FACT SHEET

7th Drinking Water Infrastructure Needs Survey and Assessment April 2023

Water is essential. We rely on it from the moment we wake up in the morning and make a cup of coffee until we brush our teeth at night. While most water infrastructure is hidden from sight, it is foundational to our daily lives. Our water infrastructure is aging and in need of repair to withstand the challenges of the 21st century. We must maintain and modernize our Nation's water infrastructure to deliver clean drinking water and safely transport and treat wastewater.

EPA's Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) is used to determine the financial needs of the nation's drinking water infrastructure over the next twenty years. It also guides EPA's distribution of annual funding to states through the Drinking Water State Revolving Fund (DWSRF), including the unprecedented funding provided by the Bipartisan Infrastructure Law (BIL).

Overview

The Safe Drinking Water Act (SDWA) requires that EPA examine the needs for infrastructure improvements and maintenance at public water systems in the United States. To accomplish this, EPA is required to conduct a survey and assessment every four years. Results from previous surveys can be found here: https://www.epa.gov/dwsrf.

EPA, states, and water systems collected data for the 7th DWINSA in calendar year 2021. This data represents the DWSRF-eligible infrastructure projects that are necessary over the next 20 years for water systems to continue to provide safe drinking water to the public. These projects include infrastructure needs that are eligible for, but not necessarily financed by, the DWSRF, including the installation of new drinking water infrastructure and the rehabilitation, expansion, or replacement of existing infrastructure.

The SDWA mandates that EPA use this survey to develop a formula to distribute DWSRF capitalization grants to states. By law, each state is guaranteed a minimum allotment of 1% of the total amount available to states. For each DWINSA, EPA uses a standardized methodology to develop a new allocation formula based on each state's 20-year infrastructure need compared to the national need and accounting for the required 1% minimum allocation for each state. There are minor changes in the allotment percentages in the allocation formula developed from the 7th DWINSA compared to the previous. Starting in FY23, this allotment formula will be used to distribute the DWSRF Base Appropriations, the BIL General Supplemental, and the BIL Emerging Contaminants funds. As described further below, EPA used information collected in the 7th DWINSA on service line materials to develop a separate allocation formula to distribute the DWSRF BIL Lead Service Line Replacement fund.

Assessment Results

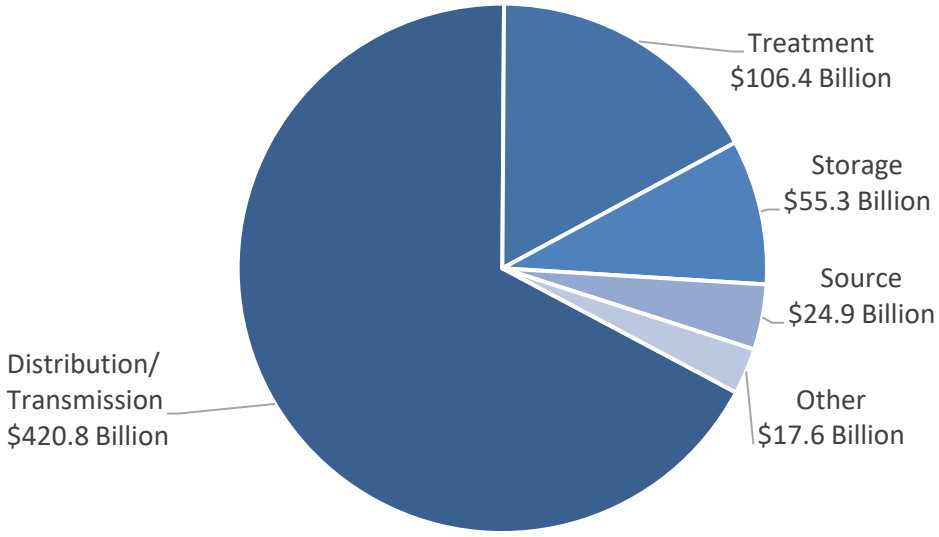
The 20-year national drinking water infrastructure need for the United States as estimated by the 7th DWINSA is $625 billion. This is a 32% increase over the 6th DWINSA ($472.6 billion). Exhibit 1 shows the breakout of the estimated need based on water system size and type. Appendix A shows this information by state and U.S. territory. The breakout of the estimated need by project category is presented in Exhibit 2 and resembles the

distribution in the 6th DWINSA.

Exhibit 1: Total 20-year Need by System Size/Type (January 2021 dollars)

Size of System	Estimated Need	Percent of Need (%)
Small ≤3,000	$100,103,837,670	16%
Medium 3,001 – 100,000	$273,124,224,526	44%
Large ≥100,001	$235,165,159,024	37%
NPNCWS	$16,597,738,681	3%
Total State Need	**$624,990,959,901**	**100%**

Exhibit 2: Total 20-year Need by Infrastructure Project Category (in billions; January 2021 dollars)



Methodology

The 7th DWINSA conducted a statistical survey of 3,629 public water systems[1] in all 50 states, Puerto Rico, the District of Columbia, and U.S. territories. These public water systems included large community water systems (CWS), medium CWS, small CWS, not-for-profit non-community (NPNCWS) and those serving American Indian (AI) and Alaska Native Villages (ANV) water systems. Small CWS were last surveyed in the 4th DWINSA, and AI/ANV were last surveyed in the 5th DWINSA. The 7th DWINSA is the largest and broadest scope effort since its inception in 1995 and includes data related to lead service lines (LSLs), operator workforce concerns, and pipe and storage tank construction materials related to SDWA's American Iron and Steel (AIS) provisions.

Out of the 3,629 public water systems surveyed, 3,526 responded, which is a 97% response rate, well above the 90% goal. This response rate goal was established to provide a high degree of confidence in the statistical precision of the assessment's findings. EPA surveyed all large systems, a random sample of medium community

[1] A public water system provides water to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. A public water system may be publicly or privately owned.

water systems in each state, a national random sample of small community water systems and a national sample of not-for-profit non-community water systems. Exhibit 3 shows the achieved number of responses by water system size.

Exhibit 3: State Community Water System Surveyed

Size of System	Total Number of Systems	Number of Surveyed Systems	Number of Survey Responses
Small ≤3,000	~40,000	606	602
Medium 3,001 – 100,000	~9000	2,181	2091
Large ≥100,001	708	708	705
NPNCWS	~26,000	134	128
Total			**3,526**

Basic statistical and survey methodologies used for this assessment are similar to those used in previous assessments. Water systems surveyed by the DWINSA submit cost estimates for capital improvements projects that the water system plans to complete over the next 20 years. For a project to be included, the water system must prove that they are committed to completing the project, and that it is feasible and necessary. One way to show commitment is for the project to be listed in a water system's capital improvement plan. To show the project is necessary and feasible a water system might submit a preliminary engineering report. Cost estimates reflect comprehensive infrastructure costs like engineering and design, purchase of raw materials and equipment, and construction labor. Project costs, which can either be actual submitted costs or modeled based on project category, are totaled for each water system and then used to extrapolate the total need for the state. State extrapolated needs are then totaled to get the national need. Additional information on methodology can found in the 6th DWINSA Report to Congress.

Credibility

EPA has been working closely with water systems and states for over 25 years to conduct the DWINSA. The survey and its methodology are widely accepted and often cited in various literature and studies. The DWINSA collects actual project and asset data from a random statistical sample of water systems, which minimizes bias and uncertainty in the survey and results. Rigorous water system project documentation is required based on a weight of evidence approach to demonstrate that a project is necessary, feasible, and has commitment. Consequently, the survey is credible, defensible, and statistically significant.

7th DWINSA Lead Service Line Information Collection

America's Water Infrastructure Act (AWIA) of 2018 mandated EPA to evaluate and include the cost to replace lead service lines (LSLs) in the drinking water infrastructure needs survey.[2] EPA collected service line material information to support this evaluation for the first time in 2021, as a part of the 7th DWINSA.

[2] The March 2019 Congressional Research Service Report on America's Water Infrastructure Act of 2018 (P.L. 115-270): Drinking Water Provisions, describes that AWIA requirement to include the cost to replace lead lines in the needs survey may potentially affect some states' allotments of DWSRF capitalization grants.
https://crsreports.congress.gov/product/pdf/R/R45656

Based on the findings from the 7th DWINSA, the total projected LSL in the United States is 9.2 million (see Exhibit 4). There are also an estimated 2.8 million standalone galvanized service lines. Currently, some states require that galvanized pipe be identified, and some states require that it be removed. The 7th DWINSA provides the best available national and state-level projections of service line materials and counts. Exhibit 5 shows the distribution of LSLs across the nation and Exhibit 6 shows the total number of projected LSLs in each state, along with their percentage of the total. This information was used to develop the LSL-specific allocation formula for distributing the DWSRF BIL LSLR fund.

Exhibit 4: National Projected Service Lines by Material

Service Line Material	Projected Count
Lead Content	9,223,745
Stand-Alone Galvanized	2,800,839
No-Lead Content	87,929,975
National Total Service Lines	**99,949,560**

Exhibit 5: Projected Number of Lead Services Lines by State

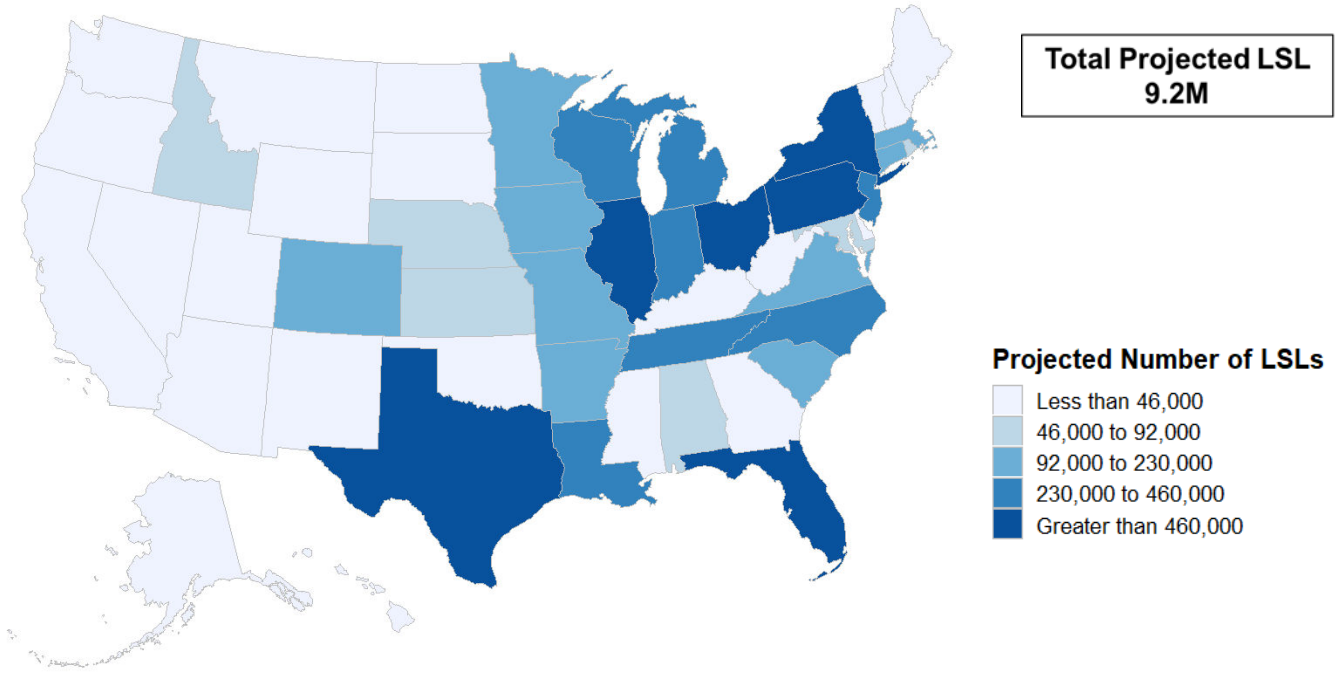


Exhibit 6: Total Projected Lead Services Lines by State

State	Projected LSL	
	Number	% of Total
Alabama	91,544	1.00%
Alaska	1,454	0.02%
Arizona	11,429	0.12%
Arkansas	171,771	1.87%
California	13,476	0.15%
Colorado	111,907	1.22%
Connecticut	146,574	1.60%
Delaware	42,479	0.46%
Florida	1,159,300	12.62%
Georgia	45,985	0.50%
Hawaii	9,589	0.10%
Idaho	49,434	0.54%
Illinois	1,043,294	11.35%
Indiana	265,400	2.89%
Iowa	96,436	1.05%
Kansas	54,107	0.59%
Kentucky	40,207	0.44%
Louisiana	266,984	2.91%
Maine	18,057	0.20%
Maryland	71,166	0.77%
Massachusetts	117,090	1.27%
Michigan	301,790	3.28%
Minnesota	136,873	1.49%
Mississippi	11,098	0.12%
Missouri	202,112	2.20%
Montana	14,125	0.15%
Nebraska	53,230	0.58%
Nevada	9,048	0.10%
New Hampshire	14,819	0.16%
New Jersey	349,357	3.80%
New Mexico	15,453	0.17%
New York	494,007	5.38%
North Carolina	369,715	4.02%
North Dakota	26,443	0.29%
Ohio	745,061	8.11%
Oklahoma	28,679	0.31%
Oregon	3,530	0.04%
Pennsylvania	688,697	7.50%
Puerto Rico	51,490	0.56%
Rhode Island	75,749	0.82%
South Carolina	108,177	1.18%
South Dakota	4,141	0.05%
Tennessee	381,342	4.15%
Texas	647,640	7.05%
Utah	14,293	0.16%
Vermont	5,263	0.06%
Virginia	187,883	2.04%
Washington	22,030	0.24%
West Virginia	20,259	0.22%
Wisconsin	341,023	3.71%
Wyoming	10,477	0.11%
District of Columbia	27,058	0.29%
Total	**9,188,545**	

7th DWINSA Service Line Questionnaire

As required by AWIA, all public water systems participating in the 7th DWINSA were asked to provide information on the number of service lines in their system (whether owned by the system, the customer, or jointly owned by both the system and the customer) and what they knew about the construction materials of the service lines and service line connectors (see Exhibit 7). The service line questionnaire was optional; however, 75% of water systems provided responses about their service lines (see Exhibit 8). To date, this is the best available data collected and assessed on service line materials in the U.S.

Exhibit 7: Questions on Service Line Questionnaire

Type of Service Line	Category of Service Line Materials
Row 1. Service lines that contain any lead pipe	Lead Content
Row 2. Service lines that do not contain any lead pipe but have lead connectors (such as goosenecks or pigtails).	
Row 3a. Service lines that contain galvanized pipe and were previously downstream from a lead pipe that was removed from the service line.	
Row 3b. Service lines that contain galvanized pipe and were previously downstream from a lead connector that was removed from the service line.	
Row 3c. Service lines that contain galvanized pipe and were previously downstream from an unknown source of lead that was removed from the service line.	
Row 3d. Service lines that contain galvanized pipe that have never been downstream from any lead pipe or lead connector in the service line.	Standalone Galvanized
Row 4a. Service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.	No Lead
Row 4b. Service lines for which the material makeup of the service line and of the connector are not known. (Unknown SLs)	Undiscovered Material
Inserted Row 5 for Analysis – Service lines that system did not disclose knowledge of material make-up (Not Reported SLs)	

Exhibit 8: Number of Responses to the DWINSA Service Line Questionnaire

Type of Service Line (Material)	Number of Responses
1. Systems that reported any lead content in any of their service lines or connectors	725
2. Systems that did not know the material of some or all of their service lines	843
3. Systems that reported some standalone galvanized service lines	127
4. Systems that reported that they had no lead content	920
5. Not reported	898
Total	**3,513**

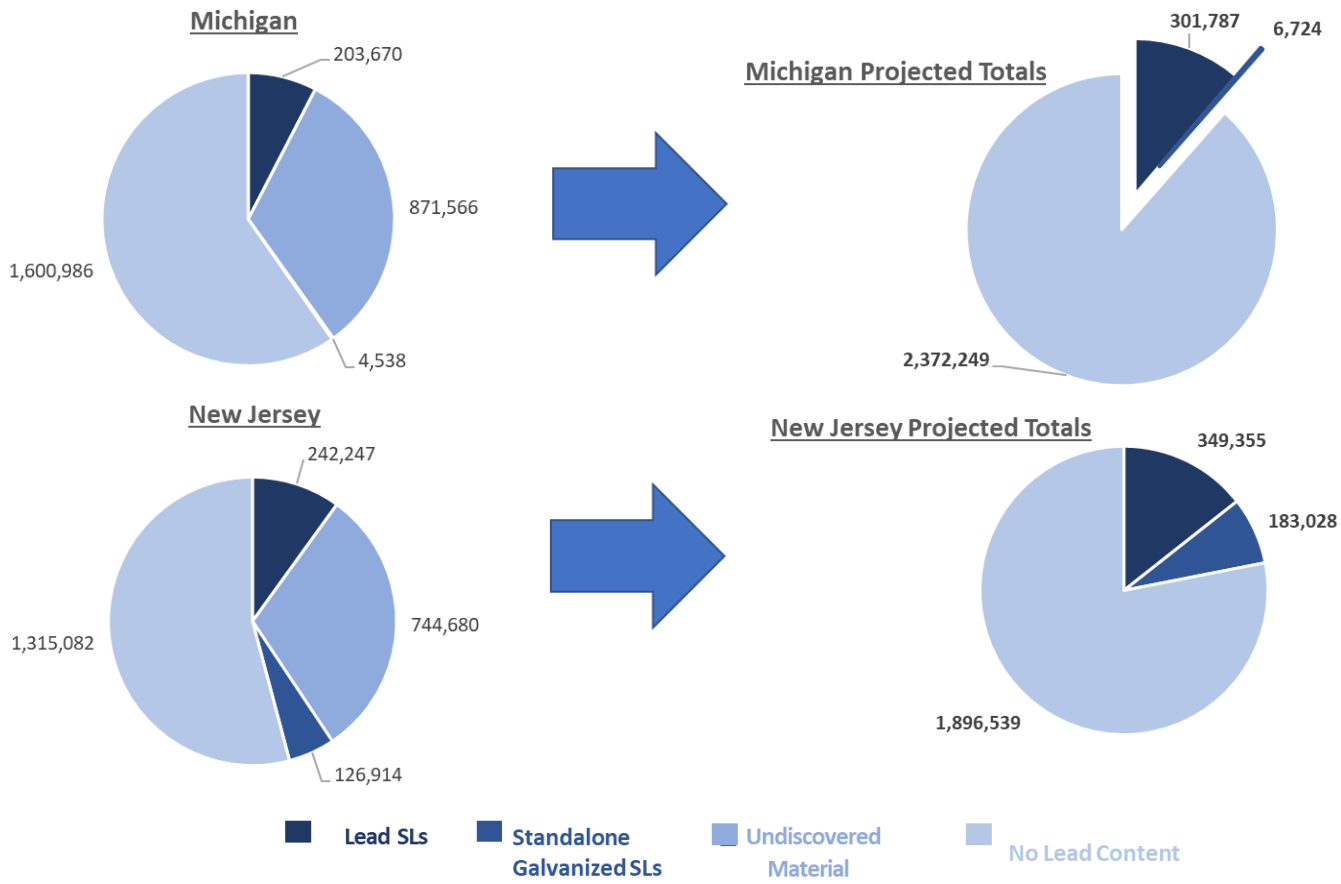
Lead Service Line Estimate Methodology

The same 3,629 water systems participating in the primary DWINSA were surveyed using the 7th DWINSA service line questionnaire, which collected information on the number of service lines by material type, as shown in

Exhibit 8. To develop estimated counts of service lines, system level data is extrapolated at the state and national level using similar methodology as for the primary DWINSA. Responses from the DWINSA service line questionnaire were used to estimate the numbers of service lines of each material type. EPA categorized these material types as known lead, standalone galvanized, no lead, and unknown/nonreported (also called undiscovered).

EPA is implementing the Lead and Copper Rule Revisions (LCRR), which require water systems to identify and make public the locations of lead service lines. In 2022, EPA issued *Guidance for Developing and Maintaining a Service Line Inventory* to support this effort. Until water systems have complete inventories, the number of reported undiscovered service lines that are actually lead is unknown. Therefore, for each state, EPA applied the ratio of the number of known LSLs to the total service lines of all known material types to project how many undiscovered service lines might be lead. This same projection was done for the standalone galvanized service lines. Examples of this methodology for two states are shown in Exhibit 9. A state specific ratio was developed to derive the total projected count of LSLs in each state. These state numbers were then totaled to calculate the total national LSL number. If a state reported all unknown materials or did not respond to the survey, for large and medium systems, a national ratio derived from the states for which EPA had data was applied. For small water systems, a national ratio was applied to the number of connections reported in small systems in each state.

Exhibit 9: Estimated Known Service Line Materials Applied to State's Undiscovered



Lead Service Line Replacement Allotment Formula

In 2021, the Bipartisan Infrastructure Law (BIL) expanded the focus of the DWSRF to include a $15 billion lead service line replacement (LSLR) fund. In addition to replacement projects, this funding can and should be used for LSL identification, including development of LSL inventories as required by the LCRR. EPA allocated the first year of this BIL LSLR fund using a formula based on all categories of infrastructure need.

EPA is using the new results of LSL information collected under the 7th DWINSA to allocate the remaining years BIL LSLR funds. EPA developed the allotment formula based on the number of projected LSLs in each state. As required under SDWA, each state is provided a minimum allotment of 1% of the total amount available to states. This new LSL-specific formula will allow states to receive financial assistance commensurate with their need as soon as possible, furthering public health protection nationwide. Any remaining imbalance in allotments would be addressed through the normal DWSRF reallotment process established under SDWA. Funds not distributed to eligible DWSRF projects by the end of the second fiscal year after apportionment are reallotted; this process is outlined in Section 1452 of the Safe Drinking Water Act and the deadline cannot be shortened or extended by EPA. The new LSL formula will reduce the need for reallotments and the administrative burden on states and EPA that is created when funding allocated outweighs the need of water systems in that state or vice versa.

Appendix A: State 20-year Need by System Size (January 2021 dollars)

State	Large	Medium	Small	NPNCWSs	Total
Alabama	$2,564,300,000	$8,709,800,000	$894,000,000	$9,900,000	$12,178,000,000
Alaska	$155,100,000	*	$509,900,000	$245,700,000	$910,700,000
Arizona	$6,973,700,000	$3,619,300,000	$1,328,100,000	$127,500,000	$12,048,700,000
Arkansas	$736,900,000	$5,054,500,000	$1,881,600,000	$10,700,000	$7,683,800,000
California	$41,926,300,000	$34,325,900,000	$5,545,800,000	$1,717,100,000	$83,515,200,000
Colorado	$4,710,000,000	$5,501,000,000	$1,718,600,000	$138,200,000	$12,067,800,000
Connecticut	$2,000,100,000	$1,780,800,000	$799,700,000	$329,500,000	$4,910,100,000
Delaware	$405,000,000	*	$424,000,000	$35,000,000	$864,000,000
District of Columbia	$3,361,900,000	**	**	**	$3,361,900,000
Florida	$12,409,600,000	$10,668,200,000	$2,821,100,000	$850,600,000	$26,749,600,000
Georgia	$10,268,900,000	$6,599,300,000	$2,677,700,000	$109,300,000	$19,655,200,000
Hawaii	$993,700,000	*	$272,000,000	$1,400,000	$1,267,100,000
Idaho	$361,300,000	*	$1,179,400,000	$180,800,000	$1,721,600,000
Illinois	$4,973,100,000	$11,824,300,000	$4,937,800,000	$475,600,000	$22,210,800,000
Indiana	$3,587,800,000	$5,611,900,000	$1,937,200,000	$646,900,000	$11,783,800,000
Iowa	$1,083,100,000	$6,312,000,000	$2,560,500,000	$149,000,000	$10,104,700,000
Kansas	$1,940,100,000	$2,737,000,000	$2,332,000,000	$25,900,000	$7,035,100,000
Kentucky	$1,543,800,000	$5,679,000,000	$614,400,000	$5,700,000	$7,842,900,000
Louisiana	$1,813,100,000	$4,727,700,000	$2,435,800,000	$34,500,000	$9,011,100,000
Maine	$137,600,000	*	$703,900,000	$172,400,000	$1,013,900,000
Maryland	$12,042,200,000	$1,319,300,000	$881,900,000	$401,500,000	$14,644,900,000
Massachusetts	$3,572,200,000	$10,803,600,000	$654,000,000	$163,000,000	$15,192,800,000
Michigan	$5,358,800,000	$6,572,700,000	$2,813,000,000	$1,513,200,000	$16,257,700,000
Minnesota	$1,171,400,000	$5,355,000,000	$2,379,400,000	$1,271,800,000	$10,177,500,000
Mississippi	$387,400,000	$4,345,400,000	$3,362,900,000	$23,200,000	$8,118,900,000
Missouri	$2,822,500,000	$4,908,600,000	$3,170,300,000	$188,000,000	$11,089,400,000
Montana	$221,200,000	*	$1,120,800,000	$211,800,000	$1,553,800,000
Nebraska	$769,800,000	*	$1,361,500,000	$104,700,000	$2,235,900,000
Nevada	$5,032,300,000	$938,500,000	$388,600,000	$55,500,000	$6,414,900,000
New Hampshire	$41,600,000	*	$1,056,100,000	$265,300,000	$1,363,000,000
New Jersey	$5,941,400,000	$4,741,300,000	$1,089,400,000	$480,600,000	$12,252,800,000
New Mexico	$516,800,000	*	$1,002,200,000	$97,700,000	$1,616,700,000
New York	$22,279,200,000	$6,971,900,000	$5,444,100,000	$452,500,000	$35,147,700,000
North Carolina	$6,521,800,000	$9,613,400,000	$2,916,700,000	$953,100,000	$20,004,900,000
North Dakota	$1,297,100,000	*	$641,100,000	$12,900,000	$1,951,100,000
Ohio	$6,179,400,000	$6,580,700,000	$2,657,000,000	$654,700,000	$16,071,800,000

Appendix A: State 20-year Need by System Size (January 2021 dollars)

State	Large	Medium	Small	NPNCWSs	Total
Oklahoma	$2,866,000,000	$4,404,600,000	$2,372,700,000	$65,600,000	$9,708,900,000
Oregon	$2,915,500,000	$5,141,800,000	$1,708,600,000	$344,600,000	$10,110,500,000
Pennsylvania	$10,218,100,000	$9,199,300,000	$4,084,000,000	$799,700,000	$24,301,100,000
Puerto Rico	$1,274,200,000	$1,599,000,000	$796,500,000	**	$3,669,800,000
Rhode Island	$837,300,000	*	$124,900,000	$66,800,000	$1,029,000,000
South Carolina	$2,747,500,000	$4,336,200,000	$961,900,000	$53,700,000	$8,099,400,000
South Dakota	$167,100,000	*	$814,100,000	$18,700,000	$999,900,000
Tennessee	$2,522,200,000	$8,127,500,000	$841,800,000	$35,300,000	$11,526,800,000
Texas	$23,091,600,000	$28,152,900,000	$9,760,600,000	$248,000,000	$61,253,100,000
Utah	$888,200,000	*	$949,100,000	$61,100,000	$1,898,400,000
Vermont	**	*	$771,500,000	$117,200,000	$888,700,000
Virginia	$3,802,300,000	$3,307,500,000	$1,991,900,000	$280,600,000	$9,382,200,000
Washington	$4,357,900,000	$7,774,100,000	$3,843,900,000	$346,600,000	$16,322,500,000
West Virginia	$127,900,000	*	$1,398,100,000	$65,300,000	$1,591,300,000
Wisconsin	$2,862,800,000	$4,582,500,000	$2,403,000,000	$1,907,400,000	$11,755,700,000
Wyoming	**	*	$558,100,000	$71,700,000	$629,800,000
Subtotal	$234,779,100,000	$272,569,200,000	$99,893,200,000	$16,597,500,000	$623,839,000,000
American Samoa	**	$165,200,000	$50,700,000	**	$215,900,000
Guam	$386,100,000	**	**	**	$386,100,000
North Mariana Is.	**	$291,500,000	$88,500,000	**	$380,000,000
Virgin Islands	**	$98,100,000	$71,300,000	**	$169,500,000
Subtotal	$386,100,000	$554,800,000	$210,500,000	$0	$1,151,500,000
Total	**$235,165,200,000**	**$273,124,000,000**	**$100,103,700,000**	**$16,597,500,000**	**$624,990,400,000**

*The total medium system needs for partial participating states is $20,642,700,000. This is represented cumulatively in the "Subtotal" and not by state. Partial participating states are those states which are likely to only receive the 1% minimum DWSRF allotment and therefore, by choice, do not conduct the survey for medium water systems. Large and small water systems are surveyed in these states.

**Indicates there are no water systems in these categories.

Note: Numbers may not total due to rounding.