

Reducing Noncompliance with Drinking Water Standards at Community Water Systems

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Potential Noncompliance Associated with Changes in Source Water at Public Water Systems

- This alert is designed to help inform the regulated community of the requirements an owner/operator of a Public Water System must comply with when undertaking a source water change. It also notes additional considerations that should be made by PWSs changing sources.
- A Public Water System (PWS) intending to change from one type of source water to another, remove one of its current sources or add an additional source, should be aware that doing so triggers certain Safe Drinking Water Act (SDWA) regulatory requirements.
- PWSs must also be aware of the impacts that changing their source water can have, even if the type of source remains the same. Changes in source water require in-depth analyses of the water chemistry and how best to treat the new source with the resources and treatment systems available to them. If source water is changed without evaluating treatment parameters, there can be serious effects on finished water quality. In some situations where the source water has changed without proper analysis and treatment, EPA has issued emergency orders to protect public health.
- EPA and its co-regulators have observed, through field activities such as sanitary surveys and compliance inspections, an increase in the number of PWSs changing source water without informing their regulating primacy agency or complying with regulatory requirements triggered by the change.



Differing source water types

Depending on the water sources available in a certain geographic area, a PWS may rely on one or more of the different types of source water to provide its customers with clean and safe drinking water. Correct identification of each water source is inherent to compliance with SDWA and the National Primary Drinking Water Regulations (NPDWR) because different rules apply to each of the three source types. Some rules apply only to systems that utilize groundwater while

others apply only to systems that utilize surface water (or groundwater under the influence of surface water). All systems changing source water, whether that be a change in source type, for example from a well to a river, or a change within the same source water type, for example, changing their source from a reservoir to a lake, must analyze the microbial and water chemistry differences between the new and old source to determine what changes in treatment may be needed. Additional considerations need to be taken into account when PWSs use multiple water sources, for example how and when in the treatment process or distribution system these waters are mixed.

Three different source water types:

Surface water: All water which is open to the atmosphere and subject to surface runoff. (40 CFR § 141.2)

Groundwater: Water below the land surface in a zone of saturation. (40 CFR § 260.10)

Groundwater under the direct influence of surface water (GWUDI): Any water beneath the surface of the ground with significant presence of insects, other macroorganisms, algae or large diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate climatological or surface water conditions. (40 CFR § 141.2)



What requirements apply when a PWS considers changing its source water?

Certain systems are subject to specific reporting and other requirements under the Lead and Copper Rule (LCR) when considering a source water change.

Reporting Requirements under the LCR:

At a time specified by the State, or if no specific time is designated by the State, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control under § 141.81(b)(3), a water system subject to reduced monitoring pursuant to § 141.86(d)(4), or a water system subject to a monitoring waiver pursuant to § 141.86(g), shall submit written documentation to the State describing the change or addition. The State must review and approve the addition of a new source or long-term change in treatment before it is implemented by the water system. 40 CFR § 141.90(a)(3)

Regardless of the type of change the PWS is planning to make, they must notify and get approval from their primacy agency (which may be a state, territory, tribe or EPA) before taking action to ensure they have considered all the possible consequences of the change and understand what regulatory requirements their system is now subject to. Additionally, some primacy agencies may have their own regulations regarding steps that PWSs need to take when considering a source water change. For some changes, a PWS will be subject to different regulations under the SDWA, for example, a system that is switching from a groundwater to a surface water source will be subject to the Surface Water Treatment Rule and will be required (in most cases, see 40 CFR 141 Subpart H), to filter and disinfect their water. Such a change may also impact the monitoring frequency required by other rules, including the Disinfectants and Disinfection Byproducts Rule, and chemical contaminant monitoring.

Whether or not a change in source water triggers a regulatory requirement, it is a best practice for PWSs considering a change to their source water to consult with their primacy agency.

What impacts are related to unapproved changes in a system's source water?

Unapproved changes to a system's water source may result in increased concentrations of lead and copper (e.g., action level exceedances of the LCR), changes in the production of disinfectant byproducts throughout the distribution system or more basic changes, such as the levels of turbidity or residual chlorine in the finished water. Sudden changes in water chemistry when changing from the old to the new water source can strip the inner lining of the distribution system piping and cause an increase (or decrease) in concentrations of various metalloid particles in distributed water. Depending on what type of distribution piping a system has and the presence of certain contaminants in either the new or old source water, compliance with several SDWA rules could be affected, including the Disinfectants and Disinfection Byproducts Rule, the LCR and others. Under the LCR, PWSs (based on system size) are required to have their primacy agency review and approve any proposed source water change; a change in source water could cause water chemistry changes which may require the PWS, as part of a LCR requirement, to conduct a new optimal corrosion control treatment study.

Source Water Case Studies

Jackson, MS

The City of Jackson, MS operates and maintains two surface water treatment plants that treat water from the Pearl River and the Ross Barnett Reservoir and a system of groundwater wells (a combination of surface water and ground water sources). At the beginning of 2014, each of these components of their drinking water system were utilized to deliver water to the distribution system. In October 2014, the system decided to take the groundwater wells offline and supply the portion of the distribution system they had served by surface water from one of the treatment plants. *This decision was a source water change* but the system did not comply with the LCR because it failed to make a formal request to the Mississippi state department of health (MSDH), their primacy agency, to make the change and did not conduct the required water quality evaluation or corrosion control treatment study. In June of 2015 the City exceeded the lead action level. Then, in July 2015, the City made a request to MSDH via



Figure 2: Sedimentation Tank at OB Curtis water treatment plant in Jackson

email to bring their well field back into service due to issues at one of their treatment plants. In February 2016 the City again exceeded the lead action level.

Due to these treatment changes and the system not maintaining optimal corrosion control treatment, MSDH issued a treatment technique violation to the system in January 2020. An EPA inspection in February 2020, which confirmed the above changes to source water made by the system and uncovered other ongoing issues, led the EPA to issue a SDWA 1431 emergency order in March 2020, requiring the City to address the immediate threats to drinking water and a SDWA 1414 administrative order on consent in July 2021, requiring the City to comply with the SDWA. More information on the inspection and the orders can be found at: <https://www.epa.gov/ms/jackson-ms-drinking-water>

Flint, MI

At the beginning of 2014, the city of Flint, Michigan (the City) was purchasing finished water from Detroit for distribution as their drinking water (a purchased surface water source). In April 2014, the City made the decision to switch from purchasing water to sourcing water from the Flint River for treatment as their drinking water. *This decision was a source water change*; however, the system did not comply with the LCR because it failed to conduct a water quality evaluation or corrosion control treatment study. Lead and Copper sampling following the source water change showed that lead levels within the system were rapidly rising by early 2015. After being encouraged by both Michigan Department of Environmental Quality and EPA to implement corrosion control treatment (CCT), the City announced they would implement CCT in September 2015. Ultimately however, in October 2015 the City switched their drinking water source back to purchased, finished water from Detroit, from an entity now called the Great Lakes Water Authority.



Figure 3: Flint River

In January 2016, to address the imminent and substantial endangerment to the people of Flint whose drinking water contained high levels of lead at the time, the EPA issued a SDWA 1431 emergency order. The order plainly states, “the presence of lead in the City water supply is principally due to the lack of corrosion control treatment after the City’s switch to the Flint River as a source in April 2014,” directly contributing the public health emergency to the source water change made by the system. For more information on EPA’s emergency order and follow up actions by both EPA and the state of Michigan, see <https://www.epa.gov/flint>, <https://www.michigan.gov/flintwater> and <https://www.cityofflint.com/ProgressReport/>

Oasis Mobile Home Park, near Thermal, CA

Oasis Mobile Home Park, a small community water system of about 1,500 residents, located on the Torres Martinez reservation, sources its drinking water from a groundwater source that has naturally occurring arsenic levels above the maximum contaminant level (MCL) of 10 parts per billion (ppb). EPA is the primacy agency as the system is located within the Tribe’s exterior boundaries. In August 2019, EPA issued a SDWA 1431 emergency order to the system for failing to



Figure 4: Remains of collapsed Well #1

treat arsenic below the MCL from Well #1 and required provision of alternative water to customers. Fixes to the system were made and the alternative water requirement was lifted. However, in August 2020, the system switched its drinking water source from Well #1 to Well #2 after Well #1 failed. *This decision was a source water change*; EPA had previously informed the system that they would need to notify and coordinate with EPA prior to using Well #2 to ensure that all required testing was completed, but the system failed to do so before switching wells.

Well #2 has naturally occurring arsenic levels of up to 100 ppb and the treatment system cannot reliably and consistently remove arsenic from this source to below the arsenic MCL. In September 2020, EPA issued a second SDWA 1431 emergency order to address the high levels of arsenic in the water being distributed to residents at Oasis Mobile Home

Park from Well #2 and other issues. This order notes that “based upon the arsenic treatment system not being designed to remove levels of arsenic above 19 ppb, there is a risk of exposure of the residents to arsenic concentrations above the MCL as a result of use of Well #2.” This increased exposure to contaminants in drinking water is a direct result of the source water change made by the system. For more information on EPA’s 2020 emergency order see this [news release](#) and for information on EPA’s third SDWA 1431 emergency order to address the ongoing situation see this [news release from 2021](#).

More Information

The resources below can help you identify and proactively correct violations and achieve sustained compliance.

Overview of this NCI

This alert is part of an ongoing National Compliance Initiative (NCI) to reduce noncompliance with drinking water standards at community water systems. For more information visit:

- <https://www.epa.gov/enforcement/national-compliance-initiative-reducing-noncompliance-drinking-water-standards-community>

Technical Resources, Assistance and Training

- EPA’s SDWA main webpage: <https://www.epa.gov/sdwa>
- EPA’s Drinking Water Regulations homepage: <https://www.epa.gov/dwreginfo/drinking-water-regulations>
- EPA’s Drinking Water training page: <https://www.epa.gov/dwreginfo/drinking-water-training>
- EPA’s Quick reference guides to Drinking Water rules: <https://www.epa.gov/dwreginfo/drinking-water-rule-quick-reference-guides>
- Rural Community Assistance Partnership: Provides resources and training for small, rural drinking water and wastewater systems: <https://www.rcap.org/>
- Association of State Drinking Water Administrators webinar page: <https://www.asdwa.org/past-events-webinar-recordings/>
- The Water Environment Federation is a nonprofit association that provides technical education and training for water quality professionals: <https://www.wef.org>
- The National Rural Water Association: Provides training and on-site technical assistance to small and rural water and wastewater systems: <https://www.nrwa.org>
- American Water Works Association: offers trainings, webinars and other resources for water utilities: <https://www.awwa.org/>

Financial Assistance and Funding Structures

- EPA’s Water Infrastructure and Resiliency Finance Center lists technical assistance partners that work with small and rural systems to increase financial capabilities: <https://www.epa.gov/waterfinancecenter/financial-technical-assistance-and-tools-water-infrastructure#partners>
- EPA’s Water Finance Clearinghouse is a database of financial assistance sources available to fund water infrastructure needs: <https://www.epa.gov/waterdata/water-finance-clearinghouse>
- USDA Rural Development Water and Environment Programs: <https://www.rd.usda.gov/programs-services/all-programs/water-environmental-programs>

Disclaimer

This Enforcement Alert addresses select provisions of EPA regulatory requirements using plain language. Nothing in this Enforcement Alert is meant to replace or revise any EPA regulatory provisions or any other part of the Code of Federal Regulations, the Federal Register, or SDWA. This alert shall not be relied upon by any regulated entity in defense of or in response to any enforcement actions brought against the entity by the EPA or any local regulating agency.