

Initial Distribution System Evaluation

The First Step in Stage 2 DBPR Compliance

The formation of disinfection byproducts (DBPs) is one of the most important issues faced by water suppliers today. Based on health effect studies and the large number of people exposed to DBPs in the U.S. (over 260 million), the USEPA has promulgated the Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2 DBPR) on December 15, 2005 as a DBP control measure beyond those already required for public water systems.

Under the Stage 2 DBPR, the USEPA requires utilities to revisit their distribution system sampling sites to better capture locations with high DBP concentrations. This is accomplished by performing an Initial Distribution System Evaluation (IDSE).

IDSE Schedule

The schedule for complying with the Stage 2 DBPR, and particularly with the IDSE, is unusually rapid as shown in the timeline below.

Applicability of the IDSE

Systems that are required to comply with the Stage 2 DBPR include all community water systems and non-transient, non-community water systems (NTNCWSs) that add a primary or secondary disinfectant other than UV or distribute water that was treated with a disinfectant other than UV. These same systems also need to perform an IDSE, with the exception of systems serving fewer than 500 people,

which are granted a Very Small System waiver. Also NTNCWSs serving fewer than 10,000 people do not have to perform an IDSE. Consecutive systems must comply with IDSE requirements on the same schedule as the system serving the largest population in the combined distribution system.

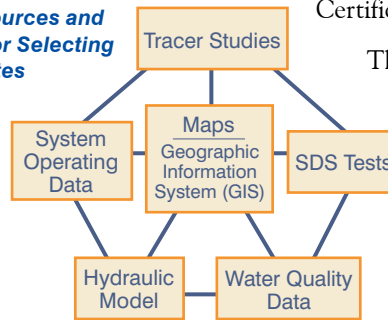
IDSE Options

Systems that need to do an IDSE can use one of three possible approaches: conduct a Standard Monitoring Program (SMP); perform a System-Specific Study (SSS); or be granted a 40/30 Certification.

The SMP entails a one-year distribution system monitoring effort to determine the locations that routinely show higher DBP concentrations. The frequency and number of samples required under the SMP are determined by source water type and system population. Prior to commencing the SMP, utilities must prepare a monitoring plan and submit it to their primacy agency for review. After conducting one year of routine monitoring at SMP sites, systems will use their Stage 1 DBPR compliance results and SMP results to select their sampling locations for Stage 2 DBPR compliance.

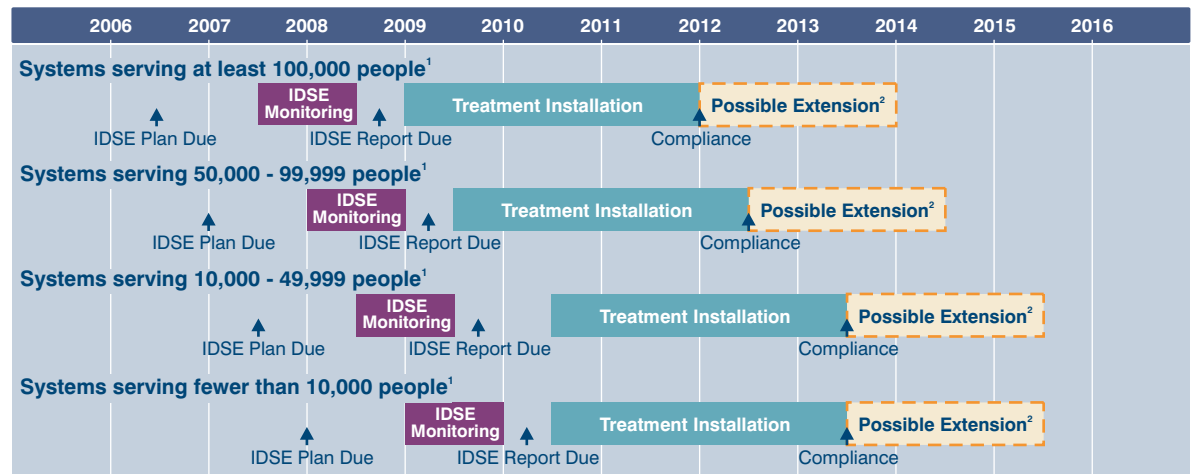
Unlike an SMP, an SSS does not require one year of routine monitoring. An SSS can be done by water systems that:

Data Sources and Tools for Selecting SMP Sites



Source: EPA's Draft Stage 2 DBPR IDSE Guidance Manual (July 2003)

IDSE Timeline



Notes:

1. Includes all systems that are part of a combined distribution system that has a largest system with this population.
2. A State may grant up to a two-year extension for systems to comply if the State determines that additional time is necessary for capital improvements needed for compliance.

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- ▼ Have sufficient historical THM4 and HAA5 data that encompass a wide range of sample sites representative of the entire distribution system.
- ▼ Have the ability to run extended period simulations using a water distribution system model for hydraulic conditions and/or water quality, and conduct at least one round of THM4 and HAA5 sampling to confirm model results.

Similar to the SMP, systems must submit an SSS plan to their primacy agency for review prior to commencing their SSS.

Utilities that have low DBP concentrations in their distribution systems may qualify for a 40/30 Certification, if every individual compliance sample were ≤ 0.040 mg/L for THM4 and ≤ 0.030 mg/L for HAA5, and no THM4 or HAA5 monitoring violations were reported.

Systems that chose to conduct an SMP or an SSS, as well as systems that qualify for a 40/30 Certification,

must prepare and submit an IDSE report to their primacy agency.

How Carollo Can Help

The IDSE is probably among the most complex distribution system evaluations faced by water utilities in order to meet drinking water regulations. Utilities need to determine whether or not they need to conduct an IDSE, understand their system classification, and develop their IDSE sampling and monitoring plans. Data analysis, compilation, and interpretation are complex, and IDSE reporting and record keeping may be challenging. As a result, utilities may not have the resources and experienced staff necessary to undertake such an extensive evaluation, particularly since this evaluation will be done only once. Carollo has assisted water utilities with numerous related projects and has the necessary staff and knowledge to assist you with your IDSE.

Carollo's Expertise	Will Help Your Utility:
<p>AwwaRF Project 2770 - Formation and Decay of DBPs in the Distribution System</p> <ul style="list-style-type: none"> ▼ Developed a framework to help utilities select distribution system sites with maximum DBP concentrations as required by the IDSE. ▼ Evaluated critical factors that affect THM4 and HAA9 behaviors in distribution systems. ▼ Evaluated changes in DBPs when systems switch residual disinfectant (free chlorine vs. chloramines). ▼ Examined the effect of booster chlorination and reservoirs/tanks on DBP fate. 	<ul style="list-style-type: none"> ▼ Thoroughly understand your IDSE options (SMP vs. SSS) and IDSE waivers. ▼ Systematically classify your water system. ▼ Proficiently develop sampling and monitoring plans and select the most accurate Stage 2 DBPR compliance monitoring sites. ▼ Accurately select compliance monitoring sites with maximum DBP concentrations. ▼ Efficiently design and conduct SMP and SSS programs. ▼ Effectively fulfill IDSE reporting and record keeping requirements.
<p>City of Santa Barbara, California - Evaluation of Disinfection Strategies for a Water Treatment Plant</p> <ul style="list-style-type: none"> ▼ Developed improvements in operational and capital strategies within the distribution system tailored toward reducing water age which affects DBPs. ▼ Evaluated the possibility of converting from free chlorine to chloramines. 	<ul style="list-style-type: none"> ▼ Accurately identify compliance monitoring sites based on water age. ▼ Use the most advanced tools/techniques to analyze, compile, and interpret DBP and other distribution system water quality data.
<p>Hydraulic Modeling of 150 Distribution Systems</p> <ul style="list-style-type: none"> ▼ Used a variety of modeling software to assist utilities serving populations from less than 5,000 to over 1 million throughout the U.S. 	<ul style="list-style-type: none"> ▼ Design and conduct the most practical SMP. ▼ Effectively design and conduct an SSS using hydraulic modeling and one round of sampling.
<p>Distribution System Monitoring Programs</p> <ul style="list-style-type: none"> ▼ Supported clients in designing distribution system monitoring programs to meet regulatory requirements and water quality goals, including the Total Coliform Rule, the Lead and Copper Rule, and nitrification monitoring programs. 	<ul style="list-style-type: none"> ▼ Identify Stage 2 DBPR compliance monitoring locations with the most precision. ▼ Efficiently design a distribution system monitoring program. ▼ Thoroughly understand sampling/monitoring protocols. ▼ Select proper analytical techniques and methods.

Additional information on the IDSE can be found in:

USEPA: *National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule, Pre-publication*, 40 CFR Parts 9, 141, and 142. December 15, 2005.

USEPA: *The Stage 2 Disinfectant and Disinfection Byproduct Rule (Stage 2 DBPR) Implementation Guidance* [No. EPA 816-D-03-002]. November 2003.