative 7-year-old (associated with the fraction of 7-year-olds experiencing the given change in CCT, POU, and/or LSLR status). SafeWater LCR calculates these pre- and post-rule BLLs in order to ultimately assess the impact of the CCT, POU, and LSLR status changes on avoided IQ loss.

The SafeWater LCR model calculates pre- and post-rule representative 7-year-old lifetime BLLs for year t (the year of the rule change in water concentration) through the end of the period of analysis. As the model moves from year t through the end of the analysis, post-rule 7-year-old lifetime average BLLs become more representative of the new water lead scenario. As an example of these calculations, in year t a single year of the BLL associated with the new WLL is included in the post-rule lifetime average BLL. In year t+1, two years of the BLL associated with the new WLL are included in the post-rule lifetime average BLL, and so on. Once the model gets to year t+6, the BLL associated with the new WLL scenario is included for all seven years of the post-rule lifetime average. This year t+6 post-rule lifetime average BLL remains constant until the end of the period of analysis, as all representative 7-year-olds would have been living with the new WLL scenario their entire lives. Although the modeling assumes BLL changes coincide with WLL changes, the use of lifetime blood lead averages in the calculation of benefits partially accounts for any unmodeled biological lag that may occur in the reduction of BLLs as they relate to reductions in WLLs. Additionally, the half-life of lead in blood is approximately 30 days (USEPA, 2013), and as the SafeWater LCR model operates on a yearly timestep, any lag in BLL change resulting from changes in WLL would likely occur within a single analysis year, precluding the need to model this lag any further. Because SafeWater LCR calculates the total discounted benefit for each change in CCT, POU, and LSLR status in the year in which the change occurs, the model applies the lead concentration change, and associated BLL change, to the same fraction of 7-year-olds for all future periods left in the 35-year period of analysis.

SafeWater LCR then uses this stream of pre- and post-rule lifetime average BLLs for each year from year t through the end of the period of analysis to estimate a resulting average change in IQ points for each year based on the Crump et al. (2013) concentration-response function. The SafeWater LCR model monetizes each year's average IQ point change using both the 3 and 7 percent rate discounted values of an IQ point, which are appropriately discounted back to Year 1 of the analysis at the 3 or 7 percent discount rate. SafeWater LCR then multiplies each year's average value of avoided IQ point loss by the number of 7-year-olds annually affected by the single regulatory change from year t. The model then sums the individual year single regulatory action (single system) estimated monetized IQ values across all the changes in CCT, POU and/or LSLR status to find the total value of all IQ points saved based on water lead changes in year t. SafeWater LCR repeats this process for each year of water lead changes that occur based on the requirements of the LCRR through the period of analysis. All CCT/POU/LSLR changes that occurred in year t are carried forward to year t+1 of the analysis as the new "baseline" water lead scenario. Thus, the number of LSL houses shrinks as the model moves through the 35-year analysis period and implements changes based on the LCRR.

The SafeWater LCR model calculates total annualized benefits over the period of analysis by discounting the yearly total monetized values back to the first period of the analysis and summing to providing a net present value for IQ impacts. This value is then annualized for the 35 years.

Appendix G presents alternative BLL estimates for children, alternative concentration-response functions for the relationship between lead and IQ, and an analysis with an alternative value of an IQ point. Benefits associated with find-and-fix are not quantified. Additional information on the Safewater LCR model including source code can be found at the following website: https://www.epa.gov/sdwa/safewater-lead-and-copper-rule-lcr-database-and-associated-files-proposed-rule.

16.4.7 Unquantified Adult Cardiovascular Disease Benefits

Summary of Comments

EPA received numerous comments encouraging modification of the EA to include monetized reduced CVD mortality benefits resulting from the LCRR. One commenter provides further details on how this benefit can be estimated and provides monetary estimates of the potential increase in benefits related to this monetization. Commenters identified additional studies that could be included in the discussion of the health effects of lead. The comments also include suggestions to reassess the current set of non-monetized benefits for the purposes of identifying opportunities for monetization of multiple adverse health effects including cardiovascular mortality as well as reproductive and developmental effects, immune effects, hypersensitivity and allergy response, resistance to bacterial infection, neurological effects (in addition to IQ from childhood exposure), and cancer. They also suggest using break even analysis to assess the non-monetized benefits. The commenters suggested EPA should address the relationship between lead in drinking water and miscarriage and stillbirth.

Agency Response

EPA disagrees with comments suggesting that additional health end points beyond IQ must be monetized for this rulemaking under the SDWA. In this rulemaking, EPA used its discretion to determine which valid benefits assessment methods to use when conducting a HRRCA. In doing so, the Agency chose to focus its limited resources and prioritize the assessment of the IQ benefits accruing from reductions in drinking water lead exposure to infants and young children, because it is a population at significant risk. EPA's Final LCRR EA indicates that there are unquantified and/or non-monetized benefits due to the rule, including those associated with reductions in adverse cardiovascular effects, renal effects, reproductive effects, immunological effects, neurological effects, and cancer. These are summarized in detail in Appendix D. EPA considered all benefits, including those that it did not monetize or otherwise quantify, in the required determination under SDWA Section 1412(b)(4)(C) as to whether the costs are justified by the benefits.

Although the EPA did not quantify or monetize changes in adult health benefits for the proposed LCRR, the Agency estimated the potential changes in adult drinking water exposures and resulting BLL to illustrate the extent of lead reduction to the adult population as a result of the proposed LCRR. Commenters indicated that the Agency should include quantification and monetization of the adult CVD benefits associated with reductions in water lead concentrations in the HRRCA for the LCRR. Some of the commenters indicated that EPA has a legal obligation to include this benefit in the HRRCA under section 1412(b)(3). EPA does not agree with these commenters that a quantified assessment of CVD benefits is necessary in this HRRCA. EPA conducts a HRRCA when proposing any NPDWR, as required in section 1412(b)(3)(C)(i) and (ii) of the SDWA. SDWA Section 1412(b)(3)(C)(i)(I) requires the inclusion of quantifiable and non-quantifiable health risk reduction benefits for which there is a factual basis in the rulemaking record to conclude such benefits are likely to occur as a result of the rule. SDWA section

1412(b)(3)(C)(iii) provides that "[t]he Administrator may identify valid approaches for the measurement and valuation of benefits" for the HRRCA.

EPA exercised its discretion to identify the validity of the approaches used to measure and value CVD benefits and determined not to quantify CVD benefits for this rulemaking because the methodology which links changes in adult BLLs to CVD health endpoints, including mortality, has not yet undergone an expert panel peer review. However, EPA has considered the substantial unquantified benefits to the rule, including those associated with reductions in adverse cardiovascular effects that are described in the HRRCA. Additional details of systematic reviews between blood lead and CVD mentioned by reviewers were added to Appendix D. These include Chowdhury et al. (2018) and Navas-Acien et al. (2007).

Some commenters asserted that if the Agency monetized the benefits of CVD, the Agency would have proposed more stringent requirements because greater quantified benefits would justify more burdensome regulation. EPA disagrees. The Agency considered information from the HRRCA at proposal to determine, as required by SDWA section 1412(b)(4)(C) "whether the benefits … justify, or do not justify, the costs." The Agency found that the quantified and non-quantified benefits justified the cost of the proposed rule requirements. EPA considered costs and benefits in its rulemaking process, as required by SDWA. The Agency established the treatment technique requirements in the rule to "prevent known or anticipated adverse effects on the health of persons to the extent feasible" consistent with section 1412(b)(7)(A) of the SDWA, while also ensuring that "[a]ny revision of a national primary drinking water regulation shall … maintain, or provide for greater, protection of the health of persons" as required in section 1412(b)(9) of the SDWA. The EPA is not employing the discretionary provision of SDWA section 1412(b)(6)) that allows the Agency to promulgate an NPDWR that "maximizes health risk reduction benefits at a cost that is justified by the benefits" when the Agency determines at proposal that the costs are justified by the benefits of the rule. Therefore, the Agency's decision to not monetize CVD benefits did not affect the stringency of the final rule. EPA conducted an analysis of quantifiable and non-quantifiable benefits that meets the statutory requirements and EPA considered both quantified and non-quantified benefits in the rulemaking. EPA received a number of comments that encouraged the Agency to obtain more data to better estimate the costs and benefits of the proposed rule. EPA engaged in additional data collection in response to comments that has improved upon the analysis conducted for the proposed rule.

As detailed earlier, IQ loss reduction is the only outcome that has been quantified and represents the quantifiable benefit of reducing lead contamination in drinking water. At a 3 percent discount rate, this quantifiable benefit of IQ loss reduction is greater than costs so that net monetized benefits are positive. At a 7 percent discount rate, the quantifiable benefit of IQ loss reduction is not greater than costs alone. Though EPA is not required to perform a breakeven analysis according to OMB Circular A-4 (OMB, 2003), such an analysis would show that the total value of non-monetized benefits of the rule would need to exceed $127,980,000 annually to exceed costs in the low cost scenario at the 7 percent discount rate, and $253,358,000 annually to exceed costs in the high cost scenario at the 7 percent discount rate.

EPA has used peer reviewed studies that support the use of the estimates of total lead intake used in the economic analysis. Appendices D and J in the Final LCRR EA discuss, in detail, that exposure to lead causes deviations from normal physiology in the cardiovascular system (USEPA, 2020a).

Additional commenters raise the fact that lead has other adverse health effects on other neurological end points which are not IQ related, including depression, nervous system disorder, panic disorder, dementia and Attention-Deficit/Hyperactivity Disorder. EPA discusses these effects in detail in Appendix D.

The commenters also bring up the effect of lead on other physiological end points such as immune, reproductive, and developmental effects (prenatal exposure), which have not been monetized in the economic analysis. Appendix D details the effects of lead exposure on each of these end points. While there is evidence of a relationship between lead exposure and changes in these health endpoints, EPA disagrees that it is necessary to devote resources toward the development of new methods to monetize these end-points for this rulemaking.

16.4.8 Uncertainty in Benefits Estimates

Summary of Comments

One commenter asserted that the handling of variability and uncertainty in the analysis is likely to lead to misinterpretation. The commenter notes that these are discussed, but that variability and uncertainty are not adequately propagated through to the estimate of benefit and net benefit. The commenter states that the use of fixed values rather than uncertain quantities could lead to misinterpretation. The commenter notes multiple sources of uncertainty, including:

- The number of water systems covered by the proposed LCRR;
- The distribution of WLLs in these water systems;
- The extent to which LSL replacement results in short-term increases in WLLs;
- Human exposure to these WLLs, both in the baseline and as a result of implementation of each provision in the proposed LCRR;
- The concentration-response functions converting increased WLL into increased BLL, and increased BLL into IQ losses;
- The concentration-response function converting reductions in WLL into reduced BLL and reduced BLL into IQ gains;
- The extent to which modeled IQ changes are statistically or clinically meaningful; and
- The valuation of IQ changes.

  The commenter further suggests that the Proposed LCRR EA reported estimates with excess precision; in particular noting that aggregate benefits and costs were reported to +/- $500, without providing support for that level of precision.

Agency Response

EPA does not agree that the handling of variability and uncertainty is likely to cause misinterpretation. The economic analysis explores potential uncertainty for each step of the benefits analysis in detail and incorporates known variability into the modeled outputs. The high and low estimates in the economic analysis are based on the largest drivers of uncertainty and capture the likely range. For the number of systems with LSLs, EPA has updated the economic analysis with more accurate inventories provided through public comment. This change has been further discussed under response to comment Sections EPA requested comment on the five drivers of costs identified in the "Economic Analysis for the Proposed Lead and Copper Rule Revisions" or "Proposed LCRR EA" (USEPA, 2019a) that include: (1) the existing number of lead service lines (LSLs) in public water systems (PWSs), 2) the number of PWSs above the lead action level of 15 µg/L or lead trigger level of 10 µg/L under the current and proposed monitoring requirements, (3) the cost of installing and optimizing corrosion control treatment (CCT), (4) the effectiveness of CCT in mitigating lead concentrations; and (5) the cost of lead service line replacement (LSLR). EPA also requested comment on the assumptions regarding labor required to comply with the proposed rule, and solicited comment and peer reviewed information on the evidence relevant to quantifying the incremental contribution of blood lead concentrations (BLL) to cardiovascular disease (CVD) (and associated mortality) relative to other predictors such as diet, exercise, and genetics that may be useful in a future benefits analysis.

Section 16 provides a summary of public comments received on EPA's economic cost and benefits analysis and the Agency's responses that includes revisions to the cost benefit analysis in response to these comments. It is further organized into 26 numbered subsections.

16.1 General Comments" and 16.2 Baseline Universe of Systems: Major Data Sources and Affected Entities." Additionally, EPA provides a range in the model based on number of systems with LSLs and four other factors designed to bound that uncertainty. These are handled in more detail in "Data Limitations and Uncertainty" in response to comment Section 16.2.

Variability in the distribution of WLLs in water systems were handled through detailed analysis of WLL profile data, followed by simulation. Unknown uncertainty related to the geographic extent of the original dataset is discussed in Section 6.2 of the Final LCRR EA (USEPA, 2020a).

Short-term increases in WLL after LSLR and timing of benefits are further discussed in response to comment Section 16.4.2 Assignment of Lead Concentrations to Populations in Baseline and Tracking Concentration Changes in SafeWater."

Variability and uncertainty in human exposure to WLL based on WLL variability, and biological factors are discussed in more detail in responses to multiple commenters regarding "Water Lead Level (WLL) Estimation Method" under response to comment Section 16.4.1, as well as EPA SAB comments regarding "Biological Variability" and "Blood Lead Distribution" under response to comment Section 16.4.3. Variability in exposure is acknowledged and incorporated in SHEDS modeling; while this may not be a perfect description of exposure, it incorporates both real-world data and modeled variability based on expert opinion. The changes in WLL represent only LSLR and CCT impacts, and benefits for other components of the rule are acknowledged as unquantifiable.

Uncertainty in concentration-response functions for modeling the effects of WLL on BLL, and BLL on IQ losses involved the comparison of three functions. This is further discussed in response to comment Sections 16.4.3 Estimation of Blood Lead Level (BLL) Changes in Children and 16.4.4 WLL Reductions through Avoided IQ Point Loss.".

EPA does not agree that costs and benefits are reported with a level of precision that may lead to misinterpretation. It is important to show the relative position of cost or benefits among options. As the

SafeWater LCR is a stochastic model, results are presented as stochastic values, down to one decimal place. As noted in Appendix C of the Final LCRR EA, this reporting method is intended to avoid confusion related to rounding uncertain values (such as zero values where the estimate is a decimal) rather than to presume the level of precision. To avoid misinterpretation, the EA contains long discussions of possible uncertainty, and reporting costs and benefits to the nearest thousand allowed differentiation of the impacts of each option.

16.4.9 Benefits: Other

Thoroughness of the Benefits Analysis

Summary of Comments

A commenter suggested that the approach to estimating the benefits of reducing lead exposure in their state point to a need for a more thorough benefits analysis for EPA's LCRR based on actual BLL data.

Agency Response

EPA disagrees that the commenter's approach is evidence that EPA's approach underestimates benefits, and that a more thorough benefits assessment based on actual blood lead data is necessary.

EPA's modeling of benefits is based on requirements of the LCRR, and the relationship of those requirements with the children that are served by each water system undergoing changes due to the rule. This does not necessarily provide benefits for all children living in the United States with some level of lead in their blood, but rather only for those children that are served by a PWS that undergoes a change in their water lead due to the requirements of the LCRR. The commenter's approach appears to assume that all children with BLLs above 0 are undergoing a blood lead reduction to 0, and that 20 percent of that blood lead reduction is necessarily from changes in water. As the two analyses are quite different in their approach, EPA is unable to use the state's analysis as evidence that a deficiency exists in the Agency's approach to modeling benefits. Furthermore, the approach used by EPA in the Final LCRR EA is based on state of the science methods, both for calculating the number of children affected by the rule, as well as for estimating the IQ benefit received due to various changes in water lead concentrations.

EPA, as described in Chapter 6 of the Final LCRR EA, used the SHEDS-IEUBK coupled model to estimate BLLs based on possible water lead scenarios associated with potential LCRR interventions. SHEDS-IEUBK takes in to account dietary exposure to lead, exposure from soil and air, and lead exposure from drinking water, and models exposure magnitudes probabilistically based on actual children's activity diaries (Zartarian et al., 2017). Estimates generated using the SHEDS-IEUBK method were compared to blood lead estimates reported from NHANES (2009-2014) and from the National Human Exposure Assessment Survey (NHEXAS) in Zartarian et al. (2017) and were shown to closely approximate these BLLs. NHANES in particular is a nationally representative dataset of BLLs in children in the United States, and as the SHEDS-IEUBK coupled model has been shown to be able to closely approximate these BLLs, it would be unnecessary and prohibitively costly for EPA to implement another comprehensive survey of children's BLLs. For further information on SHEDS-IEUBK model development and evaluation, refer to Zartarian et al.'s (2017) paper "Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision-Making." This model provides a more comprehensive representation of blood lead levels which could lead to altered life outcomes. EPA believes that using the SHEDS-IEUBK coupled model provides sufficient estimates of blood lead levels for use in the Final Rule EA, which precludes the need for the actual measurement of BLLs in children.

Need for WTP Survey or Literature Search Related to Drinking Water Safety

Summary of Comments

EPA received a comment asserting that the Agency should conduct a WTP survey specifically related to the removal of lead from drinking water or conduct a literature review for published material on the WTP to remove lead contamination and/or more generally WTP for improvements in the safety of drinking water. The commenter claims that the "SDWA provides that EPA is to consider "valid approaches" for the measurement and valuation of benefits under this subparagraph, including approaches to identify consumer willingness to pay for reductions in health risks from drinking water contaminants." [42 U.S.C. § 300g-1 (A)(3)(C)(iii)]. The commenter also provides a number of supporting studies associated with expenditures on bottled water, the percent of income in developing countries spent to obtain safer drinking water and a WTP survey conducted in Florida demonstrating values for reducing non lead pollutants in the public water supply.

Agency Response

EPA does not agree with the commenter that willingness-to pay studies are necessary or required under the SDWA. EPA conducts a HRRCA when proposing any NPDWR, as required in Section 1412(b)(3)(C)(i) and (ii) of the SDWA. The HRCCA is used by EPA at proposal to determine, as required by SDWA Section 1412(b)(4)(C) "whether the benefits … justify, or do not justify, the costs." It may also be used if EPA proposes to use its authority under SDWA Section 1412(b)(6) to establish an MCL or treatment technique that "maximizes health risk reduction benefits at a cost that is justified by the benefits" where the Administrator has determined that the benefits do not justify the costs. The commenter cites in part 1412(b)(3)(C)(iii) of the SDWA, but omits critical text indicating the discretionary nature of the provision: "The Administrator may identify valid approaches for the measurement and valuation of benefits … including approaches to identify consumer willingness to pay for reductions in health risks from drinking water contaminants." In this rulemaking, EPA exercised this discretion to determine which valid benefits assessment methods to use when conducting a HRRCA for this regulation. In determining not to conduct a WTP study for this rulemaking, EPA considered the time and resources that would be required to conduct the study specifically focused on the removal of lead hazards from drinking water as compared to other valid approaches for assessment of benefits. The Agency chose to focus its limited analytical resources on the assessment of the IQ benefits accruing from reductions in drinking water lead exposure to infants and young children, being a sub population at significant risk. EPA's Final LCRR EA indicates that there are substantial unquantified and/or non-monetized benefits to the rule, including those associated with reductions in adverse cardiovascular effects, renal effects, reproductive effects, immunological effects, neurological effects, and cancer. In the proposed rule preamble, the EPA Administrator found that both a combination of the monetized and non-quantified and/or non-monetized benefits justified the cost of the proposed rule requirements under section 1412(b)(3)(C)(ii) of the 1996 Amendments to the SDWA. For the final rule EPA did not utilize SDWA Section 1412(b)(6) in the selection of the final rule regulatory requirements because EPA had determined that the benefits justified the cost at proposal. Although EPA considered benefits in its rulemaking process, as required by the SDWA, EPA relied on the feasibility standard in SDWA Section 1412(b)(4)(D)) in establishing the treatment technique requirements in the rule to "prevent known or anticipated adverse effects on the health of persons to the extent feasible” consistent with section 1412(b)(7)(A) of the SDWA, while also ensuring compliance with the requirement in Section 1412(b)(9) that “[a]ny revision of a national primary drinking water regulation shall … maintain, or provide for greater, protection of the health of persons.” Given this statutory framework, the Agency’s decision to not monetize all possible benefits did not affect the outcome of the final rule. EPA’s assessment of those IQ benefits that have been monetized along with the non-quantified/non-monetized benefits that have been discussed in the Final LCRR EA were sufficient to meet the requirements for the HRRCA and make a determination at proposal as to “whether the benefits … justify, or do not justify, the costs” as required by SDWA Section 1412(b)(4)(C).

At the time of the proposed rule analysis EPA conducted a literature review to support the development of benefits associated with requiring an LSL inventory. This research sought to find studies which found a quantifiable causal relationship between property values and the presence of LSLs. This review found only two directly relevant studies: Blackhurst (2018) an unpublished and not peer reviewed hedonic study conducted in Pittsburg looking at the impact to property value of having a known LSL (referenced by the commenter), and Lu et al. (2019) that conducted a choice experiment to determine the likelihood of renters and buyers asking for the replacement of an LSL or looking for an alternative property. The study found renters were most willing to ask for the replacement of the LSL followed by looking for an alternative property. Of home buyers the study results were less conclusive with the buyer likelihood of asking for corrective action dependent on the way the buyer found out about the LSL’s existence. A third study Billings and Schnepel (2017) found that purchasers were willing to pay a significant premium, above the cost of lead paint remediation, to purchase a home with the lead paint hazard already removed. These studies were used by EPA to reinforce the concept that the public disclosure of LSL addresses can create an incentive, through increased property values, to replace LSLs. But these studies were for either non-drinking water lead sources or had significant methodological issue that prevented the Agency from utilizing them in the quantification of monetization of benefits for the LCRR.

In addition, a search of the literature was conducted for the final rule. EPA identified a study by Theising (2019) on the impact of LSLR on property values in Madison, Wisconsin. This study used a variety of techniques to isolate the causal impact of LSLR on property values, including spatial and temporal fixed effects, propensity-score matching and comparisons of repeat sales of the same property. Theising found that property values increased 3 to 4 percent on average in response to LSLR. This property value appreciation exceeded the capital cost of replacement, with an implied return on investment of more than 75 percent. Because the LCRR is expected to generate substantial benefits from CCT and POU filtration, not only LSLR, and because the heterogeneity across water systems means that results from the single water system included in the Theising study may not be representative of all water systems affected by the LCRR, the results from this study cannot be extrapolated to estimate the benefits of the LCRR. However, the finding that the benefits to homeowners of LSLR exceed capital costs is broadly consistent with EPA’s quantitative and qualitative analysis of the benefits and costs of the LCRR.

EPA reviewed the specific peer-reviewed studies cited in the comment and concluded that none of the evidence is sufficient to serve as the basis for the estimation of monetized benefits associated with the removal of lead from drinking water for the LCRR. EPA’s analysis of each study is discussed below.

EPA has added language to the Final LCRR EA stating that there is a lack of adequate WTP literature that is applicable to reducing lead in drinking water through different approaches at heterogenous water systems across the United States and noted that the cost-of-illness approach, monetizing the impact of reducing IQ loss in children, used in the economic analysis is the best available proxy for a WTP that captures the benefits of the major provisions of the LCRR across a wide variety of water systems.

The Hu et al. (2011) study explores the relationship between bottled water use and perceptions of quality of the local water supply but does not provide a basis for estimating a WTP.

The Vasquez et al. (2009) study estimates a WTP for safe drinking water from a mid-sized urban area in Mexico, however there are many aspects of the study that deem it unfit for use in the LCRR economic analysis. First, it is unclear how the estimates of WTP in this mid-sized city in Mexico translate to WTP in the United States given that there is widespread usage of water storage and treatment facilities at homes in the city. Thus, participants in this study are already spending time and money tending to their water at home to ensure it is potable. This could affect their WTP for clean water in a way that does not generalize broadly to the United States. Additionally, this city also has issues with the reliability of the availability of running water, which also factors into the study's WTP estimates and are not relevant to the estimation of benefits for the removal of lead. The WTP question posed to participants specifies "reduce[d] water contamination (microbes, bacterium, and heavy metal)" as the outcome for which they were paying. This question captures additional drinking water issues that may be of more concern to residents than the presence of lead, and thus it is not possible to tease out the proportion of the WTP for a reduction in water contamination that is specific to the removal of lead.

The Dey at al. (2018) study was a WTP study conducted in Bangladesh to determine WTP for safe drinking water in a coastal district of approximately 300,000 people. This study made no mention of lead in drinking water, and specifically mentioned the contamination of arsenic, salinity, and iron instead. Additionally, many respondents did not own their drinking water sources, and many others shared their drinking water sources with many other people, which could affect their WTP. It is also unclear how a study conducted in Bangladesh would translate to the United States, especially because a large portion of respondents were designated as "ultra-poor", and the water sources were not water systems but rather "tubewells" that were collecting water from aquifers. It is unclear whether the respondents were paying money for their current access to drinking water.

The Chatterjee et al. (2017) study was the only peer-reviewed study mentioned that was conducted in the United States. The study estimated the monthly WTP to "improve the quality of your water" by undertaking a phone survey in Jacksonville, FL. WTP from this study was found to be $6.22 per month. The response rate for the survey was 8.3 percent, and the study sample was deemed to be a "fair" representation of the population of Duval County, the county that encompasses Jacksonville. However, it is a poor representation of the United States population as a whole as only 38 percent of respondents were male compared to 49 percent of the United States population, in addition to other differences in the racial makeup of the study population as compared with the United States population[5]. Additionally, the water in Jacksonville is sourced from groundwater aquifers, which can sometimes produce a noticeable smell of sulfur (rotten egg), even after being aerated and disinfected with chorine at city water treatment plants. This sulfur smell has elicited concerns about tap water quality that may not be relevant to other areas of the country. The study also made no mention of lead in their telephone

[5] United States population estimates were found at the following website: https://www.census.gov/quickfacts/fact/table/US/PST045218.

assessment, and thus the results are not applicable for the purposes of estimating the benefit of reducing lead from drinking water.

The other studies mentioned[6] in the comment about "boil water advisories" in Washington DC resulting in bottled water shortages in stores are anecdotal and are not sufficient for providing an estimate for WTP for the removal of lead from drinking water.

16.4.10 Application of Discount Rates to Benefits Analysis

Summary of Comments

EPA received comments on LCRR related to how EPA applies discount rates to the benefits analysis for the proposed rule revisions. Specifically, suggestions were made that EPA should be presenting analyses using discount rates lower than 3 percent, or even using no discount rate due to a portion of the accrued benefits being intergenerational in nature. Also, a suggestion was made to incorporate an additional discount rate that reflects whether a child was in a home at the time of LSLR or moved in later.

Agency Response

EPA disagrees with the assertion that an additional discount rate should be incorporated to account for children that were "not in the home" at the time of an LSLR, as this discounting is already captured by discounting future benefits back to year 1 of the analysis. EPA assumes for modeling purposes that the percentage of individuals who are 7-years-old is constant across PWSs and constant across households with and without LSLs. The population served by each PWS is also assumed to remain constant over the analysis period; therefore, the number of 7-year-olds in each PWS for each year of the analysis remains constant and is 1.34 percent of the current population served by each PWS. As mentioned in response to comment Section 16.4.6 SafeWater Calculation of Benefits and Monetized Results, EPA assumes that the proportion of 7-year-olds living in the homes that are undergoing an LSLR is equal to the proportion of the United States population that is 7 years old. This assumption takes care of the need to model the movement of children in and out of homes in the community as the proportion of the population in these age groups is assumed to remain constant. Any future benefits accrued based on LSL changes made during the analysis period are discounted back to year 1 of the analysis, which accounts for the need to discount benefits to the year the LSL change was made. Thus, there is no need for any additional discounting beyond what is already in the modeling to specifically account for children moving between homes at the time of an LSLR.

EPA disagrees with the suggestion that it should be presenting benefits at discount rates other than 3 and 7 percent. OMB Circular A-4 (OMB, 2003) remains the current guidance on the use of discount rates

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[6] Rachel Chason, Arlington residents hunt for coffee and bottled water after water main break, Washington Post (Nov 9 2020), available at https://www.washingtonpost.com/local/virginia-politics/arlington-residents-hunt-for-coffee-and-bottled-water-after-water-main-break/2019/11/09/5e29b738-0317-11ea-8bab-0fc209e065a8_story.html (last accessed Feb 11 2020); Neal Augenstein, Arlington, DC stores hustle to restock bottled water amid boil advisory, WTOP (Nov 9 2019), available at https://wtop.com/arlington/2019/11/arlington-dc-stores-hustle-to-restock-bottled-water-amid-boil-advisory/ (last accessed Feb 11 2020); Kate Kyros, During water advisory, local restaurants spent thousands in the name of safety, WJLA (Nov 19 2019), available at https://wjla.com/news/local/water-advisory-restaurants-spent-thousands (last accessed Feb 11, 2020).

in regulatory analysis. OMB Circular A-4 recommends presenting results using discount rates of 3 and 7 percent, which is what was done in Proposed LCRR EA and Final LCRR EA. One commenter mentioned the use of OMB Circular No. A-94 (Dec. 17, 2019) as evidence for using lower discount rates than 3 percent, however this OMB Circular explicitly states that the lower rates presented in the Circular, "…do not apply to regulatory analysis or benefit-cost analysis of public investment. They are to be used for lease-purchase and cost-effectiveness analysis, as specified in the Circular." Several commenters raised the issue of intergenerational benefits being a part of the LCRR economic analysis, as the analysis period is 35 years, and the lifetime earnings calculation for the value of an IQ point assumes earnings through age 65. EPA acknowledges that the benefits analysis includes some benefits that could be viewed as intergenerational benefits however, OMB Circular A-4 does not require additional analysis at a lower discount rate, but suggests that the EPA consider doing so. EPA is not performing additional analysis at a lower discount rate, but instead describes qualitatively the results of performing such an analysis, as the quantified benefits exceed costs in both the low cost and high cost scenario at the 3 percent discount rate.

16.5 Comparison of Costs and Benefits

Summary of Comments

EPA received a number of comments on the comparison of costs and benefits. One commenter questioned if the health benefits of the rule justified the rule's costs given the overall reduction in BLLs already seen in children in the United States. One commenter suggested that the EPA is inconsistent in how it accounts for on-going Primacy Agency actions by including some of the on-going actions in the cost assumptions but excluding benefits from those actions.

Several commenters questioned whether EPA's determination that the benefits of the rule justified the costs was correct. This included the fact that under some of the assumptions and discount rates, the monetized costs of the rule exceed the monetized benefits. These comments included the assertion that EPA gave more weight to the results under the 3 percent discount rate, and less weight to the results under the 7 percent discount rate. Another commenter recommended that "EPA provide a cost-benefit analysis that demonstrates the consideration of economic reasonableness for the proposed revisions."

One commenter noted that the EPA does not quantify the benefits associated with a number of the requirements, including monitoring, public education, and LSL inventory requirements, and they suggest that the benefits should be quantified so that the net benefits of each regulatory requirement could be evaluated. The same commenter expressed concern with the use of an incremental cost analysis and argued that it is generally appropriate when multiple alternatives are considered, and that EPA should have analyzed "sunsetting" the existing LCR as an option.

EPA received a comment that suggested that the rule changes could result in fewer LSLRs each year and that this would expose children to water that exceeds the action level for lead longer than the previous LCR. EPA received a comment that suggested that EPA review whether the cost to implement any requirement for copper are justified by the associated benefits.

One comment questioned whether the estimated benefits justify the costs of the proposed LCRR given that the range of child BLLs, and water contributions are lower than they were in 1991.

A commenter asserted that because EPA did not include certain costs in the economic analysis because some Primacy Agencies already required certain activities, such as LSL inventories or school sampling, but included the benefits of these actions in the economic analysis the total benefits of the rule would be overestimated.

Agency Response

EPA agrees that due to regulatory and non-regulatory programs, average BLLs in children have declined over the past two decades in the United States. Therefore, in conducting the benefit analysis for the LCRR, EPA took these lower baseline BLLs, and lower water contributions, into account. Even with lower baseline BLLs in the United States, the Administrator has determined that the quantified and non-quantified benefits of the proposed LCRR justify the costs.

However, since EPA only quantified the health benefits associated with LSLR, CCT installation or re-optimization, and POU installation, and did not quantify for any benefits associated with these ongoing activities (LSL inventories or school sampling), EPA disagrees that it overestimated the benefits of the proposed or final LCRR.

EPA disagrees with commenters that asserted EPA's conclusion that the benefits of the proposed rule justify the costs is flawed. SDWA directs EPA to analyze the cost and benefits of any proposed rule and directs the Administrator to make a determination as to whether the benefits of the proposed rule justify the costs. SDWA makes it clear that EPA should consider, both quantified and unquantified, costs and benefits in making its determination. In addition to estimating the costs and benefits of the proposed LCRR that EPA was able to quantify, EPA also discussed in some detail a number of health benefits, such as adult CVD, and costs, such as the ecological impacts of phosphorous, that the Agency was unable to monetize or otherwise quantify. The Administrator's assessment that the benefits of the proposed LCRR justified its costs was based on the totality of the evidence, specifically the quantified and unquantified benefits and costs.

EPA also disagrees with a commenter's assertion that the Administrator's determination that the quantified and non-quantified benefits of the proposed LCRR justify the costs is a result of EPA giving more weight to the results of the economic analysis under a 3 percent discount rate, and less weight to the results under a 7 percent discount rate. This assertion is incorrect because as stated above EPA considered both quantified and unquantified benefits and costs when making this determination. Another commenter suggested that it was unclear if the determination was based on a preference for the 3% discount rate or the presence of non-monetized benefits. As stated above, the Administrator's determination that the quantified and non-quantified benefits of the proposed LCRR justify the costs was based on the totality of the evidence, not only the quantified/monetized costs and benefits.

EPA disagrees that it should provide quantified benefit estimates for each of the LCRR's regulatory requirements, including new LSL inventory and monitoring requirements, so that the net benefits of each requirement can be evaluated on its own merits. While these requirements may not directly lead to a reduction in health impacts and therefore benefits, as part of an overall regulatory schema, they allow for the benefits associated with LSLRs, CCT installation and re-optimization, and POU installation, which EPA does evaluate. Because the various components of the regulatory requirements work in concert to provide the lead health risk reduction, it would be inappropriate to try and pick and choose regulatory requirements based on each requirement's net benefits.

EPA disagrees with the comment that "sunsetting" the previous LCR should have been considered as a regulatory option. Under the SDWA, EPA must review its standards for drinking water every six years and adhere to an anti-backsliding provision: any revision to a drinking water standard must "maintain, or provide for greater, protection of the health of persons" (Section 1412(b)(9). Sunsetting the previous LCR would not meet that standard and therefore is not an appropriate alternative to include in the analysis. In addition, EPA disagrees with the assertion that under the "low-cost scenario using a 3% discount rate…the Current LCR produces annualized net costs of $364 million." EPA's incremental benefit analysis did not count the benefits associated with existing CCT under the previous LCR. Instead, only benefits associated with changes in CCT, or additional LSLR, under the previous LCR, were included in the benefits. If EPA removed the cost associated with existing CCT from the analysis ($327M), then the previous LCR, under the low cost scenario at a 3% discount rate, would have costs of $67M and benefits of $6M. Therefore, the net cost of the previous LCR is $61M, not $364M. And, this does not include the non-quantified health benefits, such as reductions in adult CVD, generated by the previous LCR. Therefore, EPA also disagrees with the statement that "USEPA should give serious consideration to stanching the endless welfare losses that the Current LCR imposes and refrain from adding to the suffering by not promulgating the Proposed LCRR."

The commenter also stated that "the use of incremental cost analysis is generally appropriate when multiple alternatives are considered, and they can be ordinally ranked in order of decreasing net benefits. But a key alternative is missing from this RIA, and without it, incremental net benefit calculations are misleading. That alternative is sun setting the Current LCR." EPA agrees that considering incremental costs and benefits is appropriate when more than one option is considered and that is why EPA conducted an incremental cost and benefit analysis between the previous LCR and the LCRR.

EPA disagrees with the comment that the LCRR would result in fewer LSLRs. As shown in Appendix C, Exhibit C-1 of the Final LCRR EA, under the LCRR, EPA estimates that between 330,228 and 429,174 full LSLRs will occur over the 35-year period of analysis. Under the previous LCR, EPA estimates that the number of LSLRs will be 8,770 to 126,292. The increase in LSLRs under the final LCRR is the result of the addition of a pro-active goal based program in addition to mandatory removal and a new requirement that PWSs replace the utility side of the LSL when households remove their segment. In addition, under the final LCRR, partial replacements (when only public side is replaced) are no longer allowed except in limited circumstances and are not counted towards the replacement rate, while under the previous LCR partial replacements counted towards the PWS's LSLR.

EPA did not modify the current requirements for copper under this rulemaking effort. SDWA includes an anti-backsliding provision that requires any revision to a drinking water standard to "maintain, or provide for greater, protection of the health of persons."

In response to the comment suggesting that the Agency "provide a cost-benefit analysis that demonstrates the consideration of economic reasonableness for the proposed revisions" EPA notes that "economic reasonableness" is not a term used in SDWA. In determining the requirements under the LCRR, EPA utilizes standards laid out in the SDWA. EPA established the treatment technique requirements in the rule based upon SDWA section 1412(b)(7)(A) which requires EPA to identify treatment techniques "which, in the Administrators judgment would "prevent known or anticipated adverse effects on the health of persons to the extent feasible" and the requirement in SDWA section 1412(b)(9) that "[a]ny revision of a national primary drinking water regulation shall … maintain, or provide for greater, protection of the health of persons." The SDWA defines feasible as "feasible with the use of the best technology, treatment techniques, and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)." EPA conducted a HRRCA when proposing the LCRR just as it would any NPDWR, as required in section 1412(b)(3)(C)(i) and (ii) of the SDWA, and EPA has updated the HRRCA for the final rule. SDWA Section 1412(b)(3)(C)(i)(I) requires the inclusion of quantifiable and nonquantifiable costs and health risk reduction benefits for which there is a factual basis in the rulemaking record. The Agency considered information from the HRRCA at proposal to determine, as required by SDWA section 1412(b)(4)(C) "whether the benefits … justify, or do not justify, the costs." The Agency found that the quantified and non-quantified benefits justified the quantified and non-quantified cost of the proposed rule requirements. EPA did not propose to use, and is not employing the discretionary provision of SDWA section 1412(b)(6)) that allows the Agency to "promulgate an NPDWR that "maximizes health risk reduction benefits at a cost that is justified by the benefits." if the Administrator determines, based on the HRRCA, that the benefits would not justify the costs.

16.6 Estimated Cost and Benefit for Alternative Options

EPA received comment under the larger category of estimating costs and benefit for alternative options that covered topics including: clarification of units associated with reported incremental costs; the impact of the fifth liter tap sampling requirement considered in an alternative option; and, the overall insufficient number of alternative options considered in the economic analysis of the proposed rule.

Incremental Costs

Summary of Comments

One commenter asked for additional clarification regarding the units used for the incremental costs presented in Exhibits 10 and 11 of the economic analysis. Specifically, the commenter asked whether the incremental costs are expressed per year, per customer, per month, or per 1,000 gallons of water.

Agency Response

EPA thinks the commenter is referring to Exhibits 5-1 and 5-2 of the Proposed LCRR EA, which are equivalent to the same exhibits in the Final LCRR EA. Exhibits 5-1 and 5-2 provide the national annualized costs, discounted at 3 and 7 percent, that PWSs, households, and primacy agencies will incur in complying with the previous LCR and the final LCRR, respectively. The values are reported in 2016 dollars. The national cost of the final LCRR, or incremental cost, is the difference between the cost of compliance with the final LCRR and the cost of compliance with the previous LCR that these entities are projected to incur each year over the 35-year period of analysis. The incremental costs in the table are annualized values discounted at 3 and 7 percent and reported in 2016 dollars. EPA estimated costs of the final LCRR under both low cost and high cost scenarios to reflect uncertainty in the cost estimates. The low cost scenario and high cost scenario differ in their assumptions made about: (1) the existing number of LSLs in PWSs; (2) the number of PWS above the lead trigger level or action level under the previous and final monitoring requirements; (3) the cost of installing and optimizing CCT (4) the effectiveness of CCT in mitigating lead concentrations; and (5) the cost of LSLR. See Chapter 5, Section 5.2 for additional detail on the assumptions for the low and high cost scenarios.

Compliance Monitoring

Summary of Comments

Citing data from Philadelphia and Michigan, AWWA in comments argued that the impact of the fifth liter sampling requirement on compliance would be highly variable but could substantially increase the number of systems triggered to meet additional regulatory requirements under the proposed revisions.

Agency Response

EPA agrees with the commenter that the new fifth liter sampling protocol for LSL systems will likely result in higher lead levels. The Final LCRR EA (USEPA, 2020a) provides EPA's revised approach for estimating a low and high likelihood that a system's lead 90th percentile levels will be at or below the lead trigger level of 10 µg/L, above the trigger level but below the action level, or above the action level. Chapter 4, Section 4.3.5.1.2 provides these estimates for the final rule. Chapter 9, Section 9.3.1 presents these estimates based on a first liter sample. Exhibit 9-6 includes a comparison of these likelihoods under the previous rule (referred to as the "first liter option") and the final LCRR.

Rule Options Considered

Summary of Comments

The Environmental Defense Fund (EDF) stated that the rule options explicitly considered by EPA were relatively minor variations, and that they did not include (1) reducing the lead action level or (2) requiring water systems to fully replace all LSLs. EDF endorses the comment made by the Institute for Policy Studies, which stated that "the lack of alternatives for which EPA provides details and analysis is inconsistent both with statutory requirements to consider alternatives, . . . as well as with best practices for regulatory analysis," and also criticized EPA for not exploring different degrees of stringency for the action level or the trigger level or re-examining the basis for the 15 µg/L action level. EDF further noted that the option of requiring water systems to proactively replace all LSLs, which EPA did not evaluate, was specifically recommended by the National Drinking Water Advisory Council and also endorsed by ASDWA in public comments. The Environmental Protection Network also requested that EPA include an analysis of the costs and benefits associated with lowering the current action level to 10 µg/L (versus adding a trigger level of 10 µg/L and retaining the current action level of 15 µg/L) and retaining a 7 percent LSLR rate versus the 3 percent rate in the proposed rule.

Agency Response

In response to the comment indicating that EPA analyzed an insufficient number of alternative options. SDWA Section 1412(b)(3)(C)(i) does not mandate that EPA consider a minimum number of alternatives when proposing a treatment technique rule or treatment technique rule revision; it just requires a HRRCA for any alternatives under consideration. In addition, OMB Circular A4 (OMB, 2003), which provides guidance and best practices to federal agencies on conducting cost/benefit analyses indicates that, "The number and choice of alternatives selected for detailed analysis is a matter of judgment." OMB Circular A4 goes on to suggest criteria that should be considered in the selection of alternative options to be analyzed. The options analyzed for the LCRR rulemaking are designed to capture three of these suggested criteria. EPA considered alternative regulatory schemes associated with first or fifth liter sampling and sampling at all schools and child cares or only on request. These alternatives capture OMB Circular A4's concept of accessing option with "Different Degrees of Stringency." EPA also assessed the public provision of specific addressed versus less specific location identifiers for known LSL locations exploring OMB Circular A4's "Informational Measures Rather than Regulation" concept for alternative options. The Agency also analyzed small system compliance alternative thresholds for systems serving 3300 or fewer persons and 10,000 or fewer persons as suggested by the OMB Circular A4's criterion "Different Requirements for Different Size Firms."

For a discussion of EPA's rationale for not lowering the action level in general or specifically to 10 µg/L, see response to comment Section 19.1. For information on the Agency's rational for requiring a 3 percent LSLR mandatory replacement rate versus retaining the 7 percent rate from the previous rule and a discussion why EPA did not require proactive LSLR, see response to comment Section 6.8.

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17 Regulatory Process

EPA requested comments on all aspects of the proposed revisions. EPA also specifically requested comment on: General Matters, Trigger Level, Lead Service Line (LSL) Requirements, Corrosion Control Treatment (CCT), Tap Sampling, Testing in Schools and Child Care Facilities, Small System Flexibilities, Public Education and Outreach, the Economic Analysis, and Recordkeeping. Response to comments for these topics are addressed in other sections of this document.

EPA received commenters request an extension of the public comment period, regulatory procedural comments and stakeholder engagement.

17.1 Request for Comment Period Extension

Summary of Comments

EPA received many requests from commenters to extend the initial public comment period of 60 days. Most commenters requested an extension of 30 days, while others requested an extension of 60 days. A few commenters did not specify the duration, but simply requested an extension of the comment period. Many commenters cited the complexity and length of the revised rule, the addition of new requirements, and the length of supporting documentation (e.g., "Economic Analysis for the Proposed Lead and Copper Rule Revisions" or "Proposed LCRR EA" (USEPA, 2019a)) as justification for the extension. Other commenters mentioned the impacts of the revised rule, which would affect many communities and existing regulation programs, as reason for the need of a comment period extension. A few commenters also noted that some supporting documents were made available later, thus giving commenters less time to review them.

Agency Response

On November 13, 2019, EPA published in the Federal Register (84 FR 61684; USEPA, 2019b) a proposed notice for rulemaking to revise the existing drinking water standards for lead and copper under the authority of the Safe Drinking Water Act (SDWA). EPA requested written comments be received by January 13, 2020, which is a 60-day public comment period. In response to public comments requesting additional time to review the proposal and provide comments, most of whom requested 30 days, EPA extended the comment period by an additional 30 days to February 12, 2020, resulting in a 90-day public comment period. The additional 30 days were designed to provide time for commenters to read and understand the proposal and to provide their comments without introducing substantial delays to the finalization of this important public health regulation. EPA notes that the Agency posted all materials related to the rulemaking effort to the public docket on November 13th, and that documents released during the public comment period were intended to address questions received on the proposed rule and provide additional information to the public.

17.2 Funding, Guidance, and Regulatory Procedural Comments

Summary of Comments

A significant number of comments address the issue of funding. Of these comments, most of them requested that the revisions for the Lead and Copper Rule (LCR) be accompanied by adequate funding. Many of these comments also offered to help the Agency request more funding from Congress. Commenters used various justifications for more funding for the Lead and Copper Rule revisions (LCRR). Several commenters referenced the existing financial issues that many water systems have. One commenter mentioned that state water programs are “stretched to the breaking point.” Another commenter highlighted that the LCRR would put small water systems under additional strain and that funding should “allocate additional funds to organizations like rural water associations to deliver technical assistance to waterworks as well as contracting assistance to complete the lead service line inventory.” A separate commenter warned that any extra costs incurred by the LCRR would have to be passed on to the customer. A similar commenter mentioned that extra funding would help keep water rates low. Some commenters emphasized that funding be prioritized for certain aspects of the LCRR. One commenter suggested funding go towards water infrastructure. Another recommended extra funding be directed towards human resources, guidance and training. Meanwhile, another commenter recommended that funding address school sampling and lead service line replacement (LSLR).

Of the comments that recommended increased funding, a significant amount focused on extra funding for LSLR. Many of these comments recommended that funding should be available for full LSLR (which would include privately-owned portions of LSLs). Some comments cited that many homeowners are financially unable to fund private side LSLRs, thus advising that funding be made available to help these homeowners. Another commenter added that extra funding or new grant programs should also target LSLR in small water systems. Some commenters provided recommendations and solutions to the funding issue. One recommendation included that the federal and state governments create a funding mechanism to help low-income consumers carry out LSLR. One commenter recommended LSLR grants and low-interest loans be made available to help finance LSLR. Another comment suggested federal grants for private side LSLR for homeowners that make up to three times the poverty level. A few commenters suggested that the Drinking Water State Revolving Fund (DWSRF), in addition to Water Infrastructure Finance and Innovation Act (WIFIA) Program (United States, 2018), and Water Infrastructure Improvements for the Nation (WIIN) Act (United States, 2016) could be better funded to aid water systems in implementing LSLR.

A few comments addressed other aspects of funding. One commenter mentions that the short collection time for the Drinking Water Infrastructure Needs Survey as well as the lack of an already prepared service line inventory would make the process for implementing LCRR burdensome for communities that do not currently have inventories. Therefore, the commenter justifies extra funding on this basis. A couple other commenters expressed concern that funding for LCRR may take away attention from other issues that a water system may have to manage for instance, per- and polyfluoroalkyl substances (PFAS) and perfluorooctanoic acid (PFOA), and certain other regulations outside of the LCR.

About 30 commenters recommended that guidance for implementation of the LCRR be provided. A few commenters had suggestions of how guidance should be made available. One commenter recommended the creation of a “centralized information warehouse” that would provide all applicable guidance for state regulators. Another commenter added that the Agency should provide training in addition to guidance and that the time needed to train public water system (PWS) staff be considered. Another commenter mentioned the idea of guidance coming from “the Environmental Justice Office at the federal level.” Guidance was recommended for a range of LCRR-related issues. One commenter recommended guidance for general implementation of LCRR. Another commenter suggested the following topics should be addressed in guidance documents: overall LCRR implementation; development and review of LSL inventories and updated compliance sampling plans based on these inventories; development of LSL replacement plans; pitcher filter programs; state review of optimal water quality parameters (OWQPs) and optimized corrosion control treatment (OCCT); addressing growing systems; re-evaluation of CCT; additional monitoring requirements; state review of source and/or treatment change proposals; homeowner educational materials; small system alternative compliance; revisions or additions to the “3Ts” guidance; and lead testing in schools and child care centers. Several more commenters recommended guidance on CCT and OCCT. Find-and-fix guidance was recommended by a couple of commenters.

One commenter recommends that find-and-fix guidance that focused on situations in which follow-up tap sampling could not be carried out. Another commenter adds that find-and-fix guidance include minimum criteria that would warrant a find-and-fix assessment. Guidance has also been recommended for LSLR. One comment recommended guidance on LSLR goal rates and conducting an LSL inventory. Commenters also recommended guidance for other issues that might be raised by the LCRR. One commenter requested guidance that better explains the “trigger” and “action” levels. Another commenter recommended guidance on materials that could be provided to homeowners. Guidance on treatment source changes and the required accompanying studies has been mentioned in a couple comments. Point-of-Use (POU) device guidance has been raised in a couple comments, which would include issues such as follow-up sampling, installation, sampling locations, and pitcher filter tracing. Finally, commenters requested guidance for other issues including: application of LCRR in consecutive systems; when the water system follows a shorter schedule than §141.84; outreach activities; funding and flexibility of small water systems; scale analyses; health-based drinking water lead action levels; interpreting lead results; and predictive modeling.

Some commenters raised the issue of public hearings. One commenter recommended that these hearings take place in “cities such as Chicago, IL; Flint, MI; Milwaukee, WI; Pittsburgh, PA; and Washington, DC with mobilized lead-in-water activists, many of whom cannot afford to travel far to testify,” “adequate public notice” is given; and the events be held “in venues that are accessible by public transportation and at times that accommodate working people’s schedules.”

A couple commenters asked the Agency to ensure that any claims made in the rule are based on the “best available peer-reviewed science and acknowledge the well-documented history of LCR’s spotty implementing and enforcement to more accurately characterize the LCR’s effectiveness to date.” Another comment from the same commenter had concerns with the claims made in the “General Information” section of the LCRR. The commenter requested the revision and review of excerpts relating to: the number of drinking water systems in exceedance over time; the percentage that drinking water makes up the total exposure to lead; infant lead exposure due to water in formula; lead exposure from homes and buildings; lead exposure during pregnancy; and state primacy agency competencies. Another commenter mentioned the “administrative burden” associated with implementation of the LCRR and that the rule should prioritize systems with a history of non-compliance. A commenter suggested that the EPA “hold L & C (lead and copper) detection and response training webinars held during both business day (Monday-Friday) and at least one Saturday every three months for small business owners that cannot easily attend during the work week.”

Agency Response

In December of 2018, the Federal Action Plan (Action Plan) to Reduce Childhood Lead Exposure and Associated Health Impacts, was issued. This Action Plan includes EPA commitments to actions to reduce lead from various sources in the environment. Regarding lead in drinking water, the Action Plan emphasizes EPA’s commitment to help communities reduce lead in drinking water through funding sources. Some of these sources include the DWSRF and the WIFIA. These loan programs offer a means to improving water infrastructure with updates and replacements. In addition, grants are available as of 2018 through the WIIN Act to help fund small disadvantaged communities and water systems with infrastructure improvements, to provide a means for testing for lead and schools and childcare facilities and for other lead reduction projects. Under the WIIN Act, Congress appropriated $50 million in 2018, $65 million in 2019 and $70.908 million in 2020 for these projects.

EPA acknowledges that small systems often have limited technical, managerial and financial capacity The final LCRR includes small system flexibilities that allow systems serving 10,000 or fewer people to select a compliance option for a lead action level exceedance that is most appropriate and effective for their community. Options include CCT, LSLR, POU devices or replacements of lead-bearing materials.

EPA maintains a web site of funding sources for lead in drinking water reduction activities at: https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement. Some may be used for replacement of the customer-side of the LSL, in response to comments on this concern. Homeowners can also look to see if grants or other funding sources are available at the state and local levels.

In response to the comment on needing more funding for communities that do not already have LSLR inventories in place, EPA notes that water systems have three years to prepare the LSL inventory and may apply for funding to support this effort. EPA expects initial inventories will be compiled from existing water system records and improved over time through normal operation and maintenance activities. EPA does not believe that funding for LCRR will be “taking away” attention from other concerns, as many federal funding sources for the LCRR are for lead and copper reduction activities only.

EPA received numerous requests for Agency guidance and training on implementation of the revised rule. EPA understands this is a critical component to ensure the rule’s effectiveness in protecting public health. The Agency intends to develop implementation guidance targeting the most significant areas of the rule. In addition to guidance, EPA will also provide training and other supporting materials that will help states and water systems implement the revised rule and promote greater national consistency. EPA will also ensure guidance is readily available in a centralized and easily identifiable web site.

In response to the commenters who requested that EPA hold public hearings after publication of the proposal, in accessible locations, at certain times, and with adequate notice, EPA declines the request. In developing the LCRR, EPA has conducted several public meetings. First, EPA held a public meeting on Nov. 4, 2010, in Philadelphia, PA to provide information to the public and an opportunity for the public to provide input on potential revisions to the LCR, including changes related to lead service line replacement, monitoring, and schools. (75 FR 63177, Oct. 14, 2010). The meeting took place in the

Philadelphia Convention Center, a venue accessible by public transportation. The meeting was scheduled for seven hours -- from 9 a.m. to 4 p.m. EPA also provided an opportunity to participate by teleconference, which addresses the commenters' concerns about those who could not travel to attend the meeting in person.

In addition, from March 2014 until June 2015, EPA held seven, two-day public meetings with a working group of the National Drinking Water Advisory Committee on the development of the long term revisions of the LCR. (79 FR 12504; 79 FR 26751; 79 FR 51153; 79 FR 60848; 80 FR 2101; 80 FR 16674; 80 FR 32372; 80 FR 34636) Then, in November 2015, the NDWAC held a public meeting focusing on developing recommendations for EPA on long term revisions to the LCR. (80 FR 67397, Nov. 2, 2015). The NDWAC working group meetings, as well as the NDWAC meeting, were all noticed in the Federal Register, open to and attended by members of the public, in a venue accessible by public transportation, with time provided for public comment. In addition to those meetings, EPA held a public meeting, after notice in the Federal Register, for the purpose of seeking public input on the LCR revisions, consistent with Executive Order 12898 (76 FR 8674). At that meeting, EPA provided the public with time to present comments. Accordingly, EPA has met the requirement to provide the opportunity for a public hearing consistent with Section 1412(d) of the SDWA to "provide opportunity for public hearing prior to promulgation" of regulations under Section 1412, such as the LCRR. EPA conducted several other public outreach efforts in the ten years that the LCRR has been in development to inform the public of EPA's rulemaking efforts and gather additional public input. These efforts included many public meetings held by webinar, after providing notice in a variety of formats.

Given the need for key decisions to be made in the development of the proposed LCR revisions, coupled with the fact that the public would have an opportunity to comment on the proposal, EPA reasonably chose to provide the opportunity for a public hearing prior to proposal. EPA then received extensive written public comments on the proposed rule, diminishing any incremental benefit of additional opportunities for the public to provide oral comments. Therefore, to avoid additional delays in finalizing revisions to the rule, EPA has determined to decline commenters' requests for additional opportunities for a public hearing. For more information about stakeholder engagement, see Section VII of the Federal Register Notice (FRN) for the final rule.

In response to the comments requesting EPA to ensure any claims made in the rule are based on best-available science, EPA notes that the supporting analyses for the proposed LCR were are publicly available in the rule docket, giving the public the opportunity to review and provide comment. In addition, EPA has consulted multiple times with scientists throughout the rule development process. For more information about these consultations Section VII of the Federal Register Notice for the final rule (USEPA, 2020a).

For response to the comment about implementation and enforcement, please see response to comment Section 15.

17.3 EPA Stakeholder Engagement

Summary of Comments

One commenter mentioned that while the proposed rule language and preamble mention concepts that have come up in EPA's stakeholder outreach efforts, the process of finalizing the rule preamble and text occurred within EPA without engagement. Another commenter recommended that the Agency continue working with the Association of State Drinking Water Administrators (ASDWA) and states to finalize the rule after the comment period. A third commenter suggested that the Agency should engage public health experts, especially with respect to detection and filter tests. The same commenter also expressed willingness to participate in a small entity representative (SER) meeting. A separate commenter raised concerns that the rulemaking process excluded “lead corrosion and LCR policy experts” and the “experiences of the community.” In addition, the same commenter added that the rule “contradicts science” and ignores certain policy recommendations.

Agency Response

EPA notes that the proposed rule has been in development for over a decade. In that time, EPA has had several consultations and extensive stakeholder outreach which informed the proposed LCR and this final rule. EPA conducted outreach through consultations with the National Drinking Water Advisory Council (NDWAC, EPA’s Science Advisory Board, states, local governments and tribes. In addition, the Agency held a public meeting on environmental justice issues. The Agency requested NDWAC form a LCR Working Group to provide feedback to EPA. The NDWAC working group was comprised a wide range of expertise and perspectives, including water system representatives, state and local public health and the environment regulators, advocacy groups, and a public utilities commission representative. The group was asked to address various components of the rule including sample site selection criteria, lead sampling protocols, public education for copper, measures to ensure OCCT, and LSLR. Additionally, EPA has considered the extensive public feedback on the proposal in developing the final rule. EPA met with ASDWA following the end of the comment period to discuss its Costs of State Transactions Study (CoSTS) model. EPA disagrees with the commenter who claimed that the rulemaking process excluded corrosion experts and experiences of the community, given the extensive public outreach opportunities over more than a decade as well as the opportunity to provide public comment on the proposal. EPA disagrees that the proposal contradicts science. EPA used the best available science in development of the LCRR and provided detailed description of the science and analysis in the Proposed LCRR EA (USEPA, 2019a) and final rule (USEPA, 2020b). EPA also disagrees that the proposed rule ignores certain policy recommendations. Although the final rule does not include every policy recommended by stakeholders or commenters, each recommendation has been carefully considered.

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USEPA. 2020b. Economic Analysis for the Final Lead and Copper Rule Revisions.

18 Statutory and Administrative Requirements

EPA received public comments related to Executive Order 12866: Regulatory Planning and Review, Executive Order 13563: Improving Regulation and Regulatory Review, Paperwork Reduction Act (PRA), Unfunded Mandates Reform Act (UMRA), Executive Order 13132: Federalism, Executive Order 13045: Protection of Children from Environmental Health and Safety Risks, National Technology Transfer and Advancement Act and Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations.

EPA did not receive public comment related to the Regulatory Flexibility Act, Executive Order 13175: Consultation and Coordination with Indian Tribal Governments, and Executive Order 13211: Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution or Use.

18.1 Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

Summary of Comments

EPA received two comments about the Executive Order 12866 and Executive Order 13563. Both comments were related to the EPA's lack of alternative proposals. One commenter stated, "EPA does not fully explore even one of the most fundamental categories of alternatives: different degrees of stringency." The commenter questions why EPA did not consider lowering the lead action level and asserts the Agency did not adequately explain the basis for the trigger level of 10 ug/L. Another comment stated "The obvious scenarios to include are the possibility of lowering the action level, implementing an [maximum contaminant level] MCL for lead, and requiring comprehensive replacement of all lead service lines. Without this, this economic analysis clearly is incomplete."

Agency Response

EPA disagrees with commenters that the Agency did not sufficiently consider reasonable alternates, or that different alternatives from those considered should have been evaluated in the proposal. The Office of Management and Budget (OMB) Circular A-4 (OMB, 2003) directs agencies to consider the benefits and costs of reasonable alternatives. The circular further recognizes that "analyzing all possible combinations is not practical when there are many options (including possible interaction effects). In these cases, you should use your judgment to choose reasonable alternatives for careful consideration." EPA has evaluated a range of reasonable alternatives and attempted to maximize net benefits in the Lead and Copper Rule revisions (LCRR).

In the 1991 LCR, EPA determined to promulgate a treatment technique rule, not an MCL, consistent with the criteria for doing so in Section1412(b)(7)(A) of the Safe Drinking Water Act (SDWA). That determination was upheld in American Water Works Association v EPA, 40 F.3d 1266 (D.C. Cir 1994). EPA considered several alternative options while developing the LCRR. These alternative options and associated costs were presented in the proposal and in Chapter 9 of the "Economic Analysis for the Proposed Lead and Copper Rule Revisions or Proposed LCRR EA (USEPA, 2019) and EPA specifically requested public comment on these alternatives. One alternative option that was considered was the requirement for water systems to conduct tap water sampling program at schools and licensed child care facilities. EPA proposed 20 percent of K – 12 schools and licensed child care facilities get sampled annually so each facility is sampled every five years. In the proposed LCRR, water systems would collect five samples from each school and two from each child care facility. EPA also considered an alternative lead tap sampling for schools and licensed child care facilities. The “upon request” option contained the same elements of the mandatory program under the proposed LCRR but would require water systems to conducting tap sampling at the request of the schools and child facilities. EPA also estimated the costs and benefits of the upon request option. Based on the analysis of these alternatives, and after considering public comment, EPA determined that community water systems (CWSs) should be required to conduct one round of sampling at each elementary school and child care facility and then conduct sampling on request. For secondary schools, CWSs will be required to conduct sampling on request only. See the response to comment Section 12.

Another alternative option EPA considered during the development of the LCRR is the lead tap sampling requirements for systems with lead service lines (LSLs). Since taking first-draw samples of one-liter may not reflect the significant contributions of LSLs to lead in drinking water EPA considered requiring water systems with LSLs to collect a fifth liter tap sample. EPA estimated the likelihood that an individual tap sample would exceed 15 µg/L based on the fifth liter sampling for LSL systems and the percent of systems with a trigger level exceedance (TLE) or action level exceedance (ALE). EPA also estimated the costs and benefits associated with the fifth liter option. Based on the thorough analysis of this alternative, and consideration of public comments, EPA concluded that the fifth liter tap sample protocol for LSL sites captures water that has been in contact with the LSL and provides a better assessment of lead concentration from that source. See the response to comment Section 9.

An additional alternative EPA considered was whether LSLs geographic information or exact addresses should be used as part of the LSL inventory requirements to make the inventory publicly available. EPA proposed to require water systems to make their LSL inventory publicly available by providing a location identifier for the LSL such as the street, intersection, or a landmark and took comment on whether an address should be used. Based on comments received, water systems will not be required to identify LSL status at individual properties and will be required to use location identifiers in the final rule. See the response to comment Section 5.

Another alternative EPA considered in the proposal is small system flexibilities. The proposed LCRR allowed small system flexibility for CWSs that serve 10,000 or fewer people, and all non-transient non—community water systems (NTNCWSs). The Agency requested comment on the appropriateness of these flexibilities. The Agency also requested comment on using a different threshold which would limit the small system flexibility provision to CWSs that serve 3,300 or fewer people and all NTNCWSs. EPA calculated the associated cost and benefits of the alternative threshold for the small system flexibility. After review of public comments and relevant analyses, EPA determined the appropriate small system flexibility threshold for CWSs is those serving 10,000 or fewer persons. Information about the alternative small system option can be found in response to comment Section 7. EPA considered a range of reasonable alternatives before finalizing the final LCRR. See also the response to comment Section 19.

18.2 Paperwork Reduction Act

Summary of Comments

EPA received several comments concerning the PRA. Some commenters stated that the LCRR introduces significant and unnecessary paperwork burden on water systems, states, and primacy agencies. There were several commenters opposing the LCRR’s monitoring and reporting requirements. Some commenters expressed concern that the LCRR monitoring and reporting requirements waste valuable resources that could otherwise be spent providing safe drinking water. There was also a comment that suggested the LCRR's reporting requirement are unnecessary stating "[t]he requirements of the current and proposed rule already require making the most pertinent information available to the public. The additional proposed requirements are duplicative."

The commenter argues that all state and local government are subjected to the Freedom of Information Act (FOIA). Thus, many water systems are also subjected to the FOIA since they fall under state and local authority. Another comment argues that monitoring and reporting violations do not accurate portray public health risks and two commenters argued reporting violations merely erode public trust. The comment stated "… an accidental failure to report could lead to violations that erode the public's confidence in their water supplier." Some commenters argue the additional paperwork may cause water systems to fail to report violations which can cause a decrease in public confidence.

Agency Response

EPA determined that it is necessary for water systems to demonstrate compliance with new requirements if the LCRR. The LCRR includes reporting requirements to demonstrate compliance. For example, water systems must submit an LSL inventory to their primacy agency and updates either annually or triennially – based on the tap sampling monitoring schedule. Water systems must also submit a lead service line replacement (LSLR) plan so they are prepared in the event of a TLE or ALE to move quickly to replace LSLs. EPA disagrees with commenters who asserted the LCRR imposes unnecessary paperwork on water systems, states and primacy agencies; that the reporting of data adds limited value; and that reporting data and violations serves no purpose other than to undermine public trust.

EPA disagrees with the comment that reporting requirements are duplicative and thus cause unnecessary burden. Water system reporting data to the state assures that regulatory requirements are met, and systems are not in violation. Sampling for lead and copper at taps allows water systems to evaluate the effectiveness of corrosion control treatment (CCT) and the 90th percentile must be accurately calculated and reported to the state. Further, monitoring optimal water quality parameters (OWQPs) to insure CCT is optimized is a critical component of the treatment technique. States are unable to perform oversight without the data and certifications water systems are required to submit under the LCRR.

The Agency believes that ensuring public access to information related to lead and copper tap samples, 90th percentiles and LSL inventories an important improvement in the LCRR. Improving transparency and communication will increase community awareness of drinking water quality and interest in participation in LSLR. See response to comment Section 5 and 8.

EPA does not agree that the PRA information collection request (ICR) is duplicative. The Agency consulted with other federal agencies, state agencies, industry organizations, water systems, and tribal organizations to minimize the risk of any potential duplication of this information collection request.

Regarding estimating burden beyond the first three years of compliance to meet the requirements of the PRA, EPA must resubmit and seek approval from OMB for an ongoing collection at least once every three years. EPA will estimate burden for purposes of the PRA prior to the fourth year of the LCRR implementation consistent with the requirements of the PRA.

18.3 Unfunded Mandates Reform Act

Summary of Comments

EPA received comments related to the UMRA. Some commenters suggested the LCRR's requirements impose unfunded federal mandates to state and local governments. The commenters assert the LCRR's requirements are detrimental to communities and violates the Unfunded Mandates Reform Act. One commenter highlighted the LSLR plan as such a provision. One commenter stated "Yet another financial burden on the CWS…. This is an unfunded mandate which appears to be in violation of the EPAs Unfunded Mandates Reform Act." A comment was received concerning the unintended consequences of the LCRR's requirements. The commenter argues the problem is at the homeowners' tap and not in the water system. Thus, forcing communities to pay for compliance actions is unnecessary and creates issues for economically disadvantage populations. There is an insistence new funding sources be put in place so the LCRR can be implemented successful and achieve compliance. It is argued the current funding that is available is inadequate to reduce lead exposure. For example, one commenter states "If the federal government has deemed removing lead from drinking water as a top priority, we suggest creating a new funding source to help communities address this issue." There is also a concern the LCRR's requirement will lead to high cost burden on homeowners. The comment states "We are concerned that the proposed rule's "find and fix" requirement will place a high cost burden on homeowners if they test above the designated lead level." The commenter also notes a concern over the legal consequences of replacing the LSL located on a homeowner's property.

Agency Response

EPA has estimated that the LCRR will result in expenditures of $100 million or more for state, local and tribal governments, in the aggregate, or the private sector in any one year. EPA engaged UMRA stakeholders in 2011 through 2018. Please see the Summary Report on Federalism: Lead and Copper Rule located in the final docket for further discussion of these meetings. These consultations were held concurrently because there are many overlapping interests between the groups. EPA has remained consistent with UMRA section 205. EPA identified and analyzed a reasonable number of regulatory alternatives to determine the treatment technique requirements in the LCRR. See response to comment Section 18.

EPA agrees that funding is important to implementation of the LCRR. EPA will continue to support states and communities by providing funding opportunities through the Drinking Water State Revolving Fund and the Water Infrastructure Finance and Innovation Act (WIFIA) (United States, 2018) loan program for updating and replacing drinking water infrastructure. In addition, there are three newly authorized grant programs under the Water Infrastructure Improvements for the Nation (WIIN) Act (United States, 2016), for which Congress appropriated $50 million in 2018, $65 million in 2019 and $70.908 million in 2020. The grants will help small and disadvantaged communities develop and maintain infrastructure, support lead reduction projects, and support voluntary testing of drinking water in schools and child care centers. As they are made available, EPA will continue to highlight additional sources of funding in the future.

EPA disagrees with the commenter who suggested: lead is only a problem at homeowner's tap; lead is not in the water system; and the implication that it is not the responsibility of the public water system to address. LSLs, when present, represent the greatest contribution to lead in drinking water and there are an estimated 6.3 to 9.3 million homes served by LSLs in thousands of communities nationwide. EPA agrees that water systems cannot unilaterally implement all of the actions that are needed to reduce levels of lead in drinking water alone. In most communities, homeowners must be engaged to assure successful LSLR because in most communities, LSLs are partially owned by the water system and partially owned by the homeowner. Because of the important roles of both the homeowner and the water system, EPA has encouraged water systems to engage with consumers to encourage actions homeowners can take to reduce lead exposure in their households, such as flushing that reduce their exposure to lead in drinking water. For these reasons, the LCRR requires systems to conduct regular outreach to the homeowners with LSL to ensure effective communication, and where appropriate, collaboration between the water system and homeowner.

18.4 Executive Order 13132: Federalism

Summary of Comments

Most of the comments EPA received about federalism were related to EPA continuing to keep an open dialogue with states. States want to continue to stay involved with EPA and ensure a cooperative relationship to address lead in drinking water. States want to be informed and be a part of the discussion concerning revising the LCRR. Commenters expressed concern about the increased burden associated with the LCRR. EPA received a comment stating "These new mandates expand federal regulatory authority over locally governed utilities' practices for the prevention of contamination, public education, and operations & maintenance of the community water supply. The federal government should not usurp local governed utilities' policies for these operations without a clear and obvious finding of contamination or exceedance of a federal public health standard." Another commenter stated the scope of federal authority should be limited to monitoring the compliance and operations of local water utilities. Additionally, the comment goes on to assert the local water supply's best practices that are not currently funded by the federal government should not become new unfunded federal mandates. EPA also received a comment encouraging the use of scientifically sound principles. The comment stated, "To ensure the protection of human health, we also urge EPA to base any and all potential revisions on scientifically sound principles."

Agency Response

EPA is committed to a cooperative relationship with states and primacy agencies and EPA intends to continue supporting states and communities during the implementation of LCRR. For development of the LCRR, EPA consulted with states and local governments early in the regulatory development process. EPA held federalism consultations starting on November 15, 2011 to seek early input on rule development. EPA initiated additional consultations on January 8, 2018 and held five meetings which concluded on March 8, 2018. EPA sought feedback and insight from states and local governments in five areas: LSLR, CCT, transparency and public education, tap sampling, and copper. During these consultations, other areas were discussed, including typical costs of actions to reduce lead in drinking water. EPA provided an opportunity for states and local governments to submit written input within 60 days after the initial meeting. EPA involved states and local governments to gain an understanding of how the potential revisions might affect local communities.

EPA does not agree with commenters who assert EPA has exceeded its statutory authority and should allow local governments to decide how to comply with SDWA-mandated requirements to ensure that potable water from public water systems is of sufficiently low risk. EPA derives its statutory authority to regulate contaminants in drinking water through the SDWA. The revisions of the LCR fall under the authority of the following sections of the SDWA: 1412, 1413, 1414, 1417, 1445, and 1450 of the SDWA (42 U.S.C. §§ 300f et seq). Section 1412(b)(7)(A) of the SDWA authorizes EPA to promulgate a treatment technique "which in the Administrator's judgment, would prevent known or anticipated adverse effects on the health of persons to the extent feasible. EPA followed the applicable procedures and requirements described in section 1412 of the SDWA, including those related to (1) the use of the best available, peer-reviewed science and supporting studies; (2) presentation of information on public health effects; and (3) a health risk reduction and cost analysis of the rule.

For additional information on potential funding sources see response to comment Section 18.7.

For information regarding EPA's cost and burden estimates see response to comment Section 16.

18.5 Executive Order 13045: Protection of Children from Environmental Health and Safety Risks

Summary of Comments

One commenter wrote that it is in our exam rooms where we see the everyday consequences of policy decisions such as Medicaid cuts, food assistance rollbacks, staggering child poverty rates, inaction on gun violence, and lax public health protections. Our children disproportionately shoulder these burdens, both in their bodies and in their blunted potentials. And as a pediatrician in Flint, I can attest and bear witness that once again our children were the victims of a failed policy, specifically the Lead and Copper Rule, that did not prioritize their health and development. As pediatricians, we respect the science that now clearly understands that there is no safe level of lead. [Centers for Disease Control and Prevention, Advisory Committee on Childhood Lead Poisoning Prevention. Low level lead exposure harms children: A renewed call for primary prevention. Atlanta, GA: Centers for Disease Control and Prevention; 2012. Available at: www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf.] [See, e.g., National Institute of Environmental Health Sciences, Lead, https://www.niehs.nih.gov/health/topics/agents/lead/index.cfm] [AAP Council on Environmental Health. Prevention of childhood lead toxicity. Pediatrics. 2016;138(1):e20161493.] And we recognize that efforts should focus on ensuring children are never exposed to lead - also known as primary prevention.

Agency Response

EPA recognizes lead is a highly toxic pollutant that can damage neurological, cardiovascular, immunological, developmental, and other major body systems. EPA also recognizes that children are vulnerable to lead. EPA is also aware of increased lead exposure to children because of increased drinking water consumption per day on a body weight basis than adolescents. EPA acknowledges there is no safe level of lead and has established a maximum contaminant level goal for lead of zero. The SDWA requires that a treatment technique prevent known or anticipated effects to the extent feasible. The LCRR includes integrated actions that will holistically reduce drinking water lead risks to the extent feasible. These additional actions will reduce lead exposure to children which will therefore, reduce children's health risks. To evaluate some of the expected benefits provided by the LCRR for children's health, EPA assessed avoided losses in the intelligence quotient (IQ) in children that result from the actions required under the LCRR compared to pre-LCRR requirements. In addition, the final rule includes requirements for CWSs to conduct lead in drinking water testing in schools and child care facilities. The requirement for water systems to conduct sampling at schools and child care facilities provides an added measure of protection, above the other elements of the treatment technique rule, in light of the vulnerabilities of the population served and the potential variability of lead levels within the system and within a school or child care facility over time. Also see response to comment Sections 12 and 16.

18.6 National Technology Transfer and Advancement Act

Summary of Comments

EPA received one comment related to using transparent language when communicating American National Standards Institute (ANSI) and voluntary consensus standards.

Agency Response

EPA agrees it is important to make clear the distinction between voluntary consensus standards and the ANSI. The commenter makes an observation that ANSI does not develop standards, rather ANSI accredits standards developing organizations. EPA agrees that clarity and transparency is important in order to be clear and concise. In response, EPA modified the language to clarify the voluntary consensus standard in the final rule are in accordance with applicable standards established by an organization accredited for that purpose by the ANSI or any other accrediting body deemed appropriate by the Administrator.

18.7 Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Summary of Comments

EPA received numerous comments pertaining to environmental justice issues associated with the proposed LCRR. Comments were mostly centered on how the proposed LSLR requirements will disproportionately negatively impact minority populations and low-income populations. Commenters asserted this is due to the requirement that water systems are not required to pay for customer-side LSLR. There were comments raising concern about the affordability of LSLRs for low-income, minority, and elderly populations. The commenters stated that these communities would not be able to afford the removal of LSLs and federal investment would be necessary and assert that significant federal funding must be made available. Many commenters were concerned about how the LCRR could result in financial hardship to vulnerable communities whose populations are at a higher risk for negative health impacts from lead in drinking water. EPA also received comments related to Title VI of the Civil Rights Act of 1964 (United States Department of Justice, 1964). One comment argues EPA does not address environmental justice issues in the rule. The comment claims states and water systems that receive federal funding will be vulnerable to legal challenges from affected residents. Another comment stated, private individuals can prevail in a lawsuit against a recipient of Title VI funding if its proven that the federally funded program intentionally discriminated. The commenter makes the argument that the rule contains aspects that create incentives for water systems to cause disparate impacts for minorities. In addition, one comment stated EPA should help states and communities that receive federal funding to avoid violations of the Title VI of the Civil Right Act of 1964.

Agency Response

EPA disagrees that the LCRR will have a disproportionately negative impact on minority populations and low-income populations, nor is the rule expected to increase poverty in low-income and minority communities. EPA concluded that it has met the requirements of Executive Order 12898 to identify and consider, and where appropriate, address potential environmental justice concerns. EPA has conducted the necessary analyses to evaluate the LCRR's impact on these communities and those analyses demonstrate that the final rule is not expected to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The final rule will result in improvements to CCT, increased public awareness of the sources of lead in drinking water and public education about lead in drinking water, as well as LSLR and thereby increases the level of health protection for all affected populations. On average, the LSLR provision may be less likely than the CCT provision to address baseline health risk disparity among low-income populations because LSLR may not be affordable for low-income households. While the economic analysis for this rulemaking assumed that households must pay for their portion of the LSLR under the goal based or mandatory replacement programs, there are federal and state programs that may be used to fund LSLR programs including the cost of LSLR for customer-owned LSLs. These include but are not limited to the Drinking Water State Revolving Fund (DWSRF), WIFIA Program, WIIN Act of 2016 grant programs, and the U.S. Department of Housing and Urban Development's (HUD) Community Development Block Grant Program. EPA is aware of several water systems that have conducted full LSLRs in cities and towns without requiring individual households to finance the replacement of the non-system-owned portion of the service line. For more information, including specific case studies of where these funding vehicles have been used to fund full LSLR, see https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement.

EPA encourages financial assistance programs by water systems to assist in achieving LSLR in disadvantaged households. To further address the comments related to the financial constraints that impact minority populations and low income populations, EPA added a requirement in the final regulation for water systems to include in their LSLR plan a description of how they will accommodate customers that want LSLR but are unable to pay. The new requirement creates an incentive for water systems to support LSLR and allows each water system to utilize financing options most appropriate for its community. Water systems are in the best position to determine how to fund their capital improvements. In any case, EPA does not have the authority under the SDWA to determine how water systems cover the costs of compliance with National Primary Drinking Water Regulations.

EPA expects that the CCT changes will account for most of the benefits from the LCRR (see Section 6.4.6 of "Economic Analysis for the Final Lead and Copper Rule Revisions" (USEPA, 2020)). Therefore, even in the absence of LSLR, health risk reduction benefits will be more uniformly distributed among populations with higher baseline health risks including minority and low-income households. The final LCRR includes many new requirements that will result in health risk reductions through reducing lead concentrations in drinking water for all consumers, including for minority and low-income households.

For example, the final rule requires water systems with LSLs to collect tap samples from LSL sites and collect the fifth liter of water, which is more likely to be in contact with the LSL during the stagnation period. The rule also requires that the exceedance of the trigger level of 10 µg/L will require water systems that currently treat for corrosion to re-optimize their existing treatment. For water systems that do not currently treat for corrosion, the systems would be required to conduct a corrosion control study. In addition, exceedance of the trigger level requires water systems to conduct LSLR at an annual goal rate approved by the state. The find-and-fix provisions require water systems to collect follow up tap sampling at any site that has a sample above 15 µg/L, collect a water quality parameters sample if the system has CCT and perform any needed modification to treatment. In the final rule, water systems are required to create an LSL inventory and make consumers aware of the presence of a LSL. Taken together, these requirements will provide reduced health risks in minority and low-income communities in a cost-effective and feasible manner.

EPA disagrees that the LCRR violates Title VI of the Civil Rights Act of 1964. Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §§ 2000d et seq. (Title VI) prohibits discrimination based on race, color or national origin in the programs or activities of recipients and subrecipients of federal financial assistance which includes loans. EPA's regulations implementing Title VI and other nondiscrimination statutes found at 40 C.F.R. Part 7 prohibit both acts of intentional discrimination and those that have the effect of discriminating based on race, color or national origin. The LCRR, like many regulations adopted by EPA and other federal departments and agencies implementing federal statutes, provides some discretion to water systems as to how they design their own implementing programs. As noted above, EPA does not have the authority under the SDWA to determine how water systems finance the cost of compliance with national primary drinking water standards. However, a condition of accepting federal financial assistance is that those water systems must exercise their discretion and implement programs and policies in a manner that does not intentionally discriminate or have the effect of discriminating based on race, color or national origin.

A finding that an action taken by a recipient or subrecipient has an adverse disparate impact based on race, color, or national origin does not necessarily mean EPA will find a violation of Title VI and EPA's implementing regulations. A violation will be found if the evidence establishes a prima facie case of adverse disparate impact and the recipient or subrecipient fails to articulate a substantial legitimate justification for the challenged policy or practice. EPA will generally consider whether the recipient can show that the challenged policy was necessary to meeting a goal that was legitimate, important, and integral to the recipient or subrecipient's institutional mission in order to establish a substantial legitimate justification. If a recipient makes that showing, EPA must also determine whether there are any comparably effective alternative practices that would result in less adverse impact -- are there less discriminatory alternatives. If the recipient or subrecipient demonstrates a substantial legitimate justification, the challenged policy or decision will nevertheless violate Title VI if the evidence shows that less discriminatory alternatives exist. EPA's Office of General Counsel's (OGC's) External Civil Right Compliance Office has published the first chapter of a toolkit which discusses this legal framework in more detail. https://www.epa.gov/ogc/chapter-1-us-epas-external-civil-rights-compliance-office-compliance-toolkit-chapter-1.

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19 Other Recommended Rule Changes

EPA received comments on revising the lead action level (AL) in §141.80(c). EPA also received comments suggesting the Agency set an enforceable maximum contaminant level (MCL) for lead in lieu of a treatment technique.

19.1 Revising the Lead Action Level (AL)

Summary of Comments

Many commenters stated that lead in drinking water can impact health at and below the current lead AL of 15 ppb (or µg/L), and that there is "no safe level of lead." Several commenters expressed concern that while the AL is intended to evaluate the system-wide effectiveness of corrosion control treatment (CCT), it is often interpreted as a safe level of lead for drinking water. They stated this results in "public confusion and misapprehension" and a "false sense of security." One commenter further stated that school districts that operate their own water systems "may believe their water supply is safe simply because it complies with a specific state or federal standard." One commenter suggested renaming the AL as "treatment technique action level (TTAL)" to clarify that it is not an MCL.

A few commenters stated that EPA did not provide justification for maintaining the AL at 15 ppb as the "most health protective, feasible standard" mandated by the SDWA (Section 300g-1(b)(7)(A)), citing various studies on health effects of lead. One commenter argued that consuming water with 15 ppb at two liters per day may lead to negative effects of "cardiovascular system, kidneys, and liver" as well as for pregnant women, and stated that more stringent regulations for lead will "improve the health of our nation." A few commenters also noted that low levels of lead exposure can have disproportionate impacts on children (e.g., decreased IQ), and that "primary prevention is the only way to avoid irreversible health effects."

Commenters noted that the AL has not been revised since it was established in 1991 and argued that both new information on health effects of lead and technological advancements in CCT justify redetermining the feasibility of an AL lower than 15 ppb. A few commenters note that the Centers for Disease Control (CDC) has reduced its reference level for children's blood lead levels since the 1991 Lead and Copper Rule (LCR). One commenter stated that given the health effects of lead on children it is "incomprehensible that the Agency has not adopted a more stringent action level." A few commenters noted that while more water systems would be required to conduct lead service line replacement (LSLR) under a lower AL, “cost is not a bar to feasibility,” citing federal investment in LSLR and infrastructure improvements. A few commenters cited Michigan’s reduction of the lead AL to 12 ppb (effective 2025), standards of 10 ppb and 5 ppb set by the European Union and Canada respectively, and the Federal Drug Administration’s (FDA’s) limit of 5 ppb for bottled water as examples of lower thresholds for lead. Others noted that it is feasible to detect lead at 1 ppb. One commenter suggesting EPA include a provision to reevaluate the lead AL once every 6 years in accordance with the Safe Drinking Water Act (SDWA) until the AL is consistent with the maximum contaminant level goal (MCLG) of 0 ppb. However, one commenter noted that the feasibility of standards of 1 ppb or less is “questionable” due to lead content in lead free plumbing and that state and federal agencies would need to “agree upon an evidence-based standard that would be feasible to adhere to.” Another commenter stated they agreed with keeping the AL at 15 ppb as proposed.

Similarly, many commenters recommended that EPA lower the AL to 10 ppb and remove the proposed lead trigger level (TL) of 10 ppb. Some commenters referenced that studies indicate 10 ppb is achievable with CCT and noted that by introducing the TL, EPA has implied that 10 ppb is a feasible standard. They also claimed that eliminating the TL while lowering the AL will reduce confusion among the water systems, customers, and the public, reduce rule complexity and implementation burden, and be more protective of public health. They note that reducing the AL would result in more systems implementing CCT and replacing lead service lines (LSLs). One commenter stated that EPA did not evaluate the option of lowering the AL to 10 ppb, but that the projected incremental increase in LSLR based on TL and AL exceedances in Exhibit 5-96 of the Economic Analysis “demonstrates that 10 ppb is more effective at protecting public health” (USEPA, 2019). Another commenter stated that EPA has implied that a level of 5 ppb is feasible by noting that many water systems will have optimized CCT when their lead 90th percentile is 5 ppb or less. One commenter further noted that as proposed, “10% of households in a water system could be drinking water with lead concentrations above the action level without the water system having any obligation to take action” and suggested changing the percentile used for the AL from 90th to 95th or 98th depending on system size.

Several commenters stated that EPA must set a household health-based level for lead, citing the National Drinking Water Advisory Council (NDWAC) recommendations. However, one commenter stated that while it is a goal to have “no exposure to lead” in absence of a household health-based level from EPA, using a “number below the community-wide action level as a household action level is not consistent with the balance of the LCR framework.”

Agency Response

EPA acknowledges commenter concerns that members of the public may misinterpret the AL as “the safe level of lead.” EPA notes that it has revised the public education requirements under §141.85 for water system customers and users to achieve a broader understanding of lead risks in drinking water, sources of lead in drinking water (e.g., LSLs), and steps individuals can take to reduce risk. This includes notification of tap sample results under §141.85(d) and annual notification of known or potential service lines containing lead under §141.85(e). Additionally, water systems are required to include lead health effects information and definitions of the AL and MCLG in the Consumer Confidence Report (CCR) which is received by all community water system customers regardless of system 90th percentile lead level. In response to a commenter that specifically expressed concerns regarding misinterpretation of the AL in the context of schools and child care facilities. Please see the response to comment Section 12 for discussion. EPA reiterates that there is no safe level of lead and intends for the revised requirements in §141.85 to increase public awareness of lead risks. EPA disagrees that introducing a new term of "treatment technique action level" would result in easier interpretation for consumers. Water systems and customers have had decades of experience using the term "action level."

In response to comments suggesting lowering the lead AL, EPA acknowledges that there is no safe level of lead and notes that the MCLG for lead is 0 ppb. The Lead and Copper Rule revisions' (LCRR's) AL prioritizes systems with the highest lead levels for state interaction and mandates actions to reduce drinking water lead levels. Similarly, the Agency has determined that 10 µg/L is a reasonable level to trigger water systems with higher (but not the highest) lead levels to have interactions with states to prepare for and to undertake actions to reduce drinking water lead levels. However, EPA disagrees that the AL should be lowered. EPA established the lead AL in 1991 to require systems serving 50,000 or fewer people exceeding it to install CCT and to require large systems and other systems with optimal corrosion control treatment (OCCT) to conduct LSLR. The AL was based on examination of data at 39 medium sized systems; while it was "limited as a basis for making broad-based estimates of treatment efficacy," EPA concluded that "the data are useful as general indictors of the range of levels systems have achieved with various treatment measures in place." (56 FR 26490; USEPA, 1991). EPA acknowledged in 1991 that the selection of the AL "is not based on a precise statistical analysis of the effectiveness of treatment" but it "reflects EPA's assessment of a level that is generally representative of effective corrosion control treatment, and that is, therefore, useful as a tool for simplifying the implementation of the treatment technique" at those systems (56 FR 26490; USEPA, 1991). EPA decided to use the same AL as a screen to determine which systems with CCT must also replace LSLs (56 FR 26491; USEPA, 1991). While EPA is not lowering the AL, the Agency is strengthening the public health protections of the treatment technique by improving the sampling procedures to better identify elevated levels of lead. This will result in more systems exceeding the AL and more actions to reduce drinking water exposure to lead. Rule requirements that apply independent of the AL, (e.g., actions required after a trigger level exceedance (TLE), source water treatment, customer notification of tap sample result and presence of an LSL or unknown, public access to the LSL inventory, and find-and-fix), address targeted lead issues that occur in systems that are at or below the AL. Thus, the rule as a whole represents a treatment technique that prevents known and anticipated adverse health effects of lead to the extent feasible.

While some commenters stated it is technologically feasible to detect lead at low levels (e.g., 1 ppb), EPA notes that it would not be feasible for most systems to achieve such levels even with optimized CCT, given the ubiquity of lead in drinking water infrastructure and premise plumbing. EPA further notes that while Section 1417 of the SDWA was amended by Reduction of Lead in Drinking Water Act to reduce the amount of lead in certified lead-free plumbing from 8 to 0.25 percent of lead by weighted average, it may not be possible to achieve lead levels as low as 1 ppb even with replacement of lead-bearing plumbing. Likewise, while some water systems have optimized CCT which brings their 90th percentile lead levels below 5 ppb, this may not be feasible for all water systems with OCCT.

Regarding the commenter recommendation to include in the LCRR a requirement that the feasibility of enforcing a lower AL be reexamined every six years, with the goal of reducing the AL until it meets the MCLG. EPA is already required under Section 1412(b)(9) of the SDWA to "review and revise, as appropriate" each national primary drinking water regulation (NPDWR) promulgated under the SDWA and that "each revision shall maintain, or provide for greater, protection of the health of persons." EPA notes that the Agency's protocol for identifying an existing NPDWR as a candidate for revision in the Six-Year Process is that, at a minimum, the revision presents a meaningful opportunity to improve the level of public health protections and/or achieve cost savings while maintaining or improving the level of health protection. As a result, there is no need to include the commenter's suggested language in the rule.

EPA also disagrees with lowering the AL to 10 ppb and removing the TL. EPA established the TL to allow states to focus on water systems with elevated lead before an AL exceedance occurs. The use of a TL of 10 µg/L in the implementation of this treatment technique rule provides a reasonable concentration that is below the AL and above the practical quantitation limit of 5 µg/L at which to require water systems to take a progressive set of actions to reduce lead levels prior to an action level exceedance (ALE) and to have a plan in place to rapidly respond if there is an ALE. Requiring such actions of systems only when a TL of 10 µg/L is exceeded, rather than all systems prioritizes actions at systems with higher lead levels and allows states to work proactively with water systems that are a higher priority. The actions water systems will be required to undertake if their 90th percentile exceeds the TL will require review and oversight from states to assure that they are effective in reducing drinking water lead levels. As shown in Exhibits 4-19 and 4-20 of the Economic Analysis, setting a lower TL would substantially increase the number of water systems required to obtain review and input from their primacy agency to comply with the CCT and LSLR requirements (USEPA, 2020). EPA has concluded it is not practicable for this significant number of water systems to obtain this state review and approval.

However, inclusion of the TL offers "greater protection of health of persons" consistent with Section 1412(b)(9) of the SDWA. Please see the response comment Section 3 for further discussion. Similarly, EPA disagrees with changing the lead threshold level from the 90th percentile to a higher percentile like 95th or 98th thereby reducing the number of consumers allowed to have higher lead levels under the calculation. EPA notes that under the requirements of §141.82(j) water systems are required to conduct follow-up activities (find-and-fix) whenever a tap sample site exceeds 15 µg/L under monitoring in accordance with §141.86, regardless of a system's 90th percentile level (see the response to comment Section 13 for more detail). Furthermore, calculating a 95th or 98th percentile from a small number of samples (e.g., 5, 10, 20) would not be statistically advisable because the number of samples is too small.

In response to comments about the health effects of lead, please see response to comment section 16. EPA disagrees that the CDC reference level can be compared to the lead AL. The CDC reference level is based on the top 2.5 percent of blood lead levels in children aged one to five, while the lead AL is a concentration of lead in drinking water based on feasibility that is used to evaluate the effectiveness of CCT. Because the CDC reference level has dropped over time does not mean that the lead AL warrants reduction.

EPA disagrees with comments suggesting that the final rule should include a health-based value that triggers immediate notification and compels coordination with public health agencies to reduce lead levels. EPA notes that there is already a health-based lead level, the MCLG, which is set to zero because there is no safe level of lead in drinking water. While EPA considered introducing a new health-based household lead level, it did not include one in the final rule. Furthermore, it is not technologically feasible to assess lead exposure and subsequent health impacts from a single tap sample due to the unpredictability of lead release and individual consumer water use habits. The final rule includes provisions to notify consumers and find-and-fix requirements to remedy elevated lead levels when individual tap samples exceed 15 µg/L. Although 15 µg/L is not a health-based standard, the final rule compels these follow-up actions when a tap sample indicates higher lead levels at individual service connections.

19.2 Setting a Maximum Contaminant Level (MCL)

Summary of Comments

Commenters asserted that the final rule should include an enforceable lead MCL. Commenters believed that an MCL is more appropriate than a treatment technique because it would make the LCR more efficient, enforceable, and simpler for water systems and the public to understand. A few commenters also stated that an MCL is easier for the public and consumers to understand and asserted that the public often incorrectly interprets the AL as an MCL. Commenters claimed that an MCL would compel more action by water systems to reduce lead levels, as the 90th percentile construct allows 10 percent of samples to exceed the AL and does not require action until lead levels are “much higher” than the MCLG of 0 ppb. One commenter said that the implementation of an MCL could also include provisions by which a variance may be granted when a specific showing of necessity has been made. A commenter suggested that there should be a lead level that if exceeded would require water systems to provide an alternate source of water to customers. One commenter suggested that the current LCR is considered the “most cheated regulation” of the SDWA and that adopting a clear MCL with enforcement implementation is the “only real solution.”

Commenters claimed that because LSLs are today considered the primary source of lead in drinking water, as compared to lead solder and lead-containing fixtures and fittings which commenters say have passivated over time, there is no question that water systems are responsible for elevated lead levels in drinking water. Given this, commenters suggested that water systems should be held accountable for elevated lead levels with an enforceable MCL.

Some commenters said the MCL should be set at 5 ppb, while another said it should be set no greater than 5 ppb. One commenter suggested that an MCL should be set at 0 ppb because there is no safe level of lead. One commenter stated that while “there are legitimate scientific challenges involved in calculating an MCL” it does not justify failure to set an MCL for lead in drinking water. Another commenter said that if no MCL is set, the final rule should include a health-based standard to communicate how lead in drinking water affects the most vulnerable and, if exceeded, trigger immediate notification from the water system and coordination with public health agencies to reduce lead exposure. A commenter said that if no MCL is set, the lead AL should be lowered to 5 ppb.

Conversely, one commenter stated that the LCR is “more protective than such an MCL” and noted that while an MCL would simplify compliance monitoring, establishing an “MCL based on some quantitative health-based linkage” between tap water and blood lead levels would present challenges.

Agency Response

EPA disagrees that an MCL at the tap is appropriate for the revisions to the LCR. EPA’s decision to promulgate a treatment technique rule for lead instead of an MCL in 1991 has been upheld by the United States Court of Appeals for the District of Columbia Circuit. American Water Works Association v. EPA, 40 F.3d 1266, 1270-71 (D.C Cir. 1994). The Court deferred to EPA’s determination that it was not “feasible” to establish an MCL as a reasonable interpretation of the SDWA in light of the specific problem of lead: “A single national standard (i.e., an MCL) for lead is not suitable for every public water system because the condition of plumbing materials, which are the major source of lead in drinking water, varies across systems and the systems generally do not have control over the sources of lead in their water. In this circumstance EPA suggests that requiring public water systems to design and implement custom corrosion control plans for lead will result in optimal treatment of drinking water overall, i.e. treatment that deals adequately with lead without causing public water systems to violate drinking water regulations for other contaminants. 56 Fed.Reg. 26,487.”

The reasons for EPA’s decision to promulgate a treatment technique rule are described in great detail in the preamble to the 1991 rule (see especially 56 FR 26472-77; USEPA, 1991) and in EPA’s brief filed in response to petitions challenging the 1991 rule. EPA affirms that those reasons apply today just as they did in 1991 when EPA promulgated the original LCR. As noted in the preamble to the 1991 final rule, “regulation of corrosion by-products in drinking water poses unique problems not associated with other contaminants regulated by EPA. These problems include variability of contaminant levels even after treatment and the elevation of lead levels at the tap even after a system has done everything within its control to remedy the sources of corrosion.” (56 FR 26473; USEPA, 1991). Even if the contribution of lead contamination in drinking water from LSLs as compared to premise plumbing has changed since EPA promulgated the LCR in 1991, that would not in itself justify revising the LCR to establish an MCL rather than treatment techniques. LSLs, like premise plumbing, are not always controlled or owned by the water system. The fact that water systems do not have control over the sources of lead in premise plumbing was a key factor in EPA’s determination to establish a treatment technique rule rather than an MCL in 1991. See, e.g. 56 F.R. 26473, 26475-26476; USEPA, 1991), and mentioned by the court in upholding EPA’s determination to establish a treatment technique rule. It is not technologically feasible at the tap to ascertain the level of lead in drinking water against which an MCL would be compared because lead release can be unpredictable over time and across households, can originate from many sources owned by the water system and the customer, can vary based on the sample technique used, and can be affected by customer water use habits. EPA believes that given these factors, an MCL is not “feasible” and a treatment technique is thus a more appropriate construct for regulating lead in drinking water than an MCL.

In addition, a treatment technique has the benefit of allowing for requirements that compel the water system to act at multiple lead levels to alert customers and reduce lead in drinking water, such as the final rule’s TL and AL, rather than the construct of an MCL where a water system remains in compliance and takes no action until the MCL is exceeded.

EPA disagrees with commenters suggesting that water systems are always responsible for elevated lead levels in drinking water. EPA notes that because customers may own lead-bearing plumbing, including customer-owned LSLs and brass fixtures that are not lead-free, As explained in the preamble to the 1991 rule, water systems can control the chemistry of that water and therefore its corrosivity when it interacts with distribution system materials such as lead and copper. Additionally, multiple factors can influence lead leaching into drinking water, such as customer water use behaviors that cause extended periods of stagnation and physical disruptions (that may be caused by the customer, water system, or a third party). These factors further obscure the cause and responsibility of elevated lead levels. The final rule’s find-and-fix provisions in § 141.82(j)(3) also recognize that the cause of elevated lead levels may be not be known even after a site assessment. Given this potential uncertainty, EPA disagrees that a water system should be in violation of the LCR, such as after the AL is exceeded, when it has optimized CCT and is following other final rule actions to reduce lead in drinking water.

EPA disagrees that if an MCL were set, an MCL of 0 would be appropriate. An MCL is “the highest level of a contaminant that is allowed in drinking water… [and] are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration.” EPA has already set an MCLG of 0 for lead because there is no safe level of lead in drinking water. However, given the ubiquity of lead in drinking water infrastructure, even in trace amounts, it is not feasible to achieve 0 ppb even with optimized CCT.

EPA agrees that water systems should provide risk mitigation when LSLs are replaced or disturbed. The final rule includes risk mitigation requirements , including flushing guidance to remove particulate lead and issuance of a filter certified to reduce lead, that the water system must comply with after the disturbance or replacement of an LSL, when lead levels are expected to increase. In addition, public notification requirements apply after a household or system exceeds the lead AL to inform consumers in a timely manner how they can reduce their exposure to lead in drinking water. For individual tap samples that are above 15 µg/L water systems must conduct find-and-fix requirements. For more information, see response to comment Sections 6 and 13.

References

United States Environmental Protection Agency (USEPA). 1991. National Primary Drinking Water Regulations: Control of Lead and Copper; Final Rule. Code of Federal Register, 40 CFR parts 141 and 142. Vol. 56, No. 110. June 7, 1991.

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