

U.S. Environmental Protection Agency
NDWAC LEAD AND COPPER WORKING GROUP

February 5-6, 2015

Location:

Cadmus Corporate Office
1555 Wilson Blvd. Suite 300
Arlington, VA 22209

MEETING SUMMARY

Meeting Objectives/Desired Outcomes:

- *Share follow up ideas and questions from past meetings.*
- *Seek conceptual agreement on recommendations.*
- *Plan next steps.*

A. Welcome, Introduction, Meeting Objective and Agenda

Ms. Gail Bingham, the meeting facilitator from RESOLVE, welcomed everyone to the fifth meeting of the National Drinking Water Advisory Committee (NDWAC) Lead and Copper Rule Working Group (hereafter referred to as the “LCRWG” or “Group”).¹ She described the handouts, which included the agenda, the January 2015 draft “Report of the Lead and Copper Rule Working Group to the Full National Drinking Water Advisory Committee” (hereafter referred to as the draft report) and Next Generation (NextGen) compliance principles.² Prior to this meeting, she emailed the Group the meeting summaries from the earlier four meetings. She explained that the goals of this meeting are to obtain agreement in principle on as many recommendations as possible and identify issues that need follow-up work by small groups to develop recommendations. Ms. Bingham noted that she would adhere to the timeslots in the Agenda so that the Group can cover the full report, but that the agenda included an open discussion at the end of the Day 2 so that the Group could revisit topics, if needed.

Mr. Eric Burneson from the Office of Ground Water and Drinking Water (OGWDW) explained that this meeting represents a change in format from the prior four meetings. In earlier meetings, EPA provided background on and discussed the merits of the current Lead and Copper Rule (LCR) and the Group began discussing possible options for addressing key issues. During this meeting, the Group is trying to develop recommendations for the Agency to consider. He expressed his gratitude for the Group’s time

¹ See Attachment A for a list of the LCRWG members and meeting presenters. See Attachment B for a list of the meeting attendees.

² See Attachment C for a copy of the meeting agenda. See Attachment D for the January 2015 draft report. See Attachment E for the October 3, 2012 version of “Next Generation Compliance – Principles for Highly Effective Regulation”.

commitments. He asked the Group as they work toward the goal to improve public health protection for the LCR, to remember that their recommendations must be feasible and enforceable.

Peter Grevatt, the EPA OGWDW Director, provided opening remarks on the second day of the meeting and expressed his appreciation to the Group for their commitment in working through very important issues on such a complicated rule. He was tremendously impressed by each member's caliber of expertise and willingness to share ideas. He reminded the Group that they are tasked with helping EPA, full NDWAC and the EPA Administrator find avenues to improve public health protection and to develop a rule that works as package. He emphasized that the rule needs to be implemented across the nation. The second point Dr. Grevatt emphasized is that, although he hoped the LCRWG would reach consensus, it is not bound to do so. He offered the Group the opportunity to have a seventh meeting, if they felt it would be desirable.

Members provided comments and questions after Dr. Grevatt's remarks as follows:

- What level of detail should the Group provide to the full NDWAC? Dr. Grevatt responded that the NDWAC and EPA would appreciate any detail that the Group could provide. He noted that he would like them to focus on places where they see gaps and where there is not enough detail to understand how a recommendation would be implemented, but not spend time on wordsmithing.
- Could their recommendations go beyond the Safe Drinking Water Act's (SDWA's) authority (e.g., a recommendation that EPA work cooperatively with other agencies to provide more effective lead public education)? Dr. Grevatt explained that their first priority is to assemble recommendations on a rule package that is enforceable and implementable on a national basis. However, EPA is interesting in hearing about ideas for collaborating with other agencies. He noted that EPA cannot require them to act under the authorities of SDWA. In addition, the NDWAC may not retain these recommendations in their report to EPA.
- Could the Group meet with NDWAC to respond to questions or meet with EPA before the Agency develops the proposed rule? In response, Dr. Grevatt indicated that EPA can ask the NDWAC to clarify information in their report, but he did not know the extent to which EPA can go back to individual members during the rulemaking process. He thought the Group might be able to meet via conference call but EPA counts on the joint members of the LCRWG and full NDWAC to carry the Group's recommendations forward. Mr. Burneson noted that there is no precedence to re-panel the Group. He added that each member is a valued stakeholder, who can provide input during the comment period for the proposed rule.
- Public education (PE) can benefit from experts that understand consumer-centered education. Can EPA start developing educational materials prior to promulgation of the revised LCR and bring in a broader group to make the messages more effective? Dr. Grevatt explained that the rule needs to operate as a package of which PE is one component. EPA will need to reach out to other sources to develop PE.

B. Follow-up on Topics from Past Meetings

EPA and the LCRWG discussed three topics from past meetings: NextGen principles, anti-backsliding and the components of a treatment technique rule. Specific discussions are provided under each subtopic.

1. NextGen Compliance Principles

A member asked the Group to consider EPA's Office of Enforcement and Compliance Assurance (OECA) NextGen principles when formulating recommendations for the Lead and Copper Rule Long-Term Revisions (LCR LTR). He explained that it is important to consider enforcement at the rule development stage; often a rule can be difficult to enforce due to ambiguity. Cynthia Giles, the Assistance Administrator for OECA, has urged NextGen compliance principles to be considered during EPA's rule development process. He walked through each of the principles and how it could be applied to the LCR LTR as follows:

- **Principle 1: Enable government, regulated entities and the public to easily identify who is regulated and the applicable requirements.** He explained that the application of this principle could address questions such as: "Who must do lead service line replacement (LSLR)? "Who has responsibility to implement corrosion control treatment (CCT)?" and "Who has to comply with which requirements?"
- **Principle 2: Structure regulations to make compliance easier than noncompliance.** He thought that the Group was already including this principle in their considerations.
- **Principle 3: Require regulated entities and/or third parties to assess compliance and to take steps to prevent non-compliance.** He clarified that this would mean taking steps to prevent non-compliance and thought this principle also is already being built into the work the Group is doing.
- **Principle 4: Leverage accountability and transparency by providing the government and the public with real-time access to quality information on regulated entities' emissions, discharges and key compliance activities and outcomes.** A key example of how to apply this principle is for the public to understand the locations of lead service lines (LSLs) and the certainty of this information.
- **Principle 5: Leverage benefits, market forces, and other incentives that promote effective regulations.** He noted that the concepts of this principle are discussed in the preamble of the draft report. Specifically, public water systems (PWSs) will have difficulty implementing a rule without a support system.

Some members provided feedback on specific principles as follows:

- Regarding Principle 2:
 - We should consider the flipside of Principle 2, i.e., whether we are creating situations that could cause noncompliance by having insurmountable goals. The regulation must be achievable and we need to leverage other resources.

- We need to think about creating a simpler rule that will promote high compliance rates and will work nationally to improve chances of success.
- Regarding Principle 4:
 - The water system has a lot of data and the subset that should be available to the public may be different from the subset reported to the state or EPA.
 - There is a difference between data and information. The public in general wants data translated into information so as to be meaningful. Not all data will be of interest to everyone.

Members also provided broader comments that included:

- Every mention of the public in the NextGen document should be emphasized because the LCR is a shared responsibility rule.
- One member asked whether EPA is implementing NextGen into the LCR or these principles have widespread consideration within EPA. In response, Mr. Burneson explained that Cynthia Giles has been a strong advocate for NextGen and it has been a fairly significant initiative in the Agency. Most of the Office of Water (OW) has taken training on the principles and how to implement them. He asked the Group to consider how to integrate these principles into the LCR revisions.

2. SDWA Anti-Backsliding Provisions

Lisa Christ, EPA OGWDW, explained that the 1996 SDWA Amendments require a review of the National Primary Drinking Water Regulations (NPDWRs) every 6 years. Specifically, “Any revision . . . shall maintain, or provide for greater, protection of the health of persons.” In making this determination, Ms. Christ asked the Group not to look at every component but to consider whether the revised rule as a whole maintains or improves public health protection. She added that the 1996 SDWA Amendments also require the Agency when considering the appropriate level of regulation for a contaminant(s) in drinking water to conduct a benefit-cost analysis.

Mr. Burneson added that the Administrator must determine whether the benefits justify the costs. He explained that EPA looks at quantifiable and non-quantifiable costs and benefits. IQ decrements are the most easily quantifiable measure from lead exposure.

Ms. Christ asked the Group to also consider: 1) enforceability and implementability especially for small systems because the rule will apply to system of all sizes; 2) the complexity of the regulation and 3) opportunities to simplify the rule.

LCRWG members had the following questions and comments:

- What levels of analysis are required under SDWA to demonstrate anti-backsliding? Ms. Christ explained that the statute doesn’t answer this directly. Mr. Burneson added that EPA will likely include a qualitative discussion in the preamble whether a specific requirement is more stringent or not.

- How could a more stringent LSLR program that is not based on a lead action level exceedance (ALE) fit into SDWA requirement to demonstrate feasibility? Mr. Burneson explained that it would be helpful for the Group to have a qualitative discussion about the feasibility of having a more stringent LSLR program. It is an area where EPA needs the Group's input.
- We need historical information that serves as a benchmark for defining the rule's success in order to assess anti-backsliding (e.g., reduction in leaded materials, reduction in 90th percentile levels, number of systems with CCT). This information should be included in the report to the full NDWAC. In response:
 - Mr. Burneson stated that the Government Performance and Results Act (GPRA) sets performance measures for the federal government. In the drinking water program, the GPRA standards are set around the percent of PWSs in compliance with health-based standards. For the LCR, these percentages are based on compliance with treatment technique requirements only and do not include monitoring and reporting requirements. He asked the Group to consider if EPA is measuring success correctly for the LCR.
 - Ms. Christ noted that the 2000 National Program Review of the LCR set the stage for the Short-Term Revision and the LCR LTR. EPA looked at the change in lead 90th percentile levels from 1992 to 2000 for 15 to 20 of the largest systems with lead ALEs. In 2000, all were well below the lead action level (AL).
 - Another member agreed with the suggestion to develop benchmarks for defining success. Looking forward, if a strong LSLR program is put in place, we will be less concerned about leaded materials, which may change how we look at the rule. He suggested using numerical data and children's health data to develop benchmarks. He added that at some point, when EPA revisits the rule as part of a future Six-Year Review, we may not be able to achieve another increment of success because we have made so much progress.

3. Treatment Technique Rule Framework

One member asked EPA to provide the basic components of a treatment technique rule as background for the Group's discussions. Mr. Burneson provided the following explanation:

- Section(c)(ii) allows EPA to promulgate a treatment technique rule, "if in the judgment of the Administrator, it is not economically or technologically feasible to so ascertain the level of such contaminant . . . "
- Paragraph (D) requires that each NPDWR have procedures for ensuring compliance.
- Paragraph (7)(A) specifies the content of a treatment technique rule as follows: ". . . The Administrator is authorized to promulgate a national primary drinking water regulation that requires the use of a treatment technique in lieu of establishing a maximum contaminant level, if the Administrator makes a finding that it is not economically or technically feasible to ascertain the level of the contaminant. . . the Administrator shall identify those treatment techniques which, in the Administrator's judgment would prevent known or anticipated adverse effects on the health of persons to the extent feasible. . . . the Administrator may grant a variance from any specified treatment technique . . .".

One member asked if a treatment technique rule that did not compel treatment would meet these requirements. Ms. Darman, EPA Office of General Counsel, clarified that EPA has interpreted its treatment authority broadly. Mr. Burneson explained that a treatment technique must include actions that “would prevent known or anticipated adverse effects on the health of persons to the extent feasible.” EPA has interpreted PE to meet this requirement.

C. Draft Report: Overview and General Comments

Ms. Bingham explained her process for developing the draft report. Much of the draft report is based on written suggestions she received from LCRWG members after the last meeting, because she assumed this would more directly represent members’ views than if she tried to summarize her interpretation of meeting summaries. Ms. Bingham called people if she had questions rather than interpreting their suggestions herself. Some of the suggestions in the report were not discussed during the meetings and, thus, some members may disagree; however, an advantage is that the Group has more information with which to work.

A member stated that he had not had time to review the report between December 20 and the February meeting. He expressed concern that two days were insufficient to cover everything on the agenda and that the report included new ideas that the Group had not previously discussed. In addition, he thought some topics were missing from the report. Ms. Bingham responded that she is confident in the Group as a whole could identify the gaps and discuss the new ideas.

Members also provided the following broad comments:

- We should think about actions that can be taken by the PWS today, since it will take several years before the rule becomes effective and early action puts a PWS in a better position when the rule takes effect.
- We should move the discussion of recommendations that are outside SDWA from the addendum to a more prominent place in the report. The Group considers these measures necessary to ensure better public health protection and putting them in an addendum makes them seem less important.
- Currently, the LCR focuses on CCT requirements and does not provide adequate LSLR. Given what we’ve learned about the complexities of CCT (and how much we now realize we don’t understand), we need an updated CCT guidance manual and one that is dynamic because we will continue to learn things about lead release.

D. Draft Report and Recommendations: Preamble and Background

Ms. Bingham explained that the Preamble (Section 2) and Background (Section 3) were written in response to the Group’s request to set the stage for the report and to provide the story of where the country has come and where it is now in a balanced way.

Members supported changing the “Preamble” title to “Considerations” to avoid confusion with the preamble to the *Federal Register* but differed in their opinions on what information should be included in the “Considerations” section. Specific questions and suggestions included:

- A member suggested expanding the Background to define the problem to be fixed and benchmarks for defining success. Another member agreed with the suggestion to expand the report's background section to include the rule's successes. However, she suggested also including areas where we have gained knowledge since the rule implementation in 1992 and information gaps or uncertainty. For example, some children have high blood lead levels (BLLs) even when their water system does not have an ALE.
- Focusing the section on points that are not contested such as "there is no safe level of lead." Ms. Bingham noted that the material was not meant to be a consensus but a compilation of diverse ideas.
- A member that also serves on the NDWAC indicated that NDWAC will want to know the full range of ideas that underlie the Group's recommendation to understand what the Group considered.
- Another member added that the report should explain the complexities of the rule and that some of the recommendations are compromises because of these complexities.
- Adding a discussion of the purpose of this section, information gaps and unknowns and simple facts about lead that individuals who do not regularly work with lead may not know (e.g., difference between soluble and insoluble lead, possibility of erratic release).
- Providing a broad description of different issues in order of importance.
- Removing the discussion of solutions because they belong in the Recommendations section (Section 4).
- Adding enforceability and implementation for all system sizes as a bullet.

The Group discussed the topic of "incentives". A member defined incentives as benefits to water systems for implementing a change and noted that they can create a culture of compliance to move more quickly down a particular path. One example is a reduction in phosphate dose or monitoring as an incentive to remove LSLs. This cost saving could also help a system explain to ratepayers or politicians why they should support a full LSLR program. Another example is allowing a system with a good LSL inventory to have more targeted PE versus delivering it to the entire service area. Some members provided additional comments as follows:

- We should make the discussion of incentives more prominent by pulling this topic out of each subsection in the report and possibly making it a separate subsection or bullet.
- The word "incentives" may have bad connotations and "benefits" may be a better term.
- We also should consider incentives for small water systems, states and key stakeholders that include society. The LCR LTR is going to be a complex drinking water regulation and the more incentives we have, the greater the chances of improved compliance.
- The idea of incentives is not routine so the Group needs to be clear in our report to NDWAC why we consider incentives to be key to the successful implementation of the LCR LTR.

E. Draft Report and Recommendations: Section 4.1 Remove the Source of Lead

The discussion of this section of the draft report included: 1) removing sources of lead, with a focus on LSLR and 2) a broader discussion of full LSLR and partial lead service line replacement (PLSLR). The discussions pertaining to these two areas are provided below.

1. Proposed Approach for Eliminating LSLs

a. Overview

A member explained the key concepts that shaped what he had proposed and what was included in the draft report for replacing LSLs as follows:

- The goal is to move from a situation where utilities are not required to replace LSLs unless they exceed the lead AL and implement CCT to one where they must replace all LSLs.
- The current rule allows systems 15 years to replace all LSLs, and creates many PLSLRs. It also does not allow adequate time for a well-planned LSLR program.
- In addition to needed rule revisions, a successful LSLR program will require home inspector involvement, changes in state regulations to deal with LSLs in real estate transactions and better training for plumbers.

The member then explained his two-step approach for removing all LSLs:

- The first step is to document the location of LSLs and make this information available to the public. The revised rule would:
 - Require PWSs to update their LSL inventories³, specify the information that should be part of the inventory and identify useful tools for improving it. The draft report included ways that PWSs have been able to develop good LSL inventory (e.g., collect data during meter replacement, ask homeowners to check for LSL when they call to ask the PWS a question).
 - Establish a clear mechanism for homeowners, residents and potential homeowners to access information on what it means to have a LSL and how it might be removed. However it may not necessarily mandate the way in which the utility will keep the data. He added that the PWS should provide caveats that the accuracy of the information is based on information available to utility.
- The second step is to create the LSLR program as follows:
 - The rule should mandate that a system with LSLs have a program within a specified period of time that includes a non-binding goal to remove all LSLs within a reasonable period of time and to develop a program plan. The plan should include: intermediate goals; a review of tools that may be available to customer to replace their portion of the LSL and three different standard operating procedures (SOPs) for dealing with: 1) customers during capital

³ All water systems were required by the original LCR to complete a materials evaluation of their distribution system in order to fulfill the sample site selection tier criteria outlined in 40 C.F.R. §141.86(a).

improvement; 2) customers when the replacement is part of an emergency repair and 3) other agencies such as the gas, cable or electric companies during their repairs. He noted that the SOPs for non-transient non-community water systems (NTNCWSs), such as a school or restaurant that owns the entire water system, should be straightforward but that the requirements for these systems need further consideration.

- A system with LSLs will be in noncompliance if they do not have a plan within a specified period of time.

In response, members of the Group provided the following broad comments:

- We should include the key concepts for the LSLR program that were just presented in the revised report.
- The title of Section 4.1, “Remove the Source of Lead” is misleading because it focuses on LSLs and does not discuss other sources of lead. To resolve this, this section could either:
 - Start with a comprehensive discussion of all sources of leaded plumbing materials including a discussion that lead release can place consumers at risk even when the lead AL is met, followed by an explanation of why the Group is focusing on LSLR and finally provide the specific recommendations for a LSLR program.
 - Be retitled to “Remove Lead Service Lines”.
- One member suggested having different requirements for systems that have control and those that do not. He defined control as something a PWS can do without having to get other people’s permission.

b. Update and Improve Access to Information about LSLs

A member agreed that to refine the LSL inventory, the PWS would start with the information it has and then confirm LSL materials by going in the house or asking the consumer. Members had additional comments on refining and reporting the inventory that included:

- To improve the usefulness of the LSL inventory, PWSs could use metadata to distinguish what is known about the portion of the LSL in the street and the portion between the curb stop and foundation. The system could document whether it suspects the presence of a LSL or has confirmed it (e.g., the date the structure was built, when someone scratched the pipe to determine whether or not it was a LSL). In addition, some of this metadata could be provided to the consumer. Some of the requirements should be in the rule but the detail should be provided in guidance. In response, another member noted the importance of being very clear on how to update and improve access to information on LSLs to avoid ending up with a lot of misinformation.
- The proposed approach in the draft report would require systems in regions that have no LSLs to go through this inventory process if they do not have records of prior searches for LSLs. This will be resource-intensive for the system and state because the system will contact them for assistance. Members discussed the idea of an “off-ramp” for states and individual systems

without LSLs. One member noted that this could be based on current sampling requirements (if no Tier 1 sites, could assume that systems would not have LSLs). These systems would not be required to update their inventory unless they become aware of a LSL.

- The PWS should not wait for a customer to call the water system with a question to find out about LSLs but do something more proactively.
- The PWS should report the LSLR plan and inventory to the community because the system does not know enough about the type of information the community needs. This is consistent with NextGen Principle #4. If the community has issues with the information, they will contact the state.

c. Establish an Active LSLR Program

Members made the following individual comments regarding the LSLR program:

- A member noted the need to clarify to which systems the suggested revisions apply. Specifically, whether a requirement to:
 - Have a non-binding goal to remove all LSLs applies to just community water systems (CWSs) or also includes large NTNCWSs.
 - Develop a long-term LSLR program plan applies only to CWSs.
 - Replace lead piping applies to NTNCWSs.
- Another suggested clarifying that the sanitary survey process is one opportunity for primacy agencies to review the LSLR plans and not the only one.
- Some members had comments regarding small system capabilities:
 - The recommended tools to assist customers in replacing their portion of the LSL seem to be geared toward large systems' capabilities. For example, small water systems cannot do assistance programs.
 - Small systems do not have SOPs. It would be easier for states to require prior notification and flushing rather than having them review SOPs.
- Another member suggested that the LSLR could also take place at the sale of a home. The PWS would be mandated to replace their portion of the LSL and the sale could not proceed until the LSL was removed (similar to the sale of a home being contingent on removal of underground storage tanks and installation of smoke detectors).

d. Compliance and Enforceability Related to LSLR

Members made the following individual comments regarding compliance and enforceability associated with LSLR:

- It may not be effective to make the LSLR program a non-binding goal as we do for the maximum contaminant level goal (MCLG).

- We should define what constitutes compliance for LSLR (e.g., when has the system done enough). Also, if we are trying to write a regulation where compliance is easier than noncompliance, we need to provide systems with as many tools as possible.
- We need to resolve the control and funding issues associated with LSLR. Otherwise, we will not have an enforceable process.
- The likelihood of having a rule that is enforceable lies more in ownership than a change in control definition for a LSL. A member questioned how to enforce an annual full replacement rate of 10%.
- Another member explained that his PWS is privately-owned. It cannot repair or replace the LSL beyond the curb and cannot fully replace 10% of LSLs. However, it can update its LSL inventory, tell consumers why they want to replace their LSL and find funding mechanisms.

[Also see Section F for a more detailed discussion regarding the issue of control.]

2. General Comments on Full and Partial LSLRs

a. Full LSLR

Ms. Bingham asked the LCRWG if they supported a revised rule that includes full LSLR. In response:

- One member stated that her assumption was that LSLR was the only way.
- Another said that it was hard to dispute the notion to take them out.
- A third noted that requiring full LSLR is the single most important thing the Group could recommend.

Members also stated other considerations:

- We need to be mindful not to give the impression that the removal of LSLs has solved the lead in water problem.
- One member questioned whether the Science Advisory Report (SAB) report unequivocally supported full LSLR. In response, Mr. Burneson explained that data about lead in homes after full LSLR was from locations with galvanized pipe. Mike Schock, EPA Office of Research and Development, added that lead levels went down when the home was resampled at a later date.
- A member stated that all systems with LSLs should replace them, but there should be adjustments that reduce costs in other parts of the rule so that water utilities can shift resources to LSLR.
- One member hoped the Group was shifting to a mandatory full LSLR program. He thought people did not participate in full LSLR because the public does not understand the potential for exposure to lead in drinking water from LSLs.

A member provided a handout (“Empirical and Legal Evaluation of Public Health Protection Under the Federal LCR Public Health Law Research Program, Robert Wood Johnson Foundation”), which presented preliminary results from interviews with 41 consumers in DC and Providence regarding their experience with LSLR. The study was conducted by Parents for Non-toxic Alternatives, who worked with DC Water and with a nonprofit in Providence, RI. All willing participants were interviewed (i.e., statistical representation of the LSL homes and bias were not considered). Based on these interviews:

- The cost of LSLR was the main impediment to replacing the private portion of the LSL. Other factors that led people to opt-out of full LSLR included water sample results below 15 ppb, no children in the house, low risk because they are using filters or bottled water and a concern for damage to property during the replacement.
- PWS informational materials focused on the logistics of the replacement rather than the impacts of PLSLR. About 50% of the people interviewed indicated they would have opted for full LSLR or more seriously considered it had they known that PLSLRs can be followed by short-term or long-term spikes.
- Thirteen of 41 paid for the replacement of their part of the LSLR (32%). This is compared to 18% of DC residents as a whole who have opted for full LSLR. Their reasons for paying for their portion to achieve full LSLR included: discounted rate offered by the PWS, general knowledge that lead is bad, resale concerns associated with a LSL, permanently getting rid of entire lead source and getting rid of aging pipes. The study found clear association with full LSLR and income and also race (people that opted for it in the study were in the highest income bracket and mainly Caucasian).

b. PLSLR

Members did not support PLSLR and discussed whether it should be allowed under any circumstances. Specific, individual comments included:

- One member suggested that PLSLRs should not be allowed unless they are the only option in the case of infrastructure repair. She noted that distribution and transmission repairs have to occur regardless of whether there is a LSLR on the street.
- Others indicated that most PLSLRs are occurring outside the LCR and the Group should try to figure ways to prevent this.
- To reduce to the incidence of infrastructure-related PLSLRs, utilities should be required to do an aggressive education program prior to the infrastructure project. In addition, a PWS is not done with its LSLR responsibility because a homeowner initially refused full LSLR. Systems would be required to periodically remind the homeowner that they have a LSL.
- A member suggested that systems also replace the LSL when they have a planned LSLR program and know there is a high likelihood that a LSL is present.
- Other members noted that:

- The ability to accomplish full LSLRs during infrastructure repair gets back to the control issue. Most systems will not be able to go onto private property.
- We cannot assume that most systems can systematically replace each LSL street by street. This may only be possible if the city can pass a local ordinance but the LCR cannot mandate this.
- Before DC Water conducts street main work, they send out educational materials to consumers and a contract. The materials indicate that the customer may have a LSL and if DC Water finds a LSL whether a customer want DC Water to replace his/her portion of the LSL. If people decline, DC Water leaves a pitcher filter with cartridges for 6 months.
- A member stated that during PLSLR, the initial lead levels go up after replacement. PLSLR is different from full LSLR in that lead levels may return to similar levels before replacement. However, removing a full LSL without proper risk mitigation and education can still be harmful to a homeowner.

F. Draft Report and Recommendations: Section 4.2 Definition of Control

A member provided background on her proposed revision to the definition of control under Option 1 on page 12 of draft report. Under this option, the current definition of control as “ownership” would be replaced with a requirement that PWSs replace the entire LSL, where they have the authority to “replace, repair, or maintain” the line or where they have other forms of authority over the LSL. She explained that this option is similar to the proposed 1991 LCR, which intended full LSLR. Returning to that definition would expand the PWS’s focus beyond what the system owns. She expressed concern that the definition of control today has allowed much more widespread use of PLSLRs.

Mr. Burneson explained that the original proposed rule had a rebuttable presumption that a water system controls the entire LSL if, the system has: (1) authority to set standards for construction, repair or maintenance of the service line; (2) authority to replace, repair or maintain the service line or (3) ownership of the service line. Systems that were triggered into LSLR would have been required to undertake full LSLR unless they could demonstrate to the state that they did not have full control.

Members provided the following individual comments:

- Regardless of how ownership is defined, the public needs to understand its meaning before a LSL is replaced to ensure they make informed decisions.
- The Group needs to understand if SDWA restricts EPA from using a broader definition. In response, Mr. Burneson explained that EPA finalized the revisions in 2000 based on the desire to see implementation occur as quickly as possible and that the court never ruled on the legality of any particular definition.
- If EPA changes the definition of control, the utility may have the authority to require the consumer’s portion of the LSL to be replaced, but the question of who pays for it should be seen as separate. Both problems need to be solved.

- A member questioned if a change to the definition of control is needed to accomplish full LSLR. Other members provided the following feedback:
 - Currently, systems have been able to get some homeowners to agree to full LSLR. Over time, they are working toward having all customers agree to full LSLR.
 - A change in definition of control would not solve the problem of gaining access to private property or to the home.
 - Some cities were successful at implementing a full LSLR program because they were able to pass a local ordinance, which gave them the authority to replace the entire LSL.
 - If a utility is responsible by law for full LSLR, they would try to find ways to get homeowners to agree and find financing.
- One member asked what happened under the original LCR when a homeowner declined to pay for private replacement. Mr. Burneson explained that systems were not replacing LSLs when the original definition of control was in effect so the Agency has no practical experience.

G. Draft Report and Recommendations: Section 4.3 Public Education for Lead

The Group and EPA discussed ways to develop stronger PE requirements and programs regarding LSLs and other sources of lead that include:

- Revising the current Consumer Confidence Report (CCR) language.
- Strengthening requirements for public access to information.
- Adding requirements for targeted outreach to customers with LSLs.

Specific discussions related to these three areas as well as general comments are provided below.

1. General Comments

Members provided the following general comments:

- Targeted outreach is key to making the long-term LSLR program work because people need to understand why they want LSLR.
- How do we handle environmental justice issues associated with LSLR?
- Educational materials should periodically go out using various channels (e.g., welcome letter) to encourage people to replace their LSLs. However, this wouldn't address funding problems.
- Some in-line filters are certified to remove lead and the general PE information should include the information on the use of filters. However, this information may or may not be appropriate for the CCR.
- The concept of particulates needs to be central to PE.

- PE should be ongoing. Our health department has found that talking to parents about lead is difficult. Incentives are needed. We link lead PE with healthy homes. Even if people have LSLs, they often do not want to remove them.
- PE needs to be robust and we need think about ways to regularly deliver PE beyond the current mechanisms of delivery. We need to more directly state that no amount of lead is safe and fetuses get lead exposure almost solely from water.

Some members provided suggestions for expanding the Working Group’s report to include the current PE distribution requirements as background. Other suggestions for Section 4.3 included:

- Adding two additional bullets to the recommendations on page 14:
 1. **Develop a national clearinghouse.** The clearinghouse would promote environmental justice by providing everyone equal, on-going and complete information. It could include videos, information and brochures in multiple languages. In addition, utilities could pull information from and add information to this site. He noted that EPA would need to make funds available for the clearinghouse.
 2. **Utilities must provide community-specific information for their customers.** Individual PWSs should have to provide local information to their customers that includes where LSLs are located, how to identify them and how to have their water tested for lead.
- Adding a bullet regarding the need to educate health care professional about lead in drinking water and getting greater involvement from Centers for Disease Control (CDC) because the medical community looks to CDC for health-related information

Another member discussed the existing National Lead Information Clearinghouse (NLIC). He provided a handout (“Current Public Education Documents by Lead by HUD, EPA and CDC”) that lists information that is available at the NLIC that includes general information, lead disclosure information, lead in public housing and studies concerning lead in blood. He noted that if the information in these documents were expanded to include lead in drinking water, it would go a long way toward developing a national clearinghouse.

2. Revise the Current CCR Language (Section 4.3.1)

Members of the LCRWG provided the following individual comments and suggestions related to the CCR:

- The CCR has improved but is not adequate in terms of context and frequency of delivery.
- People do not tend to read the CCR unless they have a question. The CCR should provide background but it is not a good learning tool. It is a dense document filled with statutory mandated words and the text gets increasingly smaller over time.
- The public does not understand lead well enough and the CCR language needs to be revised to discuss what we know today (e.g., lead can cause miscarriages, lead levels can fluctuate).

- The CCR should include basic and some community-specific information and a link to the national website for additional information.
- Change Option 1 in the draft report for revising the current CCR language as follows:
 - Define a LSL, explain why we need to replace LSLs and remove “elevated levels” from the first sentence.
 - In the second paragraph, either: 1) replace the link to the “www.epa.gov/safewater/lead” with the link to the national clearinghouse website or 2) replace the second paragraph of the current CCR language with a sentence that directs consumers to the national website for actions they can take.
- Replace the CCR health effects language with a stronger message, such as “Lead can affect children’s brains and developing nervous systems, causing reduced IQ, learning disabilities and behavioral problems. Lead is also harmful to adults.”⁴ The language could include a caveat that it may not apply in all situations. In response, some members made the following suggestions or comments related to tiering the PE language as follows:
 - The stronger language could be part of targeted PE for systems with LSLs but we should have different messaging for locations without LSLs. A member added that although gradations for PE language may be appropriate, we need to be mindful that even at lead levels of 10 to 15 ppb, there can be damage to a child’s brain.
 - The CCR should have general language for systems with non-detect lead and more stringent language for others. Utilities have indicated that the current language in the CCR is unnecessarily alarming from those with non-detectable levels of lead.
 - Mr. Burneson clarified that the PE Workgroup for the minor revisions to the LCR recommended that lead language in the CCR for systems with detectable lead levels. The full NDWAC wanted this language for all systems and EPA agreed. Based on this clarification, one member emphasized the importance of providing more thorough CCR language recommendations in their report to NDWAC to improve their chances of having the NDWAC accept them.
 - Another member questioned how the Group could base a set of language requirements on the detection of lead, if the revised rule were to no longer require tap monitoring.
- The guidance in the current CCR language that recommended a 30 second to 2 minute flush prior to use is erroneous.

3. Strengthen Requirements for Public Access to information (Section 4.3.2)

The Group discussed the three options in the draft report to strengthen the requirements for public access to information.

⁴ This information is found in EPA’s brochure, *The Lead-Safe Guide to Renovate Right*. Available at http://www2.epa.gov/sites/production/files/documents/rr_english_color_book.pdf.

Option 1 would require PWSs serving > 100,000 to provide information on their website on LSLs, how to identify an LSL, in-home sampling and full LSLR options. All other systems must make this information available, either through their web site or by other means. Members of the Group provided the following individual comments:

- We should clarify that this options pertains to LSL systems only.
- Some information, including health effects and how to identify an LSL, could be provided through the national clearinghouse website (individual utilities could provide a link on its website to the national clearinghouse).
- The information should include who is responsible for LSLR.
- This option could be revised to require a system to distribute information via its website or other method if it does not have a website.
- Information on the percent of systems with LSLs for different size categories would be useful to the Group because we are making lead PE recommendations based on system size. In response, Mr. Burneson indicated that EPA will assess what information the Agency has on the sizes of systems with LSLs.
- We already have suggestions for a LSL inventory and national website for PE. Therefore, Option 1 is repetitive. In response, Ms. Bingham noted that she will more clearly indicate linkages in the next version of the report.
- Several members commented on posting the inventory on the web:
 - Posting of this information is consistent with NextGen Principle 4, which promotes accountability and transparency by providing real-time access to quality information.
 - Several members voiced concerns about posting the full LSL inventory on the web:
 - There might be a backlash if utilities put every property on the web.
 - People do not like having information about their properties on the web.
 - It is confidential information that should not be posted.
 - Members suggested ways that information could be made available:
 - To protect people's privacy, the system could indicate that some neighborhoods may have LSLs instead of listing the specific address. Another stated that we may not be able to make generalities about neighborhoods with LSLs and instead of posting the location of LSLs, the system could provide a number people can call for more information.
 - Instead of providing the location of LSL, the system could indicate where LSLs have been removed. Infrastructure LSLs are currently outside the LCR and thus, their replacements are not reported to the state. We need to think about how to address this.

- The system could indicate the street address with the first two numbers redacted of locations with PLSLs and full LSLs, which is the procedure used by DC Water.
- The information can be made available in different ways. Someone can call the utility about a particular house.

Option 2 would require PWSs serving > 100K to provide all lead- and copper-related data, sampling methods and protocol, measurements, local ordinances and regulations online at all times. This requirement would apply to both LSL and non-LSL systems. Small and medium-sized systems would provide these data on request, in a timely fashion. Members provided the following individual comments on Option 2:

- One member's system posts monitoring data without the location. He suggested for voluntary home sampling, the system could indicate that the data are available without posting them.
- One member noted that systems typically do not post all of the data they collect for other rules.
- One member indicated that increasingly, systems are posting more of their data (e.g., Unregulated Contaminant Monitoring (UCMR)).
- One member had a concern about posting local ordinances and regulations. One of their systems serves 30 municipalities, so it would be difficult to link to local ordinances and regulations because these links change too much.
- All data may not be interesting to 99% of the people. The system should make the data available if someone wants it. Instead of posting all data, the system should make information available to demonstrate accountability.
- Small systems will know their analytical results and sampling protocol. They should not be required to post information about local ordinances because they may not have this information.

Option 3 would require robust PE about the risks of lead-bearing plumbing and the benefits of a) removing this plumbing and/or b) taking regular precautions when cooking or drinking. The PE would be delivered regularly, regardless of whether the PWS had a lead ALE or LSL since lead leaching can occur in buildings without LSLs. The member who drafted Option 3 explained that even if there is no lead ALE, 10% of homes can have lead levels > 15 ppb or others with lead up to 15 ppb. She added that this information is especially important because the LCR is a shared responsibility rule and some members are proposing switching from in-home sampling to water quality parameter (WQP) testing. In response, a member did not think this option should apply to systems without LSLs. Instead, he suggested that the CCR language be updated to talk about lead-bearing plumbing or to include a link to the national website.

4. Add Requirements for Targeted Outreach to Customers with LSLs (Section 4.3.3)

The LCRWG discussed four options in the draft report for providing targeted outreach to customers with LSLs. These options could be used in combination.

Option 1 would require systems to provide targeted outreach to customers who may have LSLs. The outreach would include information about LSLs, how to determine if a customer has one, associated risk, risk reduction options and full LSL replacement options in a “new account” welcome letter. Some members had different suggestions for the content of these materials as follows:

- The targeted information should include basic information such as health effects, available programs, risks for children and be limited to one page with a link to the clearinghouse for more detailed information (e.g., what is a LSL, how to identify a LSLs).
- Stronger health language should be used in the targeted materials.
- PE should include all sources of lead in the environment to maximize lead reduction. Locations that have LSLs usually have lead paint and could have lead in soil. Providing this information may go beyond the water system and require integration and collaboration. One member responded that the materials should not include other lead sources to avoid diluting the message about the importance of lead in water.

Option 2 would require PWSs to offer customers with LSLs the opportunity to have in-home tap samples tested. Members provided the following individual comments:

- This option may not be feasible if the system received a high number of requests for in-home sampling at the same time.
- The PWS needs to convey to the customer what results mean; i.e., that that another lead sample could be higher or lower.

Option 3 would require PWSs to conduct direct, targeted outreach to solicit full LSLR by contacting a specified percent annually (e.g. 10%) of customers with LSLs. PWSs would replace the customer’s portion of the LSLs where they have obtained agreement. Specific comments included:

- Based on Providence’s experience of having about 1% of individuals agree to LSLR, we should raise the requirement for direct targeted LSLR outreach from 10% to 20% and adjust that percentage in the future if needed.
- Improving our communication about LSLR may result in our ability to change people’s minds about wanting full LSLR. Also, although LSLR may not be a priority for some people (e.g., people over 50 without young children in the house), over time new individuals may move into a home for whom LSLR is a priority.
- As part of the long-term LSLR program, PWSs should periodically remind customers that they have a LSL and if they want to get rid of them.

Option 4 would require PWSs to provide information to customers with LSLs about filters including how to maintain them and differences in their ratings. A few members supported including information on filters. One member added that without information about filters in our PE materials, education would be left in the hands of filter marketers.

H. Draft Report and Recommendations: Section 4.4 Corrosion Control and Section 4.5 Monitoring Requirements

The Group discussed the proposals in the draft report for: 1) improving corrosion control and 2) modifying the LCR monitoring requirements. Specific discussions related to these areas are provided below.

1. Improve Corrosion Control (Section 4.4)

The Group discussed the approach in the draft report for improving CCT effectiveness by requiring all PWSs to: 1) assess the corrosivity of their water, 2) optimize corrosion control where water chemistry is corrosive and 3) conduct more robust WQP monitoring with better process control to confirm that they are maintaining these characteristics. This current rule required large systems (those serving more than 50,000 people) to optimize CCT irrespective of their lead or copper levels, did not require optimization for medium and small systems and did not explicitly require re-optimization. A member explained that about 90% of small systems do not have LCR-mandated treatment.

A member asked how, in the absence of in-home sampling, states could set optimal water quality parameters (OWQPs) or systems could assess CCT. She added that systems that meet OWQPs can have lead ALEs, states are setting wide OWQP ranges to prevent noncompliance and lead levels can vary within the distribution system. In response:

- Another member explained that tap sampling information will not indicate if OWQPs are adequate.
- Another member noted that corrosion control is one way to control lead from the tap. Distribution system and WQP monitoring may be the best way to assess CCT.
- Dave Cornwell, ET&T, explained CCT is a chemical process that is done at the treatment plant. Systems can monitor WQPs at water treatment plants (e.g., pH, alkalinity). Currently, states have set very wide OWQP ranges and the current rule does not require systems to adequately measure WQPS at key points or monitor them frequently enough.

A member questioned if the working assumption that CCT is effective at controlling soluble lead is correct or is a reduction in lead levels due in part to irregular PWS sampling protocols, such as pre-flushing and aerator removal that can lower lead. In response:

- Mr. Cornwell explained that CCT cannot control lead particulate release, no matter how well it is operated. Research indicates that PWSs with good CCT have lead 90th percentile levels around 4 or 5 ppb. However, these systems can still get peak lead levels, usually when LSLs are removed. WQPs will tell the system if they are maintaining CCT but adjusting CCT is not going to affect the peaks. The system needs to take out the LSLs. A member added that when a system has low lead levels (6 ppb) for example, the system could possibly adjust CCT to lower soluble lead but would be reluctant due to unintended consequences.
- Mr. Shock agreed there are limitations to what CCT can do. WQPs are good for assessing CCT effectiveness at removing soluble lead but less reliable for systems with LSLs because they have

complicated scales. Systems with LSLs would need to conduct oxidation-reduction potential (ORP) and calcium testing but this would be difficult for a state to oversee.

- A member explained that even with variability in how homeowners have collected data, lead levels have declined primarily due to CCT that deals with soluble lead release.

The Group discussed the issue of particulate lead. A member asked if systems with LSLs or those that replaced their LSLs have the most lead particulate release. In response, Mr. Schock indicated that the worst case is LSLs; however, lead is still variable for non-LSL and LSL systems. We have not done profiles of systems without LSLs. One member reiterated that because spikes in lead are not resolved by CCT to not require CCT as a method to resolve particulates.

The Group also discussed the use of flushing as a method for dealing with particulate lead. Specific, individual comments included:

- We should think about a treatment technique requirement that includes both household and distribution system flushing where there's a particulate problem (e.g., after LSLR).
- There is value to flushing even if you are not disturbing the line to remove particulates.
- Flushing is not a viable option for areas with water scarcity.
- How do you protect people's health while you are flushing the system? In response, members indicated that flushing is usually done in off hours and the system will usually open up the fire hydrants.
- The real issue of particulates happens when home plumbing is disturbed. We don't know enough to say lead levels are lower when doing distribution system flushing.

2. Modify Monitoring Requirements (Section 4.5)

The Group discussed two options in the draft report for modifying the LCR monitoring requirements. Specific discussions related to these two options are provided below.

a. Change in Function for Tap Samples (Option 1)

Under Option 1, the function of lead and copper tap monitoring would change. Tap sampling would continue at the request of customers with LSLs, as an off-ramp from the current approach (systems with an ALE would work with their state on appropriate next steps for transition, which may include some samples) and also may be part of investigative research when treatment or sources change. More robust WQP monitoring would be used to assess treatment effectiveness.

A member asked for clarification regarding the monitoring requirements for systems that have never conducted WQP monitoring (i.e., those serving 50,000 or fewer that have never had an ALE). One member explained that these systems would switch over to WQP monitoring. He added that many systems are on triennial monitoring, and that more frequent WQP monitoring would provide more information about the system. Process control charts could lead to more narrow OWQP ranges. The February 2015 Journal of AWWA article, "Controlling Lead and Copper Rule Water Quality Parameters",

authored by Dave Cornwell et al., discusses how to use process control charts. The Group received this article as a handout.

Some members supported the use of WQPs to assess if CCT is working properly and indicated the following limitations of tap monitoring:

- The samples are typically conducted by the homeowner, which is outside the control of the water system and make the results suspect.
- The result is specific to a home at the time the sample was collected.
- It is not a good indication of CCT effectiveness.
- It is only conducted every three years for most systems.

Other members discussed their views about the role of tap monitoring in the rule as followings:

- PWSs would have difficulty explaining to their customers that their lead level is low based on a pH range instead of a lead sample. He also questioned what parameters are being tested, where they are being tested and who is collecting the samples. He indicated that WQP testing is a good idea for those with CCT, but there are many factors to consider for smaller systems that do not have CCT.
- If there isn't a good correlation between OWQPs and tap samples, we should keep tap sampling and WQPs separate.
- Tap sampling is useful to provide an individual homeowner with information on which to base a decision, for systems with LSLs to identify particulate lead problems and unexpected events and as a check for when a system changes its source or treatment.
- Individual tap samples results could be indicating a problem with CCT. DC Water started with a few high lead samples and two and half years later had a big lead problem. The concern is that the system did not connect the dots and identify problems early enough. We need accountability, transparency and oversight. We cannot afford to lose in-home sampling in worst-case homes. It would be counter to anti-backsliding.
- There have been too many hazardous incidents when there is an acute contaminant and someone was monitoring a surrogate and built their program around it. We are not confident that WQPs correlate with tap results.
- Mr. Schock explained that tap sampling may be important depending on how the Group defines OCCT (i.e., if it is defined based on pH and alkalinity samples or lead levels). He explained that even if tap and WQP monitoring results correlate well with lead release, there is a wide variation of water qualities within the distribution system. Thus, we would need dense sampling requirements. Also, many factors affect lead release. Pipe scales are not simple lead minerals or simple functions of solubility. We need to understand the critical variables that lead to effective passivating scales before we can abandon tap sampling. Our research is indicating that we cannot depend on pH and alkalinity alone to predict lead release from LSL scales. It could depend on many other WQPs and is fairly specific to each system.

Members also discussed other sampling schemes as follows:

- A member suggested looking at tap samples from a process monitoring angle and using voluntary in-home tap monitoring. He explained that New York City Department of Environment conducts voluntary testing and found these data to have a relatively good correlation with compliance data. Based on that outcome, we should aggressively offer sampling to the customers. However, we would need to be clear on the type of monitoring that would be used for compliance. We should move away from triennial monitoring and require more continuous monitoring.
- Another suggested using a sentinel sampling program that would include monitoring from representative sites in the system and voluntary home testing. The increase in monitoring data would provide a better understanding of the water system as a whole. Another member agreed with the concept of sentinel sampling but not for compliance purposes.
- We need to think about where we want to sample and how we want to use the results in order to determine the appropriate sampling scheme.
- We need some type of compliance monitoring, whether it is follow-up monitoring or monitoring associated with the full LSLR program.
- Ideally, we should have a sampling scheme in which the sample collection and analysis are under the control of the water system. However, I doubt the Group could figure out a feasible approach in three months. Mike Schock and Dave Cornwell may be in the best position to address this. Another member added that the Group needs to make decision based on our current knowledge and if we could base decision on water systems that have lead issues.
- A member asked how the Group could design a sampling program that is implementable to adequately measure solder, particulate lead and LSLs. Each source has a different sampling protocol and the sampling for particulate lead and LSL is specific to each home. He indicated that systems need guidance on the best way to address particulate lead.

b. Link Compliance with Actions Triggered by a Health-Based Threshold (Option 2)

The member who suggested Option 2 in the draft report provided clarification. She explained that this option would require the escalation of robust PE and continued full LSLR until all LSLs were replaced if a system exceeded a health-based threshold level. She explained that to make the lead AL meaningful from a public health prospective, she was asking for an imminent and substantial endangerment level. When either the lead AL or in-home samples exceeds this level, compliance would be based on actual health risk. She was re-emphasizing the focus of the current rule, which is to capture highest lead levels.

Also refer to Section I of this meeting summary for additional discussions on establishing a health-based standard.

I. Draft Report and Recommendations: Section 4.6 Health-Based Standard

A member discussed his suggestion in the draft report to establish a health-based, “substantial and imminent endangerment” standard for lead in drinking water. Lead presents a great risk and potential

for irreversible damage, and some in-home lead samples have yielded very high results. In addition, other programs such as Superfund and Air have levels that once triggered require immediate action. The LCR similarly should establish a health-based standard that identifies a “substantial and imminent endangerment” threat from lead in water. If any in-home sample exceeds this level, the water system would need to take immediate action to communicate with the customer, recommend blood lead testing for residents, provide water filters that are certified for lead removal, provide the customer an opportunity to participate in a full LSLR program and notify similarly situated customers in the service area.

In response, members of the Group discussed the following:

- How systems currently handle high lead levels:
 - One member explained that his system contacts customers and investigates any test result above 15 ppb.
 - The current LCR requires PWSs to provide test results to customers whose home is sampled for compliance monitoring.⁵ A member suggested expanding the content of this letter to include information on the substantial and imminent endangerment level and include a recommendation to have your child’s BLL tested.
- On which sample result(s) the determination would be based:
 - We need to establish the number but not what that sampling will look like. The action may not be to test every tap or to make a public announcement. However, the people drinking the water have to be told with an extra level of urgency.
 - A problem to consider is that samples can yield false negatives.
- How a system could explain the situation to a customer and possible required actions:
 - A system could be required to provide bottled water in a substantial and imminent endangerment situation.
 - The system should conduct an investigation to determine if the problem is real. Confirmed problems should be referred to the health department. They have experience in this area and typically would conduct a BLL test.
 - The PWS should have a protocol in place so that the consumer understands that if her/his lead sample exceeds a certain threshold, the system will be communicating with the health department.

⁵ Under the Current Rule, all water systems must provide lead consumer notice to all individuals served at tested sampling locations that were used for compliance purposes. The notice consists of individual lead results at the tested tap, an explanation of the health effects of lead, steps consumers can take to reduce exposure to lead in drinking water and the lead MCLG and AL and definitions for these two terms. The system must provide the consumer notice as soon as practical but no later than 30 days of learning the tap monitoring results.

- BLL is a reportable disease. The obligation is to look at the environment. He was uncertain if there is a level that gives the health department some authority.
- Two members from health departments provided their prospective:
 - One of the members noted that some localities in her state have only one person who conducts all investigations and not all locations have local health departments. Thus, this responsibility may fall on the state. The water program would be interested and concerned with BLL.
 - The other indicated that his health department has interactive maps that display the locations of LSLs. His department provides education and encourages homeowner to take out LSLs. He explained if a child has an elevated BLL, we take samples to determine the level of lead in drinking water. If there are no lead lines, we recommend flushing.
- Possible levels or the basis for setting the substantial and imminent level:
 - The level should be correlated to the CDC's BLL of concern of 5 µg/dL.
 - EPA at one point recommended a lead level of 40 ppb for school children.
 - The level should be higher than 15 ppb because requiring the system to investigate every level above 15 ppb may be too much.
 - Mr. Burneson explained tools that are available to EPA to set levels that require action or convey health information as follows:
 - EPA's has authority under Section 1431 of SDWA to take enforcement action for situations that may pose an "imminent and substantial endangerment to human health". He noted that use of the term substantial and imminent endangerment may have legal implications and require certain actions.
 - EPA's Integrated Exposure Uptake Biokinetic Model (IEUBK) uses data from different routes of exposure for lead in food, dust, drinking water and air and translates that to the probability of a BLL of 5 µg/dL. Default values for various routes of exposure can be used based on national data.
 - The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. All requirements build off the MCLG for an MCL-based rule but EPA can use another trigger such as the AL for a treatment technique rule. EPA also used health advisories (HAs) to communicate information about health.⁶

⁶ A Health Advisory is an estimate of acceptable drinking water levels for a chemical substance based on health effects information; a Health Advisory is not a legally enforceable Federal standard, but serves as technical guidance to assist federal, state and local officials. EPA has develops life-time HAs based on a 70-kg adult consuming 2 liters of water per day and 1-day and 10-day HAs that are designed to protect a 10-kg child who consumers 1 liter of water per day.

- Lisa Donahue, EPA Region 3, explained that EPA developed a “determination of substantial and imminent endangerment health effects number” for a school in Philadelphia with high lead levels and a facility with elevated levels of PFOS and PFOA.
- Comments on setting the substantial and imminent level:
 - One member supported the idea of figuring out the substantial and imminent endangerment standard based on tools we already use for drinking water, such as using HAs or Section 1431.
 - Another did not support using a model to set this level because the inputs about other sources of lead would affect the model result. Instead, he suggested the health department is in a better position to make assessments about a particular neighborhood and to require action. Also, we should consider situations in which a sample from a home exceeds this level but the occupants are in a low risk category (e.g., late 50s or older) and lead is not a health concern for them.
 - Whether we should recommend this level be part of the LCR if EPA can identify a number on a case-by-case basis that helps with immediate enforcement action. Establishing this number would be part of a lengthy standard-setting process that would be done outside this Group. It is more important to figure out how to identify locations with high lead levels.
 - We don’t want systems that investigate any level above 15 ppb to stop doing so if we set a higher substantial and imminent endangerment level.
- The proposed recommendation that systems must notify other “similarly situated customers in the service area”:
 - This determination would be difficult for the system and would probably result in their notifying all customers.
 - The system could look at the circumstances and make the judgment (e.g., the water main was replaced).
 - There is a potential for a lawsuit if a system only contacts people in one area but not another.

J. Draft Report and Recommendations: Section 4.7 Copper

A member discussed his suggestion in the draft report to establish separate monitoring requirements for copper. He explained that much of the detail was from information provided by Dave Cornwell and Mike Schock. Systems would conduct pH and alkalinity monitoring to determine if their water is aggressiveness to copper. Those with water that is classified as non-aggressive would be required to maintain WQP levels that demonstrate their water is non-aggressive, but would not be required to conduct on-going copper monitoring. Those with water that is classified as aggressive could assess their water corrosivity using sample results from vulnerable houses (houses < 2 years old) or conducting a pipe loop study or they could make a change in water quality to move towards the non-aggressive bin. For as long as the system has aggressive water, it must conduct on-going PE program.

The member questioned if this proposed approach was warranted based on the health effects of copper compared to the additional burden that this requirement may place on systems compared to the existing rule. In response, members provided the following individual comments:

- A member stated that much of what is being discussed comes from an earlier proposal. He now thinks the required actions for a system with aggressive water is too extensive. A system in the aggressive bin would sample at new homes and probably would exceed the copper AL. It would have to do some PE and then add CCT. So a large number of systems would be adding treatment or perhaps adding more treatment. He suggested modifying the bullet on page 26 that starts with "If water is classified as aggressive to copper . . ." to eliminate the three approaches for addressing aggressive water chemistry. The remaining text would require systems with aggressive water to initiate and deliver a copper PE program without requiring CCT.
- Another member recommended retaining the three approaches to addressing aggressive water put placing it after the requirements to initiate and maintain a PE program (i.e., switching the order of the second and first sub-bullets on pages 26 and 27 in their entirety).
- Another member suggested requiring systems that know copper is being installed to have CCT.
- Another indicated that systems that do not have copper, e.g., mobile home parks (MHPs) should have an "off ramp". We should consider for systems with aggressive water how much new housing development is expected. Some systems do not have new copper and we need to consider this. Another member added that requiring a system to install CCT for a couple of new homes is not a good use of systems' resources.
- A system with water that is non-aggressive to copper should see if CCT is working but may not need thorough distribution system monitoring. In addition, a system does not need to conduct as much monitoring for copper as for lead.
- Copper tap monitoring may not be needed. Systems are already collecting samples related to lead. Under the new construct, systems are conducting pH and alkalinity monitoring to determine whether or not they have aggressive water to copper.
- A pipe loop study may not be a viable option for small systems.
- One member asked if a system with aggressive water must take measures to become a system with non-aggressive water or can they just deliver PE. In response, another member explained that the system must deliver PE unless it no longer has aggressive water.
- Another member stated that there is an inherent value and benefit to treating aggressive water, which degrades the system. Specifically, the avoided cost of replacing the distribution system and internal plumbing. This is independent of any health issues associated with copper.

The Group and EPA discussed if there was any data to indicate how many systems nationally would have water that is considered aggressive to copper. Specific comments included:

- Mr. Shock explained that EPA's data do not include copper samples from new homes or water quality data from small systems, which would be the best way to answer this question.

- Matt Robinson (OGWDW) indicated that EPA is having difficulty coming up with WQP screens that are implementable and that better data might be needed.
- Miguel Del Toral (EPA, Region 5) explained that EPA conducted a “back of the envelope” calculation in which they assessed the likelihood of systems serving < 50,000 having a copper ALE. The smaller ones that did WQP monitoring from representative sites⁷ are the systems we tended to not catch with the current copper sampling. He explained that some small ground water systems with high alkalinity in the Midwest have aggressive water. However, once these systems get above a certain alkalinity, they tend to have some CCT. We estimated that about 5% of all systems have aggressive water and most of them had CCT.
- Regarding the percentage of systems with water that is aggressive, one member thought there was some question whether the percentage of systems with aggressive water is higher than 5%. Another stated that the Group should not scale back our recommendations based on our uncertainty of the percentage of systems that have aggressive water. It is not the Group’s job to determine costs associated with a recommendation. One member responded that although we are not trying to figure out the burden of our recommendations, we need to think about the consequences.
- In considering moving away from required treatment for water that is aggressive to copper to only requiring PE, one member asked is there is another rule where education is the only recourse and if we can demonstrate that PE alone is reducing risk.
- Another did not see where high levels will trigger additional CCT needs. In response, one member explained that under the current rule, systems with aggressive water are sampling at sites where copper is unlikely to be found; therefore, they are not triggered into CCT installation. Under the modified rule construct, a system would determine if they have water that is aggressive to copper based on water quality. Those with aggressive water would be required to conduct PE as a first step. The second step would be to either prove that their water is non-corrosive or treat it to make it non-corrosive. The modified proposal is a step forward from the current rule; albeit it has fewer requirements than the Group’s original proposal to conduct monitoring and treatment first and PE in the meantime.
- Systems that do not have an ALE would not have WQP data so they would have to collect new data. Those that are currently collecting WQPs should be able to use that data.

EPA and the Group discussed compliance and copper health effects as follow:

- A member expressed concern that the proposal in the draft report allows systems to determine whether to install treatment or take samples. She would prefer that the LCR provides criteria that require CCT and a compliance mechanism. Another member explained that the current rule requires CCT if the system exceeds the copper AL. He added that the earlier proposal regarding

⁷ Section 141.87(c)(3) specifies that “Any ground water system can limit entry point sampling . . . to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated ground water sources mixes with water from treated ground water sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment.”

copper still had this requirement. In addition, copper has secondary effects such as bad taste and staining. He is comfortable leaving the decision to the PWS and state because the PE materials will explain the secondary effects of copper and customers are likely to complain or replace their copper if they have high levels.

- Mr. Burneson reminded the Group that copper has a general population effect as well as one for sensitive populations (those with Wilson Disease) and EPA is concerned about both.
- A member asked if there should still be copper sampling that would result in an ALE. In response one member explained that the proposed recommendations in the draft report provide for tap monitoring at vulnerable homes or a pipe loop study if water is considered aggressive. He added that water that is aggressive to copper will not always have copper issues due to passivation. Passivation occurs at different rates. He suggested a study to figure out the length of passivation as a possible option. Additional comments regarding copper passivation included:
 - Whether the criteria for determining if water is aggressive or not for new copper could be adjusted based on passivation time.
 - Mr. Schock indicated that the suggested criteria for aggressive water are based on national WQP data associated with water that may lead to copper ALEs in first-draw samples. PE may be a reasonable tool if passivation occurs in 6 months or year but he questioned if it is the best tool in those instances where passivation does not occur for decades. The original rule has an MCLG and assessment that treatment was warranted when the copper level exceeds 1.3 mg/L. He added that phosphates retard this passivation if there is an inadequate amount. If a system has one new house, it could provide filters.
 - Another member commented that the current rule might identify situations where water is very aggressive to copper and has long (multiple years) passivation time because copper would appear in tap samples.

K. Public Comments

1. Paul Swartz, Water Alliance

Mr. Swartz provided comments on Day 1 and Day 2 of the meeting. Remarks from both days are provided below:

- To get to where we want to go will be a complex and lengthy process. The LCRWG are vested in the issue of lead and need to be mindful that they know a lot more about lead than most people.
- PE needs improvement. For example, there are consumers from all educational backgrounds that do not know what to do if they have high lead levels (e.g., boiling water is not an appropriate measure for high lead). We have a medical professional community that is struggling with how to deal with this. We need to make sure consumers understand what is at stake so they can react to the problem. I am hopeful the LCRWG will figure out how to get rid of LSLs and continue to do the type of painful follow-up needed to make sure we will we get the

lead out. At this point, we cannot leave education to the public health organizations. They think that the lead in paint and dust is the highest priority and are not incorporating lead in drinking water into their programs. We need outside expertise for PE.

- Replacing LSLs is an important measure but LSLs are not the only source of lead for drinking water and these other sources need to be addressed. I have a few other concerns about the suggested long-term LSLR program:
 - Utilities have a mindset that lead is the consumers' problem because it is not coming from the plant. The LSLR program may take the place of more aggressive monitoring and the Group has not decided on the level of PE. Thus, the public may still have lead in homes or faucets, have even less information and have more of a sense of being alone in dealing with their lead problem.
 - CCT should be robust regardless of whether the system replaces its LSLs.
 - The Group needs to consider if their approach under SDWA will be robust enough in the long-run even if all LSLs are removed.
 - EPA should work with communities on obtaining financing for LSLR, with a focus on the most vulnerable populations.
- For each major section of the draft report, the Group should consider the consumer piece and integration within and beyond SDWA (e.g., integration with other federal and local programs, such as soil, paint and dust to remove lead sources).
- Consider what innovative approaches used under the Clean Water Act (CWA), such as consent decrees and science-based frameworks that allow for longer implementation, could be applied to the LCR. Build flexibility into the rule that would allow the utility to pick from a menu and over time to expand approaches that work. I applaud thinking outside the box, but the Group also needs to think through the consequences. Science including social science should be at the center of your decision and decisions should not be made on information that is a guess.
- We should establish technology transfer to get best management practices (BMPs) to smaller PWSs. Do not construct off ramps for small systems but build additional support that is centralized from EPA or a consortium of systems that would allow the sharing of information.
- The cost to the utility should not be the focus. The money comes from the consumers. Instead, we should consider if funds are spent in the wrong direction and we do not want to be responding to lead during emergencies.
- Do not allow systems to replace tap monitoring with volunteer home sampling. Volunteer testing does not give statistical results or provide information about worst case sites. Tap monitoring can be improved and volunteer testing could also be conducted in addition to tap monitoring.

2. France Lemieux, Health Canada

Ms. Lemieux provided the following comments on Day 2 of the meeting:

- I have concerns about not sampling at the tap. We need to scientifically understand what we are seeing when we sample at tap. If this aspect of the rule changes, I will need to explain why Canada is requiring this monitoring and the United States is not.
- The objective of the LCR is to have lead levels at the tap that are as low as possible. It is an indirect health-based objective. The goal is minimize exposure of lead, which Health Canada shares. I question how the lowest level of lead can be demonstrated if lead is not sampled at the tap. Also, corrosion control is optimized only if the system can demonstrate it against some measured baseline. The system needs to measure, put in treatment and determine if it works.
- Monitoring WQPs is important. CCT is controlling lead levels to some degree but WQPs are not a surrogate for lead at the tap. As a community dealing with lead level issues, we need to see we are controlling the process and minimizing WQP variability. The February 2015 AWWA article that was distributed at this meeting on process control lists some of variability that can occur in WQPs. About 90% of the pH samples had a high variability of 0.5 pH units. The range should be around 0.1 – 0.2 pH units. Also other factors influence WQPs such as seasonal variation. I have not seen any studies that have demonstrated any surrogate to estimate lead levels at the tap including WQPs.

L. Wrap up and Next Steps

The LCRWG decided to hold two additional meetings before the report is delivered to NDWAC. Ms. Bingham summarized the next steps as follows:

- LCRWG members will send her editorial comments on the draft report during February.
- The week of February 9, 2015: Ms. Bingham will email each LCRWG member to identify his/her interest in participating in a particular sub-group(s). Ideally, each sub-group will have 4 to 5 people and represent diverse backgrounds. To achieve that, members may be asked to switch subgroups. Topics the Group highlighted for sub-group discussion are:
 - LSLs including inventory, replacement program requirement, financing and definition of control.
 - Lead PE.
 - CCT and monitoring, with the possibility of having the role of tap monitoring as a separate subgroup topic.
 - Copper PE.
 - Compliance.
 - NTNCWS (as a possible topic).

- During March: Sub-groups will meet by phone to discuss specific topics.
- Late March: A sub-group will meet by phone to discuss compliance/enforcement issues.
- April 10: Distribution to LCRWG of revised draft report in track changes that reflects the discussions from the February meeting and sub-group discussions.
- April 23 -24, 2015: Meeting 6 in Cadmus' Arlington office. The goal will be to get agreement in principle on all recommendations.
- To be determined: Meeting 7. The goal will be to refine the language in the report that will be presented to NDWAC in late July.

EPA will also check the possibility of having a webinar prior to the last meeting to provide the NDWAC with key concepts and to get their thoughts and questions for consideration.

Action Items from the NDWAC LCR Working Group Meetings

TABLE 1: ACTION ITEMS FROM FEBRUARY 5 AND 6, 2015 MEETING

Row	Action Item	Responsibility ¹
1	Provide list of topics to RESOLVE for subgroup discussions.	LCRWG
2	Determine LCRWG member interest in subgroup participation.	RESOLVE/LCRWG
3	Hold subgroup meetings to discuss key topics and to provide refinements of these areas including enforceability and compliance recommendations.	LCRWG/RESOLVE
4	Provide suggested editorial changes to RESOLVE.	LCRWG
5	Provide a revised draft report in track changes that contains information from the February 2015 meeting and subgroups prior to the seventh meeting on April 23 and 24.	RESOLVE
6	Determine if and how NextGen principles can be addressed by the LCRWG in their report that would help EPA with the revised rule.	EPA
7	Provide information to the LCRWG on the size distribution of systems with LSLs.	EPA
8	Check if protocol allows for a webinar to be presented to the full NDWAC on the LCRWG's report in advance of the July NDWAC meeting.	EPA
9	Send doodle request for seventh and eighth meetings.	RESOLVE
10	Scan handouts and post materials to Google Drive	Cadmus/EPA

**TABLE 2: OUTSTANDING ACTION ITEMS FROM NOVEMBER 11 AND 12, 2014 MEETING
(NUMBERING REFLECTS NOVEMBER 2014 ACTION ITEM LIST)**

Row	Action Item	Responsibility ¹
3	Post Dave Cornwell's flushing study to Google Drive when it becomes available.	Dave Cornwell/EPA

**TABLE 3: OUTSTANDING ACTION ITEMS FROM MAY 29 AND 30, 2014 MEETING
(NUMBERING REFLECTS MAY 2014 ACTION ITEM LIST)**

Row	Action Item	Responsibility¹
11	Provide estimate of the number of systems that may qualify for a copper waiver.	EPA

**TABLE 4: OUTSTANDING ACTION ITEMS FROM MARCH 25 AND 26, 2014 MEETING
(NUMBERING REFLECTS MARCH 2014 ACTION ITEM LIST)**

Row	Action Item	Responsibility¹
10	If available, provide additional, existing background materials to LCRWG: Lead level trends for some Massachusetts systems	Steve Estes-Smargiassi
11	Assess availability of other requested information/conduct analysis as needed. How many large, medium and small systems are estimated to be required to re-optimize (i.e., how many will exceed the lead/copper action level) under new rule?	EPA

Acronyms: LCRWG = LCR Working Group; LSLR = lead service line replacement; NDWAC = National Drinking Water Advisory Council; OECA = Office of Enforcement and Compliance Assurance; PE = public education.

Notes: ¹ Unless otherwise stated, EPA refers to the Standards and Risk Management Division (SRMD).

List of Attachments

- Attachment A – List of Lead and Copper Rule Working Group Members and Meeting Presenters
- Attachment B – List of Attendees
- Attachment C – Final Meeting Agenda
- Attachment D – First draft Report of the “Lead and Copper Rule Working Group to the Full National Drinking Water Advisory Committee”. January 2015.
- Attachment E – “Next Generation Compliance – Principles for Highly Effective Regulation”. October 3, 2012.

ATTACHMENT A

Fifth NDWAC Lead and Copper Working Group Meeting
List of Lead and Copper Rule Working Group Members and Public Commenters
 February 5 and 6, 2015

NDWAC LCR Working Group
Christina Baker: Deputy Public Counsel, Office of the Public Counsel, State of Missouri
Leon Bethune, Director, Director of Office of Environmental Health, Boston Public Health Commission
Gary Burlingame: Laboratory Director, Philadelphia Water Department
Marilyn Christian: Manager, Environmental Health Programs, Harris County Public Health
Matthew Corson: Manager, Environmental Compliance, American Water
Derrick Dennis: Water Quality Unit Supervision, Office of Drinking Water, State of Washington
Stephen Estes-Smargiassi: Director of Planning, Massachusetts Water Resources Authority
Hector Gonzalez, Director Health Department, Laredo, Texas ¹
Yanna Lambrinidou, Parents for Non-toxic Alternatives
Thomas G. Neltner: National Center for Healthy Housing ²
John Sasur Jr.: Three Rivers Fire District, Massachusetts
Robert C. Steidel: Director Department of Public Utilities, City of Richmond Virginia
June Swallow: Chief, Division of Water Quality, Rhode Island Department of Health
Lynn Thorp: National Campaigns Director, Clean Water Action
Chris Wiant: President, Caring for Colorado
Nse Obot Witherspoon: Executive Director, Children’s Environmental Health Network ¹
EPA Office of Ground Water and Drinking Water
Eric Burneson: Division Director, Standards and Risk Management Division
Lisa Christ: Branch Chief, Targeting and Analysis Branch
Public Commenters
France Lemieux, Health Canada
Paul Schwartz, Water Alliance
Meeting Facilitator: Gail Bingham, RESOLVE

¹ These members were unable to attend the meeting.

² Formerly with National Resources Defense Council.

ATTACHMENT B

Fifth NDWAC Lead and Copper Working Group Meeting

List of Attendees

February 5 and 6, 2015

First Name	Last Name	Affiliation
John	Arnett	Copper & Brass Fabricators Council
Christina	Baker	MO Office of Public Council/National Association of State Utility Consumer Advocates
Victoria	Banus ¹	EPA
Leon	Bethune	Boston Public Health Commission
Scott	Biernat	Association of Metropolitan Water Agencies
Gail	Bingham	RESOLVE
Gary	Burlingame	Philadelphia Water Dept
Eric	Burneson	EPA
Lisa	Christ	EPA
Marilyn	Christian	HCPHES/NACCHO
David	Cornwell	EE&T
Megan	Cottrell ¹	Beacon Reader.com
Matt	Corson	NAWC/American Water
Leslie	Darman	EPA
Miguel	Del Toral	EPA
Derrick	Dennis	WA Department of Health
Shawn	Desaish	EPA
Lisa	Donahue	EPA
Laura	Dufresne	Cadmus
Jerry	Ellis	EPA
Stephen	Estes-Smargiassi	AWWA/MWRA
Peter	Grevatt ²	EPA
Chris	Fultz	EPA
Erik	Helm	EPA
Lisa	Huff	EPA
Anne	Jaffe Murray	Cadmus
Jeff	Kempic ¹	EPA
Carol	King ¹	EPA
Andy	Kireta Jr.	Copper Development Association
Yanna	Lambrinidou	Parents for Nontoxic Alternatives
France	Lemieux	Health Canada
Frank	Letkiewicz	Cadmus
Aaron	Levin ¹	EPA

First Name	Last Name	Affiliation
Dave	Lipsky	New York City Dept. of Environment
Suril	Mehta	EPA
Tom	Neltner	National Resources Defense Council
Darrell	Osterhoudt	Association of State Drinking Water Administrators
George	Rizzo	EPA
Alan	Roberson ¹	American Water Works Association
Matt	Robinson	EPA
Stephanie	Salmon ¹	EPA
John	Sasur	Three River Water Dept/NRWA
Mike	Schock	EPA
Paul	Schwartz	Water Alliance
Nicole	Shao	EPA
Lameka	Smith	EPA
Francine	St. Denis ²	EPA
June	Swallow	RI Department of Health
Jim	Taft ²	Association of State Drinking Water Administrators
Lynn	Thorp	Clean Water Action
Lynn	Thorp	Clean Water Action
Steve	Via	American Water Works Association
Chris	Wiant	National Drinking Water Advisory Council

¹Attended the February 5, 2015 session only.

²Attended the February 6, 2015 session only.

ATTACHMENT C

U.S. Environmental Protection Agency NDWAC LEAD AND COPPER WORKING GROUP

*The Cadmus Group, Inc.
1555 Wilson Blvd., Suite 300 | Arlington, VA 22209
703.247.6161
February 5-6, 2015*

Final Agenda

Meeting Objectives/Desired Outcomes:

- **Share perspectives and questions from past meetings;**
- **Seek conceptual agreement on recommendations; and**
- **Plan next steps.**

Advance materials: NDWAC LCR Work Group Report DRAFT [1 20 2015]; see also technical references and other materials on Google Drive: <https://drive.google.com/folderview?id=0B-3D2NT30pQDaFIGTTJnTWxmZ0k&usp=sharing#list>

Thursday February 5th, 2015

8:45-9:00 Informal gathering

9:00-9:30 Welcome, Introductions, Meeting Objectives/Agenda, Materials and Logistics

Advance materials: Proposed agenda

Welcome: Eric Burneson, Director, Standards and Risk Management Division, Office of Groundwater and Drinking Water Introductions:

Gail Bingham, *facilitator*

9:30-10:00 Discussion: Follow up on Topics from Past Meetings

Objectives: Address any unanswered or follow up questions. Share “take-aways.”

NextGen Compliance Principles [discussion of applicability to LCR]

SDWA anti-backsliding provisions

Other Discussion

10:00-10:45 Discuss Draft Report and Recommendations: Preamble (*Key Concepts?*) and Background Sections

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- Which preamble concepts in the straw draft should be included in the work group's report? Modified?
- Are any broad concepts missing from the preamble?
- Are there any significant gaps in the background section?

10:45-11:00 BREAK

11:00-12:00 Discuss Draft Report and Recommendations: Section 4.1 Remove the Source of Lead

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- See pages 11-12 of the draft.

12:00-1:00 LUNCH [on your own]

1:00-1:15 Public Comment

1:15-2:15 Discuss Draft Report and Recommendations: Section 4.2 Definition of Control

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- See pages 12-13 of the draft.

2:15-3:15 Discuss Draft Report and Recommendations: Section 4.3 Public Education for Lead

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- See pages 14, 15, 16 and 17 (four sets of questions, divided by section)

3:15-3:30 BREAK

3:30-5:15 Discuss Draft Report and Recommendations: Section 4.4 Corrosion Control and Section 4.5 Monitoring Requirements

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- *See pages 18, 20, 23 and 24 of the draft.*

5:15-5:30 Wrap Up

5:30 ADJOURN FOR THE DAY

Friday, February 6th, 2014

8:30-8:45 Informal gathering

8:45-9:00 Review Day Two Agenda

Objective: Reflections from Day One and confirm agenda for today.

9:00-9:30 Discuss Draft Report and Recommendations: Carry-Over Topics from Day One

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

9:30-10:30 Discuss Draft Report and Recommendations: Section 4.6 Health-Based Standard

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- *See page 25 of the draft.*

10:30-10:45 BREAK

10:45-12:15 Discuss Draft Report and Recommendations: Section 4.7 Copper

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- *See page 27 of the draft.*

12:15-1:15 LUNCH *[on your own]*

1:15-1:30 Public Comment

1:30-2:45 Discuss Draft Report and Recommendations: Open Session (for Addendum and for issues needing additional discussion)

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agreement on specific wording can wait until the April meeting.

Suggested Discussion Questions:

- *See page 28 of the draft.*

2:45-3:00 Wrap up and Next Steps

3:00 ADJOURN MEETING

Appendix D

Report of the Lead and Copper Rule Working Group To the National Drinking Water Advisory Council

DRAFT

[NOTE: THIS IS A FIRST DRAFT PREPARED BY THE FACILITATOR, FOR REVIEW AND DISCUSSION BY THE WORKING GROUP. IT DOES NOT REFLECT A CONSENSUS OF THE WORKING GROUP. THIS DRAFT DRAWS ON ELEMENTS TAKEN FROM MEETING SUMMARIES AS WELL AS FROM INPUT FROM INDIVIDUAL MEMBERS. IN SOME CASES, MORE THAN ONE OPTION IS INCLUDED.]

January 2014

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Appendices

Appendix A – Lead and Copper Working Group Members

Appendix B –

Figures

Abbreviations

AL – Action Level
ALE – Action Level Exceedance
CCR – Consumer Confidence Report
CCT – Corrosion Control Treatment
EPA – Environmental Protection Agency
LAL – Lead Action Level
LCR – Lead and Copper Rule
LCRWG – Lead and Copper Rule Working Group
LSL – Lead Service Line
LSLR – Lead Service Line Replacement
LTR LCR – Long Term Revisions to the Lead and Copper Rule
MCLG – Maximum Contaminant Level Goal
µg/L – Microgram per Liter
NDWAC – National Drinking Water Advisory Committee
OGWDW – Office of Ground Water and Drinking Water
OCCT – Optimum Corrosion Control Technology
OWQP – Optimal Water Quality Parameter
PE – Public Education
pH – Negative log of hydrogen ion molar concentration
PLSLR – Partial Lead Service Line Replacement
POTW – Publicly owned treatment works
POU – Point-of-use treatment device
PWS – Public Water System
SAB – Science Advisory Board
SDWA – Safe Drinking Water Act
TT – Treatment Technique
WQP – Water Quality Parameter

Report of the Lead and Copper Rule Working Group to the National Drinking Water Advisory Council

1. Executive Summary

The Lead and Copper Rule Working Group (LCRWG) of the National Drinking Water Advisory Council (NDWAC) has completed its deliberations on issues associated with long term revisions to the Lead and Copper Rule (LCR). This report includes the group’s findings and recommendations.

This executive summary provides a brief overview of the report. Details of the findings and recommendations are provided in the body of the report. A list of the members of the working group can be found in Appendix A.

1.1. Charge

The charge to the LCRWG was to provide advice to the NDWAC as it develops recommendations for the U.S. Environmental Protection Agency (EPA) on targeted issues related to long term revisions to the Lead and Copper Rule (LCR) under the Safe Drinking Water Act (SDWA).

1.2. Findings and Recommendations

There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for children and other vulnerable populations raising important questions of disparate impact and environmental justice. The best way of preventing lead exposure through drinking water is to remove lead from the drinking water system. Although leadership by EPA is essential, the goal to “get the lead out” can not be achieved by EPA regulation alone. Thus, this report includes recommendations both for revisions to the LCR and for renewed commitment, cooperation and effort by government at all levels and by the general public.

Specific recommendations of the LCRWG include:

Insert summary of recommendations after February meeting

2. Preamble [Key Concepts?]

There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for children and other vulnerable populations and lack of resources to reduce the sources of exposure in some communities raises important questions of disparate impact and environmental justice.

The best way of preventing lead exposure through drinking water is to remove lead from the drinking water system, the primary source of which is lead service lines (LSLs) in systems where they continue to be used. Lead also can be found in plumbing materials in residential buildings, schools, office buildings and elsewhere.

The Long Term Revisions to the Lead and Copper Rule (LTR LCR) are very important in removing sources of lead in contact with drinking water and for reducing exposure to lead from drinking water in the meantime. However, removing lead from drinking water systems also will require renewed commitment, cooperation and effort by government at all levels and by the general public. Creative financing and robust public education also are essential. Thus, this report includes recommendations both for revisions to the LCR and for wider action. We urge EPA to play a leadership role not only in the revisions to the LCR but also in educating, motivating and supporting the work of other agencies.

Several foundational concepts underlie the recommendations in this report, some of which can be accomplished by public water systems (PWSs) through the LCR and others of which may require non-regulatory action or programs by EPA and others. Additional detail is provided in the recommendations section below.

- As is emphasized above, there is no safe level of lead. Lead-bearing plumbing materials pose a risk at all times (not just when there is a lead action level (LAL) exceedance).
- Proactive action is needed to remove the sources of lead, with appropriate incentives to encourage such action both for (PWSs) and their customers. PWSs should establish lead removal programs with the goal of removing all lead from contact with drinking water over time, with risk reduction measures implemented in the meantime. In addition, stronger action must be taken when lead exposure levels pose a risk of imminent and substantial endangerment to the residents.
- Creative financing will be needed to achieve this goal for all individuals potentially exposed to lead, regardless of race, ethnicity or income. Leaving a lead service line in place because a low-income resident does not have the means to pay raises serious environmental justice concerns. EPA needs to work with agencies at all levels of government to support financial assistance programs for LSL removal. Building costs into a PWS's capital budget planning should also be a consideration.
- Enhanced public education must be a priority. The public plays a critical role in protecting their health by reducing exposure to lead and copper, and informing the public enables them to be effective participants in implementing their share of the responsibility.
- Successful implementation of the revised LCR can only take place in the context of a more holistic effort on lead in water issues involving stakeholders other than just EPA and water systems, and resources beyond those able to be brought to bear by water systems. Partnerships at all levels are essential. Recognizing that public agency budgets are tighter than ever, greater engagement by local health agencies, those funding housing programs, and those involved in permitting and construction is particularly important.

- The characteristics of the issues associated with lead and copper are very different. Thus, the monitoring requirements for lead and copper should be separated.
- The LCR should remain a treatment technique rule, but it can be improved, e.g., by developing more robust water quality parameter monitoring (WQP) requirements to demonstrate that a PWSs water is non-corrosive and to maintain those conditions.
- In-home sampling remains an important part of the LCR, but with a change in its purpose to site assessment sampling to provide information to residents.
- Filters are an effective means to protect residents from lead exposure, especially soluble lead, but they pose maintenance problems and may create the impression that the water isn't safe.
- OCCT is very complex. Providing technical assistance to PWSs is important, including updating the guidance manual on determining and evaluating OCCT to improve minimization of lead in plumbing systems from all sources.
- Attention to unintended consequences is important in complex situations such as the LCR. Examples in this context include considering the impact of phosphate as an OCCT chemical on POTWs and receiving waters and considering the role of OCCT for metals in addition to lead and copper.
- Attention to what systems can implement and States are able to oversee and enforce also is important. This may include recognizing the limits to a water system's authority on private property, including issues of access to private property or legal prohibitions against spending public money on private property. It also may require partnering with other entities that have additional roles, such as local government in setting ordinances, local health authorities in providing public education and assistance and customers in participating in risk reduction efforts.
- Reducing complexity by eliminating or modifying requirements that increase system burden without achieving reasonable reduction in lead and/or copper exposure can allow resources to be focused on actions that better achieve health outcomes.

3. Background

Under the Safe Drinking Water Act (SDWA) EPA sets public health goals and enforceable standards for drinking water quality.¹ The Lead and Copper Rule (LCR) is a treatment technique rule. Instead of setting a maximum contaminant level (MCL) for lead or copper, the rule requires (PWSs) to take certain actions to minimize lead and copper in drinking water, to reduce water corrosivity and prevent the leaching of these metals from the premise plumbing and drinking water distribution system components and when that isn't enough, to remove lead service lines under their control. The current rule sets an action level (AL), or concentration, of 0.015 mg/L for lead and 1.3 mg/L for copper. An AL is not the same as an MCL. An MCL is based on health effects and feasibility; whereas an action level is a screening tool for determining when certain treatment technique actions are needed.

The LCR action level is based on the practical feasibility of reducing lead through controlling corrosion. In the LCR, if the AL is exceeded in more than ten percent of tap water samples collected during any monitoring period (i.e., if the 90th percentile level is greater than the AL), it is not a violation, but triggers other requirements that include water quality parameter monitoring, corrosion control treatment (CCT),

¹ EPA establishes national primary drinking water regulations (NPDWRs) under SDWA. NPDWRs either establish a feasible maximum contaminant level (MCL) or a treatment technique "to prevent known or anticipated adverse effects on the health of persons to the extent feasible."

source water monitoring/treatment, public education, and lead service line replacement (LSLR). The rule also requires States to report the 90th percentile for lead concentrations to EPA's Safe Drinking Water Information System (SDWIS) database for all water systems serving more than 3,300 persons, and for those systems serving fewer than 3,300 persons only when the lead action level (LAL) is exceeded. States only report the 90th percentile for copper concentrations in SDWIS when the copper action level is exceeded in water systems regardless of the size of the service population. Public education requirements ensure that drinking water consumers receive meaningful, timely, and useful information that is needed to help them limit their exposure to lead in drinking water.

In early 2004, EPA began a wide-ranging review of the implementation of the LCR to determine if there was a national problem related to elevated levels of lead in drinking water. As part of its national review, EPA collected and analyzed lead concentration data and other information, carried out a review of implementation in States, held four expert workshops to discuss elements of the regulations and worked to understand local and State efforts to monitor for lead in school drinking water, including a national meeting to discuss challenges and needs. EPA released a Drinking Water Lead Reduction Plan (DWLRP) in March 2005. This plan outlined short-term and long-term goals for improving implementation of the LCR. The plan can be found at the following web address:
http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/lead_review.cfm.

In 2007, EPA promulgated regulations, which addressed the short-term revisions to the LCR that were identified in the 2005 DWLRP. These requirements enhanced the implementation of the LCR in the areas of monitoring, treatment, LSLR, public education and customer awareness. These revisions better ensured drinking water consumers receive meaningful, timely and useful information needed to help them limit their exposure to lead in drinking water.

EPA has continued to work on the long-term issues that required additional data collection, research, analysis and full stakeholder involvement, which were identified in the 2005 DWLRP and the 2007 rule revisions. This action is referred to as the LCR Long-term Revisions (LTR). The LCR LTR would apply to all community water systems (CWSs) and non-transient non-community water systems (NTNCWSs). In this report, the term public water system (PWSs) is meant to refer to both of these categories but not to transient non-community water systems.

Seeing the need for additional input on potential revisions to the Lead and Copper Rule, EPA requested that the National Drinking Water Advisory Committee (NDWAC) form the Lead and Copper Rule Working Group (LCRWG) to consider several key questions for the LCR LTR, taking into consideration previous input. The LCRWG met six times in 2014 and 2015 to produce this report, in which it provides recommendations on the LCR LTR.

A list of members of the working group is provided in Appendix A. *[add following approval...]* This report was approved by consensus of the LCRWG.]

4. Recommendations for Revisions to the Lead and Copper Rule

4.1. Remove Sources of Lead

Removing the sources of lead in drinking water should be a national goal. More proactive action than has taken place to date is needed to get the lead out. Although success in achieving this goal will require a concerted effort by many and can not be accomplished solely through the authorities provided under the Safe Drinking Water Act, revisions to the Lead and Copper Rule are an important component to

achieving this goal and should be structured accordingly. [See the Addendum to this report for recommendations that complement revisions to the LCR.]

The existing LCR has not been as successful as originally envisioned at creating incentives to fully remove LSLs and other sources of lead, such as from premise plumbing. To the contrary, a significant unintended consequence has been partial LSL replacement. EPA asked the Science Advisory Board (SAB) to evaluate the current scientific data regarding the effectiveness of PLSLR and the review centered around five issues: (1) associations between PLSLR and blood lead levels in children; (2) lead tap water sampling data before and after PLSLR; (3) comparisons between partial and full LSLR; (4) PLSLR techniques; and (5) the impact of galvanic corrosion.

The SAB found that the quantity and quality of the available data are inadequate to fully determine the effectiveness of PLSLR in reducing drinking water lead concentrations. The small number of studies available had major limitations (small number of samples, limited follow-up sampling, lack of information about the sampling data, limited comparability between studies, etc.) for fully evaluating PLSLR efficacy.

Recognizing the limits to current data, the SAB concluded that PLSLRs have not been shown to reliably reduce drinking water lead levels in the short-term, ranging from days to months and potentially even longer. Additionally, PLSLR is frequently associated with short-term elevated drinking water lead levels for some period of time after replacement, suggesting the potential for harm, rather than benefit during that time period. The available data suggest that the elevated tap water lead levels tend to increase then gradually stabilize over time following PLSLR, sometimes at levels below and sometimes at levels similar to those observed prior to PLSLR. The SAB also concluded that in studies comparing full LSLR versus PLSLR, the evaluation periods were too short to fully assess differential reductions in drinking water lead levels. However, the SAB explained that full LSLR appears generally effective in reliably achieving long-term reductions in drinking water lead levels, unlike PLSLR. Both full LSLR and PLSLR generally result in elevated lead levels for a variable period of time after replacement. The limited evidence available suggests that the duration and magnitude of the elevations may be greater with PLSLR than full LSLR.

The LCRWG has concluded that a key element in reliably reducing lead levels is to create interest and incentives for full LSL replacement, both by PWSs and their customers. Foundational building blocks for this include improved stakeholder education and engagement pertaining to LSLs and LSL replacement, active support in identifying funding sources and developing creative funding solutions and an active LSL replacement program. A revised definition of service line “control” should also be considered.

4.1.1. Update and improve access to information about lead service lines

Updating and improving access to information about the location of both full and partial lead service lines is important to successful, proactive outreach to customers who are most likely to have a LSL. The LCRWG recommends the following, step-wise approach.

- All PWSs should be required to review, update and prepare a plan for improving their existing LSL inventory, which was initially prepared to comply with the current LCR and which may potentially have been updated following lead action level exceedances. This should be accomplished within **xx** months of the effective date of a revised LCR.
 - The initial review and update would be based on existing records, such as historic building codes and practice, knowledge of local building patterns, home construction

dates, data readily available in utility records such as known areas where water main replacements have removed lead service lines.

- The plan for improving the PWSs LSL inventory should integrate data collection opportunities from on-going field activities, including the following:
 - Implement a SOP for identifying lead service lines during capital construction and emergency repairs and communicating with customers (information about lead service lines, associated risk, risk reduction options and full-lead service line replacement options).
 - Provide information to customers on how they can determine if they have a LSL (This outreach can be targeted based on local knowledge of areas with LSL vs newer construction) and solicit return provision of observations to the water utility.
 - Collect data during meter replacement program (or similar activity)
 - Notation of lead service lines during water quality or other service visits.
- The review/update of the system's LSL inventory and the plan for improving this inventory over time should be available for review by the state primacy agency during subsequent sanitary surveys.
- All PWSs should establish a clear mechanism for customers to access information on LSL locations (at a minimum). Detailed public education recommendations follow in a separate section. With respect to information about LSLs, PWSs should:
 - Have outreach materials that indicate that property specific information is available
 - Inform customers who may have LSLs the risks of partial line replacement, who is responsible for replacing the service line and the legal basis of that responsibility determination.
 - Provide information it has to existing home owners and residents on request
 - Provide information to realtors, home inspectors and potential home buyers on request
 - Communicate to those that inquire that this information is subject to disclaimer for accuracy based on information available to utility.

Compliance would include failure to prepare a plan for updating information about existing LSLs and/or failure to implement the plan within a reasonable time period, as determined by the primacy agency.

4.1.2. Establish active LSL replacement programs

Proactive LSL replacement programs are key to moving to a future in which lead is not in contact with drinking water. To accomplish this, the LCRWG recommends replacing the current regulations, in which LSL replacement is required only after the PWS takes action to optimize CCT. This currently means the LSL replacement horizon ranges from 15 years (7% per year) to never depending on action level status and where replacement most often means partial replacement). Instead, a revised LCR should include a requirement that all PWSs with lead service lines prepare and implement a LSL replacement program, along with a combination of changes to the regulatory approach described in this report and supportive actions by other public and private agencies and stakeholders.

Supportive actions include increased funding of federal lead risk reduction programs under the Department of Housing and Urban Development (HUD) to help fund customer-owned portions of LSLs and federal tax deductions for this purpose. Additionally, states should pass legislation requiring inspection, disclosure and/or replacement of LSLs on sale of property. Details on these and other ideas are included in the Addendum.

Revisions to the LCR should include the following provisions for PWSs to work with their customers to achieve full LSL replacement over time.

1. The LCR should set a non-binding goal to remove all lead service lines within a reasonable period of time. Such a goal would be analogous to a maximum contaminant level goal (MCLG), in that it is a “non-enforceable public health goal,” considering “only public health and not the limits of detection and treatment technology” such that they may be “set at a level which water systems cannot meet.” (See compliance requirements below.)
2. PWSs that identify LSLs in their inventory should be required to develop a Long-Term Lead Service Line Replacement Program Plan within **xx** months of the effective date of a revised LCR. Such plans should be submitted to the primacy agency for review as part of the sanitary survey process. Plans should include:
 - Integration of nonbinding goals (analogous to MCLG) for LSL replacement into long-term utility planning objectives, including a target timeline for achieving the goal(s).
 - Intermediate goals for replacement of utility and consumer portions of lead service lines over the length of the plan; periodically evaluate the program efficacy relative to these goals
 - Review of tools that may be available to assist customers replace their portion of lead service lines, such as:
 - Adapt low-income assistance programs for plumbing improvements
 - Adapt service line insurance programs
 - Adapt emergency bill payment relationships with community NGOs
 - Identify plumbers with appropriate training and potential provide a community-based reduced rate for LSLR
 - Community absorbing additional costs associated with street, sidewalk and other repairs that might otherwise be shared with homeowner.
 - Zero or low interest low programs paid through water bill
 - Others as appropriate given local institutional arrangements
 - Standard operating procedures (SOPs) to engage customers in full lead service line replacement and to take appropriate risk reduction measures during planned capital projects.
 - The SOP will be available to the state for review during sanitary surveys
 - Elements of SOP would include :
 - Prior notification (e.g., 45 days prior to planned main replacement or repair) - Contact letter to affected households likely to have lead service

- lines, providing (information about lead service lines, associated risk, risk reduction options and full-lead service line replacement options).
 - Reminder of flushing post LSLR (e.g., 48 hours prior to actual field work affecting structure) -- Door hanger (or alternative direct contact) with information on flushing and POU devices immediately after lead service line replacement.
 - Standard operating procedures (SOPs) to engage customers in full lead service line replacement and to take appropriate risk reduction measures during emergency main and service line repairs. At the time of actual field work affecting the structure, CWSs must provide:
 - Direction to information on lead service lines, associated risk, risk reduction options and full-lead service line replacement options.
 - Door hanger (or alternative direct contact) with information on flushing and POU devices immediately after lead service line replacement.
 - Water system SOPs include measures to obtain as complete a lead service line replacement as possible in the course of utility operations within existing legal constraints
 - Complete replacement of portions of lead service line owned by water system that are lead.
 - Provision of information to customer on available financial assistance programs.
 - Water system SOPs include flushing of service lines after lead service line replacement
 - CWS flush outside hose bib
 - Initial CWS flush followed by house flush by homeowner or plumber using multiple taps to maximize water velocity
 - Water utility will advise other utilities engaged in construction that affects water service lines or water mains of required SOPs for lead service line replacement.
3. A revised LCR also should include the following requirements for individual structures or campuses of buildings that are “public water systems” and own their own pipes.
- Noncommunity water systems with lead service lines should replace lead piping within **xx** years of rLCR.
 - Individual businesses, nonprofit organizations and governmental buildings or campuses that are operated as “public water systems” (e.g., hospitals, churches, schools, jails, etc.) should replace lead piping within **xx** years of rLCR.

Compliance would include failure to prepare a plan for LSL removal and/or failure to implement the plan within a reasonable time period, as determined by the primacy agency.

Discussion Questions:

1. *How can the rule be structured to encourage utilities to set and implement ambitious goals for LSL removal without being overly punitive? What should the revised LCR require, e.g., for what must be included in the plans? For enforceable milestones?*

2. *What should be the deadline for submitting LSL removal plans? For removal by non-community water systems?*
3. *What are the implications and/or variations for small systems?*
4. *How will compliance be determined? Are intermediate milestones binding? What are the timeframes and replacement frequencies to demonstrate progress towards the long-term non-binding replacement goals? Should PWS plans include some set number/percentage of LSL replacements for enforcement purposes?*
5. *What are the implications of LSL replacement programs for the anti-backsliding requirements under SDWA (depending on the degree to which actions to implement the plans are required)?*
6. *Would partial LSLR be prohibited or allowed under capital improvement programs?*
7. *Should there be a separate section on requirements for LSLR and/or PE during emergency main and service line repairs? e.g., flushing?*
8. *How would partial LSL replacement be considered under emergency and infrastructure replacements? (Is the assumption that these lines would not be considered as replaced until they are fully replaced?)*

4.2. Revise the definition of “control”

In the current lead and copper rule, when a system exceeds the LAL, EPA requires water systems to replace only that portion of the LSL that it owns. This is based on EPA’s current interpretation of the term “control” in the definition of public water system as limited to ownership. In the original LCR, promulgated in June 1991, EPA interpreted “control” more broadly and required systems to replace the entire LSL up to the building inlet, unless the system demonstrated to the State that it controls less than the entire service line. The 1991 LCR included a rebuttable presumption that a water system controls the entire LSL if, as defined by state statutes, municipal ordinances, public service contracts or other applicable legal authority, the system has: (1) authority to set standards for construction, repair or maintenance of the service line; (2) authority to replace, repair or maintain the service line; or (3) ownership of the service line.

EPA’s regulation establishing the presumption of control was the subject of a legal challenge. The Court found that EPA had not provided adequate notice of the definition of control and accordingly, remanded the matter to the Agency. (*Am. Water Works Ass’n v. E.P.A.*, 40 F.3d 1266, 1274 (D.C. Cir. 1994)). The Court did not rule on the merits of EPA’s definition of control.

On remand, EPA proposed in 1996 a revised definition of control that would require water systems to replace the portion of the line that they own, as well as any additional portion which the system has the authority to replace, in order to protect the quality of water delivered to the user. So that the rule would be self-implementing, EPA also proposed to not include either the rebuttable presumption of control or the requirement for systems to affirmatively document to the state that they do not control the entire service line. The Agency solicited comments, specifically regarding the degree to which systems may have the authority to replace the privately-owned portions of LSLs. EPA also solicited comments regarding the option of only requiring replacement of the portion of the line owned by the water system, explaining that such an approach would further simplify implementation of the rule because the division in ownership between the system and the user would be clear to all parties. In the final rule promulgated in 2000, EPA elected to define control to mean ownership. This was to eliminate confusion, and to avoid delays with implementation of the rule. As a result, under the current rule, a water system is only required to replace

the portion of the lead service line it owns and to offer to replace, at the customer's expense, the portion of the line that the system does not own.

Option 1:

- The current definition of control as “ownership” should be replaced with a requirement that PWSs must replace the entire LSL, where they have the authority to “replace, repair or maintain” the line or where they have other forms of authority over the LSL.

Option 2:

- Retain the current definition of control as “ownership.”

Discussion Questions:

1. *Are there other options?*
2. *What is being sought through each definition?*
3. *What are the concerns with these definitions?*
4. *What opportunities are created by a change in the definition of control? Any limitations?*
5. *How can concerns be mitigated? And/or how can desired outcomes be achieved in another way?*
6. *What implications does the control vs. ownership issue have for the proposal for a revised LSL replacement program?*
7. *Is the control vs. ownership definition as significant an issue, if all systems have a mandatory LSL replacement program?*

4.3. Develop Stronger Public Education Requirements and Programs for Lead and LSLs

Notifying and educating the public about lead in drinking water is very important for real risk reduction. The current LCR does not adequately focus on creating on-going opportunities to educate customers on the risks of LSLs or on opportunities to replace them, especially when action is most likely, e.g., at the sale of a home. Public education about the risks of lead in drinking water also is important regardless of whether LSLs are present, since lead can be present in other premise plumbing materials.

Various elements that should be included in PWS education and notification materials are presented below. Communication in languages appropriate to the demographics of the community, in clear terms understandable by the public and with engaging, reader-friendly graphics, photos and video all help achieve greater understanding. Outreach programs and materials can be improved by involving people with diverse and consumer oriented expertise and perspectives, included consumer-centered risk communication experts, community members with extensive experience with lead in water including individuals not necessarily affiliated with an organization, lead/copper corrosion experts, grassroots public-health workers and staff of PWSs, state and federal regulatory agencies and public health agencies. In-person communication also is important.

Health risks

- Clear and prominent statement that no level of lead in drinking water is safe for human consumption

- Clear and distinct language on the health risks of consuming lead in drinking water and identification of the most vulnerable populations
- Importance of drinking water as a lead source
- How to have BLLs checked and limitations of testing

Forms of lead in water and health risk implications

- Soluble
- Particulate
- Concentrations of lead compared to lead in paint and CPSC “acute health risk” standard
- Unpredictability of lead release

Sources of lead in water

- Where lead can come from community systems
- LSLs
- Other lead-bearing plumbing
- Scale on internal plumbing that became a source of lead from present or past LSLs
- Relative importance of LSL as a source
- How to have water tested and limitations of testing
- List of labs for testing water other than the utility and what to ask for in terms of number and size of bottles, diameter of mouth of bottles, analysis that measures lead particles, etc.

Identification of service line material

- How to recognize a pipe that is made of lead (and when not to check due to age of home)

For homes with LSL

- LSL ownership
- Difference between full and partial lead service line replacement (physically and in terms of health risks)
- Benefits to full LSL replacement
- Actions to take if you have a partially replaced LSL
- Available methods for LSL removal
- Opportunities for removal, approximate cost and financing options
- Overall benefits to the community of removing LSLs fully (lower treatment costs, better community health, environmental, etc.)
- Where applicable, requirements for notification during real estate transfer or new rental

Health-protective actions

- Precautionary water-use practices
- Replacement of leaded plumbing with lead-free plumbing

Additional information

- How to contact your utility and request an inspection and/or water test
- Reference to utility-specific website with local lead-related documents and data (e.g., CCRs, sampling protocol used for LCR compliance, lead-in-water test results, etc.)
- What you need to know about lead in water in schools and day care centers (it is not regulated, and link to national website that provides more information)
- Reference to a national website that provides a video version of basic educational information, including information on how the LCR works (with minority language versions)
- Where to get more information on drinking water, on lead in water, and on lead in general

This information can and should be conveyed in different ways and through different communication channels, tailored to the specific circumstances.

The LCRWG recommends the following:

- Revise the current CCR language to address lead service lines and update the health statements.
- Strengthen requirements for public access to information about lead service lines, tap monitoring results and other relevant information.
- Add requirements for targeted outreach to customers with lead service lines

Discussion Questions:

1. *Are there other options? Elaborations to these options? (e.g., Are any recommendations needed to address PE in situations where there is no LAL exceedance or are current rule requirements sufficient?)*
2. *Concerns / revisions to address concerns?*
3. *When should PE materials be provided? On-going? Triggered?*
4. *What delivery mechanisms should be allowed for PE?*
5. *At what frequency should PE materials be provided? For how long?*
6. *Who should create the national web site?*
7. *Are there privacy concerns that need to be considered?*

4.3.1. Revise the current CCR language

The LCRWG recommends the following requirements be included in a revised LCR:

[options are not necessarily mutually exclusive.]

Option 1:

The following is a suggested revision intended to increase public awareness about LSLs and to encourage public engagement in replacing them (added language is underlined).

Important Information from EPA about Lead *If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with ~~service lines and~~ home plumbing and service lines (the pipe connecting your house to the water main). (System name) is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. Contact us for information about lead service lines, how to find out if you have one and why you should replace it.*

When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or www.epa.gov/safewater/lead.

Option 2:

The public health statements in the CCR should be updated to reflect current understandings that there is no safe level of lead, that this risk pertains to everyone, and that some individuals are particularly vulnerable.

Discussion Questions:

- 1. Are there other options? Elaborations to these options?*
- 2. Concerns / revisions to address concerns?*
- 3. Comments on the flushing instructions?*

4.3.2. Strengthen requirements for public access to information

Greater public access is needed to information of many kinds. A national, accessible website would be valuable in addition to the recommendations below, as described in the Addendum to this report.

The LCRWG recommends the following requirements be included in a revised LCR:

[options are not necessarily mutually exclusive.]

Option 1:

Utilities serving populations greater than 100,000 currently are required to post their CCR on a publically accessible web site and many have their own web site. The LCR should be revised to require such systems also to provide information about lead service lines, how to determine if they have one, associated risk, information about in-home sampling (as further described in Section 4.5), risk reduction options and full-lead service line replacement options.

All other systems must make this information available, either through their web site or by other means.

Option 2:

A revised LCR should require that PWSs serving more than 100,000 population provide all lead and copper related data, sampling methods, measurements, local ordinances and regulations online at all times. Small and medium-sized systems should be required to provide such data on request, in a timely fashion.

Option 3:

Robust PE about the risks of lead-bearing plumbing and the benefits of a) removing this plumbing and/or b) taking regular precautions when cooking or drinking, would be delivered regularly, regardless of a PWS's compliance with the LAL and regardless of whether there are LSLs in the service area since lead leaching can occur in buildings without LSLs.

Discussion Questions:

1. *Are there other options? Elaborations to these options?*
2. *Concerns / revisions to address concerns?*
3. *Option 2 – How long would data remain on the site? Would addresses be provided? Privacy concerns? Reporting burden?*
4. *Option 3 – what would be the frequency and delivery mechanisms?*
5. *What, if any, forms of e-communication would be appropriate/allowed?*
6. *Should PWSs be required to update information periodically?*
7. *How will requirements be enforced?*

4.3.3. Add requirements for targeted outreach to customers with LSLs

PWSs should implement a program of targeted outreach to customers with LSLs, which would inform the customer that they have a LSL and/or how to determine if they have one, the health risks associated with exposure to lead, risk reduction options and their options for full LSL replacement. Targeted outreach would be based on available information, updated over time, per recommendation 4.1.1 above. When detailed understanding of LSL occurrence is lacking, then targeting can be based on more general information such as development period of home or even distributed to communities as a whole.

The LCRWG recommends:

[options are not necessarily mutually exclusive]

Option 1:

Where customers are believed to have LSLs based on the LSL inventory (or alternatively to customers more broadly), PWSs should be required to include information about LSLs, how to determine if they have one, associated risk, risk reduction options and full LSL replacement options in a “new account” welcome letter.

Option 2:

PWSs should be required to offer customers with LSLs the opportunity to have in-home tap samples tested, seeking to capture water that has been resident in the LSL for some time.

Option 3:

PWSs should be required to conduct direct, targeted outreach actively soliciting LSL replacement by contacting xx percent annually (e.g., 10%) of customers with LSLs in water system service area encouraging those customers to participate in full LSL replacement. Where customer agrees to participate, the PWS will replace its portion of the LSL. Timing of replacement should be coordinated between customer and the PWS.

Option 4:

PWSs should be required to provide information to customers with LSLs about filters including how to maintain them and differences in their ratings.

Discussion Questions:

- 1. Are there other options? Elaborations to these options?*
- 2. Concerns / revisions to address concerns?*
- 3. Option 2 – who pays for the tap sampling (resident or system)?*
- 4. Option 3 – is there a minimum percentage that needs to be replaced? What is the consequence if customers don't agree to full LSLR?*
- 5. Option 4 – are systems providing filters under this scenario? (If so, POU filters with exception of pitcher filters can invoke SDWA requirements.) What information would be provided, if not?*

4.4. Improve Corrosion Control

PWSs subject to the LCR are required to minimize lead and copper levels at consumers' taps by controlling corrosion in the distribution system. Corrosion Control Treatment (CCT) involves the addition of chemicals (e.g., orthophosphates or silicate) to create a barrier between the pipes and the drinking water or to modify drinking water chemistry (such as pH and hardness) to inhibit the potential for corrosion. The concept is to manage the treatment system to reduce corrosion (and, thus, the release of metals such as lead and copper) in the distribution system.

Under the current LCR, PWSs serving more than 50,000 people were required to work with their primacy agency (typically the state) from 1994 to 1997 to designate and install optimal corrosion control treatment. Systems serving 50,000 people or less must optimize corrosion control treatment only if the results of lead and copper tap sample exceed the action levels. A PWS exceeds the action level if ten percent or more of the tap samples collected are greater than the action level. A PWS serving 50,000 people or fewer must work with the primacy agency to designate and install optimal corrosion control within a six or more year period following lead or copper sampling results that exceed the action level for lead and copper.

The LCRWG has concluded that it is possible to improve the corrosion control requirements of the LCR by requiring all PWSs to: 1) assess the corrosivity of their water; and 2) where water chemistry is corrosive, to optimize corrosion control; and 3) monitor water quality parameters to confirm that they are maintaining these characteristics.

Specifically,

- When water system does not contain lead it does not have to consider Pb release in corrosion control planning (Current waiver from monitoring for lead is retained and extended.)
- When making changes to treatment or changes in water source a water system should work with the primacy agency to identify proper sampling if needed. Sampling could include targeted sampling such as profiling, sampling of lead service lines, etc. as part of special studies to spot potential corrosion control difficulties.
- There are counter-balancing constraints on orthophosphate addition that must be considered:
 - Efficacy given corrosion control goals beyond lead and copper release
 - Negative impacts on water system infrastructure and customer plumbing
 - Increasingly stringent regulation of phosphorus under the Clean Water Act
 - Lack of demonstrated adequacy to control particulate lead release
- Water systems collect, record and manage data in a manner that informs long-term improvement of corrosion control practice
 - Guidance for use of control chart techniques to track and improve corrosion control chemistry
 - Maintenance of records including control charts available for review during sanitary surveys
 - Control charts should be based on median binned data as described in Cornwell et al JAWWA Scheduled Feb 2015. In general,
 - Individual data points grouped into appropriate bin sizes
 - Use median control charts rather than mean
 - Control charts are to improve operations and are to be made available for sanitary survey
 - Control chart limits are not regulatory limits
 - Primacy agency and water system to establish allowed ranges or minimum/maximum for WQPs. These values can be superimposed on control charts for compliance review

Compliance is failure to maintain control charts and/or failure to maintain median of “binned” values within defined regulatory range for **XX** (??) consecutive months.

Discussion Questions:

- 1. What kind of testing would systems be asked to do to assess corrosivity? Corrosivity to what?*
- 2. What would be the optimization requirements?*
- 3. What is contemplated with respect to retaining and extending the current waiver for monitoring for lead (first bullet above)?*
- 4. Does the second bullet leave it up to the state and PWS to develop utility-specific sampling plans?*
- 5. Should and/or how should this recommendation be tailored to systems of different sizes and/or water chemistries? Community versus non-community? Would small systems prefer the option to continue with tap sampling instead of process control WQP monitoring? What would the implications be?*
- 6. What would the differences be to the current system of WQP monitoring? How might these requirements complement current WQP requirements?*
- 7. Are there other options for improving corrosion control treatment? Modifications to this option?*
- 8. How would compliance with State specified WQPs be determined under this control chart approach? How would compliance with ranges be determined in the last sub-bullet of the data management expectations above?*
- 9. Are the data management expectations in the fourth bullet a requirement or suggestions (possibly for guidance)? Would expectations differ by size of system?*

4.5. Modify Monitoring Requirements

Under the current LCR, a PWS is required to conduct monitoring to assess the effectiveness of its corrosion control treatment (CCT) and trigger additional actions to reduce exposure when necessary. Water systems must compare sampling results to an Action Level (AL). The AL for lead is 15 µg/L and the AL for copper is 1.3 mg/L. In the Lead and Copper Rule (LCR), water systems must prioritize sample site locations (often residences) within the distribution system which are at a high-risk of elevated lead and/or copper in the water. Selection and use of these elevated lead and copper sites enables a smaller number of sample sites than random or geographic site selection procedures.

Implementation of this approach over time has revealed numerous challenges. Recruitment of customers to take in-home samples is difficult. Customers are not professional samplers and, thus, may implement the sampling protocols inconsistently. Research on sampling protocols has shown that sampling results may vary and not necessarily consistently, based on the configuration and length of lines from the water main to the sampling tap and whether the sample is a first draw or a subsequent sample intended to reflect water that had been in a LSL for some time.

In addition, while such sampling is intended to assess the effectiveness of CCT to achieve public health protection rather than as a direct measure of public health protection, concerns about residents of individual households still being exposed to high levels of lead are understandable, whether or not the system as a whole exceeds the AL. Concerns that adjustments to CCT can't reduce public health risk when high lead levels in individual samples may come from particulate lead also must be taken seriously,

particularly given the risk of changes to CCT causing unintended consequences to other aspects of drinking water treatment.

Option 1:

Thus, the LCRWG recommends a shift in the functions of monitoring at the tap and of water quality parameter (WQP) monitoring in the LCR. The rationale for this approach is that WQP monitoring is a more direct way to ensure CCT is optimized. It should be strengthened.

The LCRWG believes there is a role for in-home tap monitoring and suggests that it be used to understand and take action to reduce lead exposure in specific premises as part of a robust program of lead removal as described above, where households with LSLs have been identified, informed that they have a LSL, can participate in a LSLR program and need information to reduce the risks of lead exposure directly until their LSL is replaced.

CCT and appropriate monitoring of and adherence to water quality parameters, plus a more aggressive approach to LSL replacement reduces the value of in home sampling for regulatory purposes. Tap sampling would continue at the request of customers with LSLs, as an off-ramp from the current approach (systems that are over the action level would work with their State on appropriate next steps for transition, which may include some samples) and also may be part of investigative research when treatment or sources change.

Option 2:

PWS compliance with the LCR would be linked to a LAL that is set to reflect a specific level of risk in a specific vulnerable population and used as a trigger to *escalate* corrective measures, not to determine whether such measures are needed, since to some degree public health protection measures are needed at all times whenever lead is in contact with drinking water.

Public water system compliance with the LCR would *not* be linked to water quality parameters. Water quality parameters would be used simply for guiding CCT, not for achieving regulatory compliance.

In-home water sampling would be restricted to a sampling protocol that is designed to capture highest lead levels in truly highest-risk homes, whether the leaching comes from LSLs, leaded brass, lead solder or non-lead particles that have absorbed lead from other lead-bearing plumbing components.

Escalation of remedial measures during a LAL exceedance (or repeated LAL exceedances) OR during exceedance of a health-based threshold level (i.e., health-based standard) as follows:

+ **For PE:** During a LAL exceedance or when a health-based threshold level of lead in water (or health-based standard) was exceeded in any home in a PWS's sampling pool (this bullet echoes CDC's 1/19/11 recommendation to EPA; although escalation of PE requirements during a LAL exceedance is already part of the Rule, it needs serious improvement).

+ For LSL replacement: If the LAL were exceeded twice (or re-exceeded again at a future time), PWSs would be required to continue with full LSL replacement until all LSLs were out regardless of the PWSs' ability to fall back under the LAL.

Discussion Questions (Section 4.5 as a whole):

1. *What are the pros and cons of using WQP monitoring for compliance purposes and in-home tap sampling for assessing and mitigating risk at individual premises?*
2. *Should / how should these options be strengthened to ensure protection against exposure to lead in systems that do not have LSLs?*
3. *Any other options? Modifications to these options?*
4. *What are the enforcement and compliance implications?*
5. *How is copper handled under these options?*
6. *Option 1 –*
 - a. *What is the role of an AL under this construct? How would compliance with the AL work if there's no in-home sampling? Are there other ways to use the current AL, other than as a trigger requiring system-wide actions, e.g., for actions in response to results of tap monitoring at individual premises?*
 - b. *What are the implications of using WQP monitoring for compliance purposes for the anti-backsliding requirements under SDWA? Does this imply setting WQPs more tightly than they have been in the past?*
 - c. *What is the compliance monitoring frequency for WQPs under this option?*
 - d. *What should the frequency be of in-home tap monitoring for customers with LSLs? Who would pay for the analyses?*
 - e. *What are the appropriate criteria/steps for a PWS transition from current monitoring requirements to a new system? (discuss in context of table below)*
7. *Option 2 –*
 - a. *What information (studies) are available to inform a “specific level of risk for specific vulnerable populations?” How would this work without revising tap monitoring to reflect normal exposure?*
 - b. *How would a LAL exceedance be determined? (e.g., through the in-home tap sampling described in the third paragraph?)*
 - c. *How would the LSL replacement requirement here work with the LSLR plan requirement in section 4.1.2?*

[Sections 4.5.1 and 4.5.2 below provide additional detail on option 1.]

4.5.1. Sampling for Customers, Changes in Treatment or Source Water and for CCT Compliance

A revised LCR should require the following:

- Households with LSLs must be given the opportunity to have tap water samples tested by the PWS, be provided the results, and be provided information on ways to reduce lead exposure, including but not limited to LSL removal. Samples should be taken using a protocol that captures water that had been in the LSL for some time.
- PWSs making a major change in treatment (e.g., change in disinfectant) or adding a new water source should evaluate CCT, which may or may not require sampling at the tap. This determination should be made in consultation with the primacy agency
- PWSs in compliance (either with a lead removal program or that have no LSLs in their distribution system) may transition from in-home sampling for lead to water quality parameter (WQP) monitoring for assessing the effectiveness of CCT or of their water quality characteristics, whether or not the system’s treatment system was designed for corrosion control.

4.2.1.1 Sampling for Customers

While in-home sampling may not be useful for determining compliance with CCT requirements as part of a revised LCR, in-home sampling does provide information about a specific premise that can help a customer put appropriate risk reduction measures in place. PWSs should respond to customers about lead generally and must give households with LSLs an opportunity to have their tap water sampled by the PWS.

In-home sampling also can be used to:

- Build awareness of lead in drinking water with local health agencies
- Inform changes in drinking water treatment and source water changes (assuming the same sites are being monitored)
- Be part of full investigation by health agency in homes where children have elevated BLL

EPA should provide sampling guidance for in-home sampling that would assist systems and customers take samples that are “fit for purpose.” Such purposes include: screening, understanding the exposure at a single structure, evaluating sources of lead in a specific home and understanding impacts from changes in treatment or source.

Other considerations in sampling for customers:

- Utility may process samples for customers on request or direct customers to state approved laboratories
- When a utility processes such samples, the system will retain the observed values for use to inform future analyses of system water quality
- If compliance monitoring no longer includes lead sampling in the home, then CWS should provide screening sample analysis as a component of public education

4.2.1.2 Changes in Treatment or Water Source

Requirements of the current LCR should continue. PWSs making a major change in treatment (e.g., change in disinfectant) or adding a new water source should evaluate CCT, which may or may not require sampling at the tap. This determination should be made in consultation with the primacy agency.

4.2.1.3 Transition to CCT Compliance Monitoring

PWSs in compliance (either with a lead removal program or that have no LSLs in their distribution system) may transition from in-home sampling for lead to WQP monitoring for assessing the effectiveness of CCT or of their water quality characteristics, whether or not the system’s treatment system was designed for corrosion control.

Condition	Monitoring for Pb with in-home sampling required.
<ul style="list-style-type: none"> • If below current AL (Pb= 15 ppb) (e.g., in-home monitoring for lead is no longer required for LCR compliance monitoring) 	<ul style="list-style-type: none"> • Two most recent consecutive rounds below the AL. • Maintain OCCT conditions during past satisfactory performance period • No change in source or treatment.
<ul style="list-style-type: none"> • If above current Lead AL ([Pb] > 15 ppb) 	<ul style="list-style-type: none"> • Work with primacy agency to optimize corrosion control

4.5.2. Water Quality Parameter Monitoring (frequency and number of locations)

If WQP are to be used as the focus of ensuring the corrosion control is continuing to be appropriately practiced, the revised LCR should include requirements to make the sampling fit for that purpose.

- Systems that manage pH and/or alkalinity or add a corrosion inhibitor for purposes of optimized corrosion control should **maintain a record of practice.**
 - No less frequently than daily observation of finished water (point-of-entry-to-the-distribution system) pH, alkalinity and/or corrosion inhibitor as applicable to the system’s corrosion control strategy.
 - Logs of chemical usage including chemical and weight applied.
- All community water systems should monitor distribution system water quality parameters (whether or not CCT is employed).
 - Sample locations
 - Located to capture variability in the distribution system
 - Coordinated with other distribution system sampling schemes (TCR, DBPR)
 - Reflected in a plan approved by the State and available to be reviewed in Sanitary Survey
 - Samples per sample site / monitoring period
 - Monitoring described as single sample per sample site per monitoring event
 - Monitoring to be distributed throughout the monitoring period and calendar year

- Number of samples per year does not need to be large in order to capture relevant variability. Number of sites would increase as a function of system size and number of sources / treatment
- Concept is frequency is increased, but number of sites might be able to be decreased
- Frequency (Routine)
 - Monitoring should be monthly
 - Frequency could be lower for GW systems than SW systems
 - Frequency could be lower for systems with less corrosive water
- Frequency (Reduced)
 - No reduced monitoring provision for water quality parameter monitoring
- Frequency (Waiver)
 - No waiver provision for water quality parameter monitoring

Discussion Questions:

1. *What is the additional burden of maintaining a record of practice for small systems that meet the AL now but adjust pH, alkalinity or OPO4?*
2. *How would sections ii and iii relate to one another? Is the frequency in iii(1) less stringent than the current rule?*
3. *What is the rationale for iii(2)?*
4. *How would “less corrosive” be defined in iii(3)?*

4.5.3. Sample Invalidation Criteria

Under the existing regulation (141.86 (f)(1)), “The State may invalidate a lead or copper tap water sample if at least one of the following conditions is met.

- (i) The laboratory establishes that improper sample analysis caused erroneous results.
- (ii) The State determines that the sample was taken from a site that did not meet the site selection criteria of this section.
- (iii) The sample container was damaged in transit.
- (iv) There is substantial reason to believe that the sample was subject to tampering.”

These are all good and necessary reasons for invalidating a sample and should be retained, but because this list is limited, samples must be accepted that are obvious “outliers” and don’t represent the water that is normally consumed and should not be used as a basis for treatment changes or public education. This is especially true for small systems where the limited number of samples required means that a single, unusually high, value can cause the Action Level to be exceeded. This could lead to installation of expensive treatment when treatment is not needed or adequate corrosion control is already being provided. While probably not as frequent, non-representative samples could also cause water systems to

be below the action level when treatment changes really are needed. Good invalidation criteria can help states address both problems.

The purpose of the invalidation is to make sure that decisions are based on the most representative set of samples possible and to do so through a process that provides adequate information to make good invalidation decisions and assures documentation of the reasoning behind the invalidation.

The following is a proposal from states that will serve those two functions.

States believe that the essential criteria for invalidation are already well stated in the Revised LCR Monitoring and Reporting Guidance (EPA 816-R-10-004, March 2010) (<http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/upload/Revised-Lead-and-Copper-Rule-Monitoring-and-Reporting-Guidance-for-Public-Water-Systems.pdf>) or the October 2006 memorandum on Management of Aerators During Collection of Tap Samples to Comply with the Lead and Copper Rule (http://water.epa.gov/lawsregs/guidance/sdwa/upload/wsg_178.pdf). The language in these documents is consistent with the sampling requirements in 141.86 (b).

- “Always collect a first-draw sample from a tap where the water has stood in the pipes for at least six hours (e.g., no flushing, showering, etc.). However, make sure it is a tap that is used regularly, and not an abandoned or infrequently used tap.”
- “First-draw samples collected at single-family residences must always be drawn from the cold-water kitchen tap or bathroom tap.”
- “First-draw samples collected from buildings other than single-family homes must always be drawn from an interior tap from which water is typically taken for consumption.”
- “Therefore, public water systems should not recommend that customers remove or clean aerators prior to or during the collection of tap samples for lead.”

Discussion Questions:

1. *How would these recommendations fit with some of the scenarios above, where tap monitoring is no longer used to trigger actions?*
2. *Would EPA’s proposed maximum stagnation time help address the first bullet above?*

4.6. Establish a Health Based, Substantial and Imminent Endangerment Standard

The current LCR attaches PWS compliance to two main requirements: staying within a set range of water quality parameters and staying under the LAL. However, neither requirement directly corresponds to consumer exposure to lead in water or associated health risks from such exposure. In other words, neither requirement is designed to directly protect public health. Specifically, staying within a set range of water quality parameters does not address all the factors that cause lead to leach into the water, and staying below the LAL does not address the health hazard of exposure to lead for many homes (whether lead levels tend to be <15 ppb but above the MCLG of zero or whether they tend to be >15 ppb). This leaves large segments of the public unprotected from exposure to lead in water but assured that their water is safe to drink.

Thus, in addition to the public education and LSL removal programs described in earlier sections of this report, the LCR should be revised to establish a health based standard that identifies a “substantial and imminent endangerment” threat from lead in water. This concept can be found under other environmental programs (e.g., CERCLA) where exposure risks are considered so high that immediate action must be

taken. For example, this would be analogous to a situation in which EPA’s Superfund program would require bottled water to be provided to individuals with drinking water from wells where ground water samples of lead reached this level of concern. In a SDWA context, this could be a threshold set such that an infant on formula would be expected to have blood lead levels above the current threshold of concern of 5 micrograms per deciliter set by the Centers for Disease Control and Prevention (CDC). *[A handout distributed at a meeting referred to an EPA web site that identified 40 ppb for school-aged children.]*

The LCRWG recommends EPA calculate such a level of concern and, where in-home tap samples exceed the level of concern regardless of whether there is an AL exceedance, require PWSs to communicate directly with the customer, recommend blood lead testing for residents, provide water filters rated effective for the lead levels found in the samples taken and provide the customer an opportunity to participate in a full LSL replacement program. In addition, the PWS should be required to notify other similarly situated customers in the service area.

Discussion Questions:

- 1. What information (studies) are available for EPA to use to establish a “level of concern” for lead?*
- 2. What should be done in cases where lead levels at the tap are high due to premise plumbing and not a LSL?*
- 3. What sampling protocols would be used to determine whether the standard has been exceeded?*
- 4. How will the PWS determine “other similarly situated customers,” especially if LSL does not seem to be the primary lead source?*

4.7. Establish Separate Monitoring Requirements for Copper

The current LCR does not deal effectively with copper. Generally speaking, the current rule is based on the health benefits associated with lead risk reduction. Although the LCRWG was briefed on health risks associated with copper, it was not asked to assess whether these health risks warrant managing risks for copper more aggressively. Instead, this report focusses on the regulatory approach itself.

A revised LCR should separate lead and copper risk management, refocusing attention to where there may be a problem with copper without increasing the burden on systems where there is not a problem. This can be achieved in a cost effective manner by targeting copper monitoring requirements to those PWSs that have waters aggressive to copper.

Elevated exposures to copper generally result from a combination of new plumbing² where water chemistry is aggressive to copper. It is technically possible to identify water chemistries that are aggressive versus not aggressive to copper. Thus, the LCRWG recommends that the requirements for copper monitoring focus first on sampling for basic finished water quality parameters such as pH and alkalinity in a way that is representative of the distribution system to identify waters that are aggressive to copper. Systems that can demonstrate that their finished waters are not aggressive to copper should have no further copper monitoring requirements. This could be written into the rule, rather than require a monitoring “waiver.” Systems with source water quality parameters that are aggressive to copper should implement appropriate corrosion control treatment and water quality parameters for copper.

² New copper is generally understood to be up to six months to three years of age.

The following are considerations to take into account in taking this approach.

1. Bin systems using data on water quality, with appropriate actions for different bins, similar to the LT2.
2. Waters that are not aggressive to copper based on water chemistry:
 - a. Ground water that is anoxic independent of pH and alkalinity below
 - b. Finished water in the following pH and alkalinity ranges
 - pH 7 to 7.2 and alkalinity < 35
 - pH 7.2 to 7.5 and alkalinity < 100
 - pH 7.5 to 8 and alkalinity < 150
 - pH > 8 and alkalinity < 250

These ranges could be presented as a curve
 - c. Finished water in the orthophosphate and alkalinity ranges
 - If the water is considered corrosive to copper based on pH and alkalinity then orthophosphate can be used to produce a non-corrosive water if the following is met
 - PO₄ > 3.3 and any alkalinity
 - PO₄ = 3 to 3.3 and alkalinity < 240
 - PO₄ = 2 to 3 and alkalinity < 200
 - PO₄ = 1 to 2 and alkalinity < 150

These ranges could be presented as a curve
3. Additional information needs to be gathered on the current distribution of pH, alkalinity and phosphate residual among system nationally to fully understand the implications of this approach.
4. The rule can:
 - Reflect definitions (similar to above) for non-aggressive water and describe how a system determines if its water is aggressive
 - If a water is **classified as non-aggressive** the water system must:
 - Maintain those WQPs that demonstrate it maintains a non-aggressive water.
 - Compliance is based on maintaining WQPs.
 - If the water system does not practice CCT, a monitoring program with a thorough representation of the distribution system would still be required.
 - Monitoring locations could be based on DBP monitoring sites and frequency to reduce burden while achieving an understanding of on-going water quality.
 - No on-going copper in-home tap monitoring is required.
 - If a water is classified as aggressive to copper, the water system:
 - Can take one of several approaches to address aggressive water chemistry:
 - Conduct copper sampling at vulnerable houses (houses < 2 years old) to demonstrate that water chemistry is non-aggressive (copper levels fall under the AL/SMCL)
 - Limited number of sample sites needed given copper chemistry

- Provision for sample invalidation based on site-specific conditions such as biologically-induced corrosion.
 - Conduct a pipe loop study to demonstrate the water chemistry is non-aggressive
 - Change water chemistry to non-aggressive water quality
- Until such time as the water is determined to be non-aggressive to copper, the water system must initiate and maintain a public education (PE) program
 - Targeted information is provided to all new homes or newly renovated homes OR Information is provided to all customers annually (choice is systems)
 - Notify contractors, plumbing suppliers, plumbers of copper corrosivity
 - Work with building codes to not allow copper piping in new construction if the corrosive water conditions cannot be eliminated
- If a system makes significant changes in source or treatment, then notice to primacy agency and consultation are required and the system may be required to demonstrate continued non-aggressive water.

Ultimately corrosion control must address risk reduction from lead, copper, other metals and management of unintended consequences.

Discussion questions:

1. *How do the tap monitoring requirements proposed here for copper compare to the approach proposed for lead that relies solely on WQPs?*
2. *Do the health effects of copper warrant the proposed approach?*
3. *What age range should be used for “new copper?”*
4. *Is there data to support the ranges suggested? How many systems would fall outside these ranges?*
5. *Is the water quality parameter monitoring taken from finished waters or from the distribution system or both?*
6. *How might existing WQP data be used? Should there be requirements for collecting new data to determine what category a PWS falls into?*
7. *Does the LCRWG want to provide more detail on how to define waters aggressive to copper?*
8. *What should be the public education delivery and frequency requirements for all systems?*
9. *What should be the additional requirements (monitoring? Public education? Other?) for systems with waters aggressive to copper? What is within their authority? What does EPA have authority to require?*
10. *What should the requirements be for confirming whether a PWS does or does not have waters aggressive to copper? (the “gray” areas) Do pipe rigs fit here as an option?*

5. Addendum: Recommendations for Additional Action

The LCRWG urges EPA not only to promulgate a revised LCR, but also to play a leadership role in educating, motivating and supporting the work of other agencies, where EPA does not have the authority

to act. The Long Term Revisions to the Lead and Copper Rule (LTR LCR) are very important. However, removing lead from drinking water systems and for reducing exposure to lead from drinking water in the meantime also will require renewed commitment, cooperation and effort by government at all levels and by the general public.

Specific recommendations for action in addition to the LTR LCR include:

[Note: These items are taken from a variety of sources, are in no particular order, and will be edited after the February discussion.]

- EPA working across all offices to take an integrated approach to action and education on lead from all sources (paint, air, site clean-up, etc.), with proper emphasis on lead in drinking water, especially in relation to the populations most vulnerable to this source (i.e., fetuses and infants dependent on reconstituted formula). For example, OGWDW should coordinate with EPA's lead-based paint program so lead hazards are communicated consistently.
- Work with other federal agencies including HUD in terms of lead programs, including but not limited to expanding federal funding from those programs to include lead service line replacement; HUD/DOT in terms of efficiency in possible coordination of lead service line replacement with road projects, construction projects; and CDC in terms of childhood lead poisoning prevention, screening and protection programs
- Enhanced cooperation with state, county, local health departments to promote an integrated approach to childhood lead poisoning screening, prevention and protection that emphasizes drinking water and its potential as a primary lead source, especially for fetuses and infants dependent on reconstituted formula
- EPA should include diverse perspectives in its stakeholder engagement programs, including affected consumers (who should not be required to be members of formal organizations), lead poisoning prevention/clean water advocates, EJ advocates, lead/copper corrosion experts and representatives from PWSs, States and federal agencies with Healthy Homes and childhood lead poisoning prevention programs.
- Zoning, including possibility of prohibiting copper plumbing where water is aggressive to copper
- A federal tax deduction to support replacement of the customer portion of LSLs
- State Actions to support customer lead service line replacement, e.g.
 - State legislation requiring inspection or replacement on sale of home.
 - Disclosure requirements at sale of home.
 - Requirements for LSL removal as part of school and day care licensing.
 - Building code requirements for LSL removal upon substantial renovation (could be national action as well).
 - Priority in SRF funding (especially if increased funding is available).
- Establishing a national, accessible information resource including a website with information, educational materials and guidance on lead and copper issues that is thorough, accurate and up-to-date including case examples of how communities have been getting-the-lead-out, funding sources and contacts to other agencies that should be connected in the campaign.

Report of the Lead and Copper Working Group to the National Drinking Water Advisory Council [FIRST DRAFT – FOR DISCUSSION PURPOSES ONLY. DOES NOT REFLECT A CONSENSUS OF THE WORKING GROUP. THIS DRAFT INCLUDES ELEMENTS FROM MEETING SUMMARIES AND FROM INDIVIDUAL INPUT FROM MEMBERS.]

- PWSs should educate (encourage partnerships with?) healthcare providers and health departments even when levels are below the AL.
- Additional technical review (additional study?) is needed on flushing.

Discussion questions:

1. *Other recommendations?*
2. *Modifications to these recommendations?*
3. *Should these recommendations be grouped in some way to indicate what EPA should do and what should be done by others? To highlight legislative action?*
4. *What can EPA (or others) do to strengthen public education prior to the effective date of a revised LCR? Update EPA guidance? Voluntary programs / partnerships? Other?*

6. Conclusion

[Conclusions will be added after the February meeting.]

ATTACHMENT A

NDWAC Lead and Copper Working Group

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“Principles for Highly Effective Regulations”

As of October 3, 2012

Principle 1: Enable government, regulated entities and the public to easily identify who is regulated and the applicable requirements.

Tools:

- a. Where possible, focus regulatory requirements on fewer, better-defined "upstream sources" (supply chain) rather than numerous diverse or diffuse "downstream sources."
- b. Consider whether simpler rules promoting high compliance can deliver more actual regulatory benefits than more complicated rules with low compliance.
- c. Use clear and objective regulatory requirements and applicability criteria.

Principle 2: Structure regulations to make compliance easier than noncompliance

Tools:

- a. If possible, build in physical structures (e.g., speed bumps) and product designs (matching fuel nozzle to inlet) to make noncompliance difficult.
- b. Use immediate feedback technology.
- c. Build self-implementing regulatory consequences to deficiencies and noncompliance.

Principle 3: Require regulated entities and/or third parties to assess compliance and to take steps to prevent non-compliance

Tools:

- a. Regulated entities perform periodic self-monitoring and self-certification of their activities and outcomes related to compliance.
- b. Third party verification of compliance and/or information reporting.
- c. Require continuous emissions monitors.
- d. Use fence-line monitoring and other remote emissions/pollutant monitoring (especially given advances in emissions and information technology).

Principle 4: Leverage accountability and transparency by providing the government and the public with real-time access to quality information on regulated entities' emissions, discharges and key compliance activities and outcomes.

Tools:

- a. Electronic reporting to the government.
- b. Public accountability via websites, paper/electronic mailings, and other ways to provide the public and stakeholders (e.g., customers, ratepayers) with compliance information.

Principle 5: Leverage benefits, market forces, and other incentives that promote effective regulations.

Tools:

- a. Motivate and empower the local community to encourage compliance.
- b. Show investors and consumers when products and services are compliant.
- c. Harness market forces to promote compliance, such as emission reduction credits or tradable allowances.
- d. Provide and highlight benefits to regulated entities from compliance, .e.g., energy efficiency or waste reduction.

Using the Principles and Tools in practice:

- Integrate the principles and tools to create a regulatory system that is practical for the government to implement and promotes compliance.
- Ensure that the government will be able to assess the effectiveness of the regulation after implementation.