



Checklist for Identifying Systemic Issues at Public Water Systems and Reporting to EPA

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Disclaimer

This document provides a checklist for primacy agency personnel to use as they conduct sanitary surveys and capacity development assessments to document systemic issues at public water systems (PWSs) and a process for reporting identified systemic issues to the EPA.

The term “primacy agency” used in this document includes states, territories, Tribes, and the EPA, when the EPA is the Safe Drinking Water Act (SDWA) primary enforcement authority (primacy) for PWSs. The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on the EPA, states, or the regulated community. The EPA and states retain the discretion to adopt different approaches where appropriate. Any decisions regarding a particular facility will be made based on the statute and applicable regulations. Therefore, interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation. This document does not confer legal rights or impose legal obligations upon any member of the public.

This document is not intended to be comprehensive, and other approaches may be appropriate for conducting sanitary surveys or technical, managerial, and financial (TMF) assessments and satisfying the requirements of the National Primary Drinking Water Regulations (NPDWRs). While the EPA has made every effort to ensure the accuracy of the discussion in this document, the obligations of the regulated community are determined by statutes, regulations, or other legally binding requirements. In the event of a conflict between the discussion in this document and any statute or regulation, this document would not be controlling.

1. Introduction

Public Water Systems (PWSs) are the frontline for providing safe, reliable drinking water which is essential to the nation's public health and national security. In support of this, the EPA implements the Safe Drinking Water Act (SDWA) by [establishing standards](#) that PWSs must meet and provides oversight of states, territories, and Tribes that have [primary enforcement responsibility](#) (also called primacy). The EPA recognizes the many pressures faced by water systems: PWSs must invest in asset management, evaluate vulnerabilities, navigate workforce development, and maintain their aging water infrastructure to deliver clean drinking water to consumers. Primacy agencies can support these efforts by implementing a robust sanitary survey program that includes the identification, tracking, and resolution of systemic issues.

Every primacy agency is required to have a sanitary survey program¹ as a part of their PWS program. Sanitary surveys are akin to inspections and allow primacy agencies to routinely assess system compliance with drinking water regulations and ensure that systems are protecting their source waters, properly operating and maintaining their water infrastructure. During sanitary surveys, it is important to identify “systemic issues,” which are problems that, if left unaddressed, may lead to an eventual failure of a PWS’ ability to deliver safe, reliable, drinking water to consumers. Systemic issues may stem from a PWS’s lack of technical, managerial, and financial (TMF) capability – for example, the PWS may lack an asset management plan and has not performed essential repairs or replacement of aging infrastructure.

Primacy agencies need efficient and effective ways to identify systemic issues so that they are addressed before a community’s drinking water is jeopardized. Early identification of systemic issues can lead to quicker resolutions and implementation of long-term solutions where appropriate. The EPA encourages primacy agencies to leverage their state and local authorities to track and resolve issues identified during sanitary surveys, even if those issues do not rise to the level of a significant deficiency at the time of the survey, to ensure that issues and concerns do not become systemic in nature or contribute to the onset of significant deficiencies that could endanger public health.

The EPA strongly encourages primacy agencies to coordinate efforts between their sanitary survey and capacity development programs, which by statute, must have a strategy to improve TMF capability at all PWSs². Through close coordination with their agency’s capacity development programs, sanitary surveyors can contribute to TMF assessments, and in turn, findings from TMF assessments can alert surveyors to pre-existing and/or potential systemic issues to consider during surveys.

The EPA has developed this guidance document to help primacy agencies identify, track, and address systemic issues. This document provides a series of checklists that primacy agencies may use to identify and document systemic issues at PWSs. The checklists are designed to supplement a primacy agency’s existing sanitary survey program so as not to create new processes or additional

¹ See 40 CFR 141.2 and 40 CFR 141.401(b) for regulatory definitions.

² SDWA 1420(a) and 1420(c).

burden on primacy agencies or PWSs. Additionally, this document provides recommendations for long-term resolution of systemic issues.

This document is not intended to preclude or supersede existing processes for significant deficiencies and violations or delay timely enforcement when violations are present. Identification of a systemic issue does not in and of itself result in a determination of noncompliance. The checklist offers guidance on a process to identify and track PWSs with systemic issues not otherwise addressed by existing state or federal authorities. The checklists may be incorporated into existing primacy agency sanitary survey programs, capacity development, and other existing checklists and processes.

2. Examples of Systemic Issues at Public Water Systems

Examples of systemic issues that primacy agencies should assess are described below. These examples are not intended to be all-inclusive or definitive. Rather, this list is designed to serve as a resource to primacy agencies for categorizing observations made in the field or issues reported to the primacy agency. Inclusion of this list below does not imply PWS noncompliance solely based on one or more of the examples being present at a PWS. Because each primacy agency determines what issues are identified as significant deficiencies and resolved accordingly, these examples may be classified as significant deficiencies by some primacy agencies.

Source

- PWS water demand is nearing maximum source capacity, with no actions taken to identify new sources of water; or no actions taken to address water quality degradation such as increases in regulated contaminant concentrations over time.
- PWS lacks backup or emergency sources of water, including interconnections, and lacks the capability to do so.
- PWS has not taken action to address contamination vulnerability concerns within the wellhead/source water protection area.

Treatment

- Treatment processes or equipment are consistently poorly maintained or malfunctioning, or otherwise at risk of compromising the treatment process as designed.
- Treatment processes are consistently observed as not being utilized according to their intended design specifications.
- PWS lacks or does not utilize process control equipment and/or procedures.

Distribution System

- Frequent water main breaks, or sustained periods of unaccounted water loss.
- Escalating frequency of Boil Water Notices over time.
- Continued failure to issue precautionary Boil Water Notices in the event of PWS pressure losses and failure to notify the primacy agency.

- PWS lacks an approach to mitigate water quality degradation associated with stagnant water in the distribution system, including the absence of a comprehensive water management or flushing program.
- Lack of a valve exercise program leading to inadequate distribution system valving and lack of knowledge about the condition of existing valves.

Finished Water Storage

- Finished water storage is insufficient to accommodate projected future PWS growth, with no plans to increase storage capacity.
- Finished water storage tanks are nearing or beyond their designed lifespan, and the PWS has neither a replacement plan nor the financial resources to address the issue.
- PWS lacks strategies for conducting routine maintenance, or maintenance is impossible without necessitating service interruptions.

Pumps

- PWS pumps, valves, and/or other equipment have been observed to be poorly maintained, or otherwise unable to reliably function as designed and required.
- Lack of backup or redundant pumps and equipment necessary to maintain drinking water service in the event of a primary pump failures (e.g., disinfecting pumps, or booster pumps).
- Replacement valves and components are difficult for the PWS to procure, and an on-site inventory is not kept. Future repair delays may result in service disruptions lasting multiple days.

Monitoring and Reporting

- PWS has repeatedly been in violation for failing to report compliance results to primacy agency within the time requirements.
- Monitoring equipment is consistently observed to be unmaintained and/or uncalibrated.
- PWS does not have standard sample collection procedures.

Management and Operation

- PWS revenue is sufficient to cover operational expenses, but insufficient to cover future system upgrades and asset replacement/repair.
- PWS has a history of deferring maintenance on water system supply equipment and lacks an active preventive maintenance program.
- PWS does not have an asset management program or comparable strategic planning tool for repair and replacement of their infrastructure and PWS facilities.
- The governing body of the PWS (local board, elected officials, etc.) is unable or unwilling to make decisions that would improve PWS operation and regulatory compliance.
- PWS operation has contributed to inconsistent water quality even though this has not resulted in maximum contaminant level or treatment technique violations.

Operator Compliance

- PWS has the proper number and/or grade of required operators, but operators are unable to comply with NPDWRs without assistance.

- PWS lacks hiring and succession planning to address departure of certified operators which would disrupt system operation and jeopardize compliance with regulatory requirements.

3. Identifying Systemic Issues at Public Water Systems

The sanitary survey process is a useful opportunity to identify and follow up on systemic issues at PWSs. Below are items related to potential systemic issues that the EPA recommends that primacy agencies incorporate into their sanitary survey protocols, to the extent they are not already incorporated. The EPA also encourages surveyors to consider these issues in the context of the TMF capability of the surveyed PWS. Surveyors should reach out to the PWS prior to the site visit portion of a sanitary survey to ensure that PWS representatives will be available and prepared to address the items below.

During sanitary surveys, the EPA suggests that surveyors pay particular attention to elements with unresolved issues or discrepancies identified during a previous site visit. The following questions can be helpful in identifying systemic issues:

- Is there a lack of TMF capability that has previously been noted or is now apparent?
- If the PWS has previously received capacity development or other technical assistance, has the technical assistance resulted in improved PWS performance and/or a reduction in systemic issues? If not, what could be done to improve the situation?

Recommended Items to Review during Sanitary Surveys

Prior to the Survey

It is useful to review information available to the primacy agency prior to conducting a sanitary survey³. Reports, correspondence, and previous sanitary surveys will contain useful information about a PWS and its performance. Surveyors should also check with their agency's capacity development program to evaluate if additional information and/or previous TMF assessments of the PWS are available. If prior assessments are available, surveyors should evaluate whether any of the TMF elements of the PWS have degraded or are in danger of degrading over time: a TMF assessment that highlighted concerns about a lack of funding for equipment, for instance, can indicate that the surveyor should pay close attention to equipment maintenance and condition during the site visit.

Sanitary Survey Preparation Checklist:

Checklist Items	Check (Yes/No/N/A)	Notes
1. Review at least the two most recent sanitary surveys, if available, and note any recommendations or other sanitary deficiencies identified during previous surveys. Do the previous sanitary survey reports reveal a pattern of issues such as non-compliance?	☐ Yes ☐ No ☐ N/A	

³ Section 1.2.1, [How to Conduct a Sanitary Survey of Drinking Water Systems – A Learner's Guide](#) (EPA 816-R-17-001)

Checklist Items	Check (Yes/No/N/A)	Notes
1.1. If the previous surveys were conducted by other surveyors, then check with previous surveyors (if available) if there were any concerns that were not noted in the survey reports.	☐ Yes ☐ No ☐ N/A	
1.2. If there were recommendations made or other sanitary deficiencies identified, then check whether there are any records or correspondence to confirm whether these issues have been resolved?	☐ Yes ☐ No ☐ N/A	
2. Check if there are records or correspondences detailing complaints made about the system, looking back to at least two sanitary surveys. Identify if there is a history or pattern of complaints regarding the PWS and make a note of these concerns prior to the site visit.	☐ Yes ☐ No ☐ N/A	
3. Check the compliance monitoring history of the PWS for the periods since the last two sanitary surveys; is there a history of missed, late, or other problems associated with compliance monitoring?	☐ Yes ☐ No ☐ N/A	
3.1. Are there any records detailing these compliance monitoring issues?	☐ Yes ☐ No ☐ N/A	
3.2. Are there any trends visible in the compliance monitoring data that may point to a future sanitary or violation issue – an increase in nitrate concentrations over time, for example?	☐ Yes ☐ No ☐ N/A	
4. Review the most recent TMF assessment, if available, and note any findings or recommendations. Does the previous assessment report identify any capabilities gaps that have resulted in or could lead to systemic issues?	☐ Yes ☐ No ☐ N/A	
4.1. If there were findings or recommendations identified, check whether there are any records or correspondence to confirm whether these issues have been resolved?	☐ Yes ☐ No ☐ N/A	

During the Survey

During the survey itself, the entity conducting the survey should discuss potential areas that may bring to light potential systemic issues occurring at the PWS. This should include discussing any long-standing or historic issues identified in preparation for the survey.

On-Site Sanitary Survey Discussion Checklist:

Checklist Items	Check (Yes/No/N/A)	Notes
1. Are there any long-standing issues identified in preparation for the survey that have since been addressed by the PWS?	☐ Yes ☐ No ☐ N/A	
1.1. If not, can the PWS provide any plans or details for how they plan to address these issues? Can the PWS identify any barriers to addressing these issues (e.g., funding, staffing, experience, etc.)?	☐ Yes ☐ No ☐ N/A	
1.2. Have any of these issues worsened since the previous survey?	☐ Yes ☐ No ☐ N/A	
1.3. Does the PWS have an asset management plan and is it being implemented and updated?	☐ Yes ☐ No ☐ N/A	
2. Discuss with the PWS how maintenance is tracked and completed.		
2.1. Is there a history of missed maintenance that could be a systemic issue (i.e., deferred preventative maintenance due to funding, staffing, etc.)?	☐ Yes ☐ No ☐ N/A	
2.2. Does the PWS perform preventive maintenance?	☐ Yes ☐ No ☐ N/A	
2.2.1. Is there a system in place to track preventive maintenance?	☐ Yes ☐ No ☐ N/A	
2.2.2. Are preventive maintenance items marked as completed?	☐ Yes ☐ No ☐ N/A	
2.2.3. Were they completed on schedule?	☐ Yes ☐ No ☐ N/A	
2.2.4. Are the preventive maintenance tickets encompassing the processes present at the facility?	☐ Yes ☐ No ☐ N/A	
2.2.5. If not, can the PWS provide an explanation as to why? Are there any barriers to conducting preventive maintenance?	☐ Yes ☐ No ☐ N/A	
2.3. Does the PWS have a system for tracking maintenance needs and/or customer complaints?	☐ Yes ☐ No ☐ N/A	
2.3.1. If so, are there any areas (both within the distribution system and within the plant itself) of specific concern?	☐ Yes ☐ No ☐ N/A	
2.4. If the PWS does not have a tracking system for repairs and preventive maintenance, inquire about how maintenance is tracked and review any records.	☐ N/A	
2.4.1. Is the lack of a procedure/system to track repairs and preventive maintenance causing a systemic issue (i.e., causing maintenance delay, breakdown/failures, etc.)?	☐ Yes ☐ No ☐ N/A	

Checklist Items	Check (Yes/No/N/A)	Notes
3. Does the PWS have standard operating procedures (SOPs)?	☐ Yes ☐ No ☐ N/A	
3.1. If yes, verify whether the SOPs are readily available and on-site.	☐ Yes ☐ No ☐ N/A	
3.1.1. Do the SOPs cover all areas of the PWS's operation	☐ Yes ☐ No ☐ N/A	
3.1.2. Are the PWS staff aware of the SOPs?	☐ Yes ☐ No ☐ N/A	
3.1.3. Are the SOPs used by PWS staff?	☐ Yes ☐ No ☐ N/A	
3.1.4. Is there a process to update SOPs as needed? When was the last update?	☐ Yes ☐ No ☐ N/A	
3.2. If not, can the PWS provide an explanation as to why?	☐ Yes ☐ No ☐ N/A	
3.3. Can an SOP be used to improve, resolve, or prevent a systemic issue? Ensure that this is noted in the sanitary survey report.	☐ Yes ☐ No ☐ N/A	
4. Is the PWS planning any development in the service area or expansion of the service area?	☐ Yes ☐ No ☐ N/A	
4.1. If yes, will the PWS have adequate source capacity to accommodate the development or expansion? Is the response based on estimates or calculations?	☐ Yes ☐ No ☐ N/A	
4.2. If unknown, can the PWS provide an explanation as to why? Are the operators involved in development and expansion discussions?	☐ Yes ☐ No ☐ N/A	
5. How are management and operations of the system going, generally? Are operators involved in discussions with management about these topics?	☐ Yes ☐ No ☐ N/A	
5.1. Are there any systemic or long-standing issues noted with any of these topics?	☐ Yes ☐ No ☐ N/A	
5.1.1. Staffing levels/retention	☐ Yes ☐ No ☐ N/A	
5.1.2. Operator training and certification	☐ Yes ☐ No ☐ N/A	
5.1.3. PWS revenue	☐ Yes ☐ No ☐ N/A	
6. Has the PWS received technical assistance in the past?	☐ Yes ☐ No ☐ N/A	
6.1. Has this resulted in measurable improvements?	☐ Yes ☐ No ☐ N/A	
6.1.1. If not, can the PWS explain why not?	☐ Yes ☐ No ☐ N/A	
6.1.2. Are there any barriers preventing improvements through technical assistance?	☐ Yes ☐ No ☐ N/A	

Checklist Items	Check (Yes/No/N/A)	Notes
6.2. Has documentation been obtained for all technical assistance provided (e.g., reports, notes, correspondence) describing the nature of the technical assistance?	☐ Yes ☐ No ☐ N/A	
6.3. Check whether the PWS has implemented or continues to implement any recommendations provided by technical assistance?	☐ Yes ☐ No ☐ N/A	
6.3.1. If not, can the PWS explain why?	☐ Yes ☐ No ☐ N/A	

After the Survey

Following the completion of the on-site portion of the sanitary survey, the surveyor should consider the list of findings and observations from the survey as well as the responses to questions from the PWS in the context of systemic issues. Any issues identified during the survey that violate state regulations or meet the definition of a significant deficiency as defined by the surveyor's primacy agency should be resolved accordingly. Below are items surveyors may consider during their review of issues noted prior to and during the site visit of a sanitary survey:

After the Sanitary Survey Checklist:

Checklist Items	Check (Yes/No/N/A)	Notes
1. For each sanitary deficiency noted during this survey (new or existing), note any contributing factors to the deficiency to help determine if a systemic issue could be present.		
1.1. Were there any deficiencies noted in prior sanitary surveys that remained unresolved during this sanitary survey?	☐ Yes ☐ No ☐ N/A	
1.1.1. How long have these issues persisted?		
1.1.2. Have the issues become more frequent in occurrence or worse in condition?	☐ Yes ☐ No ☐ N/A	
1.2. If left unaddressed, could these issues lead to significant deficiencies and threats to public health?	☐ Yes ☐ No ☐ N/A	
2. What is the primacy agency's policy for previously identified and unaddressed issues? Would this issue be a systemic issue?	☐ Yes ☐ No ☐ N/A	

The EPA strongly recommends developing a final written report following every sanitary survey to notify PWS operators and owners of the results of the survey⁴. Any systemic issues identified through the sanitary survey process should be noted and documented in the final sanitary survey report and should include an explanation as to why systemic issues were identified, why the issues may result in threats to public health, and a recommendation and timeline to address the issue(s). This report serves as a record of observations for future sanitary surveys and thus is vital to ensure that issues noted during a survey are resolved and do not remain unaddressed. PWSs with identified systemic issues should be communicated back to the primacy agency's capacity development program.

4. Reporting and Addressing Systemic Issues

The EPA strongly encourages primacy agencies to explore what authorities, partnerships, and discretion they have available to resolve systemic issues identified at PWSs. One such authority is through capacity development: states with a capacity development program are required to ensure that both new and existing PWSs have adequate capability to remain in compliance with NPDWRs.⁵ As previously noted, systemic issues are often related to a lack of TMF capability on the part of PWSs and the EPA encourages primacy agencies to leverage their capacity development programs to address capability challenges at PWSs.

Primacy agencies can use the results of TMF assessments to assist surveyors with identifying specific areas of weakness and avenues for improvement during surveys: if an assessment indicates that technical capability is lacking, for instance then surveyors should take extra care to ensure that equipment is properly operated and maintained during the survey. After the survey, surveyors could also identify opportunities for the primacy agency to work with the PWS on developing technical capability through workforce development, operator certification, and/or other training resources. Similarly, findings from sanitary surveys can inform agencies on where to focus capacity development efforts: if systemic issues are identified at a PWS that has not had its capability assessed since the last two sanitary surveys, for example, the surveyor should consider scheduling a TMF assessment for the system that considers observations made during the survey. Primacy agencies should also ensure that PWSs are aware of Drinking Water State Revolving Fund (DWSRF) loans as a source of funding to address systemic issues: a PWS with systemic capability challenges can qualify for DWSRF loans to address these issues.⁶

The EPA also received input from several primacy agencies regarding other approaches to addressing systemic issues at PWSs. These agencies highlighted the importance of utilizing partnerships: for instance, some agencies work with their public service commission to conduct rate studies to assist with PWS financial planning, some agencies provide training and informational material for new PWSs and/or new PWS management, while other agencies proactively engage technical assistance providers to assist struggling PWSs. Primacy agencies

⁴ Section 1.6, [How to Conduct a Sanitary Survey of Drinking Water Systems – A Learner's Guide](#) (EPA 816-R-17-001)

⁵ SDWA 1420(a) and 1420(c).

⁶ SDWA 1452(a)(3).

should also consider using their authority under SDWA 1414(h)(3) to require the owner or operator of a PWS to assess options for restructuring, including physical consolidation, financial and/or administrative consolidation, transfer of ownership, or operational changes.⁷

Regardless of how primacy agencies choose to identify, track, and address systemic issues, the EPA strongly encourages primacy agencies to document systemic issues identified at PWSs and communicate to their regional EPA offices all PWSs with identified systemic issues on an annual basis. The EPA recognizes that state, Tribal, and territory primacy agencies are in regular contact with their regional EPA drinking water programs, and the Office of Groundwater and Drinking Water expects that the EPA Regional offices prepare a summary of systemic issues identified at PWSs during each primacy agency's PWSS Annual Program Review (APR) process⁸.

This summary will include:

1. how the primacy agency is incorporating systemic issue identification into their PWS program;
2. the list of PWSs with identified systemic issues;
3. actions, including whether there are any technical assistance or capacity development efforts undertaken by the primacy agency or the PWS to address these systemic issues; and,
4. any additional support or resources requested from the EPA to further support the assistance in addressing systemic issues.

The EPA Regions will communicate the specific deadline for submitting this information as a part of the APR development process each year in coordination with primacy agencies. The information developed for the APR should also be shared with the primacy agency's capacity development program to coordinate all available resources to ensure that systemic issues are addressed.

Additionally, the EPA has programs and resources available on a national level to assist PWSs in need of assistance. Notifying the EPA Regional offices of systemic issues present at PWSs can help coordinate assistance, or if appropriate, enforcement efforts to ensure that systemic issues at PWSs are resolved. Some of these programs and resources are listed below:

- [EPA's Drinking Water Capacity Webpage](#)
- [NPDWR Training](#)
- [EPA's RealWaterTA](#)
- [Compliance Advisors for Sustainable Water Systems](#) (sponsored by the EPA's Office of Compliance)
- [Water Finance Clearinghouse](#)

For more information on capacity development and on resources the EPA provides to bolster the states' Capacity Development and Operator Certification programs and other efforts to mitigate systemic issues in their jurisdictions, the EPA encourages primacy agencies to visit

⁷ Please refer to the proposed Water System Restructuring Assessment Rule, available at 89 FR 46998.

⁸ As required under 40 CFR 142.17.

<https://www.epa.gov/dwcapacity/resources-states> and contact their EPA Region's capacity development office or state capacity develop coordinators.

Sanitary surveys and capacity development assessments play a vital role in safeguarding public health. The EPA reiterates the importance of primacy agencies exercising their authorities to ensure that PWSs have the capability to comply with and remain in compliance with NPDWRs to better protect public health through the identification, tracking, and resolution of systemic issues at PWSs.