

U.S. House Committee on Energy and Commerce
Subcommittee on Oversight and Investigations
“Corrosion, Collapse, and Clean-Up: Examining the Potomac Interceptor Collapse.”
May 20, 2026
Documents for the Record

1. September 2023, A report from the Environmental Protection Agency entitled "Drinking Water Infrastructure Needs Survey and Assessment," submitted by the Minority.
2. 2026, A table from the EPA FY27 Congressional Budget Justification entitled "EPA Budget by National Program Manager and Major Office," submitted by the Minority.
3. April 2024, A report from the Environmental Protection Agency entitled "2022 Clean Watersheds Needs Survey," submitted by the Minority.
4. April 2, 2026, An article from the Washington Post entitled "Catastrophic Sewage Spill Followed Years of Delay on Repairs, Post Review Finds," submitted by Rep. DeGette.
5. February 16, 2026, A Truth social post by President Trump, submitted by Rep. Tonko.
6. February 17, 2026, A Truth social post by President Trump, submitted by Rep. Tonko.

Drinking Water Infrastructure Needs Survey and Assessment

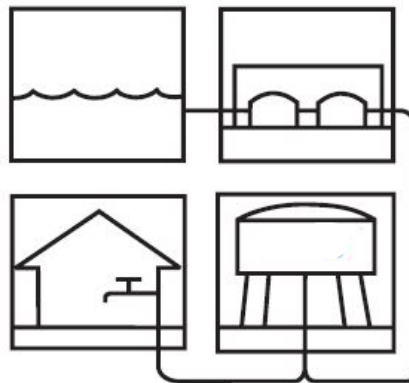
7th Report to Congress



Office of Water
EPA 810R23001
September 2023

DRINKING WATER INFRASTRUCTURE NEEDS SURVEY AND ASSESSMENT

7TH REPORT TO CONGRESS



Drinking Water Infrastructure Needs Survey and Assessment

EXECUTIVE SUMMARY	6
SECTION 1 TRADITIONAL STATE INFRASTRUCTURE NEEDS.....	7
Section 1.1 Background	7
Section 1.2 Methodology	7
Section 1.3 Survey Credibility.....	9
Section 1.4 State Survey Results.....	9
SECTION 2 STATE AND U.S. TERRITORY LEAD SERVICE LINE COUNTS.....	17
Section 2.1 Service Line Questionnaire.....	17
Section 2.2 Lead Service Line Estimate Methodology.....	20
Section 2.3 Lead Service Line Replacement Allotment Formula.....	23
Section 2.4 Lead Service Line Results.....	24
SECTION 3 WORKFORCE SURVEY RESPONSE	28
Section 3.1 Background	28
Section 3.2 Operator Workforce Responses	28
SECTION 4 IRON AND STEEL CONSTRUCTION MATERIALS	30
Section 4.1 Background	30
Section 4.2 Storage Tank Materials Responses	30
Section 4.3 Pipe Materials Responses	33
SECTION 5 TRIBAL WATER SYSTEM TRADITIONAL INFRASTRUCTURE NEEDS	36
Section 5.1 Background	36
Section 5.2 Assessment Results.....	36
APPENDIX A PROCESS FOR DEVELOPING SERVICE LINE COUNT ESTIMATES.....	42
APPENDIX B STATE-BY-STATE FINDINGS CHARTS	46

EXHIBITS

EXHIBIT 1.1: DWSRF-ELIGIBLE STATE WATER SYSTEMS SURVEYED	8
EXHIBIT 1.2: TOTAL 20-YEAR STATE NEED BY INFRASTRUCTURE PROJECT CATEGORY (IN BILLIONS; JANUARY 2021 DOLLARS)	10
EXHIBIT 1.3: TOTAL 20-YEAR STATE NEED BY SYSTEM SIZE/TYPE (IN BILLIONS; JANUARY 2021 DOLLARS)	10
EXHIBIT 1.4: STATE 20-YEAR NEED REPORTED BY PROJECT CATEGORY (IN MILLIONS; JANUARY 2021 DOLLARS)	11
EXHIBIT 1.5: STATE 20-YEAR NEED BY SYSTEM SIZE (IN MILLIONS; JANUARY 2021 DOLLARS)	13
EXHIBIT 1.6: TOTAL STATE AND U.S. TERRITORY 20-YEAR NATIONAL NEED COMPARED TO PREVIOUS DWINSA FINDINGS (DOLLARS IN BILLIONS)	15
EXHIBIT 1.7: TOTAL 20-YEAR STATE AND U.S. TERRITORY NEED BY SYSTEM SIZE/TYPE (IN BILLIONS; JANUARY 2021 DOLLARS)	15
EXHIBIT 1.8: TOTAL STATE 20-YEAR NEED BY PROJECT CATEGORY FOR EACH ASSESSMENT (IN BILLIONS; JANUARY 2021 DOLLARS)	16
EXHIBIT 2.1: QUESTIONS ON SERVICE LINE QUESTIONNAIRE	18
EXHIBIT 2.2: EXAMPLE COMPLETED LEAD SERVICE LINE SUPPLEMENTAL QUESTIONNAIRE....	19
EXHIBIT 2.3: NUMBER OF SURVEYED SYSTEMS THAT RESPONDED TO THE STATE SERVICE LINE SUPPLEMENTAL QUESTIONNAIRE (NATIONAL SUMMARY)	20
EXHIBIT 2.4: ESTIMATED SERVICE LINE MATERIAL BASED ON SURVEY RESPONSE.....	21
EXHIBIT 2.5 ESTIMATED KNOWN SERVICE LINE MATERIALS APPLIED TO STATE’S UNDISCOVERED	23
EXHIBIT 2.6: NATIONAL PROJECTED SERVICE LINES BY MATERIAL	24
EXHIBIT 2.7: PROJECTED NUMBER OF LEAD SERVICES LINES BY STATE AND TERRITORY	25
EXHIBIT 2.8: TOTAL PROJECTED LEAD SERVICES LINES BY STATE	26
EXHIBIT 2.9: NUMBER OF STATE SERVICE LINES BY MATERIAL TYPE AND SYSTEM SIZE	27
EXHIBIT 3.1: CURRENT WORKFORCE HIRING FOR RESPONDING WATER SYSTEMS	28
EXHIBIT 3.2: HIRING NEXT 5 YEARS FOR RESPONDING WATER SYSTEMS	29
EXHIBIT 3.3: HIRING CHALLENGES BY SYSTEM SIZE FOR RESPONDING WATER SYSTEMS.....	29
EXHIBIT 4.1: LIKELY TANK REPLACEMENT MATERIAL (ELEVATED) FOR RESPONDING WATER SYSTEMS	31

EXHIBIT 4.2: LIKELY TANK REPLACEMENT MATERIAL (GROUND) FOR RESPONDING WATER SYSTEMS	31
EXHIBIT 4.3: LIKELY MATERIAL FOR NEW TANKS (ELEVATED) FOR RESPONDING WATER SYSTEMS	32
EXHIBIT 4.4: LIKELY MATERIAL FOR NEW TANKS (GROUND) FOR RESPONDING WATER SYSTEMS	32
EXHIBIT 4.5: EXISTING PIPE MATERIAL BY PERCENT OF LENGTH OF PIPE FOR RESPONDING WATER SYSTEMS	33
EXHIBIT 4.6: REPLACEMENT MATERIAL FOR EXISTING PIPE AND EXISTING MATERIAL BY PERCENT OF LENGTH OF PIPE FOR RESPONDING WATER SYSTEMS	34
EXHIBIT 4.7: LIKELY REPLACEMENT MATERIAL FOR EXISTING PIPE BY PERCENT OF LENGTH OF PIPE FOR RESPONDING WATER SYSTEMS	34
EXHIBIT 4.8: LIKELY MATERIAL TYPE FOR NEW PIPE PROJECTS BY PERCENT OF RESPONDING WATER SYSTEMS	35
EXHIBIT 5.1: 20-YEAR NEED FOR AMERICAN INDIAN AND ALASKA NATIVE VILLAGE SYSTEMS BY EPA REGION AND TYPE OF NEED (IN MILLIONS; JANUARY 2021 DOLLARS).....	37
EXHIBIT 5.2: AMERICAN INDIAN AND ALASKA NATIVE VILLAGE 20-YEAR NEED REPORTED BY SURVEY YEAR (IN MILLIONS; JANUARY 2021 DOLLARS).....	38
EXHIBIT 5.3: TOTAL 20-YEAR NEED BY PROJECT TYPE FOR AMERICAN INDIAN WATER SYSTEMS (IN MILLIONS, JANUARY 2021 DOLLARS)	39
EXHIBIT 5.4: TOTAL 20-YEAR NEED BY PROJECT TYPE FOR ALASKA NATIVE VILLAGE WATER SYSTEMS (IN MILLIONS, JANUARY 2021 DOLLARS)	40

EXECUTIVE SUMMARY

The United States Environmental Protection Agency's (EPA) 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 Infrastructure Investment and Jobs Act (P.L. 117-58), also known as the Bipartisan Infrastructure Law.

The 7th DWINSA includes a State survey and a Tribal survey. The State survey includes the U.S. territories, the District of Columbia, and Puerto Rico and shows a twenty-year capital improvement need of \$625 billion. Of that \$625 billion, \$620.4 billion is for states and Puerto Rico, \$1.2 billion is for U.S. territories, and \$3.4 billion is for the District of Columbia. The Tribal survey shows a need of \$4.1 billion, of which \$3.2 billion is for American Indian systems and \$0.9 billion is for Alaska Native Villages. This \$629.1 billion total estimate represents DWSRF-eligible infrastructure projects necessary, from January 1, 2021, through December 31, 2040, for water systems to continue to provide safe drinking water to the public. The findings are based on data collected in calendar year 2021.

The seventh survey and assessment relied primarily on a statistical survey of 3,629 public water systems in all 50 states, Puerto Rico, the District of Columbia, and U.S. territories as well as 198 American Indian water systems and 97 Alaska Native Village water systems for 3,924 systems total. These public water systems consisted of small community water systems (CWS), medium CWS, large CWS, and not-for-profit non-community water systems (NPNCWS). Out of the 3,924 public water systems surveyed, 3,820 responded, which is a 97% response rate. This response rate provides a high degree of confidence in the statistical precision of the assessment's findings. The 7th DWINSA is the largest and broadest scope effort since its inception in 1995, including new data on lead service lines (LSLs), operator workforce concerns, and pipe and storage tank construction materials related to the Safe Drinking Water Act's (SDWA) American Iron and Steel (AIS) provisions.

Section 1 Traditional State Infrastructure Needs

Section 1.1 Background

The 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>. The 7th DWINSA includes a State survey and a Tribal survey. The State survey includes the U.S. territories, the District of Columbia, and Puerto Rico. The Tribal survey includes American Indian systems and Alaska Native Villages.

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 20-year period of January 1, 2021, through December 31, 2040, 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 findings of the State survey of traditional 20-year infrastructure needs are reported in this section; the findings of the Tribal survey are reported in Section 5.

The SDWA mandates that EPA use the DWINSA to develop a formula to distribute DWSRF capitalization grants to states. By law, each state, the District of Columbia, and Puerto Rico are guaranteed a minimum allotment of 1% of the total amount available to states and the U.S. territories share 1.5% 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 Bipartisan Infrastructure Law General Supplemental, and the Bipartisan Infrastructure Law 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 Bipartisan Infrastructure Law Lead Service Line Replacement (LSLR) fund for FY23.

The Assessment was developed in consultation with a workgroup consisting of state and EPA regional coordinators. The workgroup met several times by conference call and in person to discuss and to receive feedback on the Assessment's policies and processes. In addition, in compliance with the Paperwork Reduction Act (44 U.S.C. §3501 et seq.), the survey design and instrument were reviewed and approved by the Office of Management and Budget (OMB). The Information Collection Request for the survey can be accessed in the Federal Register (86 FR 6542; February 5, 2020).

Section 1.2 Methodology

The 7th DWINSA conducted a statistical survey of 3,629 public water systems in all 50 states, Puerto Rico, the District of Columbia, and the U.S. territories. Exhibit 1.1 shows the total number of DWSRF-eligible systems and the number of systems surveyed. These public water systems included large community

water systems (CWS), medium CWS, small CWS, and not-for-profit non-community water systems (NPNCWS). Due to the burden of participating, small CWS are not included in every survey. Small CWS were last surveyed in the 4th DWINSAs. The 7th DWINSAs 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 state 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. For the State survey, EPA surveyed all large CWS, a random sample of medium CWS in each state, a national random sample of small CWS and a national sample of NPNCWS. Large and medium CWS either filled out the survey themselves or with state assistance. EPA’s contractor assisted small CWS and NPNCWS. States which are likely to only receive the 1% minimum DWSRF allotment may choose to not conduct the survey for medium CWS, and if so, are known as partial participating states. Large and small CWS are still surveyed in partial participating states. Exhibit 1.1 shows the achieved number of responses by water system size for the State survey.

Exhibit 1.1: DWSRF-Eligible State Water Systems Surveyed

Size of System	Total Number of Systems	Number of Surveyed Systems	Sampling Rate	Number of Survey Responses	% Survey Responses
Small Community Water Systems (serving 3,300 and fewer people)	~40,000	606	1.60%	602	99.3%
Medium Community Water Systems (serving 3,301 to 100,000 people)	~9,000	2,181	22.70%	2,091	95.9%
Large Community Water Systems (serving over 100,000 people)	708	708	100%	705	99.6%
Not-for-Profit Noncommunity Water Systems	~26,000	134	0.50%	128	95.5%
Total				3,526	97.6%

Basic statistical and survey methodologies used for this assessment are the same as those used in previous assessments. Water systems surveyed by the DWINSAs submit cost estimates for capital improvement projects that the water system plans to complete over the next 20 years (for this survey, January 1, 2021, through December 31, 2040). For a project to be included, the water system must

document 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.

The 20-year national infrastructure need for the State survey is calculated for each individual state and territory using the reported needs of large CWS, the weighted needs of medium CWS and by applying the small CWS national need to each state's small CWS inventory. The medium CWS need for partial participating states was estimated using data from full participating states and the inventory of medium CWS in the partial participating states. Use of this method allowed EPA to meet its precision target for each full participating state as well as at the national level.

State extrapolated needs are then totaled with the results of the American Indian and Alaska Native Village surveys to get the national need. Additional information on methodology can be found in the 6th DWINSA Report to Congress.

Section 1.3 Survey 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 stratified 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.

Section 1.4 State Survey Results

The 20-year national infrastructure need for states (including territories, Puerto Rico, and the District of Columbia) estimated by the 7th DWINSA is \$625 billion. This is a 32% increase over the 6th DWINSA (\$472.6 billion, in January 2015 dollars). Accounting for inflation, this is a 14% increase in need over the adjusted 6th DWINSA (\$546.6 billion, in January 2021 dollars). The breakout of the need by project category is presented in Exhibit 1.2. The distribution across categories is similar to the 6th DWINSA, although the quantity of need has increased. Exhibit 1.3 shows the breakout of the need based on water system size and type. The U.S. territory needs, reported as part of the total 20-year state need, total approximately \$1.15 billion, of which \$519.3 million is needed for distribution and transmission, \$232.3 million for treatment, \$266.7 million for storage, \$70.6 million for source, and \$62.7 for other needs. Additional information on U.S. state and U.S. territory needs, including a breakout by territory, can be found in Exhibit 1.4, Exhibit 1.5 and Appendix B.

Exhibit 1.2: Total 20-year State Need by Infrastructure Project Category (in billions; January 2021 dollars)

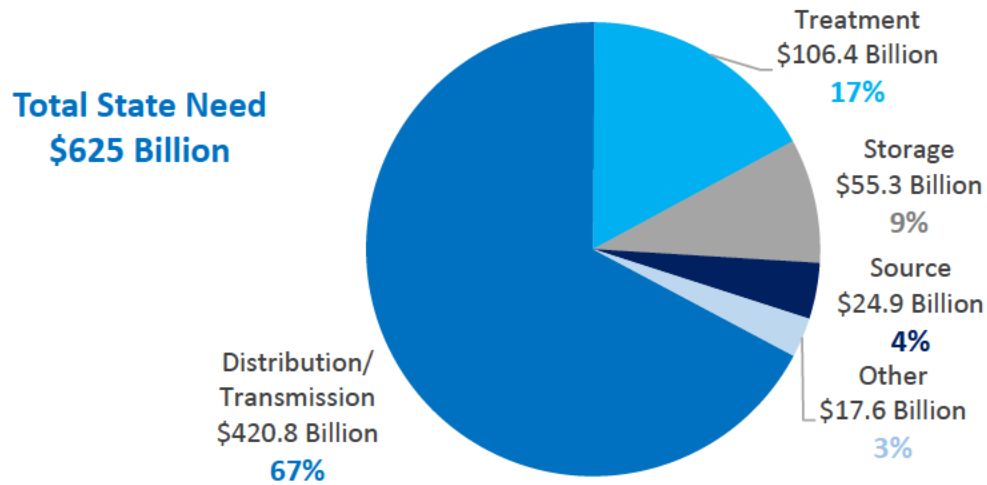


Exhibit 1.3: Total 20-year State Need by System Size/Type (in billions; January 2021 dollars)

System Size/Type	Estimated Need	Percent of Need (%)
Small Community Water Systems (serving 3,300 and fewer people)	\$100.1	16%
Medium Community Water Systems (serving 3,301 to 100,000 people)	\$273.1	44%
Large Community Water Systems (serving over 100,000 people)	\$235.2	37%
Not-for-Profit Noncommunity Water Systems	\$16.6	3%
Total State Need	\$625.0	100%

Exhibit 1.4: State 20-year Need Reported by Project Category (in millions; January 2021 dollars)

State	Distribution/ Transmission	Treatment	Storage	Source	Other	Total
Alabama	\$9,241.7	\$1,486.3	\$948.2	\$182.5	\$319.2	\$12,178.0
Alaska*	\$729.4	\$291.1	\$201.9	\$87.7	\$52.9	\$1,363.0
Arizona	\$7,455.6	\$2,175.3	\$1,161.4	\$699.0	\$557.4	\$12,048.7
Arkansas	\$5,626.8	\$956.4	\$695.6	\$152.3	\$252.7	\$7,683.8
California	\$55,742.3	\$13,549.9	\$9,238.6	\$3,571.1	\$1,413.3	\$83,515.2
Colorado	\$7,502.3	\$2,877.6	\$1,022.9	\$290.6	\$374.4	\$12,067.8
Connecticut	\$3,017.6	\$1,066.1	\$445.4	\$184.0	\$197.0	\$4,910.1
Delaware*	\$1,193.4	\$301.4	\$176.4	\$77.8	\$60.8	\$1,809.9
District of Columbia	\$3,316.4	n/a	\$45.5	n/a	\$0.0	\$3,361.9
Florida	\$17,615.2	\$5,135.6	\$1,778.1	\$1,454.8	\$765.9	\$26,749.6
Georgia	\$13,966.4	\$3,299.9	\$1,263.1	\$552.3	\$573.6	\$19,655.2
Hawaii*	\$1,442.8	\$454.8	\$252.2	\$109.1	\$54.5	\$2,313.4
Idaho*	\$1,905.8	\$552.5	\$313.0	\$188.4	\$114.1	\$3,073.8
Illinois	\$14,101.7	\$4,280.5	\$2,019.5	\$972.0	\$837.2	\$22,210.8
Indiana	\$8,161.4	\$1,691.0	\$872.5	\$601.2	\$457.7	\$11,783.8
Iowa	\$6,924.3	\$1,373.1	\$716.1	\$860.2	\$231.0	\$10,104.7
Kansas	\$4,607.9	\$1,495.0	\$503.2	\$280.0	\$149.1	\$7,035.1
Kentucky	\$6,020.7	\$974.1	\$651.0	\$90.3	\$106.7	\$7,842.9
Louisiana	\$6,130.8	\$1,513.2	\$694.7	\$307.8	\$364.6	\$9,011.1
Maine*	\$1,236.6	\$355.7	\$206.6	\$93.9	\$68.3	\$1,961.1
Maryland	\$12,780.4	\$1,041.5	\$480.9	\$271.0	\$71.1	\$14,644.9
Massachusetts	\$10,205.1	\$2,880.1	\$1,143.9	\$440.0	\$523.7	\$15,192.8
Michigan	\$11,696.1	\$2,246.2	\$1,110.9	\$751.7	\$452.9	\$16,257.7
Minnesota	\$6,017.2	\$2,122.2	\$1,043.4	\$593.7	\$401.0	\$10,177.5
Mississippi	\$4,925.5	\$1,962.4	\$650.0	\$366.1	\$215.0	\$8,118.9
Missouri	\$7,890.2	\$1,562.9	\$1,025.7	\$372.0	\$238.6	\$11,089.4
Montana*	\$1,342.6	\$490.3	\$264.6	\$137.8	\$90.6	\$2,326.0
Nebraska*	\$2,296.6	\$403.0	\$268.0	\$169.0	\$100.8	\$3,237.4
Nevada	\$3,926.2	\$997.3	\$1,220.3	\$208.2	\$63.0	\$6,414.9
New Hampshire*	\$1,452.6	\$481.7	\$279.7	\$149.9	\$96.2	\$2,460.2
New Jersey	\$8,261.5	\$2,230.6	\$1,087.5	\$361.2	\$312.0	\$12,252.8
New Mexico*	\$2,101.0	\$547.5	\$327.0	\$171.8	\$162.6	\$3,309.8
New York	\$24,472.1	\$5,415.4	\$3,237.9	\$1,101.6	\$920.6	\$35,147.7
North Carolina	\$14,028.7	\$3,215.0	\$1,372.1	\$826.0	\$563.2	\$20,004.9
North Dakota*	\$1,326.8	\$343.9	\$197.4	\$1,229.7	\$70.3	\$3,168.0
Ohio	\$10,819.6	\$2,767.8	\$1,308.8	\$652.9	\$522.7	\$16,071.8
Oklahoma	\$6,331.9	\$1,724.7	\$739.8	\$606.6	\$306.0	\$9,708.9
Oregon	\$5,678.3	\$2,170.7	\$1,349.7	\$509.4	\$402.3	\$10,110.5

State	Distribution/ Transmission	Treatment	Storage	Source	Other	Total
Pennsylvania	\$15,844.1	\$4,710.0	\$2,197.1	\$691.2	\$858.8	\$24,301.1
Puerto Rico	\$2,197.3	\$822.9	\$425.2	\$120.6	\$103.8	\$3,669.8
Rhode Island*	\$1,264.6	\$347.2	\$126.7	\$47.4	\$40.6	\$1,826.5
South Carolina	\$5,531.3	\$1,246.3	\$644.4	\$415.3	\$262.0	\$8,099.4
South Dakota*	\$1,361.5	\$362.8	\$240.1	\$121.1	\$81.9	\$2,167.4
Tennessee	\$9,054.7	\$1,401.0	\$871.9	\$154.7	\$44.5	\$11,526.8
Texas	\$41,372.6	\$11,466.1	\$4,828.6	\$1,596.1	\$1,989.8	\$61,253.1
Utah*	\$3,286.3	\$1,146.2	\$460.9	\$192.8	\$149.6	\$5,235.7
Vermont*	\$1,096.7	\$325.4	\$197.0	\$93.9	\$66.3	\$1,779.3
Virginia	\$6,147.5	\$1,761.0	\$927.8	\$250.2	\$295.6	\$9,382.2
Washington	\$10,105.9	\$2,685.9	\$2,152.3	\$647.1	\$731.3	\$16,322.5
West Virginia*	\$3,008.7	\$804.5	\$455.8	\$158.3	\$138.0	\$4,565.3
Wisconsin	\$7,494.8	\$2,321.9	\$1,068.2	\$604.5	\$266.3	\$11,755.7
Wyoming*	\$987.7	\$291.5	\$169.1	\$76.1	\$56.4	\$1,580.8
Subtotal	\$420,245.3	\$106,125.2	\$55,078.3	\$24,842.6	\$17,548.0	\$623,839.4
American Samoa	\$86.1	\$62.4	\$44.2	\$19.4	\$3.9	\$215.9
Guam	\$132.1	\$63.3	\$127.6	\$29.9	\$33.2	\$386.1
Northern Mariana Islands	\$207.0	\$91.4	\$50.1	\$14.0	\$17.5	\$380.0
Virgin Islands	\$94.1	\$15.3	\$44.7	\$7.3	\$8.1	\$169.5
Subtotal	\$519.3	\$232.3	\$266.7	\$70.6	\$62.7	\$1,151.6
Total	\$420,765	\$106,357	\$55,345	\$24,913	\$17,611	\$624,991

*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. Medium system needs in these states are estimated based on average medium system needs nationally, by stratum, derived from data from full participating states. The medium system and total needs of partial participating states is estimated but do not meet the data quality objectives for the survey.

Note: Numbers may not total due to rounding.

Exhibit 1.5: State 20-year Need by System Size (in millions; January 2021 dollars)

State	Large	Medium	Small	NPNCWS	Total
Alabama	\$2,564.3	\$8,709.8	\$894	\$9.9	\$12,178
Alaska	\$155.1	*	\$509.9	\$245.7	\$910.7
Arizona	\$6,973.7	\$3,619.3	\$1,328.1	\$127.5	\$12,048.7
Arkansas	\$736.9	\$5,054.5	\$1,881.6	\$10.7	\$7,683.8
California	\$41,926.3	\$34,325.9	\$5,545.8	\$1,717.1	\$83,515.2
Colorado	\$4,710	\$5,501	\$1,718.6	\$138.2	\$12,067.8
Connecticut	\$2,000.1	\$1,780.8	\$799.7	\$329.5	\$4,910.1
Delaware	\$405	*	\$424	\$35	\$864
District of Columbia	\$3,361.9	**	**	**	\$3,361.9
Florida	\$12,409.6	\$10,668.2	\$2,821.1	\$850.6	\$26,749.6
Georgia	\$10,268.9	\$6,599.3	\$2,677.7	\$109.3	\$19,655.2
Hawaii	\$993.7	*	\$272	\$1.4	\$1,267.1
Idaho	\$361.3	*	\$1,179.4	\$180.8	\$1,721.6
Illinois	\$4,973.1	\$11,824.3	\$4,937.8	\$475.6	\$22,210.8
Indiana	\$3,587.8	\$5,611.9	\$1,937.2	\$646.9	\$11,783.8
Iowa	\$1,083.1	\$6,312	\$2,560.5	\$149	\$10,104.7
Kansas	\$1,940.1	\$2,737	\$2,332	\$25.9	\$7,035.1
Kentucky	\$1,543.8	\$5,679	\$614.4	\$5.7	\$7,842.9
Louisiana	\$1,813.1	\$4,727.7	\$2,435.8	\$34.5	\$9,011.1
Maine	\$137.6	*	\$703.9	\$172.4	\$1,013.9
Maryland	\$12,042.2	\$1,319.3	\$881.9	\$401.5	\$14,644.9
Massachusetts	\$3,572.2	\$10,803.6	\$654	\$163	\$15,192.8
Michigan	\$5,358.8	\$6,572.7	\$2,813	\$1,513.2	\$16,257.7
Minnesota	\$1,171.4	\$5,355	\$2,379.4	\$1,271.8	\$10,177.5
Mississippi	\$387.4	\$4,345.4	\$3,362.9	\$23.2	\$8,118.9
Missouri	\$2,822.5	\$4,908.6	\$3,170.3	\$188	\$11,089.4
Montana	\$221.2	*	\$1,120.8	\$211.8	\$1,553.8
Nebraska	\$769.8	*	\$1,361.5	\$104.7	\$2,235.9
Nevada	\$5,032.3	\$938.5	\$388.6	\$55.5	\$6,414.9
New Hampshire	\$41.6	*	\$1,056.1	\$265.3	\$1,363
New Jersey	\$5,941.4	\$4,741.3	\$1,089.4	\$480.6	\$12,252.8
New Mexico	\$516.8	*	\$1,002.2	\$97.7	\$1,616.7
New York	\$22,279.2	\$6,971.9	\$5,444.1	\$452.5	\$35,147.7
North Carolina	\$6,521.8	\$9,613.4	\$2,916.7	\$953.1	\$20,004.9
North Dakota	\$1,297.1	*	\$641.1	\$12.9	\$1,951.1
Ohio	\$6,179.4	\$6,580.7	\$2,657	\$654.7	\$16,071.8
Oklahoma	\$2,866	\$4,404.6	\$2,372.7	\$65.6	\$9,708.9
Oregon	\$2,915.5	\$5,141.8	\$1,708.6	\$344.6	\$10,110.5
Pennsylvania	\$10,218.1	\$9,199.3	\$4,084	\$799.7	\$24,301.1

State	Large	Medium	Small	NPNCWS	Total
Puerto Rico	\$1,274.2	\$1,599	\$796.5	**	\$3,669.8
Rhode Island	\$837.3	*	\$124.9	\$66.8	\$1,029
South Carolina	\$2,747.5	\$4,336.2	\$961.9	\$53.7	\$8,099.4
South Dakota	\$167.1	*	\$814.1	\$18.7	\$999.9
Tennessee	\$2,522.2	\$8,127.5	\$841.8	\$35.3	\$11,526.8
Texas	\$23,091.6	\$28,152.9	\$9,760.6	\$248	\$61,253.1
Utah	\$888.2	*	\$949.1	\$61.1	\$1,898.4
Vermont	**	*	\$771.5	\$117.2	\$888.7
Virginia	\$3,802.3	\$3,307.5	\$1,991.9	\$280.6	\$9,382.2
Washington	\$4,357.9	\$7,774.1	\$3,843.9	\$346.6	\$16,322.5
West Virginia	\$127.9	*	\$1,398.1	\$65.3	\$1,591.3
Wisconsin	\$2,862.8	\$4,582.5	\$2,403	\$1,907.4	\$11,755.7
Wyoming	**	*	\$558.1	\$71.7	\$629.8
Subtotal	\$234,779	\$272,569	\$99,893	\$16,598	\$623,839
American Samoa	**	\$165.2	\$50.7	**	\$215.9
Guam	\$386.1	**	**	**	\$386.1
North Mariana Is.	**	\$291.5	\$88.5	**	\$380
Virgin Islands	**	\$98.1	\$71.3	**	\$169.5
Subtotal	\$386.1	\$554.8	\$210.5	\$0	\$1,151.5
Total	\$235,165	\$273,124	\$100,104	\$16,598	\$624,991

*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 at all in these categories.

Note: Numbers may not total due to rounding.

Exhibits 1.6 through 1.8 present the 7th DWINSA results for states compared to previous assessments. Note that the assessments differed in scope (small CWS, American Indian and Alaskan Native Village systems and NPNCWs were not included in data collection every survey cycle, but where data was not collected the total need for the state was calculated using previously collected data for those categories, converted that Assessment’s year). Exhibit 1.6 shows each DWINSA total state and U.S. territory need in “current year” dollars (in other words, dollars from the year of the specific Assessment) and expressed in January 2021 dollars. It shows the percentage change in the inflation-adjusted need from the previous assessment’s total need. This means the percentage change shown accounts for inflation and reflects the real change in need.

Exhibit 1.6: Total State and U.S. Territory 20-year National Need Compared to Previous DWINSA Findings (dollars in billions)

	1995	1999	2003	2007	2011	2015	2021
Total National Need (as listed in Assessment Year's Report to Congress in Current Year Dollars)	\$137.1	\$148.7	\$274.3	\$331.9	\$380.9	\$468.8	\$625.0
Cost adjustment factor to January 2021 dollars (based on Construction Cost Index)	114%	94%	77%	48%	30%	17%	--
Total National Need in 2021 Dollars	\$292.8	\$288.2	\$484.6	\$489.7	\$495.5	\$546.6	\$625.0
Percent Increase from Previous Assessment	--	-1.6%	68.2%	1.0%	1.2%	10.3%	14.3%

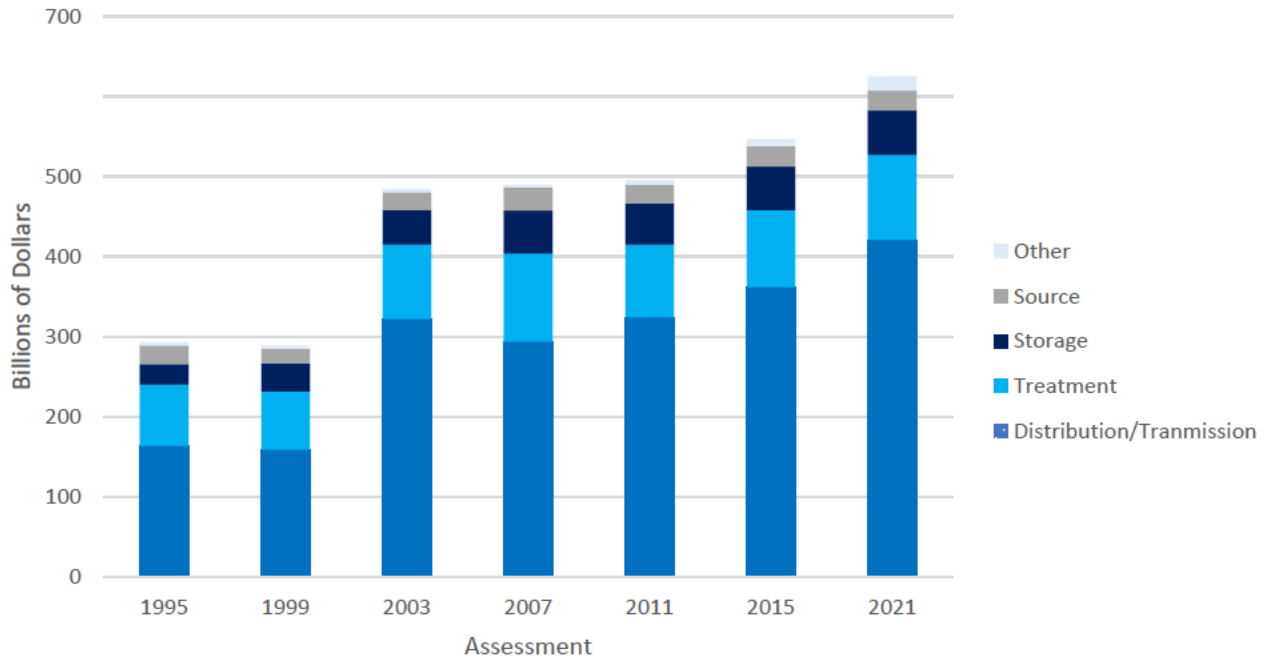
The 1999 through 2015 National Need each included the estimated capital cost of proposed or recently promulgated regulations taken from the regulations' Economic Analyses. The 1995 and 2021 National Need do not include any proposed or recently promulgated regulations.

Exhibit 1.7: Total 20-Year State and U.S. Territory Need by System Size/Type (in billions; January 2021 dollars)

System Type	1995	1999	2003	2007	2011	2015	2021
Small CWSs (serving 3,300 or fewer people)	\$79.5	\$60.4	\$60.4	\$87.7	\$83.9	\$86.8	\$100.1
Medium CWSs (serving 3,301 to 100,000 people)				\$214.0	\$210.5	\$245.6	\$273.1
Large CWSs (serving more than 100,000 people)				\$171.7	\$188.7	\$203.3	\$235.2
Combined Medium/Large CWSs*	\$213.4	\$203.8	\$399.1				
Not-for-Profit Noncommunity Systems		\$6.0	\$6.0	\$6.0	\$6.0	\$6.0	\$16.6
Total Need	\$292.9	\$270.1	\$465.4	\$479.4	\$489.1	\$541.7	\$625.0

Note: Numbers may not total due to rounding. Total Need presented in Exhibit 1.7 does not include estimated capital costs of proposed or recently promulgated regulations, which were included in the 1999 through 2015 reported Total National Need.

Exhibit 1.8: Total State 20-year Need by Project Category for Each Assessment (in billions; January 2021 dollars)



Section 2 State and U.S. Territory Lead Service Line Counts

Section 2.1 Service Line Questionnaire

America's Water Infrastructure Act (AWIA) of 2018 amended Section 1452(h) of SDWA to mandate that EPA evaluate and include the cost to replace lead service lines (LSLs) in future drinking water infrastructure needs surveys. EPA collected service line material information to support this evaluation for the first time in 2021, as a part of the 7th DWINSA.

In accordance with Section 1452(h)(2) of SDWA, 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 their knowledge of the construction materials of the service lines and service line connectors (see Exhibit 2.1). This includes medium CWS in partial participating states which were not surveyed for 20-year infrastructure needs. These systems were sent an abbreviated version of the DWINSA questionnaire which contained only the operator workforce and service line questions. Exhibit 2.1 also shows how the responses for each row were categorized by service line material. If a system reported any LSLs or connectors, EPA included those service lines in the lead content category. EPA included service lines that systems reported as galvanized pipe previously downstream of lead source (including lead pipes, lead connectors and/or any unknown source of lead) in the lead category as well. Galvanized service lines that have never been downstream of a source of lead are reported as standalone galvanized. Service lines known to not be lead are categorized as no lead. Service lines for which the system did not know the material or did not report a material are included in the undiscovered (including unknown and nonreported) category.

Exhibit 2.2 shows an example completed questionnaire. Like participation in the full needs survey, the service line questionnaire was optional; however, 75% of water systems in the State survey provided responses.

EPA recognizes that states and communities continue to make progress on identifying LSLs. To account for this rapidly developing data, states will be provided a one-time opportunity to adjust their reported service line data in Fall 2023. The updated service line information will be first used in distribution of DWSRF BIL LSLR funding to states in 2024.

Exhibit 2.1: 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 <u>previously</u> downstream from a lead pipe that was removed from the service line.	
Row 3b. Service lines that contain galvanized pipe and were <u>previously</u> downstream from a lead connector that was removed from the service line.	
Row 3c. Service lines that contain galvanized pipe and were <u>previously</u> downstream from an unknown source of lead that was removed from the service line.	
Row 3d. Service lines that contain galvanized pipe that have <u>never been</u> 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) Inserted Row 5 for Analysis – Service lines that system did not disclose knowledge of material make-up (Not Reported SLs)	Undiscovered Material

Exhibit 2.2: Example Completed Lead Service Line Supplemental Questionnaire

LEAD SERVICE LINE TABLE			
For each category, include those service lines <i>for which it is known or there is reason to believe</i> the service line likely fits the description. Please record the number of service lines that fit the description of each row and column and count each service line only once.			
	Number of Service Lines that are Solely System-Owned	Number of Service Lines that are Solely Customer-Owned	Number of Service Lines for which the System and Customer Share Ownership
Service Lines That Contain Lead Pipe			
Row 1. Service lines that contain any lead pipe.	0	0	100
Service Lines That Contain Lead Connectors			
Row 2. Service lines that do not contain any lead pipe but have lead connectors (such as goosenecks or pigtails).	0	0	0
Service Lines That Contain Galvanized Pipe			
Row 3a. Service lines that contain galvanized pipe and were <u>previously</u> downstream from a lead pipe that was removed from the service line.	0	0	0
Row 3b. Service lines that contain galvanized pipe and were <u>previously</u> downstream from a lead connector that was removed from the service line.	0	0	0
Row 3c. Service lines that contain galvanized pipe and were <u>previously</u> downstream from an unknown source of lead that was removed from the service line.	0	0	0
Row 3d. Service lines that contain galvanized pipe that have <u>never been</u> downstream from any lead pipe or lead connector in the service line.	0	0	200
Other Service Lines and Service Lines of Unknown Materials			
Row 4a. Service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.	0	0	500
Row 4b. Service lines for which the material makeup of the service line and of the connector are not known.	0	0	200
Total Number of Service Lines by Column	0	0	1,000

Exhibit 2.3 shows the number of surveyed systems that responded for each category of service line material. A system may have responded with information on more than one type of service line. Some or all of the 725 systems that reported one or more services lines with lead content may also have reported some lines were known to not have lead content and some were of unknown material. Category 5 in Exhibit 2.3 captures the systems that did not respond to the questions on service line inventory. To date, this is the best available data collected and assessed on service line materials in the U.S.

Exhibit 2.3: Number of Surveyed Systems that Responded to the State Service Line Supplemental Questionnaire (National Summary)

Type of Service Line (Material)	Number of System 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 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

Note: A system may have reported data for more than one category (e.g., reported they have lead content in some service lines (Row 1) and known no lead content in other service lines (Row 4). The system would be included as responding in both rows.

Section 2.2 Lead Service Line Estimate Methodology

The same 3,629 water systems participating in the primary state DWINSA were surveyed using the 7th DWINSA service line questionnaire, which collected information on the number of service lines by material type. Medium CWS selected for the survey in partial participating states were asked to respond to the service line questionnaire even though they did not report 20-year infrastructure needs. 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. A description of this approach is included in Appendix A. Responses from the DWINSA service line questionnaire were used to estimate the number of service lines of each material type. As shown in Exhibit 2.3, EPA categorized these material types as known lead, standalone galvanized, no lead, and undiscovered (including unknown and nonreported).

The Lead and Copper Rule Revisions (LCRR) require water systems to identify and make public an initial inventory of the locations of LSLs by October 16, 2024. In 2022, EPA issued the document *Guidance for Developing and Maintaining a Service Line Inventory* (found here: <https://www.epa.gov/ground-water-and-drinking-water/revise-lead-and-copper-rule>) to support this effort. Until water systems have complete inventories, the number of reported undiscovered (including unknown and nonreported) 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 (including unknown and nonreported) service lines might be lead. This same projection was done for the standalone galvanized service lines. The DWINSA estimated service line material based on survey response is shown in Exhibit 2.4 for each state and U.S. territory. Appendix B includes

information for each state on the number of service lines by category estimated from survey responses and the number projected for the state using the state ratios.

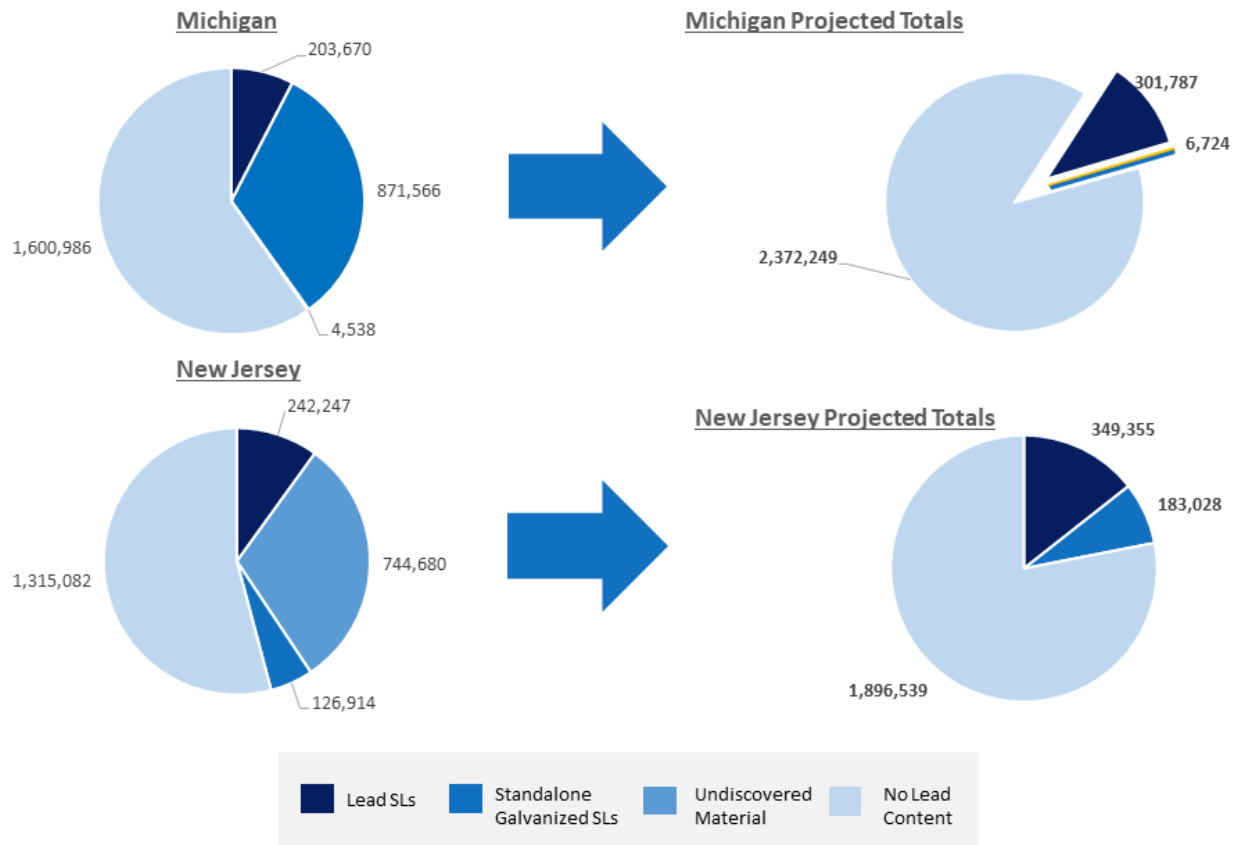
Examples of this methodology for two states are shown in Exhibit 2.5. A state-specific ratio was developed to derive the total projected count of LSLs in each state. These state numbers were then totaled to calculate the total national LSL number. This is illustrated in Exhibit 2.5, where Michigan’s 871,566 service lines of undiscovered (including unknown and nonreported) material are projected to be either lead, standalone galvanized, or not lead pipe based on state-specific ratios and are added to the totals for those materials from the survey’s estimates. If a state reported all unknown materials or did not respond to the survey, for medium CWS, EPA applied a national ratio derived from the states with reported data. For small CWS, a national ratio was applied to the number of connections reported in small CWS in each state. Appendix A provides a more detailed step-by-step description of the methodology used to develop service line estimates.

Exhibit 2.4: Estimated Service Line Material Based on Survey Response

State/Territory	Service Line Material				
	Lead Content	Unknown Material	Standalone Galvanized	No Lead Content	Not Reported
Alabama	54,838	397,891	34,613	1,029,411	351,025
Alaska	520	41,528	1,351	38,488	30,981
Arizona	8,310	381,240	29,092	1,473,006	185,676
Arkansas	77,248	102,889	21,654	449,384	568,005
California	12,984	215,308	199,929	9,085,439	136,974
Colorado	86,831	135,639	2,291	1,201,973	237,207
Connecticut	17,604	532,699	297	68,482	100,153
Delaware	17,952	53,998	8,322	101,362	120,377
District of Columbia	23,952	16,072	714	99,262	0
Florida	792,534	956,068	791,911	2,939,425	1,137,447
Georgia	32,786	742,610	36,059	2,253,691	192,310
Hawaii	5,715	58,986	5,109	153,278	52,248
Idaho	33,451	70,269	29,823	264,679	86,383
Illinois	690,280	757,795	28,141	1,754,954	507,117
Indiana	174,647	602,747	3,368	1,054,922	37,923
Iowa	64,230	270,987	8,086	667,634	100,024
Kansas	8,385	832,983	2,096	151,310	49,246
Kentucky	20,713	265,507	2,313	802,881	511,796
Louisiana	140,244	267,811	11,005	739,979	537,606
Maine	13,420	56,521	13,616	174,274	13,037
Maryland	8,099	20,196	1,712	155,938	1,270,475
Massachusetts	86,736	413,494	26,754	1,233,738	57,932
Michigan	203,670	569,384	4,538	1,600,986	302,182
Minnesota	81,993	518,229	1,686	750,761	40,263

State/Territory	Lead Content	Unknown Material	Standalone Galvanized	No Lead Content	Not Reported
Mississippi	4,035	358,522	5,055	434,959	418,706
Missouri	130,044	219,620	10,836	1,124,278	481,476
Montana	5,274	118,333	9,479	86,462	51,467
Nebraska	38,796	126,560	1,831	394,418	35,302
Nevada	5,331	173,212	15,118	446,382	152,271
New Hampshire	11,643	43,192	1,605	202,159	15,544
New Jersey	242,247	574,955	126,914	1,315,082	169,725
New Mexico	8,460	159,641	3,127	332,997	125,171
New York	201,075	936,794	8,041	1,240,706	1,175,258
North Carolina	272,078	640,448	59,669	1,986,416	191,370
North Dakota	14,624	18,709	515	114,075	85,692
Ohio	369,077	657,490	12,895	1,409,102	1,167,069
Oklahoma	12,250	735,471	2,621	573,712	53,850
Oregon	1,316	165,812	6,003	428,382	567,257
Pennsylvania	257,315	1,123,477	21,792	1,123,770	1,228,363
Puerto Rico	30,689	309,050	26,821	801,757	273,322
Rhode Island	17,204	166,988	63	51,809	68,075
South Carolina	50,350	786,265	11,670	779,545	180,279
South Dakota	3,554	21,710	687	243,057	19,157
Tennessee	79,769	1,976,379	20,719	478,840	213,813
Texas	378,873	1,284,408	10,482	7,206,494	4,103,903
Utah	9,017	243,215	9,454	540,448	83,793
Vermont	3,317	13,773	2,852	98,420	47,577
Virginia	64,360	408,853	26,385	657,562	1,027,314
Washington	11,893	1,113,290	97,278	1,261,166	54,647
West Virginia	6,906	408,507	3,221	215,470	27,682
Wisconsin	256,363	157,160	11,938	873,704	219,939
Wyoming	6,405	35,280	2,813	99,065	33,544
Subtotal	5,149,407	20,784,452	1,732,567	52,765,494	18,486,209
American Samoa	11	180	11	9,665	221
Guam	0	0	0	0	44,736
Northern Mariana Is.	8	151	8	1,623	11,201
Virgin Islands	35,002	54	1	264	66
Subtotal	35,021	385	20	11,552	56,224
Total	5,184,428	20,784,837	1,732,587	52,777,046	18,542,433

Exhibit 2.5 Estimated Known Service Line Materials Applied to State’s Undiscovered



Section 2.3 Lead Service Line Replacement Allotment Formula

In 2021, the Bipartisan Infrastructure Law included a specific DWSRF appropriation of \$15 billion for Lead Service Line Replacement (LSLR) and associated activities. 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 the Bipartisan Infrastructure Law LSLR funding using a formula based on all categories of infrastructure need.

EPA is using the new results from LSL information collected under the 7th DWINSA to allocate the remaining years of Bipartisan Infrastructure Law LSLR funding. EPA developed a LSL percentage for each state by dividing the states’ projected LSLs (as derived using the methodology described in Appendix A) by the total national number of projected LSLs. EPA used the state percentages to develop the LSL-specific allocation formula for distributing the DWSRF Bipartisan Infrastructure Law LSLR funding. As required under Section 1452(a)(1)(D) of SDWA, each state is provided a minimum allotment of 1% of the

total amount available to states and the U.S. territories share 1.5% of the national total based on each territory’s share of the territories total.

The new LSL 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 is expected to be addressed through the normal DWSRF reallocation process established under SDWA. Funds not distributed to eligible LSLR DWSRF projects by the end of the second fiscal year after apportionment are reallocated; this process is outlined in Section 1452(a)(1)(E) of SDWA and the deadline cannot be shortened or extended by EPA. The new LSL formula will reduce the need for reallocations as well as the administrative burden on states and EPA that is created when allocated funding outweighs the need of water systems in that state or vice versa.

EPA recognizes that states and communities continue to make progress on identifying LSLs. To account for this rapidly developing data, states will be provided a one-time opportunity to adjust their reported service line data in fall 2023. The anticipated updated information would be first used in distribution of DWSRF BIL LSLR funding to states in 2024.

Section 2.4 Lead Service Line Results

Based on the findings from the 7th DWINSA, the total projected number of LSLs in the United States is 9.2 million for the states, U.S. territories, Puerto Rico, and the District of Columbia (see Exhibit 2.6). The estimated cost to replace these LSLs ranges from approximately \$50 billion to \$80 billion (2021 dollars). This is derived from service line replacement cost information collected as part of the 7th DWINSA for both full and partial lead service line replacement. The low estimate (25th percentile or 25% of LSLR cost data is below this value) is \$5,328/LSL and the high estimate (75th percentile or 25% of LSLR cost data is above this value) is \$9,015/LSL. There are also an estimated 2.8 million standalone galvanized service lines that have never been downstream of lead. Currently, some states require that galvanized pipe be identified, and some states require that it be removed.

Exhibit 2.6: 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

**Projected Count includes known lines and unknown and unreported lines projected to be in one of these three categories.*

The 7th DWINSA provides the best available national and state-level projections of service line materials and counts. Exhibit 2.7 shows the distribution of LSLs across the nation and Exhibit 2.8 shows projected LSLs by state and territories. Exhibit 2.9 shows the number of service lines by type of material and system size.

Exhibit 2.7: Projected Number of Lead Services Lines by State and Territory

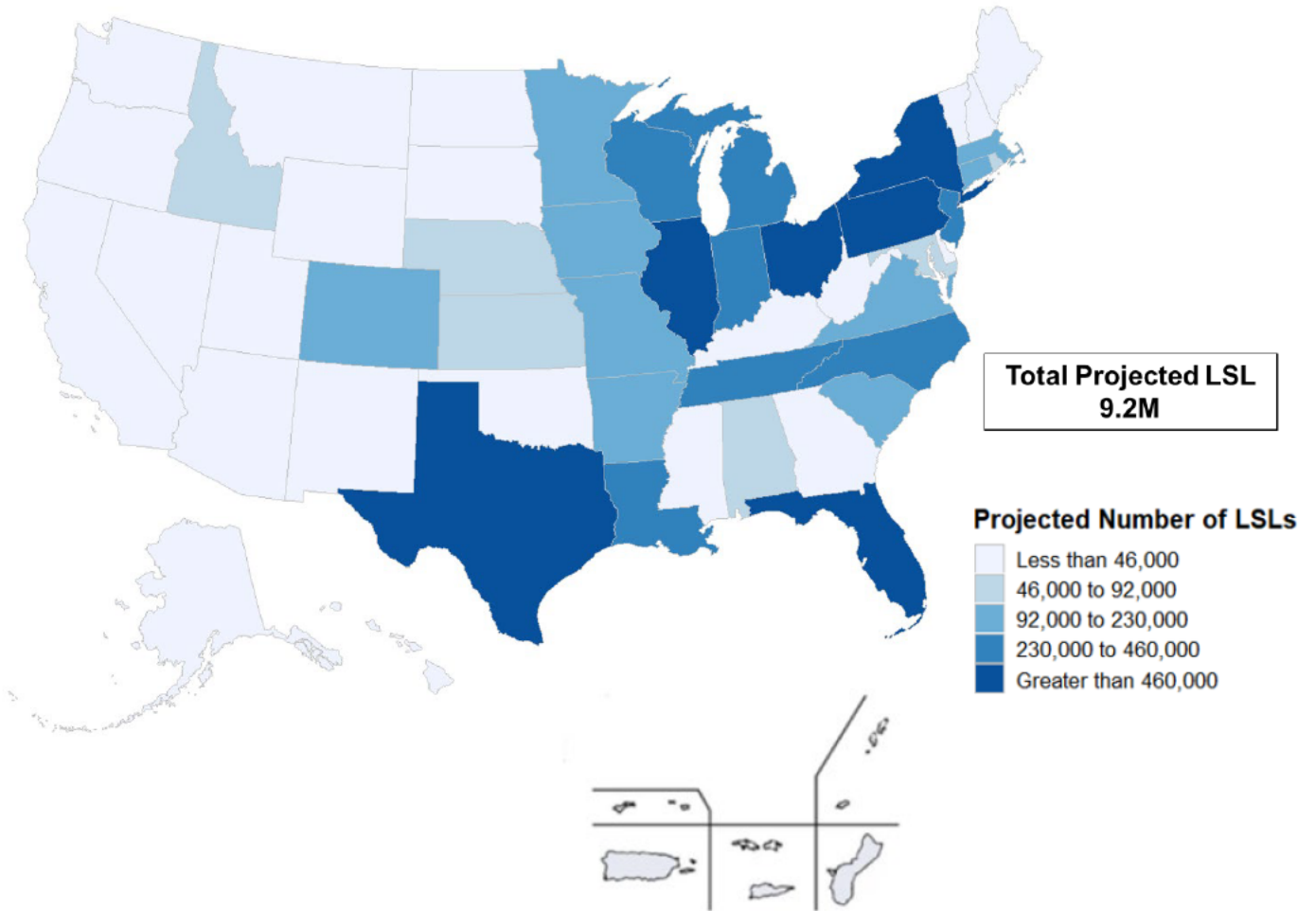


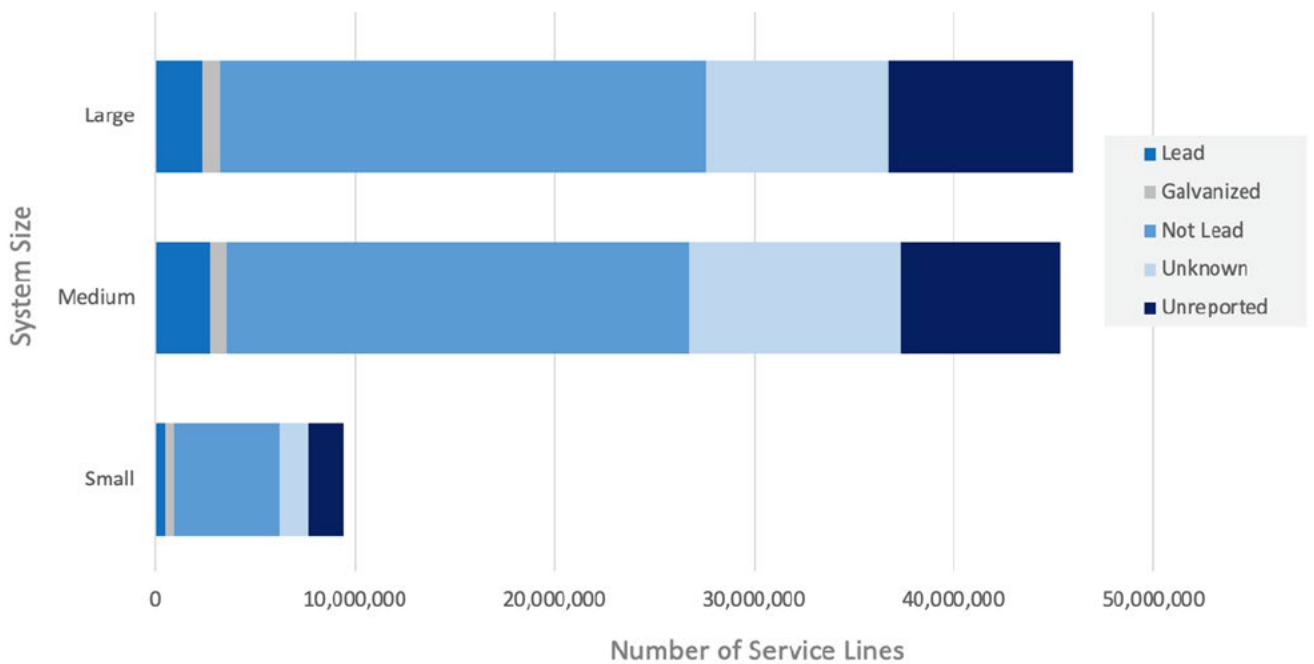
Exhibit 2.8: Total Projected Lead Services Lines by State

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%
District of Columbia	27,058	0.29%
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%

State	Projected LSL	
	Number	% of Total
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%
State Subtotal	9,188,545	100%
Territories	35,202	0.38%
Total	9,223,745	

Note: Numbers may not total due to rounding.

Exhibit 2.9: Number of State Service Lines by Material Type and System Size



Section 3 Workforce Survey Response

Section 3.1 Background

As in many technical sectors, the drinking water industry is predicting large-scale retirements and consequently a potential workforce shortage. EPA, states, and drinking water industry associations and organizations are working to promote the water sector as a good source of employment and career opportunities. These efforts are intended to help ensure that there are enough trained and qualified water professionals to meet current and future needs.

For the first time, the 7th DWINSA collected responses to operator workforce questions, which provides a unique opportunity to estimate projected water sector workforce shortfalls over the next five to ten years and quantify the reasons for anticipated shortfalls. This data includes responses from all surveyed systems in the states, U.S. territories, Puerto Rico, the District of Columbia, and American Indian and Alaska Native Village water systems. Of the 3,924 systems surveyed, 3,818 responded to the operator workforce questions, for an overall response rate of 97.3%. Of the systems that received the state survey, 97.16% responded, and 98.98% of American Indian and Alaskan Native Village systems responded to the operator workforce questions.

Section 3.2 Operator Workforce Responses

The following exhibits show the results of the responses to the operator workforce questions. These graphics show that workforce issues are universal across water systems of all sizes. A significant percentage of responding systems of each size reported that hiring difficulties will increase over the next five to ten years and identified lack of interest and lack of candidates as the top reasons. Small water systems cited the inability to hire full-time employees and offer benefits as more significant reasons than larger water systems.

Exhibit 3.1: Current Workforce Hiring for Responding Water Systems

Do you currently have difficulty hiring employees or obtaining contracted water operators?

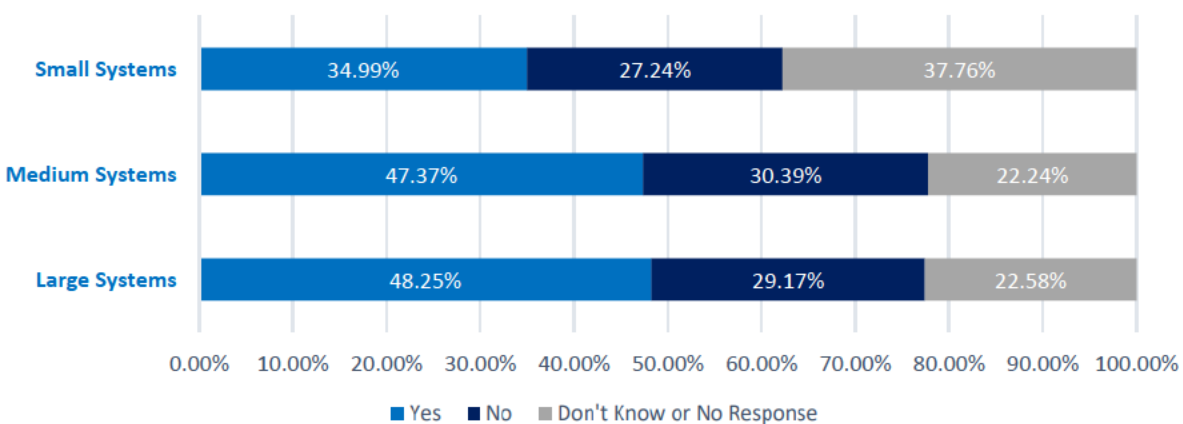


Exhibit 3.2: Hiring Next 5 Years for Responding Water Systems

Which of the following best describes what you anticipate in the next 5 years for replacing or increasing the number of employees or contracted operators?

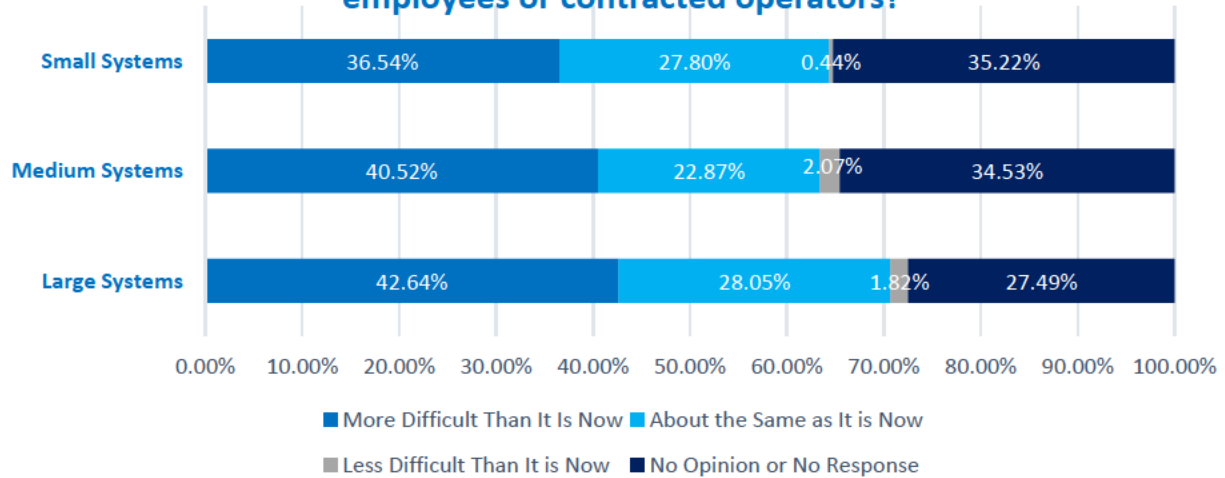
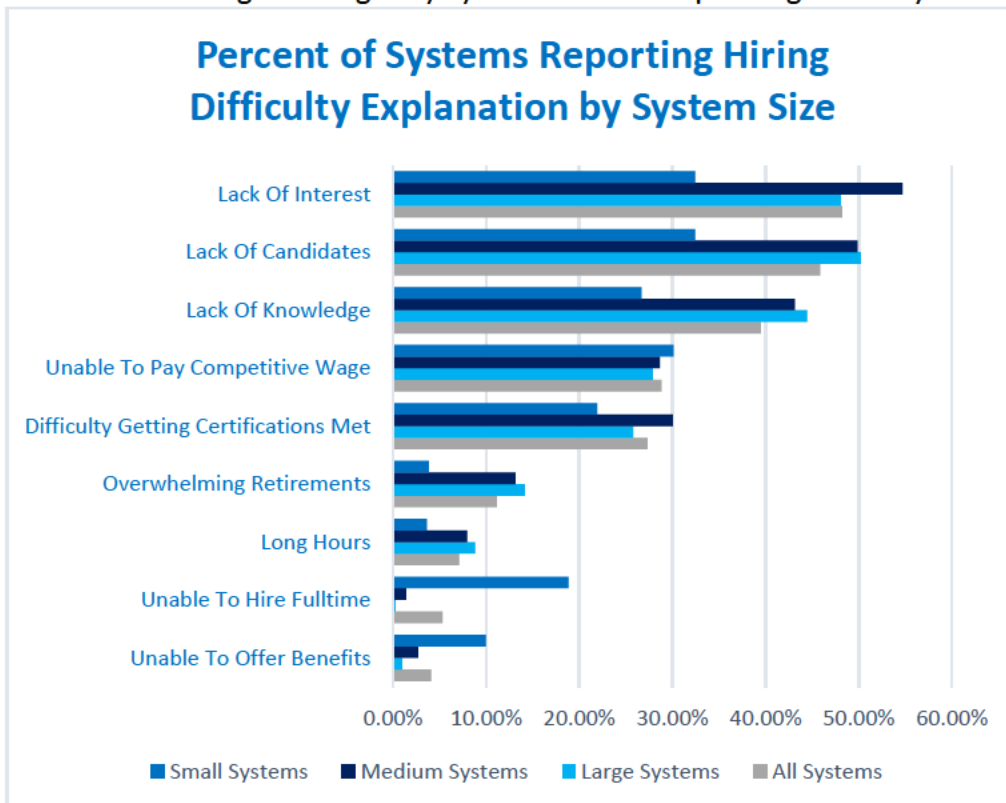


Exhibit 3.3: Hiring Challenges by System Size for Responding Water Systems



Section 4 Iron and Steel Construction Materials

Section 4.1 Background

Questions on pipe and storage tank construction materials were included in the 7th DWINSA to provide information on materials used for specific types of infrastructure that are often, but not always, comprised of primarily iron or steel and thus subject to the American Iron and Steel (AIS) requirements under SDWA section 1452(a)(4). The responses to these questions and the data from the 7th DWINSA will aid EPA in management and oversight of the AIS requirements. The questions were provided to all small CWS, medium CWS in full participating states and large CWS in states and the U.S. territories. American Indian and Alaska Native Village were not asked about the material of their pipes and tanks as they are not subject to AIS requirements. Medium CWS in partial participating states were not asked these pipe and tank materials questions because they were not asked to report their 20-year infrastructure needs.

The types of infrastructure for which materials information was requested include raw water transmission, finished water transmission, distribution mains, elevated finished water storage, and ground-level finished water storage. The construction materials questions were formatted as inventory tables and focused on identifying the material used for the following project types:

Transmission and Distribution Mains

Existing material (cast iron, ductile iron, plastic, unknown, etc.)

Materials of pipe typically used for replacement

Materials typically used for new pipe installation and existing policies for the type of pipe to be installed (e.g., mains <6" are HDPE and >6" are ductile iron)

Elevated and Ground Storage Tanks

Existing material (bolted or welded steel, glass fused to steel, fiberglass, concrete, composite)

Materials typically used for tank replacement

Materials typically used for new storage tanks

The exhibits in this section show the information provided by survey respondents for the iron and steel construction materials questions. For replacement of existing materials, the exhibits are based on the reported number of existing tanks or the reported pipe length of the surveyed systems. For new materials (tank or pipe), the figures are based on the number of systems offering each response. Overall, 72% of systems responded to pipe material questions and 87% of systems responded to tank material questions. These results have not been adjusted for the statistical weights of each system in the survey.

Section 4.2 Storage Tank Materials Responses

These exhibits show that storage tank material for future tank construction is generally the same composition as the existing tank materials. Understandably, there are significant differences between the types of materials for elevated tanks versus ground level tanks. While the most common material for both elevated tanks and ground level tanks in responding systems is steel, ground level tanks are

concrete one-third of the time. In addition, the material is consistent whether for replacement of a tank or construction of a new tank.

Note that the “other” category includes responses such as but not limited to, “no future elevated storage tanks planned, elevated storage tank not used, unlikely to construct elevated storage tank,” etc.

Exhibit 4.1: Likely Tank Replacement Material (Elevated) for Responding Water Systems

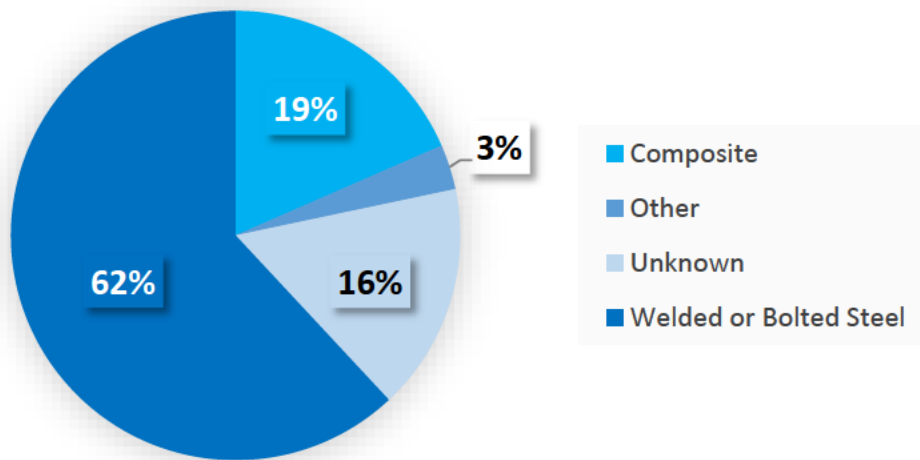


Exhibit 4.2: Likely Tank Replacement Material (Ground) for Responding Water Systems

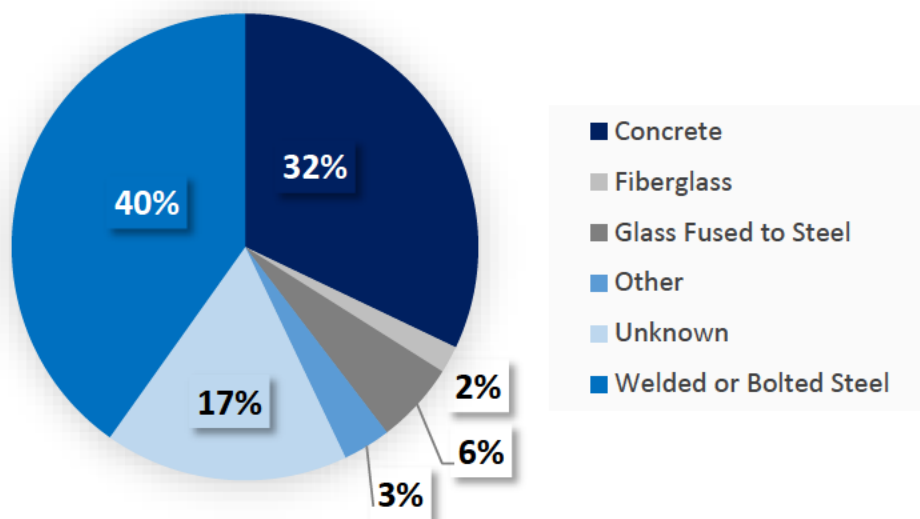


Exhibit 4.3: Likely Material for New Tanks (Elevated) for Responding Water Systems

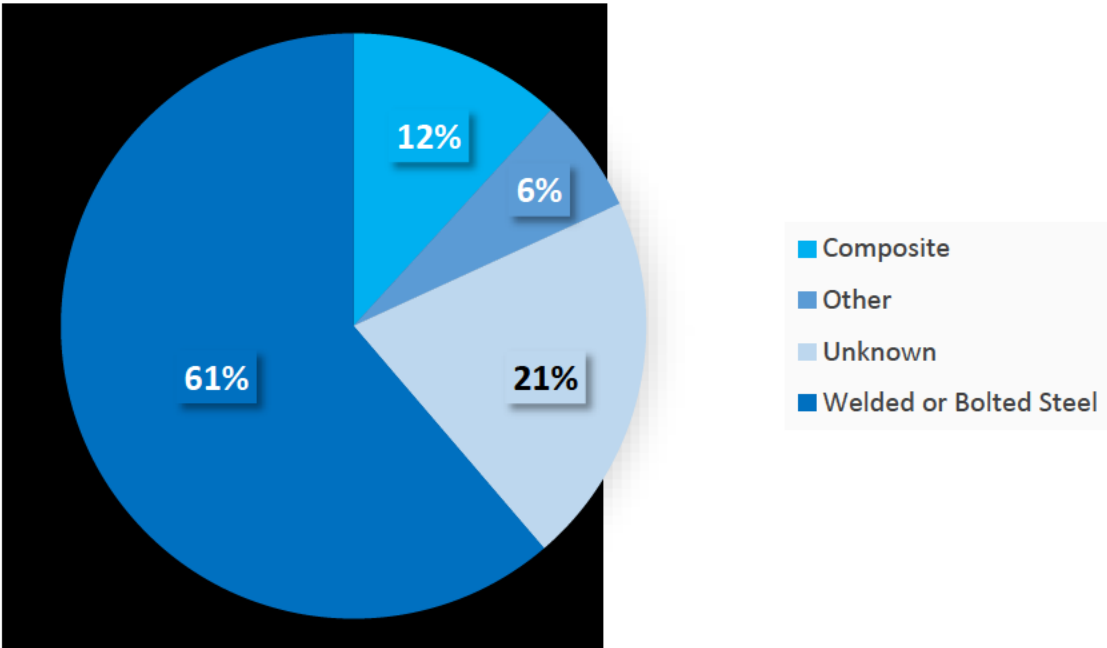
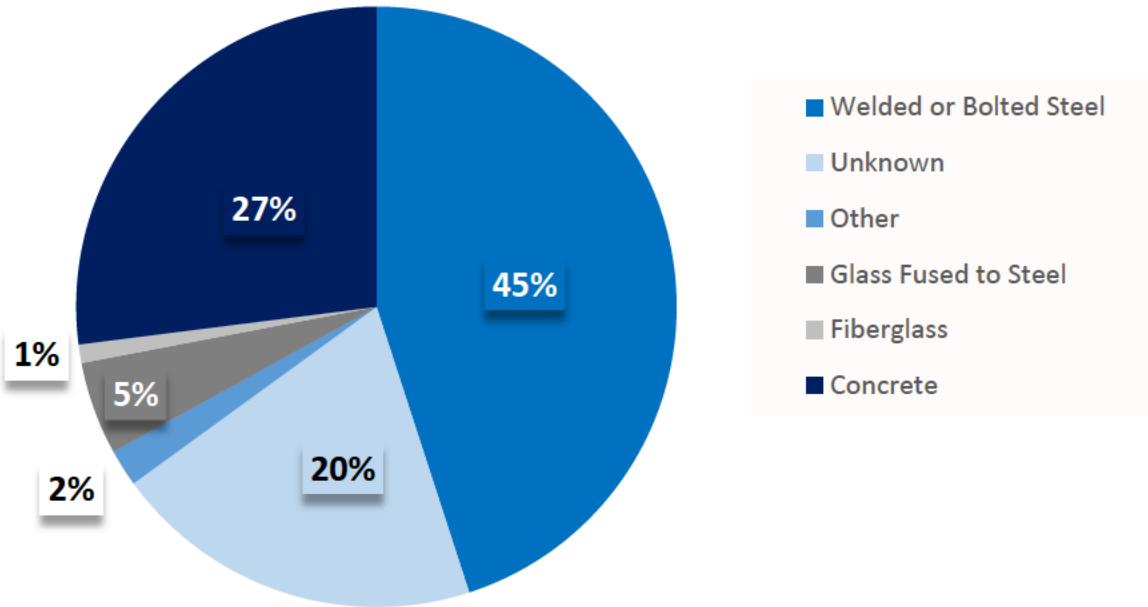


Exhibit 4.4: Likely Material for New Tanks (Ground) for Responding Water Systems



Section 4.3 Pipe Materials Responses

The following exhibits show that cast iron and asbestos cement pipe materials are reported as relatively infrequently used for pipe replacement or new construction. Asbestos cement is reported as replaced primarily with plastic pipe, while cast iron pipe is reported as replaced with ductile iron or plastic pipe. Based on the reported material of existing pipe, approximately one-third of existing pipe is plastic in the surveyed systems. Additionally, based on reported material for replacement of existing pipe, systems in the survey will replace 54% of existing pipe length with plastic pipe and replace 34% of existing pipe with ductile iron pipe. Similarly, 47% of systems stated that plastic is the most likely material for new pipe projects, while 34% stated that ductile iron is the most likely material for new pipe projects. These data report surveyed-system responses and have not been extrapolated to represent national data. Respondents did not indicate the pipe length of new pipe projects (as that length is presently unknown); data for new project questions is shown by percentage of respondents.

Note that the “other” category includes, but is not limited to, cement mortar lined pipe, reinforced concrete cylinder pipe (RCCP), and a combination of material types such as HDPE and cement mortar lined pipe.

Exhibit 4.5: Existing Pipe Material by Percent of Length of Pipe for Responding Water Systems

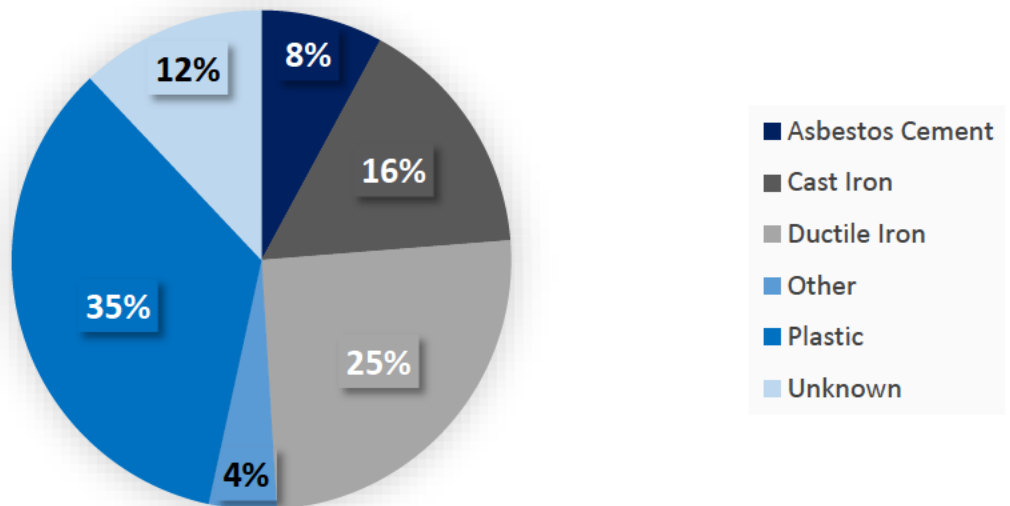


Exhibit 4.6: Replacement Material for Existing Pipe and Existing Material by Percent of Length of Pipe for Responding Water Systems

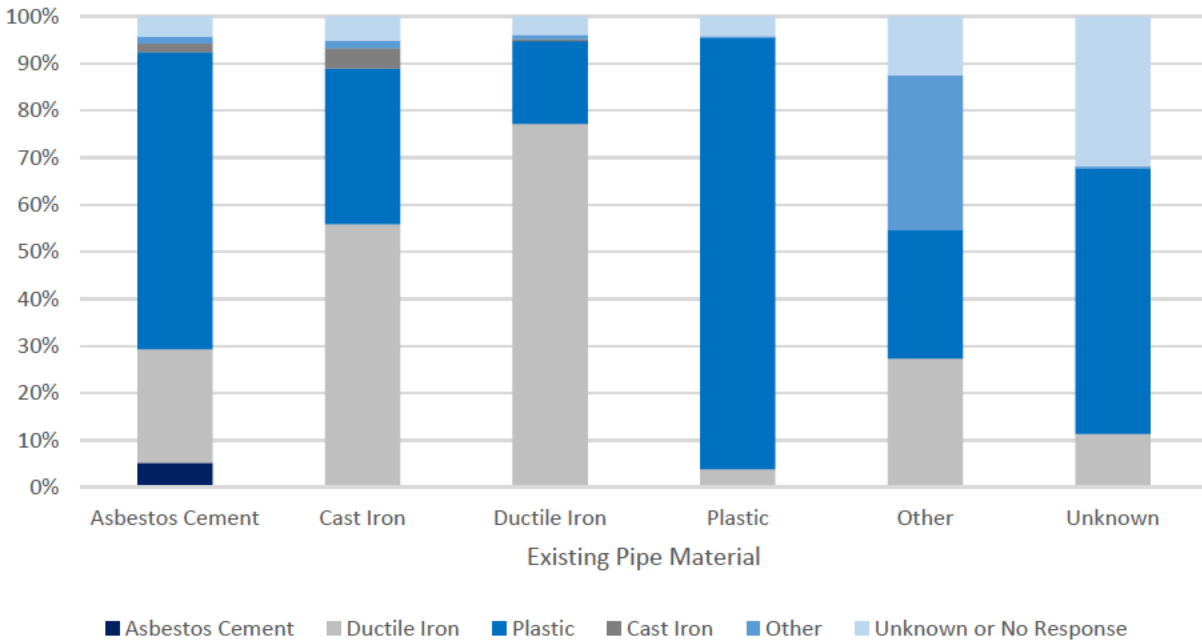


Exhibit 4.7: Likely Replacement Material for Existing Pipe by Percent of Length of Pipe for Responding Water Systems

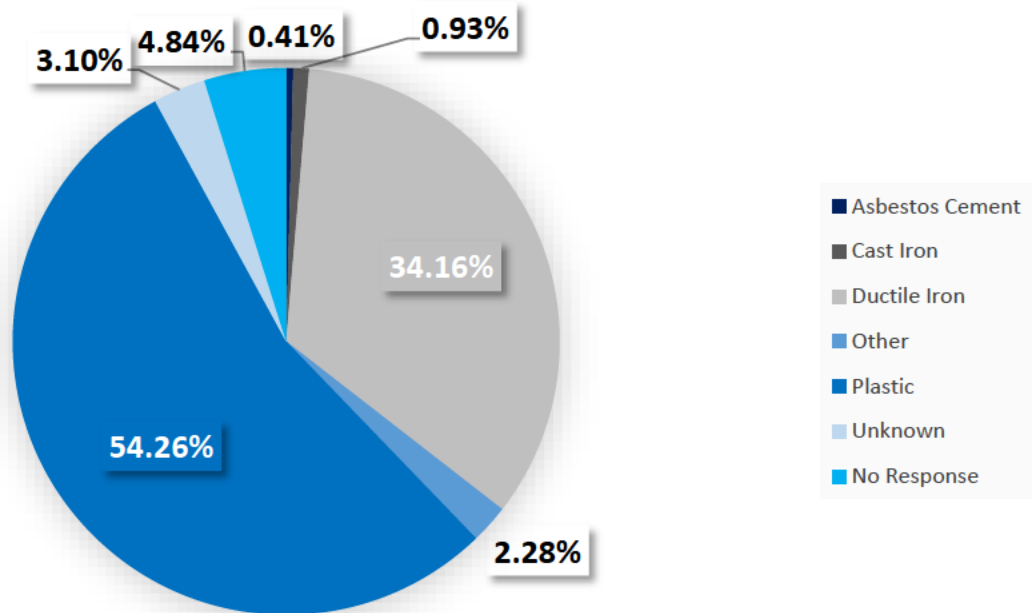
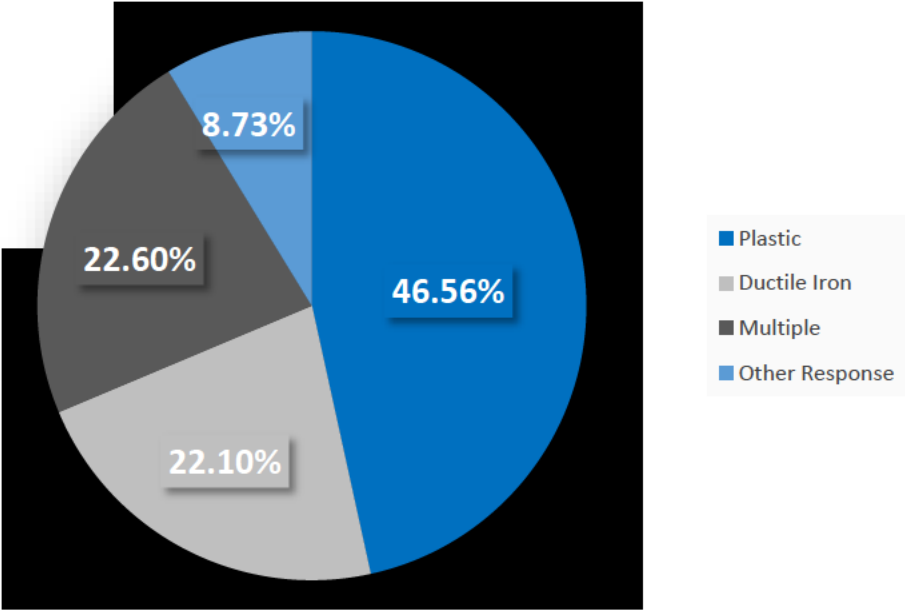


Exhibit 4.8: Likely Material Type for New Pipe Projects by Percent of Responding Water Systems



Section 5 Tribal Water System Traditional Infrastructure Needs

Section 5.1 Background

The 7th Drinking Water Infrastructure Needs Survey and Assessment estimates that the capital investment needs of water systems serving American Indian and Alaska Native Village water systems totals \$4.1 billion over the next 20 years. This is the first time Tribal water systems have been surveyed since the 5th DWINSA in 2011.

The Tribal need is compounded by high average per-household costs compared to most non-Native water systems due to unique circumstances that many of these water systems face. Tribal public water systems are almost all small – serving 3,300 or fewer people. They are often located in remote rural areas, some in areas with permafrost, and the communities served may have households that lack piped access to the public water supply. These conditions present special challenges for providing safe drinking water.

Section 5.2 Assessment Results

The 7th DWINSA Tribal survey is based on distinct and statistically designed surveys of American Indian water systems and Alaska Native Village water systems. These surveys were designed and implemented as distinct efforts due to differences associated with their water systems' geographic locations and infrastructure. Of the 925 American Indian water systems, 198 were included in the survey and all 198 responded; of the 154 Alaska Native Village water systems, 97 were included in the survey and 96 responded. These combine to over 99% response rate for the Tribal survey.

Data was submitted for the surveys by Tribal water systems in coordination with the Navajo Nation, EPA Regions, Village Safe Water, and Indian Health Service (IHS) Areas. Exhibit 5.1 presents the American Indian and Alaska Native Village water system need by EPA Region and by type of need. American Indian System needs are presented by the EPA Region in which they are located and for the Navajo Nation. Alaska Native Village water system needs are presented separately and are not included in EPA Region 10, although they are located in that region. Exhibit 5.2 presents the need estimated by the four DWINSAs completed to date in which data were collected for American Indian and Alaska Native Village water systems.

Bureau of Reclamation Projects for American Indian Water Systems

The Bureau of Reclamation is responsible for several large projects that impact water systems serving American Indian and other communities. These include the Navajo Gallup Water Supply Project, Rocky Boy's/North Central Montana Rural Water System, and the Mni Wiconi Project (Oglala Sioux Rural Water Supply System Project), among others. These are costly projects that are usually completed in phases over many years. The water they provide may have several uses, including community water supplies, irrigation, and power. Under acts of the U.S. Congress, various public laws specify federal funding obligations including water rights settlements; annual funding is specified in the Bureau's budget requests.

The American Indian need documented in this DWINSA does not include the costs of the Bureau of Reclamation water projects that are underway or planned for the next 20 years. However, these projects and their costs are noteworthy because they address significant drinking water infrastructure needs. Water supplied by Bureau of Reclamation projects compensates for reduced ground water availability, replaces poor quality sources, and brings piped water to regions where it was not previously available. If operations and maintenance responsibilities are transferred to tribes, considerable infrastructure needs would have to be included in future DWINSA efforts. As these projects are completed, responsibility for future repair and replacement of the infrastructure may shift to American Indian utilities; if and when that should occur, future DWINSA efforts will capture these needs.

Exhibit 5.1: 20-Year Need for American Indian and Alaska Native Village Systems by EPA Region and Type of Need (in millions; January 2021 dollars)

	Transmission and Distribution	Source	Treatment	Storage	Other	Total Need
Region 1	\$3.2	\$3.6	\$2.0	\$0.5	\$0.2	\$9.5
Region 2	\$26.5	\$2.2	\$2.8	\$1.3	\$0.7	\$33.5
Region 3	\$0.4	\$0.2	\$0.3	\$0.1	\$0.1	\$1.0
Region 4	\$43.7	\$17.2	\$16.1	\$7.2	\$4.4	\$88.5
Region 5	\$121.7	\$37.3	\$41.7	\$20.5	\$9.3	\$230.4
Region 6	\$129.4	\$42.1	\$46.8	\$22.2	\$10.7	\$251.2
Region 7	\$19.1	\$6.4	\$6.5	\$3.4	\$1.5	\$36.9
Region 8	\$456.3	\$90.0	\$93.8	\$35.1	\$21.0	\$696.1
Region 9	\$422.7	\$167.2	\$183.4	\$79.1	\$58.2	\$910.6
Region 10 ¹	\$135.4	\$50.7	\$54.6	\$26.7	\$11.3	\$278.7
Navajo Nation ²	\$431.0	\$56.5	\$118.7	\$48.2	\$13.9	\$668.4
Alaska Native Village Systems	\$422.8	\$197.3	\$140.1	\$83.5	\$23.7	\$867.5
Total	\$2,212.1	\$670.9	\$706.8	\$327.8	\$154.9	\$4,072.5

Note: Numbers may not total due to rounding.

1. Needs for Alaska Native Village water systems are not included in the EPA Region 10 total.
2. Navajo water systems are in EPA Regions 6, 8, and 9, but for purposes of this report all Navajo water system needs are reported in Navajo Nation.

Exhibit 5.2: American Indian and Alaska Native Village 20-year Need Reported by Survey Year
(in millions; January 2021 dollars)

EPA Region	1995 Results (1 st DWINSA)	1999 Results (2 nd DWINSA)	2011 Results (5 th DWINSA)	2021 Results (7 th DWINSA)
Region 1	\$0.6	\$7.6	\$6.8	\$9.5
Region 2	\$3.8	\$11.6	\$32.8	\$33.5
Region 3 ¹	\$0.0	\$0.0	\$0.0	\$1.0
Region 4	\$33.3	\$34.5	\$59.0	\$88.5
Region 5	\$88.0	\$304.8	\$239.7	\$230.4
Region 6	\$73.7	\$294.4	\$229.7	\$251.2
Region 7	\$12.2	\$27.7	\$43.5	\$36.9
Region 8	\$204.0	\$258.4	\$568.8	\$696.1
Region 9	\$684.6	\$1,063.6	\$731.4	\$910.6
Region 10 ²	\$97.2	\$229.2	\$249.3	\$278.7
Navajo Nation ³	\$0.0	\$0.0	\$1,345.5	\$668.4
American Indian Subtotal	\$1,197.5	\$2,232.0	\$3,506.6	\$3,205.0
Alaska Native Village Systems	\$1,649.1	\$2,068.0	\$771.9	\$867.5
American Indian and Alaska Native Village Total	\$2,846.6	\$4,300.0	\$4,278.5	\$4,072.5

Note: Numbers may not total due to rounding.

1. There were no American Indian water systems in EPA Region 3 for the 1995, 1999 and 2011 surveys.
2. Needs for Alaska Native Village water systems are not included in the EPA Region 10 total.
3. Navajo water systems are in EPA Regions 6, 8, and 9, but for purposes of this report all Navajo water system needs are reported in Navajo Nation. Navajo Nation water system needs were included in EPA Region 9 for the 1995 and 1999 Assessments.

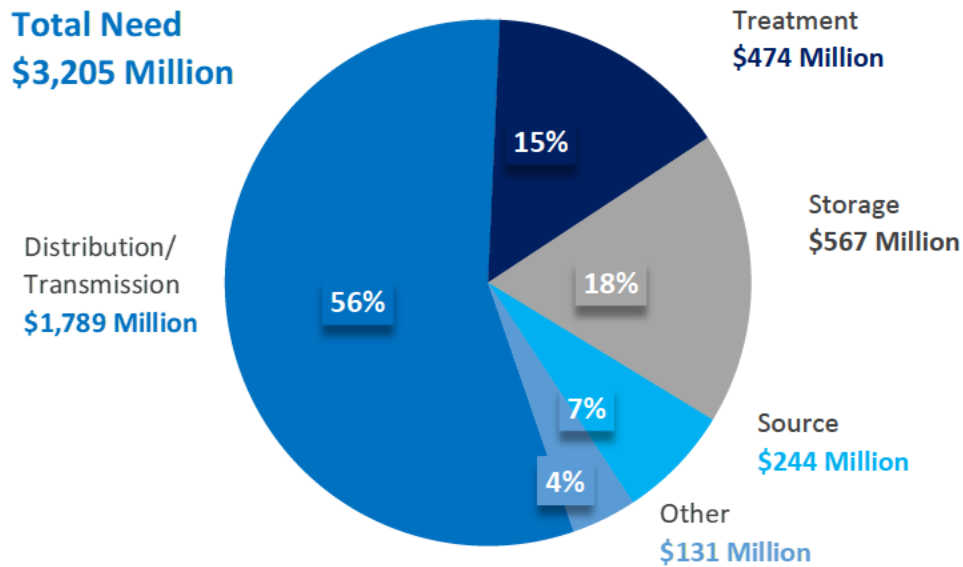
The decrease in the Alaska Native Village Need from the 2nd DWINSA to 5th DWINSA is due to a change in criteria for increased project-specific documentation of project feasibility. The decreased American Indian water system need from the 5th DWINSA to the 7th DWINSA is primarily attributable to exclusion of projects funded by the Bureau of Reclamation that were included in the 5th Assessment, and significant completion of the Navajo-Gallup Water Supply Project between the 5th and 7th Assessments.

American Indian Water System Needs

The total 20-year need for American Indian water systems is estimated to be \$3.2 billion, a decrease of \$301 million from the 5th DWINSA estimate of \$3.5 billion.

Exhibit 5.3 shows the total American Indian water system need by project type. As would be expected for these systems, transmission and distribution is the largest category of need, representing 56 percent of the total need. This high percentage reflects the significant infrastructure and logistical challenges associated with American Indian water systems that must serve widely dispersed populations in remote locations or transmit piped water long distances from their source to the consumers.

Exhibit 5.3: Total 20-year Need by Project Type for American Indian Water Systems (in millions, January 2021 dollars)

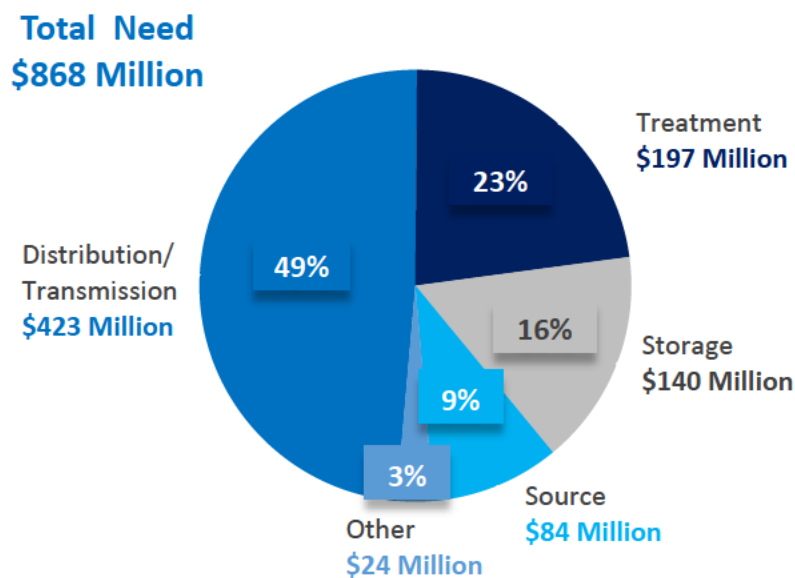


Alaska Native Village Water System Needs

The total 20-year need for Alaska Native Village water systems is estimated to be \$868 million, a \$95.6 million increase from the 5th DWINSA estimate of \$772 million. This difference is attributable in part to investments needed to improve access to safe drinking water in Villages where piped water is not provided to homes.

Exhibit 5.4 shows the total Alaska Native Village water system need by project type. The need for Alaska Native Village water systems differs from more typical community water systems and American Indian water systems in that costs for piping in Alaska Native Village water systems make up less than half the need, with storage and treatment comprising a greater percentage of the total. These smaller communities with homes in close proximity typically have lower relative need for piping. However, the cost per foot of pipe is high due to shipping costs to these remote locations and the specialized piping necessary to prevent water from freezing under arctic conditions. Alaska Native Villages face higher treatment and storage costs than American Indian systems and typical systems in the lower 48-states because of their remote or arctic conditions that require they obtain and treat water sufficient for several months of use during a short period of time when warmer conditions enable those water system operations.

Exhibit 5.4: Total 20-year Need by Project Type for Alaska Native Village Water Systems (in millions, January 2021 dollars)



Appendix A Process for Developing Service Line Count Estimates

The 7th Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) collected information about the investment needs of public water systems. The 7th DWINSA also collected supplemental information from systems about the number of service lines by material composition. A sample of drinking water systems were selected to participate in the 7th DWINSA that included all large systems (those serving more than 100,000 people), a random sample of medium systems (those serving 3,301 to 100,000 people) for each state, and a national random sample of small systems (those serving 3,300 or fewer people). EPA used the information provided by the responding systems to project the number of lead service lines in each state and territory.

Step 1. Categorize the service lines reported by surveyed systems by material composition.

EPA used the supplemental data about service lines to categorize the service lines by material. Systems provided the following information:

1. The number of service lines that contain any lead pipe.
2. The number of service lines that do not contain any lead pipe but contain lead connectors.
3. The number of service lines that contain galvanized pipe and were previously downstream of a lead pipe that was removed from the service line.
4. The number of service lines that contain galvanized pipe and were previously downstream of a lead connector that was removed from the service line.
5. The number of service lines that contain galvanized pipe and were previously downstream of an unknown source of lead that was removed from the service line.
6. The number of service lines that contain galvanized pipe and were never downstream of a lead pipe or lead connector in the service line.
7. The number of service lines that do not contain any lead pipe or galvanized pipe and that do not have lead connectors.
8. The number of service lines for which the material makeup of the service line and the connector are not known.

The DWINSA Sample Weights

The 7th DWINSA relies on a random sample of water systems to estimate the number of LSLs in each state and in the nation. Within each state, medium and large water systems are divided into several categories based on each system's water source and the size of the population served. The DWINSA includes all large systems and a sample of medium systems. A random sample of medium systems is selected from each category of systems in each state. In addition, a random sample of small systems is selected from each category of systems nationally. To estimate state totals for medium and large systems using the sample, each system is assigned a weight that is equal to the number of systems in the category divided by the number of systems sampled from that category. For example, if the survey included a sample of three systems from a category that consists of 12 systems, each of the three systems from that category would receive a weight of 4 ($12 \div 3 = 4$).

For purposes of the allotment of the BIL LSLR SRF fund, EPA considers service lines to be eligible if they contain any lead pipe or connectors or are galvanized pipe previously downstream of any lead sources. Therefore, service lines reported under items 1 through 5 above were categorized as lead service lines.

Some surveyed systems did not respond to the supplemental service line questions. For those systems, EPA used their reported number of connections as an estimate of their number of service lines. EPA categorized those service lines as “unreported.” EPA used the following five material type categories:

1. Lead service lines
2. Standalone galvanized service lines
3. Lead-free and galvanized-free service lines
4. Unknown service lines
5. Unreported service lines

Step 2. Estimate the proportion of service lines in medium and large systems by material type in each state.

EPA used the sample data developed in Step 1 to estimate the proportion of service lines in medium and large systems in each state that are in each of the five material type categories. EPA weighted the sample data by each responding system’s sampling weight, including the systems that did not respond to the supplemental service line questions. EPA weights the estimates to ensure the proportions are representative of all the medium and large systems in each state. (See the text box for an explanation of how EPA determines each system’s sampling weight.) Table 1 shows the estimated proportions for a sample state. A similar set of proportions was estimated for each state.

Table 1. Proportion of Service Lines in Each Material Type Category in Medium and Large Systems in an Example State	
Service Line Material	Proportion of Service Lines in Each Category
1. Lead Service Lines	0.025
2. Standalone Galvanized Service Lines	0.047
3. Lead- and Galvanized-Free Service Lines	0.184
4. Unknown Service Lines	0.560
5. Unreported Service Lines	0.184
Total	1.000

Step 3. Estimate the proportion of service lines in small systems by material type in the nation.

EPA used data from the national sample of small systems in Step 1 to estimate the proportion of service lines in those systems that are in each of the five material type categories. EPA contractors visited the small systems in person to help them respond to the survey. All the small systems responded to the supplemental questions, although many responded as “unknown.” Table 2 shows the proportion of service lines in each material category for small systems nationally.

Table 2. Proportion of Service Lines in Each Material Type Category in Small Systems in the United States	
Service Line Material	Proportion of Service Lines in Each Category
1. Lead Service Lines	0.009
2. Standalone Galvanized Service Lines	0.009
3. Lead- and Galvanized-Free Service Lines	0.613
4. Unknown Service Lines	0.369
5. Unreported Service Lines	0.000
Total	1.000

Step 4. Use the proportions estimated in Steps 2 and 3 and data on the number of connections per state to estimate the number of service lines in each state by type of material.

To estimate the total number of service lines of each material type in each state, EPA multiplied the proportions estimated in Steps 2 and 3 by the total number of connections in each state. EPA took the number of connections from the federal version of the 2019 Safe Drinking Water Information System (SDWIS Fed), which provides estimates of the number of connections for every system in the country. For medium and large systems, EPA multiplies the proportions estimated in Step 2 by the number of connections in medium and large systems in each state. For small systems, EPA multiplies the proportions estimated in Step 3 by the number of connections among small systems in the state. For example, if a state has 186,000 service lines among medium and large systems and using the example state proportion of lead service lines from Table 1, the total number of lead service lines among medium and large systems would be 4,650:

$$186,000 \times 0.025 = 4,650$$

If the same state has 85,000 service lines among small systems and using the national proportion of lead service lines from Table 2, the total number of lead service lines among small systems would be 765:

$$85,000 \times 0.009 = 765$$

The total number of lead service lines in the state in small, medium, and large systems would be:

$$4,650 + 765 = 5,415$$

This calculation is repeated for each material type category. Table 3 shows the result for the example state.

Table 3. Estimated Number of Service Lines by Material Type in an Example State	
Service Line Material	Estimated Number of Service Lines in Each Category
1. Lead Service Lines	5,415
2. Standalone Galvanized Service Lines	9,507
3. Lead- and Galvanized-Free Service Lines	86,329
4. Unknown Service Lines	135,525
5. Unreported Service Lines	34,224
Total	271,000

Step 5. Estimate the number of service lines in each state whose material type is unknown that are projected to be lead, standalone galvanized, or lead-free and galvanized-free.

The unreported lines and the lines for which the material makeup is unknown likely include some number of lead service lines. To project the total number of lead service lines in each state, including unknown and unreported service lines that might be lead, EPA assumed that the proportion of unknown and unreported service lines that are lead is the same as the proportion of known service lines that are lead. For the example state the proportion of known service lines that are lead is 0.053:

$$5,415 \div (5,415 + 9,057 + 86,329) = 0.053$$

The estimated number of unknown and unreported service lines that are projected to be lead is 9,078:

$$0.053 \times (135,525 + 34,224) = 9,078$$

(Due to rounding, the totals do not match.) The total number of projected lead service lines is then equal to the estimated number of known lead service lines plus the estimated number of unknown and unreported lines that are projected to be lead, or 14,493:

$$5,415 + 9,078 = 14,493$$

Appendix B State-by-State Findings Charts

Appendix B presents State survey findings for each state and U.S. Territory.

The top two pie charts show the findings for total need by water system size and by project category, representing the DWSRF-eligible infrastructure projects that are necessary over the 20-year period of January 1, 2021, through December 31, 2040.

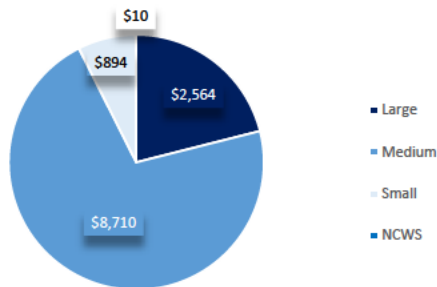
The middle bar chart and table present the estimated number of service lines by material and by water system size, and the pie chart in the lower left presents the total estimated number by material. EPA used survey response sample data to estimate the proportion of service lines in each state that are in each of the five material type categories (including unknown and not reported).

The pie chart in the lower right shows the projected service lines findings for lead, galvanized, and all other materials are the total number of service lines in each state that fit these three categories, including unknown and unreported service lines that might be lead. These findings are projected from the estimated findings based on the proportion of known service lines that are lead or galvanized to the number of lines of known material.

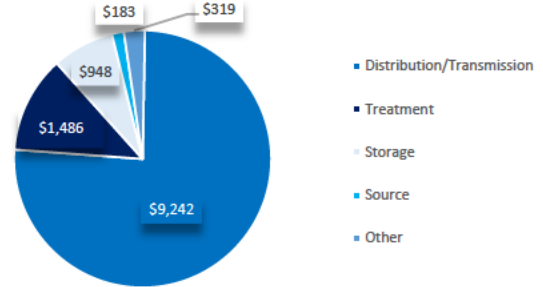
See Appendix A for a detailed step-by-step description of the methodology used to develop service line estimates.

Alabama

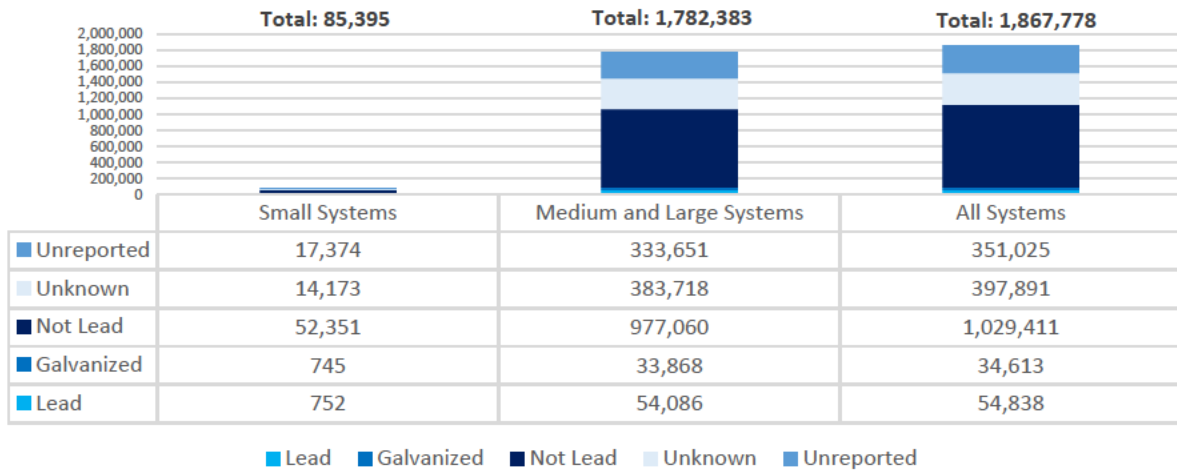
Alabama Total Need by System Size
(in millions; January 2021 dollars)



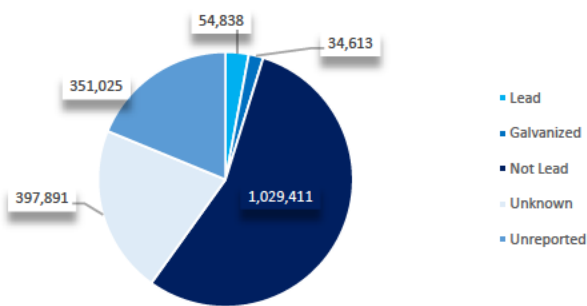
Alabama Total Need by Project Category
(in millions; January 2021 dollars)



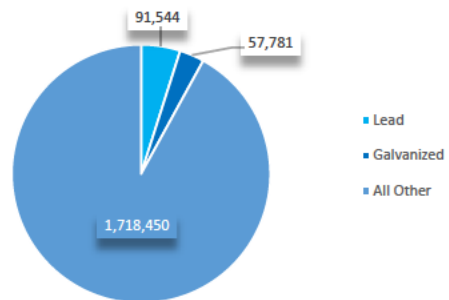
Alabama Estimated Service Lines by System Size



Alabama Service Lines - Estimated from Survey Responses

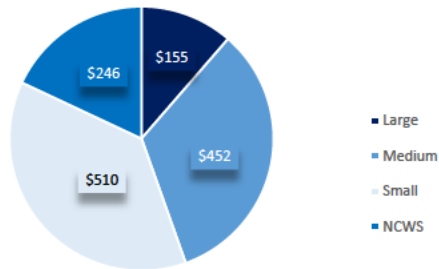


Alabama Projected Service Lines

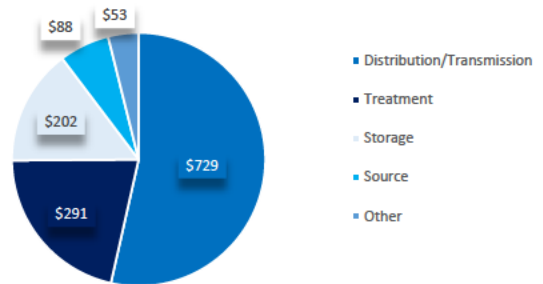


Alaska

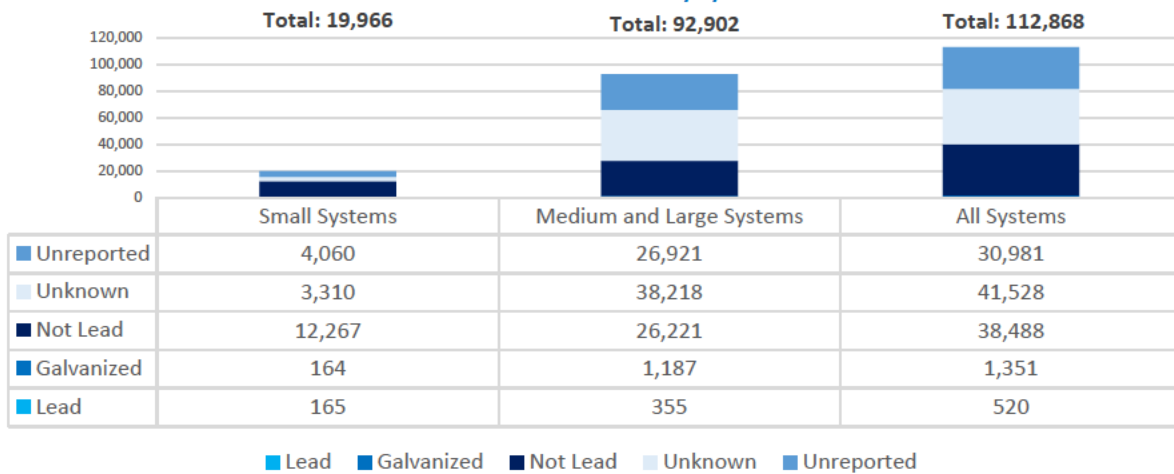
Alaska Total Need by System Size
(in millions; January 2021 dollars)



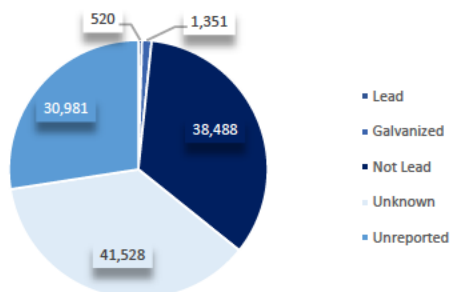
Alaska Total Need by Project Category
(in millions; January 2021 dollars)



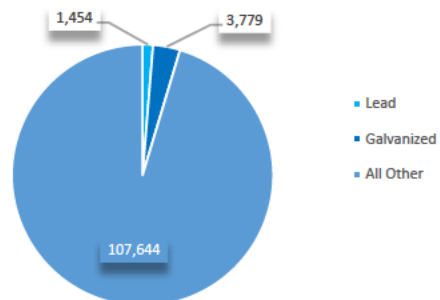
Alaska Estimated Service Lines by System Size



Alaska Service Lines - Estimated from Survey Responses

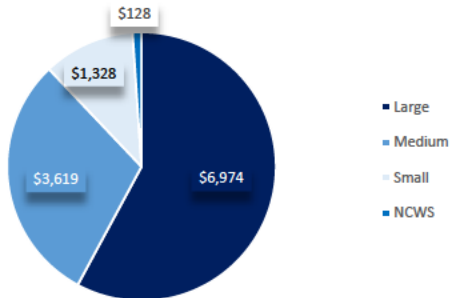


Alaska Projected Service Lines

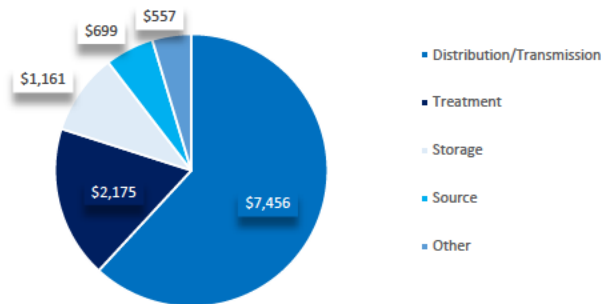


Arizona

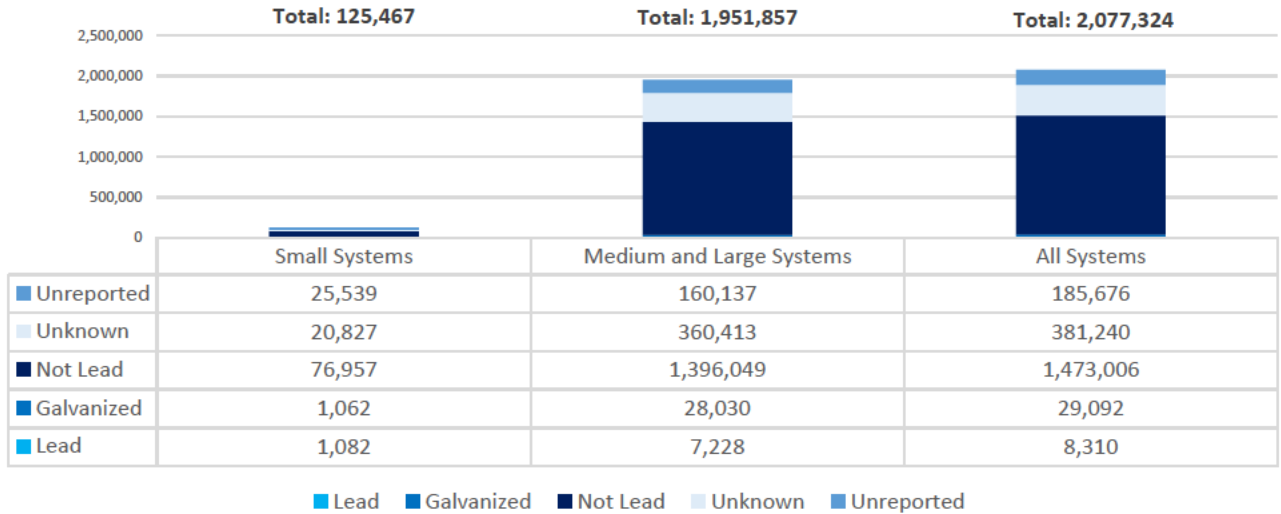
Arizona Total Need by System Size
(in millions; January 2021 dollars)



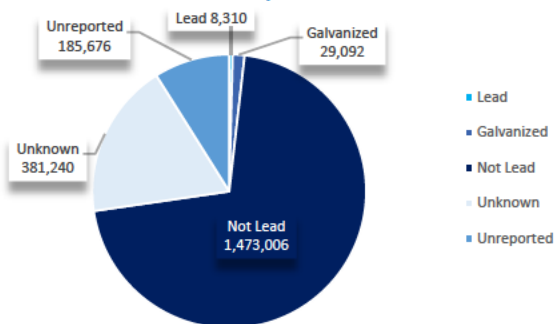
Arizona Total Need by Project Category
(in millions; January 2021 dollars)



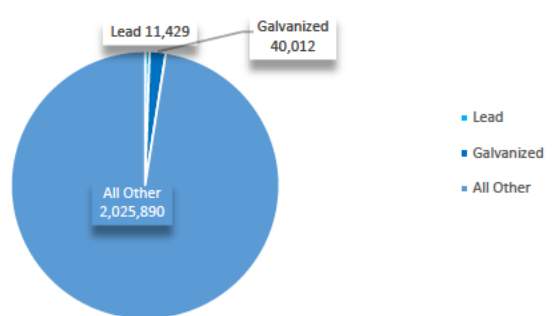
Arizona Estimated Service Lines by System Size



Arizona Service Lines - Estimated from Survey Responses

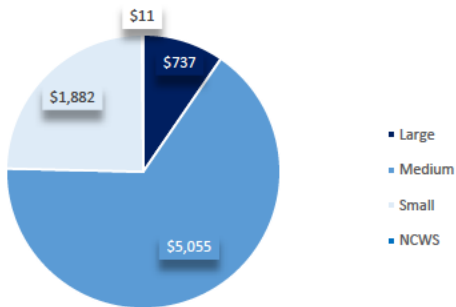


Arizona Projected Service Lines

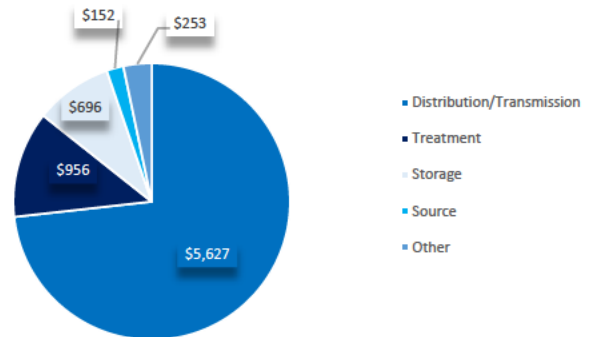


Arkansas

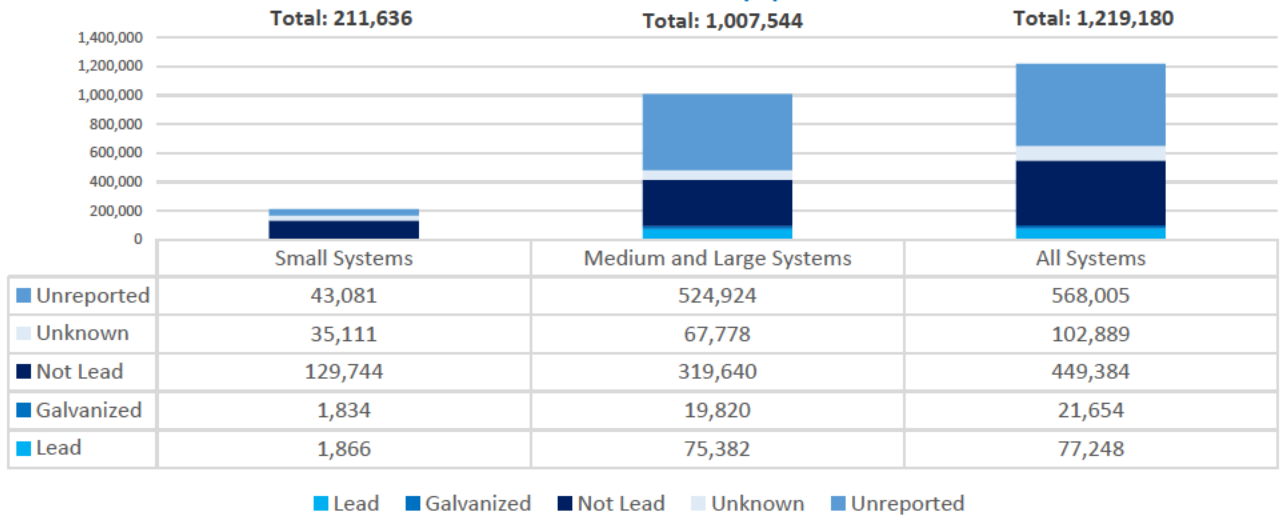
Arkansas Total Need by System Size
(in millions; January 2021 dollars)



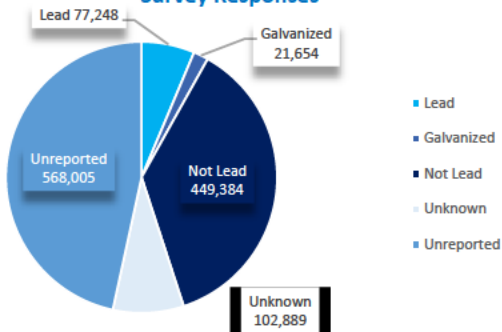
Arkansas Total Need by Project Category
(in millions; January 2021 dollars)



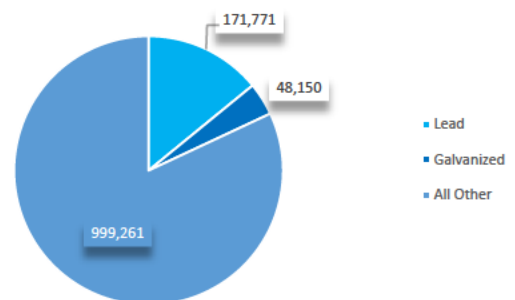
Arkansas Estimated Service Lines by System Size



Arkansas Service Lines - Estimated from Survey Responses

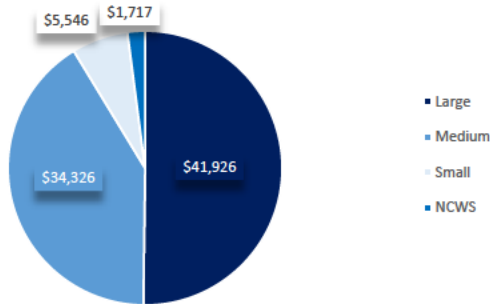


Arkansas Projected Service Lines

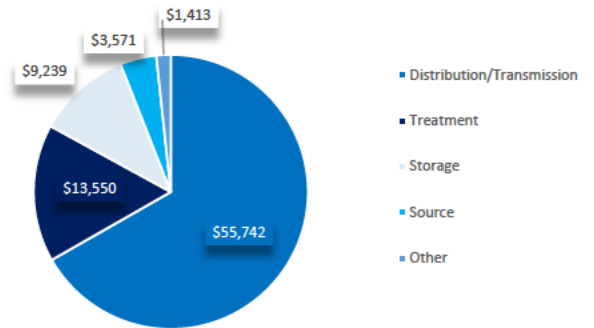


California

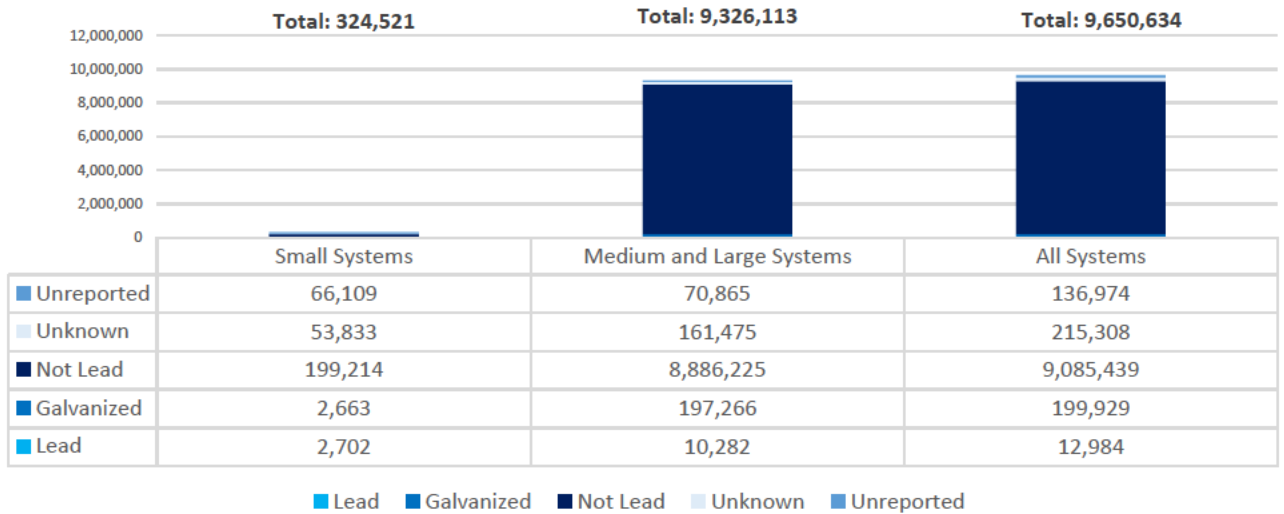
California Total Need by System Size
(in millions; January 2021 dollars)



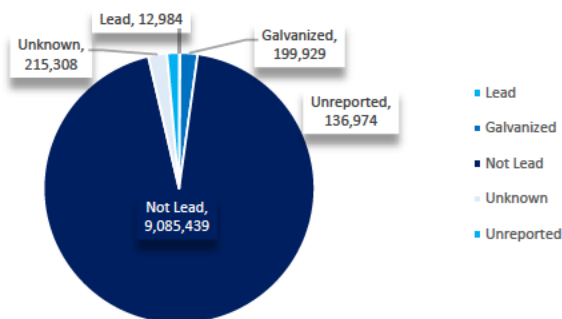
California Total Need by Project Category
(in millions; January 2021 dollars)



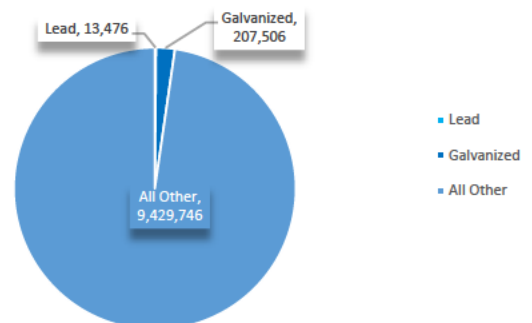
California Estimated Service Lines by System Size



California Service Lines - Estimated from Survey Responses

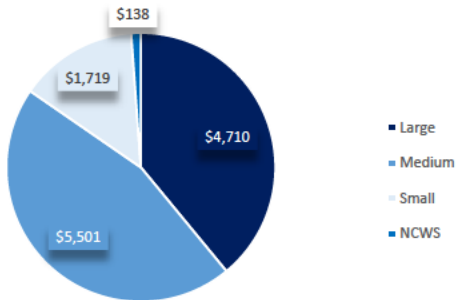


California Projected Service Lines

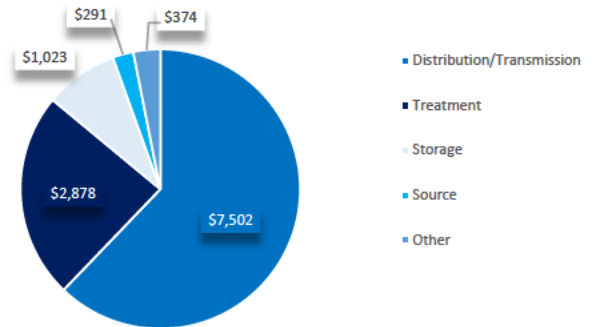


Colorado

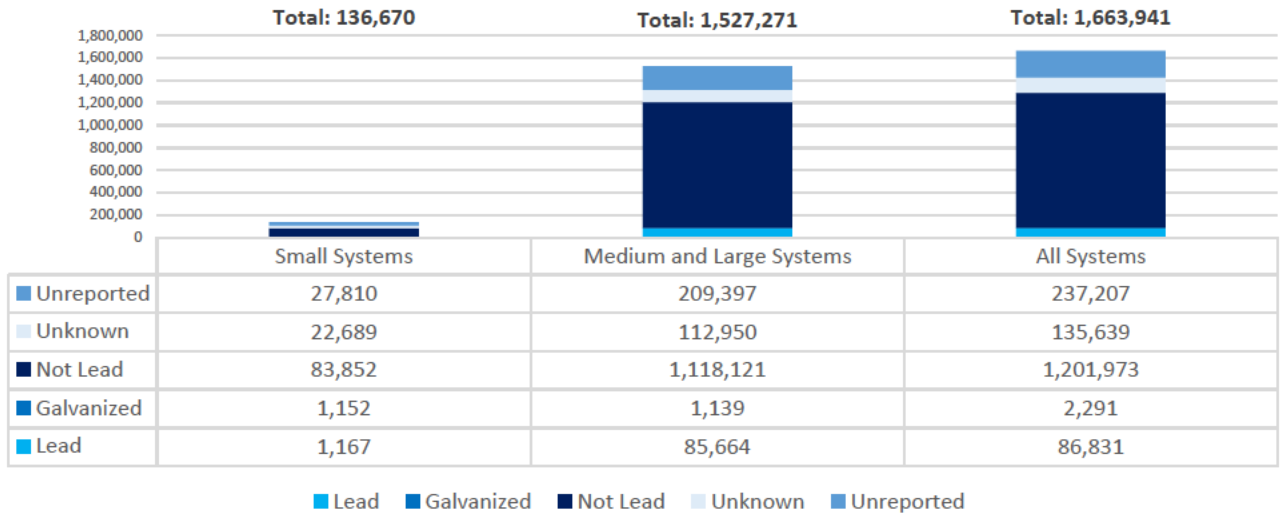
Colorado Total Need by System Size
(in millions; January 2021 dollars)



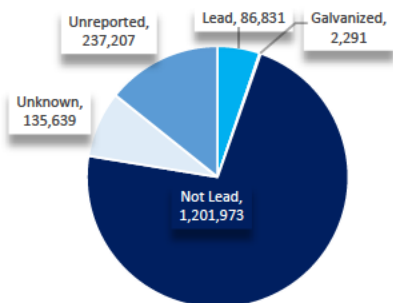
Colorado Total Need by Project Category
(in millions; January 2021 dollars)



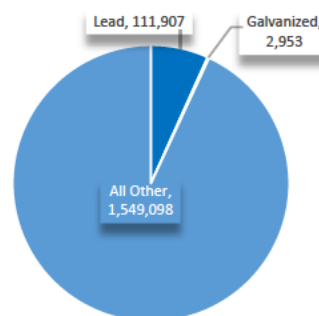
Colorado Estimated Service Lines by System Size



Colorado Service Lines - Estimated from Survey Responses

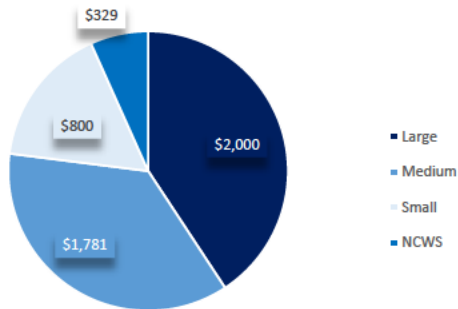


Colorado Projected Service Lines

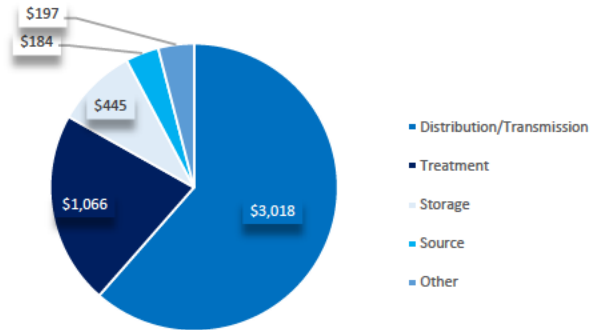


Connecticut

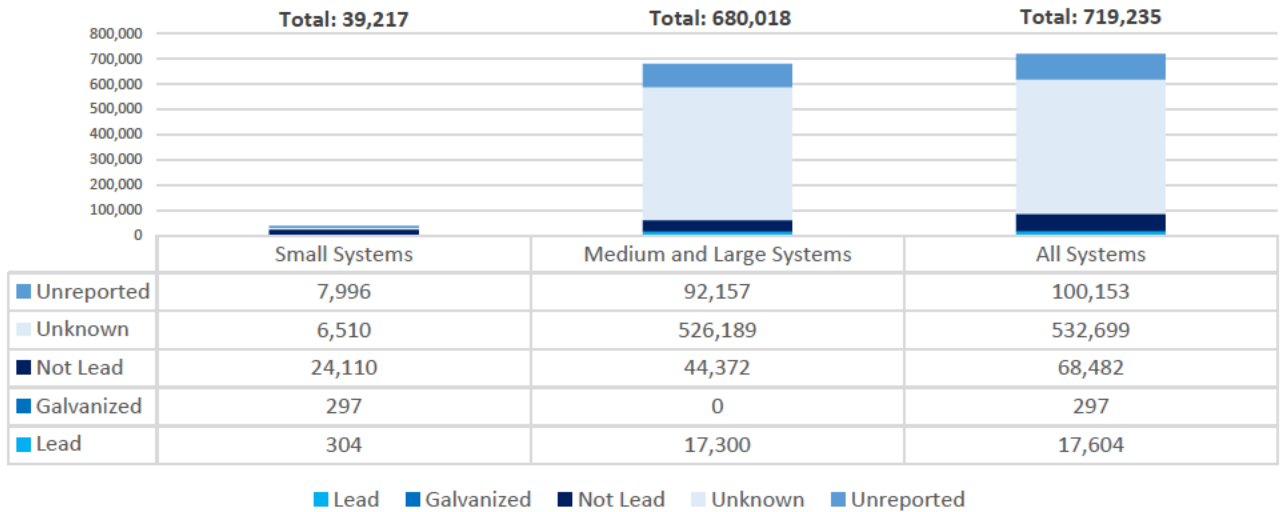
Connecticut Total Need by System Size
(in millions; January 2021 dollars)



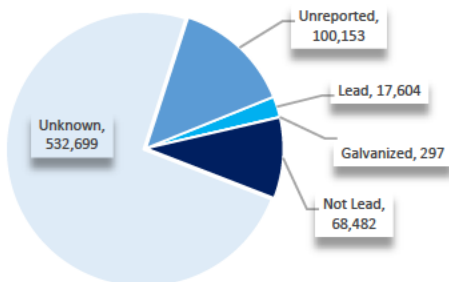
Connecticut Total Need by Project Category
(in millions; January 2021 dollars)



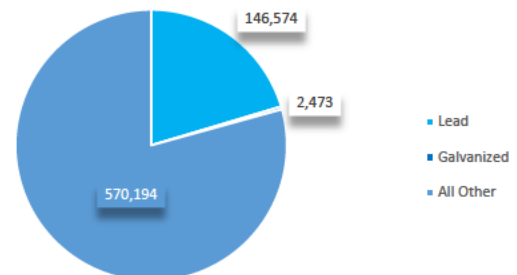
Connecticut Estimated Service Lines by System Size



Connecticut Service Lines - Estimated from Survey Responses

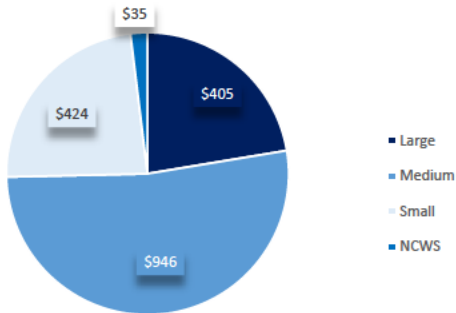


Connecticut Projected Service Lines

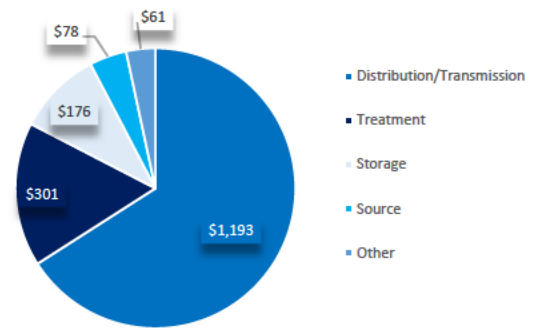


Delaware

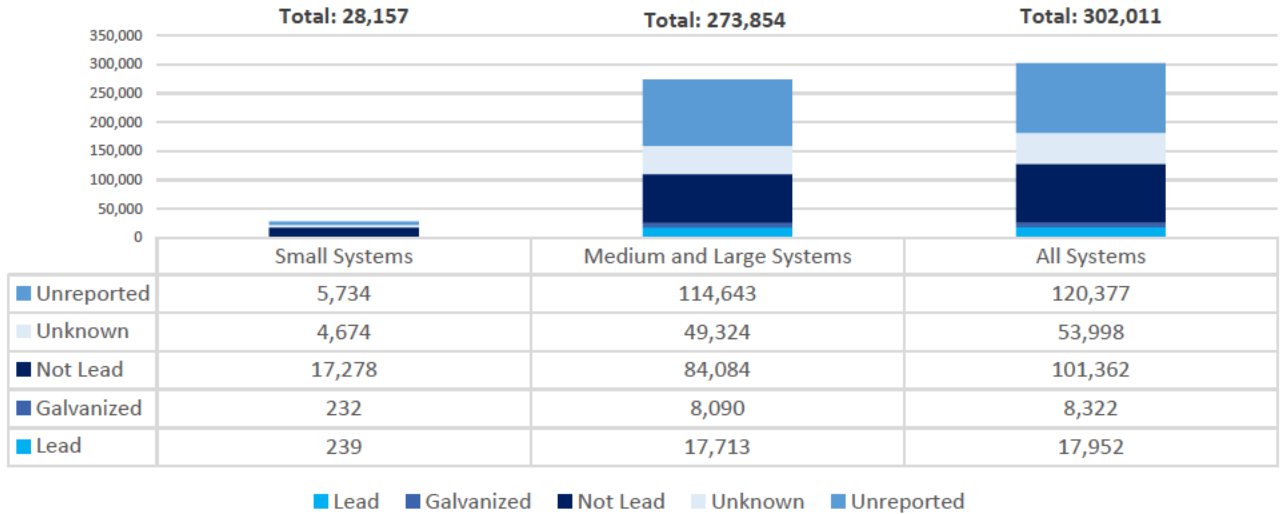
Delaware Total Need by System Size
(in millions; January 2021 dollars)



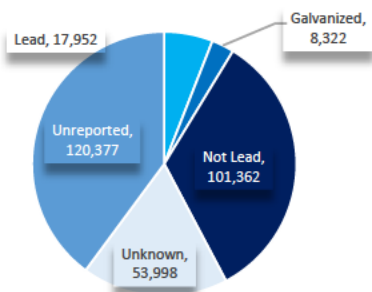
Delaware Total Need by Project Category
(in millions; January 2021 dollars)



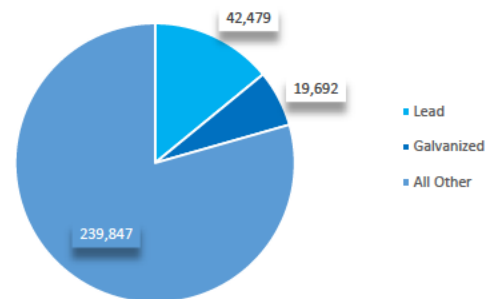
Delaware Estimated Service Lines by System Size



Delaware Service Lines - Estimated from Survey Responses

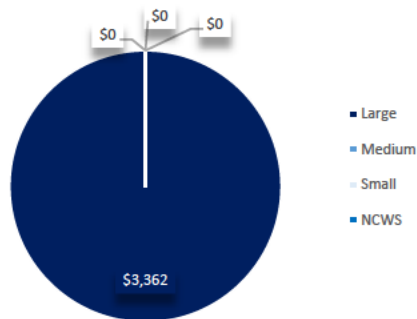


Delaware Projected Service Lines

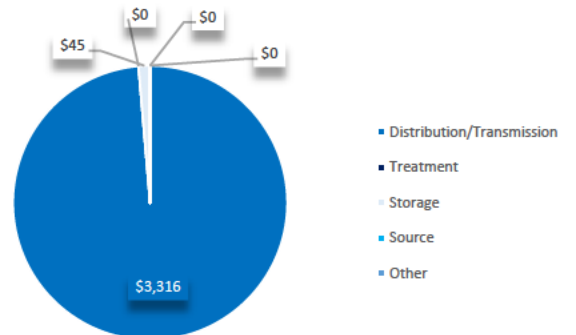


District of Columbia

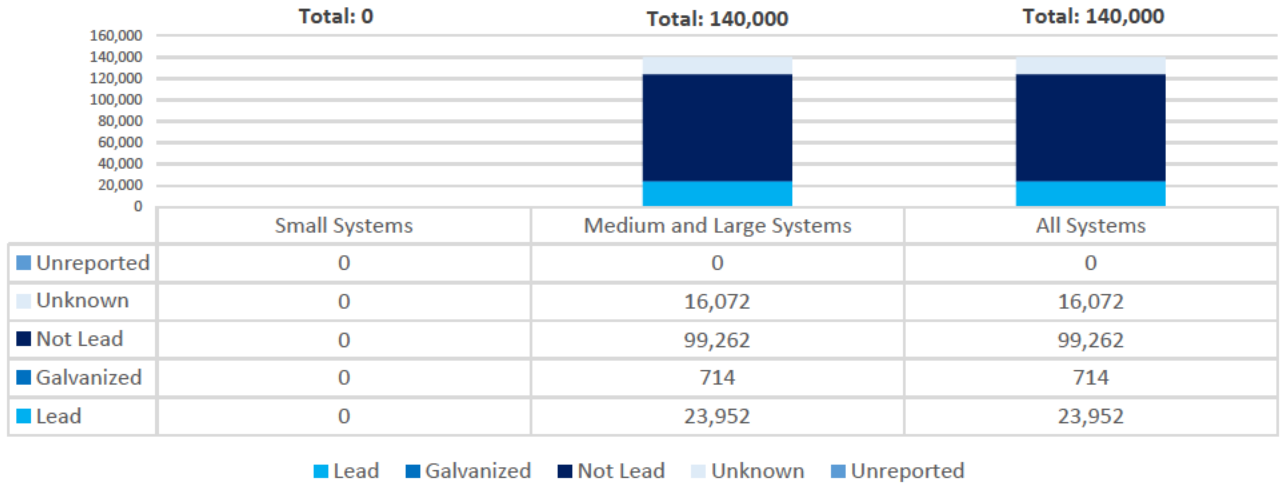
District of Columbia Total Need by System Size
(in millions; January 2021 dollars)



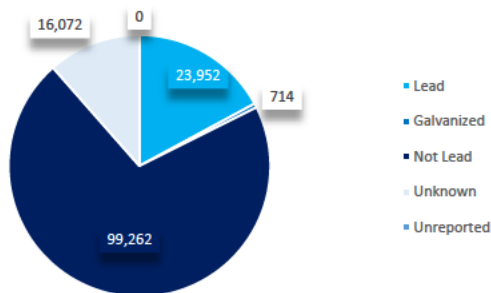
District of Columbia Total Need by Project Category
(in millions; January 2021 dollars)



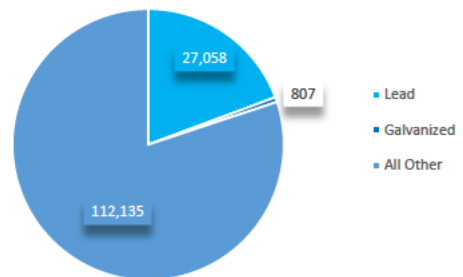
District of Columbia Estimated Service Lines by System Size



District of Columbia Service Lines - Estimated from Survey Responses

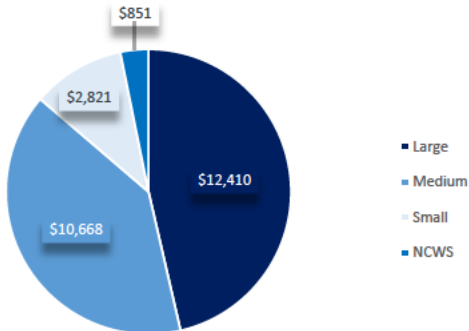


District of Columbia Projected Service Lines

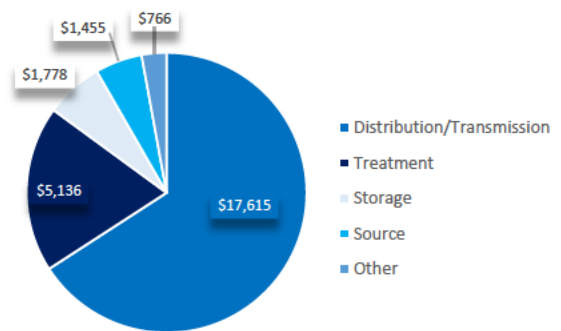


Florida

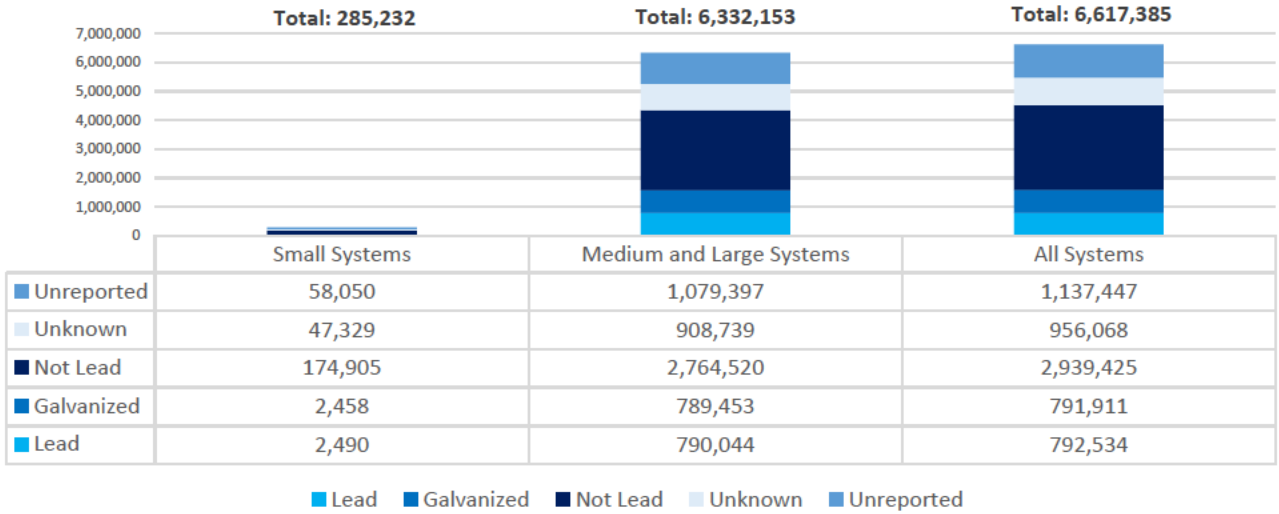
Florida Total Need by System Size
(in millions; January 2021 dollars)



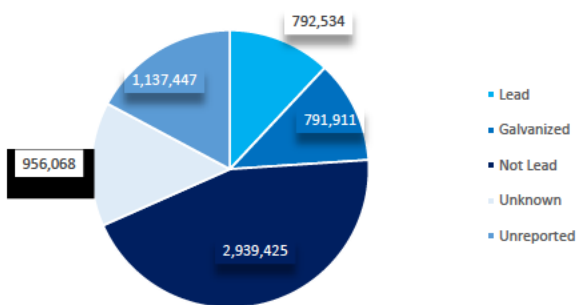
Florida Total Need by Project Category
(in millions; January 2021 dollars)



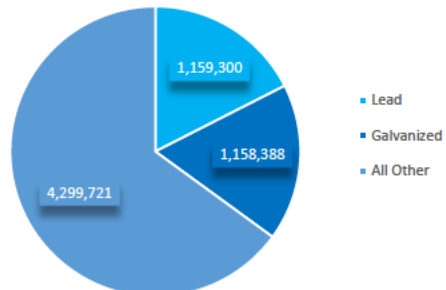
Florida Estimated Service Lines by System Size



Florida Service Lines - Estimated from Survey Responses

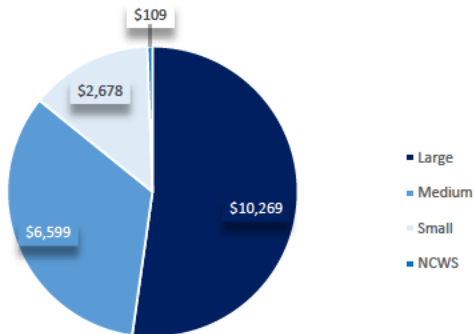


Florida Projected Service Lines

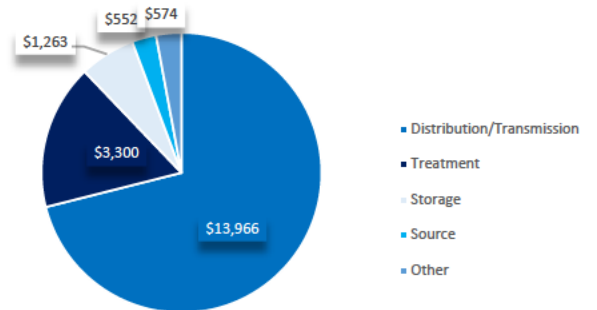


Georgia

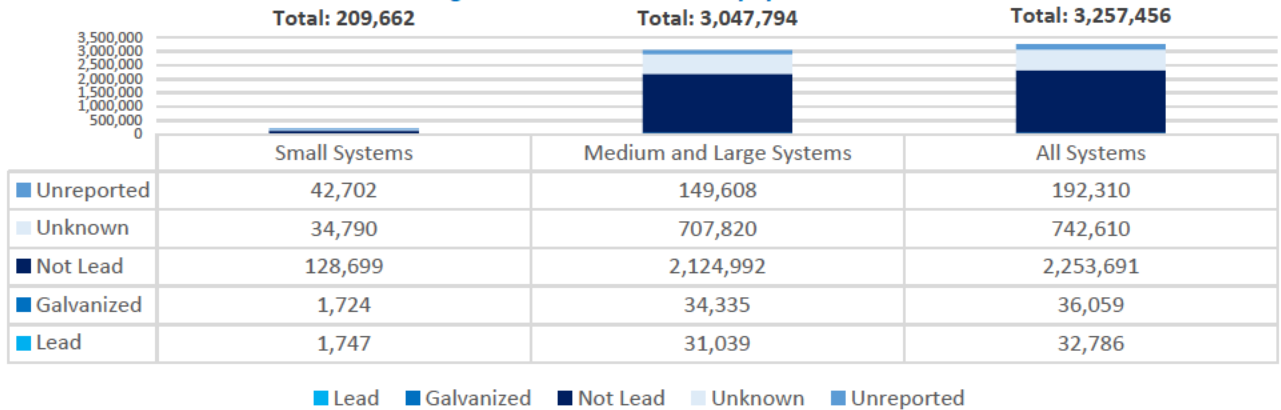
Georgia Total Need by System Size
(in millions; January 2021 dollars)



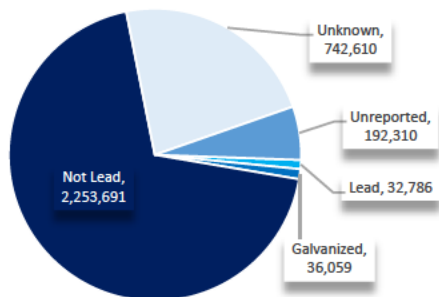
Georgia Total Need by Project Category
(in millions; January 2021 dollars)



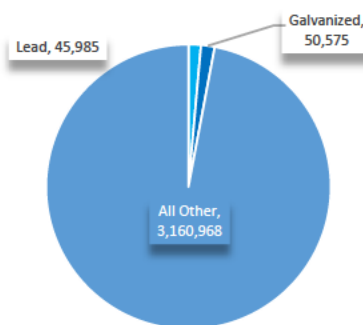
Georgia Estimated Service Lines by System Size



Georgia Service Lines - Estimated from Survey Responses

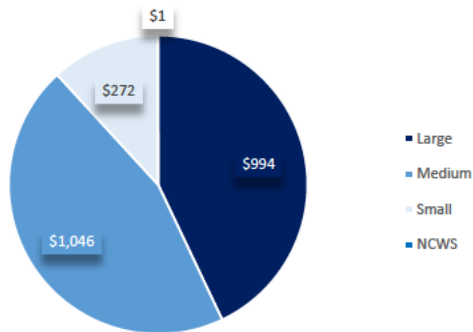


Georgia Projected Service Lines

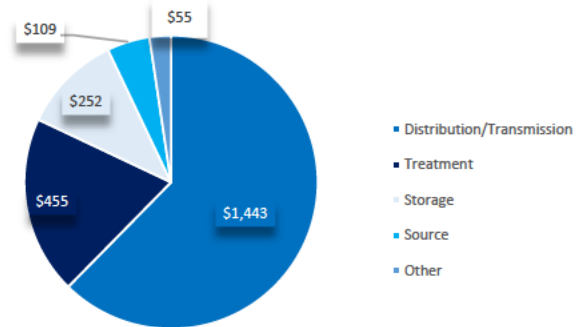


Hawaii

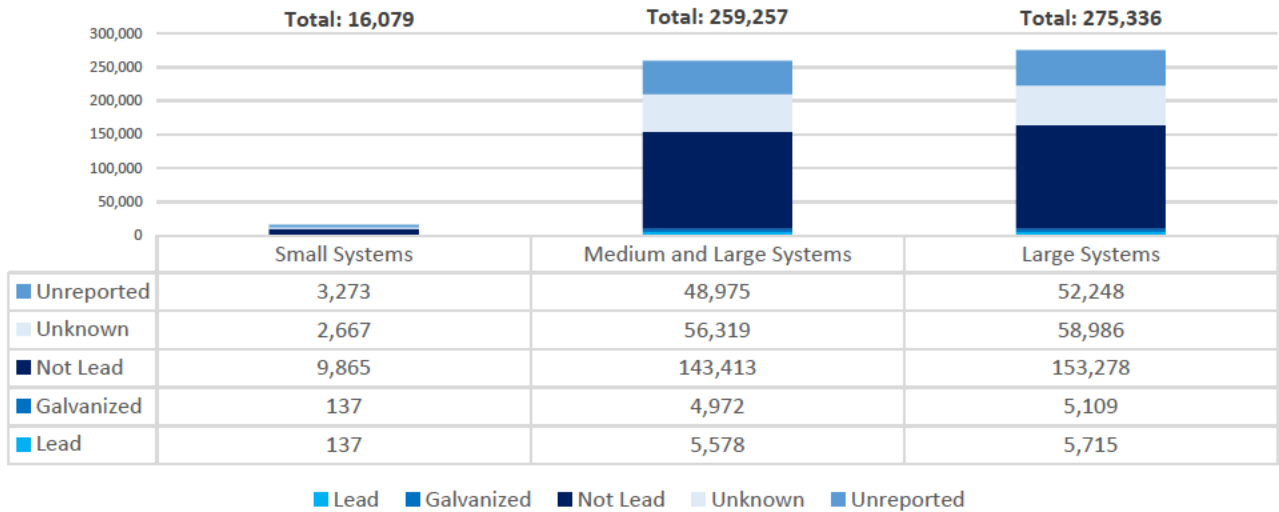
Hawaii Total Need by System Size
(in millions; January 2021 dollars)



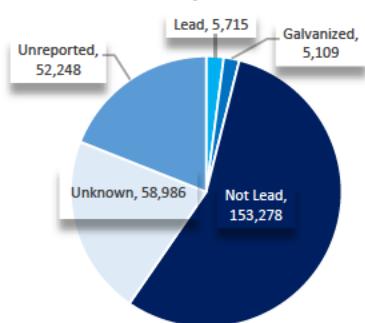
Hawaii Total Need by Project Category
(in millions; January 2021 dollars)



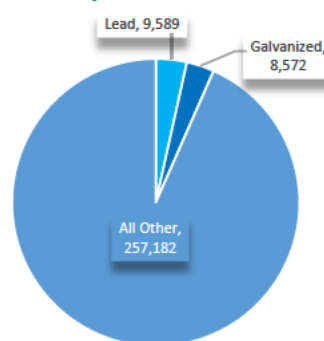
Hawaii Estimated Service Lines by System Size



Hawaii Service Lines - Estimated from Survey Responses

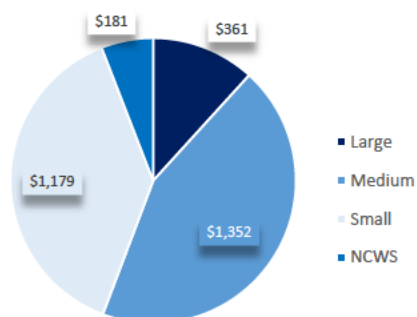


Hawaii Projected Service Lines

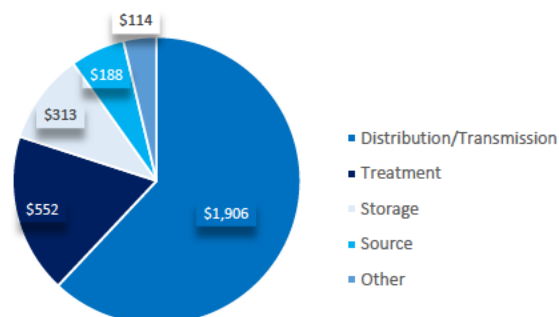


Idaho

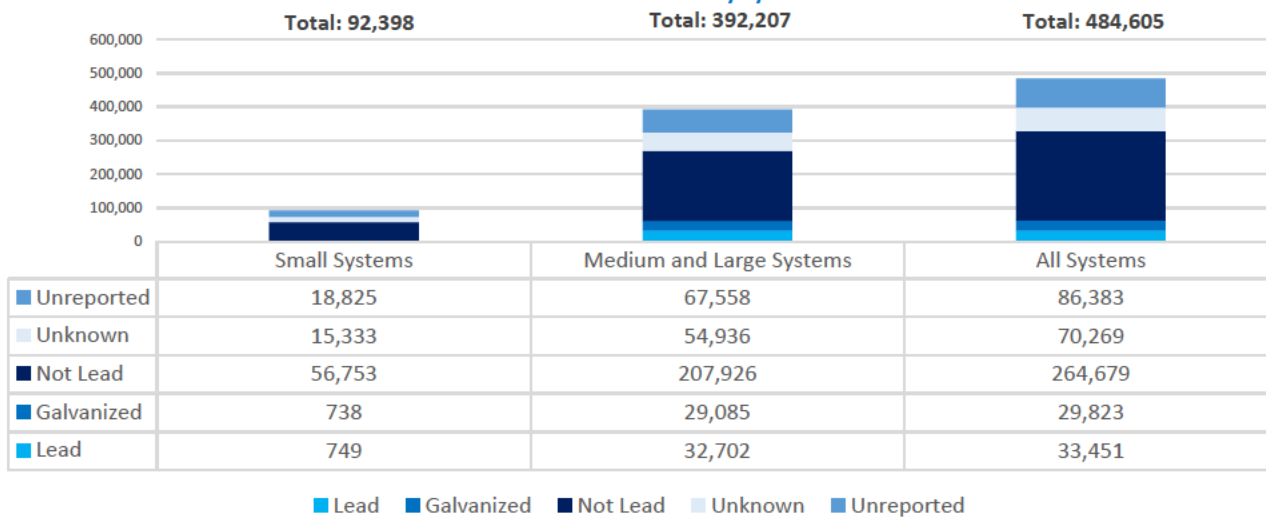
Idaho Total Need by System Size
(in millions; January 2021 dollars)



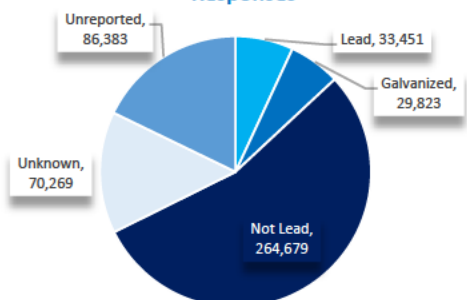
Idaho Total Need by Project Category
(in millions; January 2021 dollars)



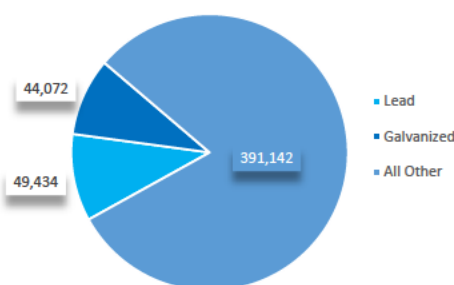
Idaho Estimated Service Lines by System Size



Idaho Service Lines - Estimated from Survey Responses

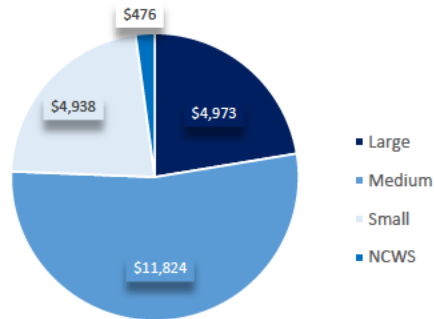


Idaho Projected Service Lines

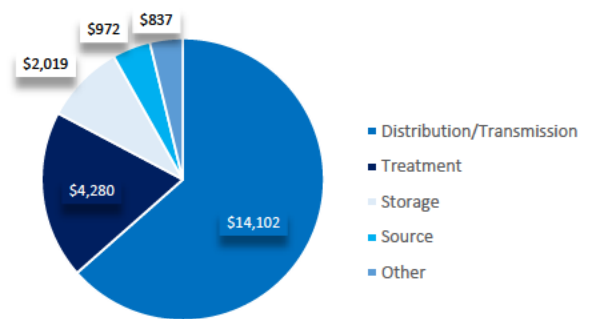


Illinois

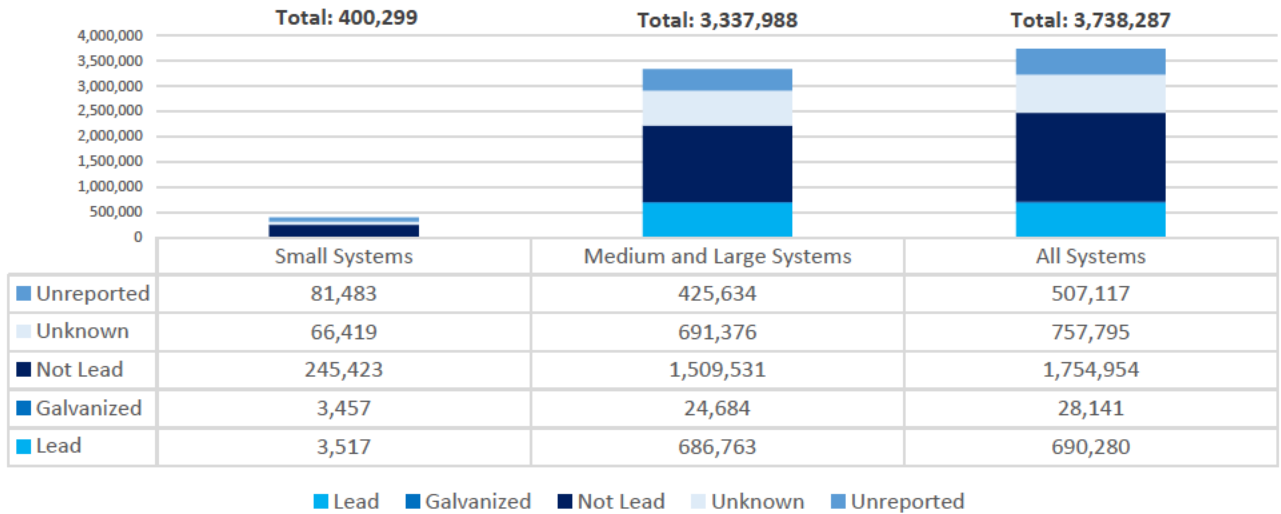
Illinois Total Need by System Size
(in millions; January 2021 dollars)



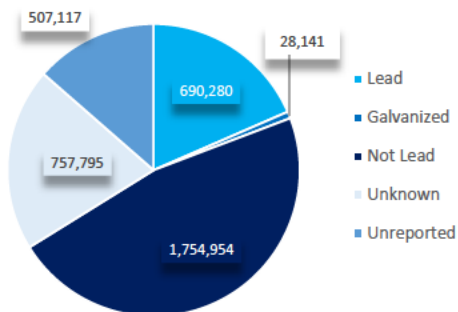
Illinois Total Need by Project Category
(in millions; January 2021 dollars)



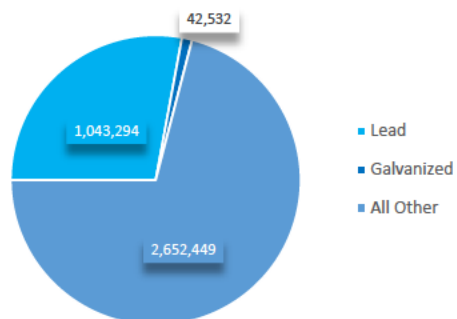
Illinois Estimated Service Lines by System Size



Illinois Service Lines - Estimated from Survey Responses

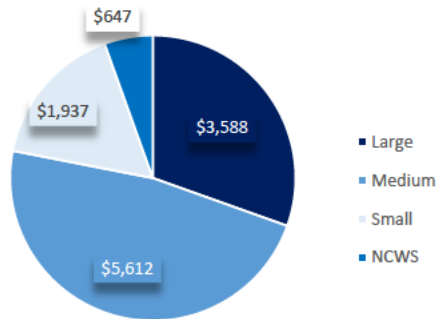


Illinois Projected Service Lines

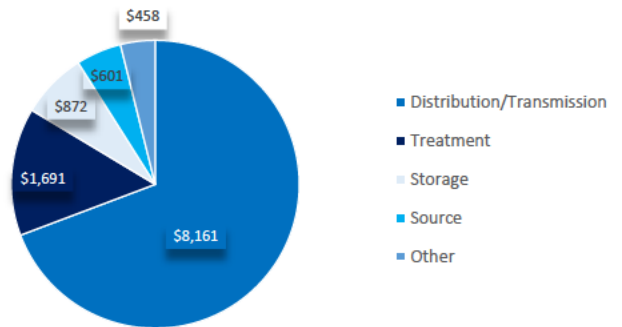


Indiana

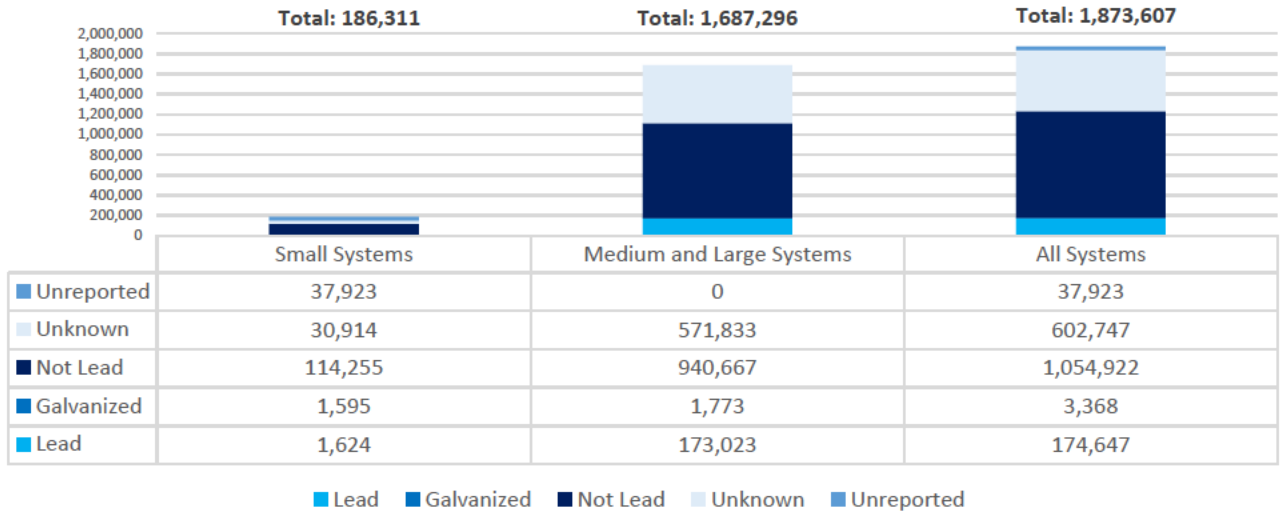
Indiana Total Need by System Size
(in millions; January 2021 dollars)



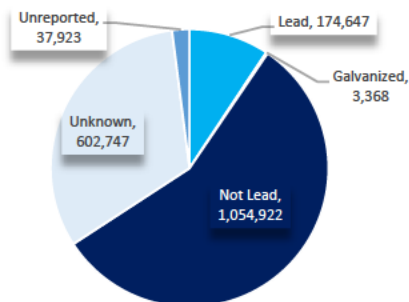
Indiana Total Need by Project Category
(in millions; January 2021 dollars)



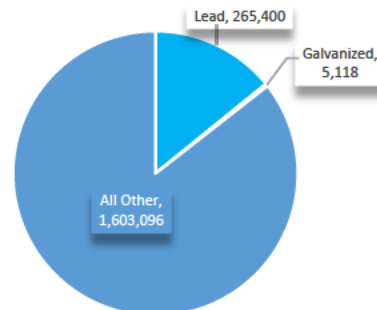
Indiana Estimated Service Lines by System Size



Indiana Service Lines - Estimated from Survey Responses

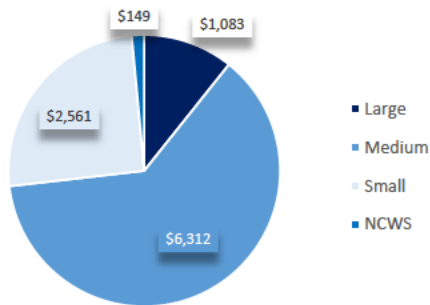


Indiana Projected Service Lines

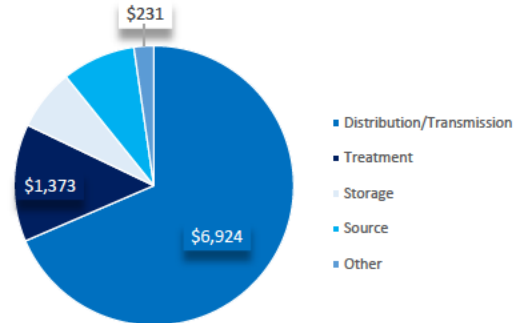


Iowa

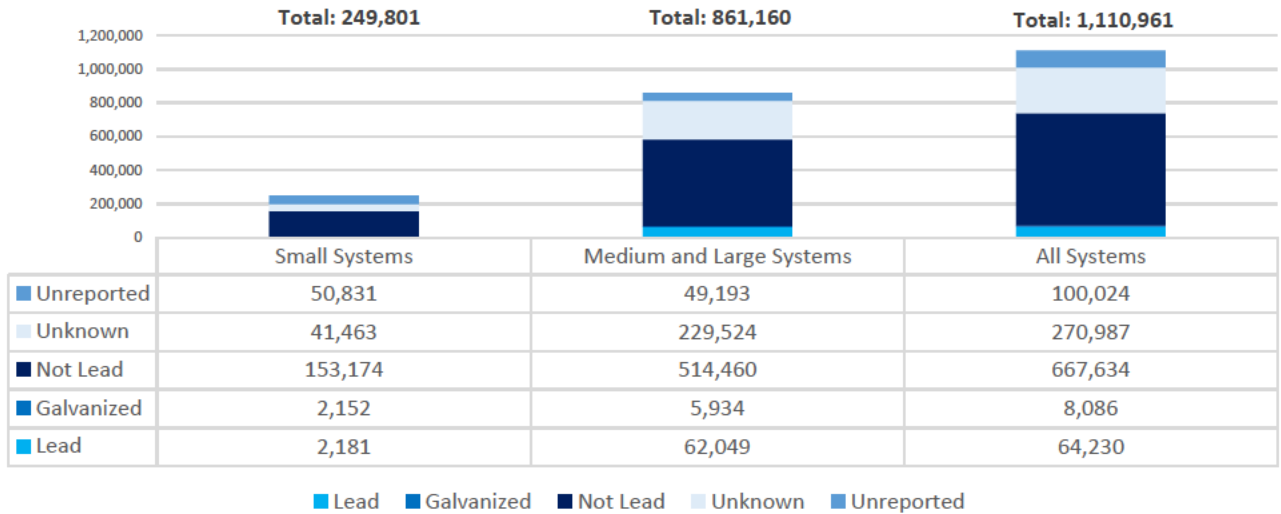
Iowa Total Need by System Size
(in millions; January 2021 dollars)



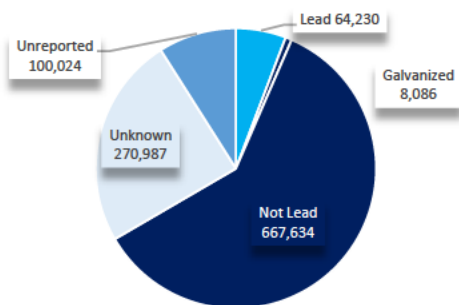
Iowa Total Need by Project Category
(in millions; January 2021 dollars)



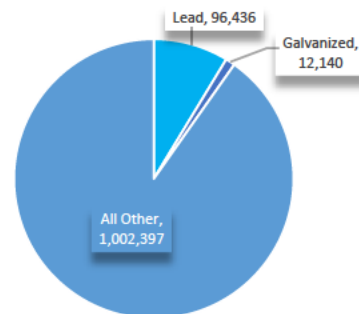
Iowa Estimated Service Lines by System Size



Iowa Service Lines - Estimated from Survey Responses

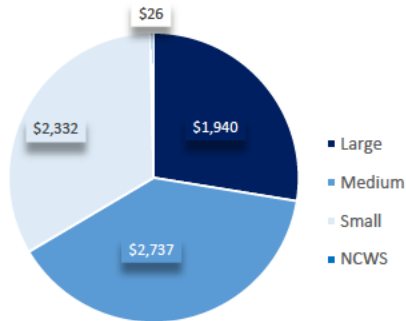


Iowa Projected Service Lines

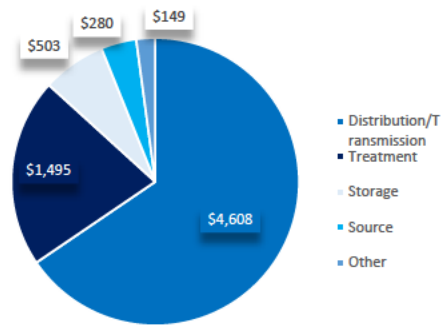


Kansas

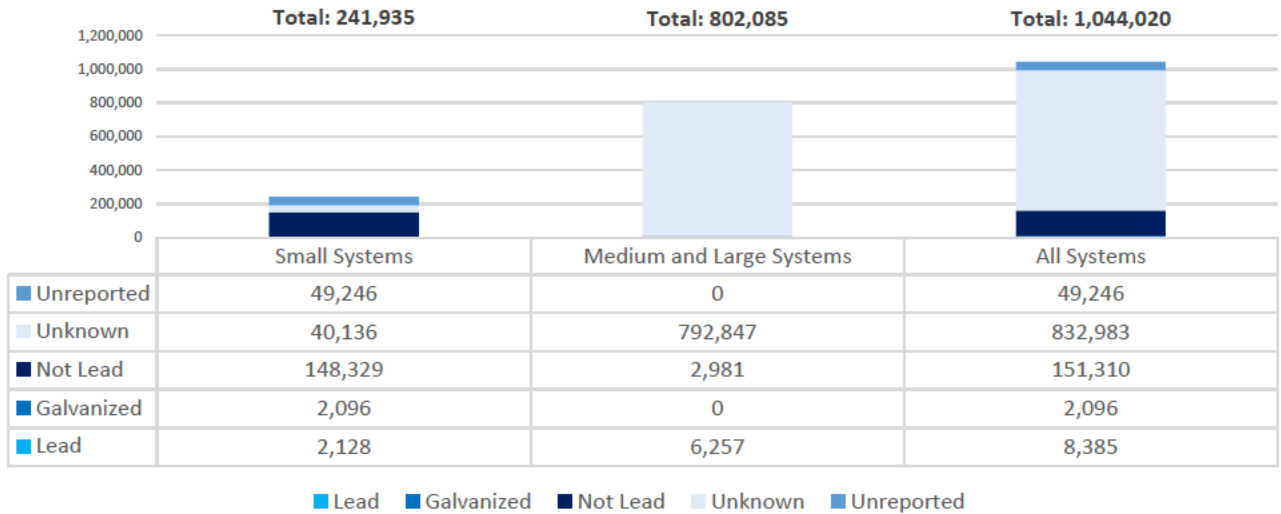
Kansas Total Need by System Size
(in millions; January 2021 dollars)



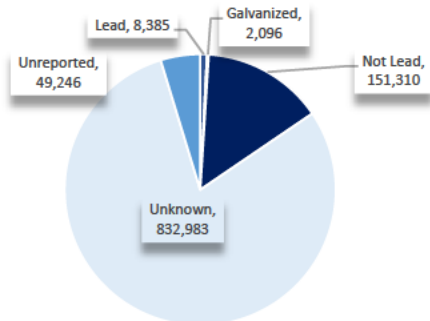
Kansas Total Need by Project Category
(in millions; January 2021 dollars)



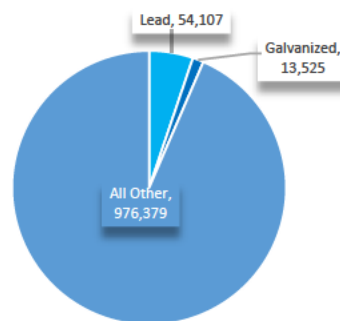
Kansas Estimated Service Lines by System Size



Kansas Service Lines - Estimated from Survey Responses

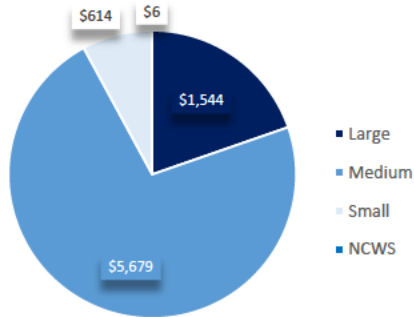


Kansas Projected Service Lines

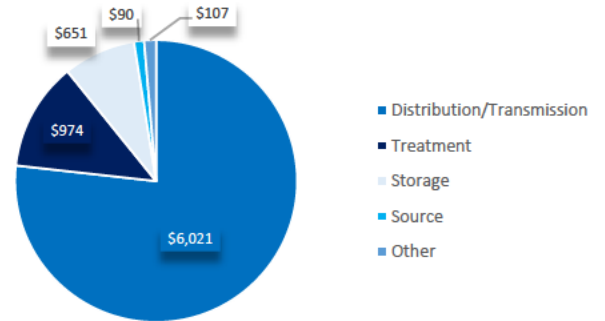


Kentucky

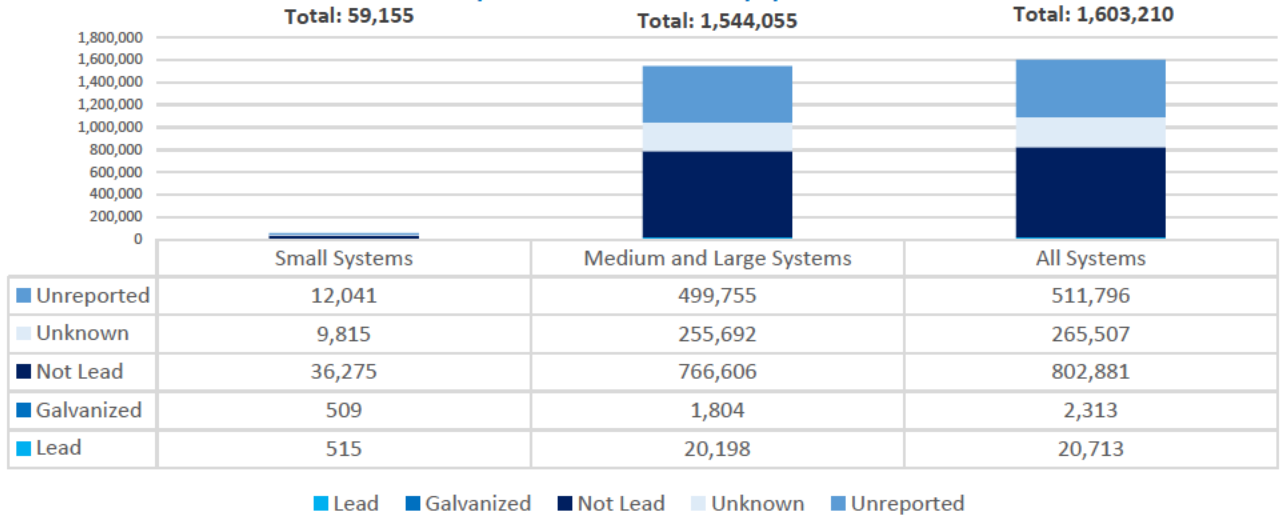
Kentucky Total Need by System Size
(in millions; January 2021 dollars)



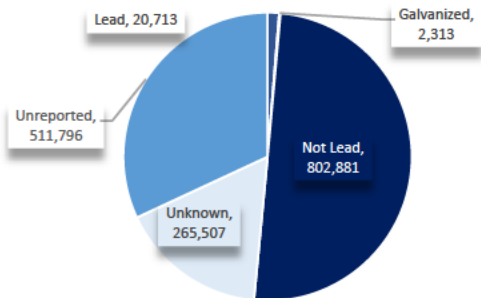
Kentucky Total Need by Project Category
(in millions; January 2021 dollars)



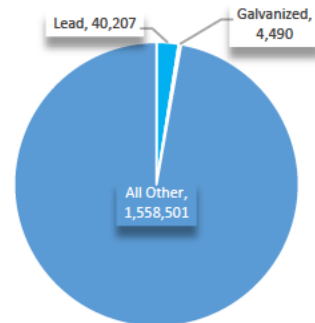
Kentucky Estimated Service Lines by System Size



Kentucky Service Lines - Estimated from Survey Responses

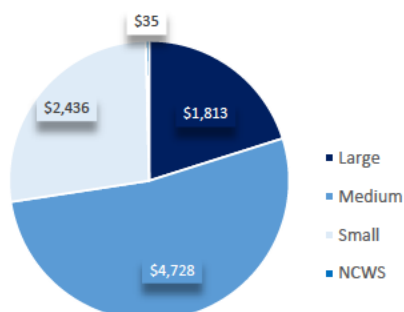


Kentucky Projected Service Lines

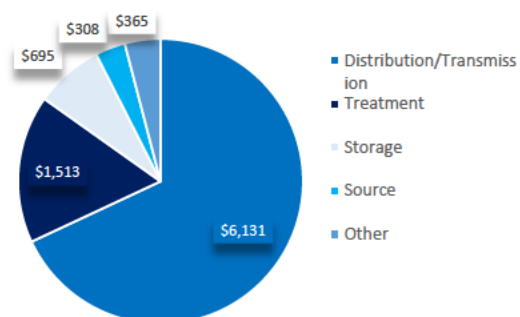


Louisiana

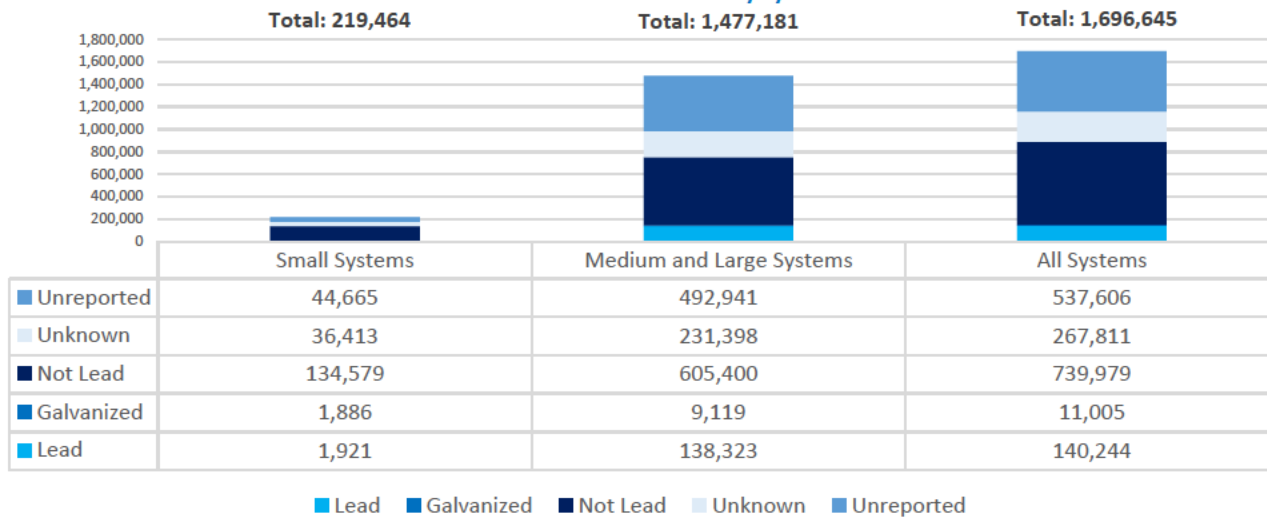
Louisiana Total Need by System Size
(in millions; January 2021 dollars)



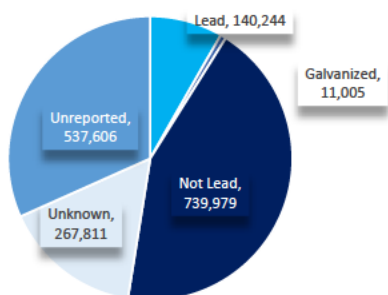
Louisiana Total Need by Project Category
(in millions; January 2021 dollars)



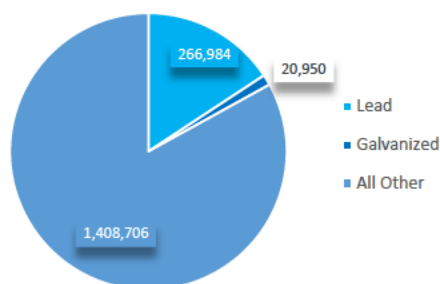
Louisiana Estimated Service Lines by System Size



Louisiana Service Lines - Estimated from Survey Responses

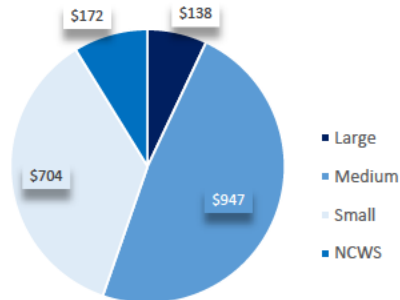


Louisiana Projected Service Lines

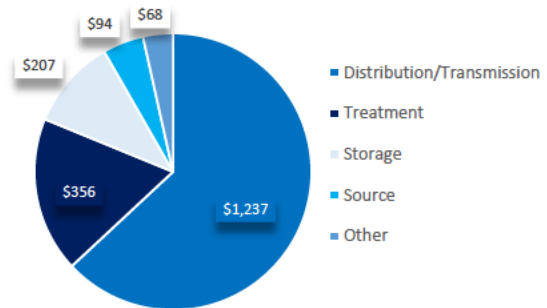


Maine

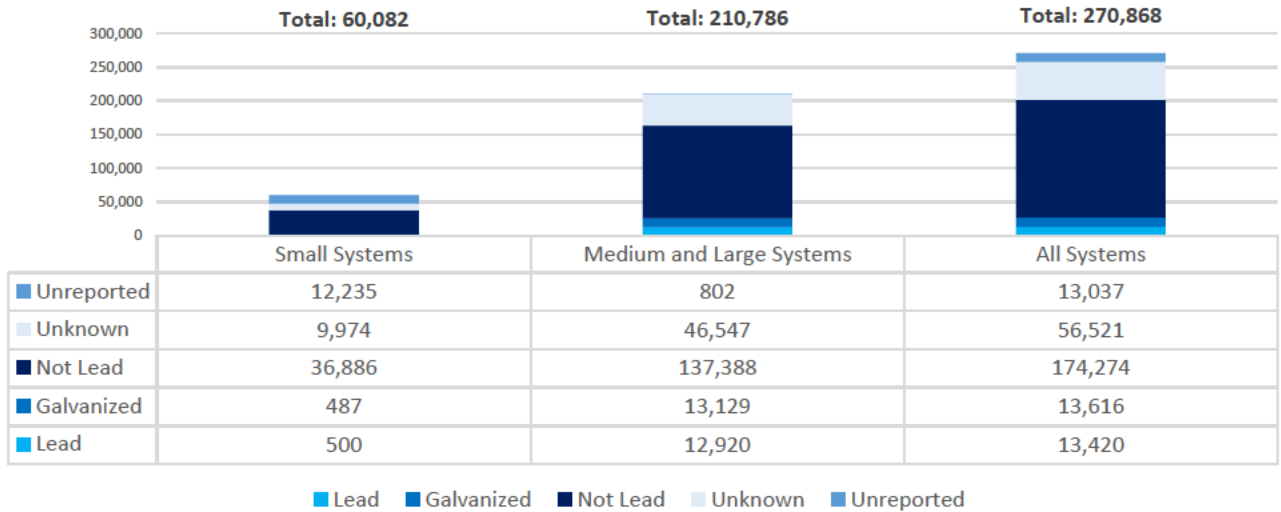
Maine Total Need by System Size
(in millions; January 2021 dollars)



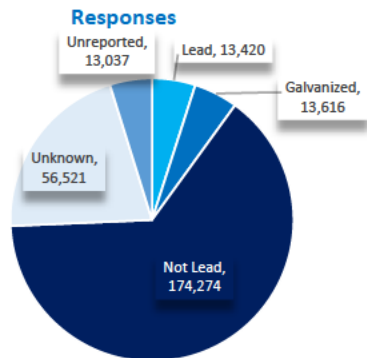
Maine Total Need by Project Category
(in millions; January 2021 dollars)



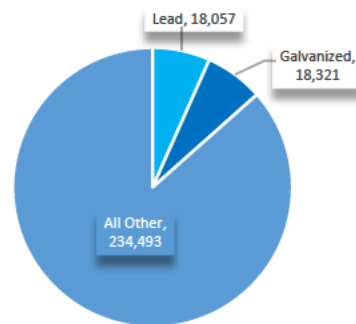
Maine Estimated Service Lines by System Size



Maine Service Lines - Estimated from Survey Responses

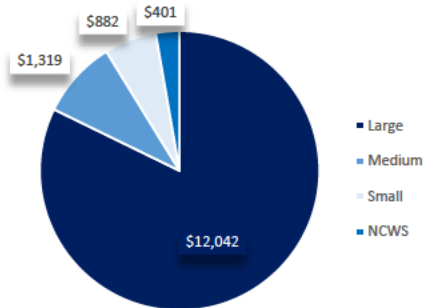


Maine Projected Service Lines

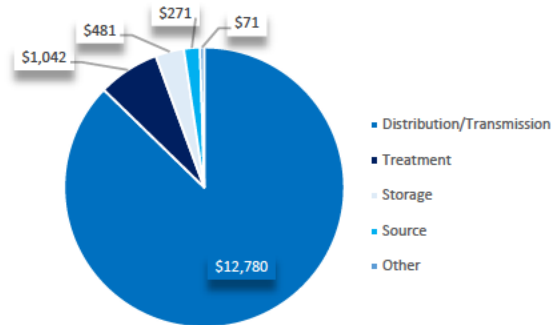


Maryland

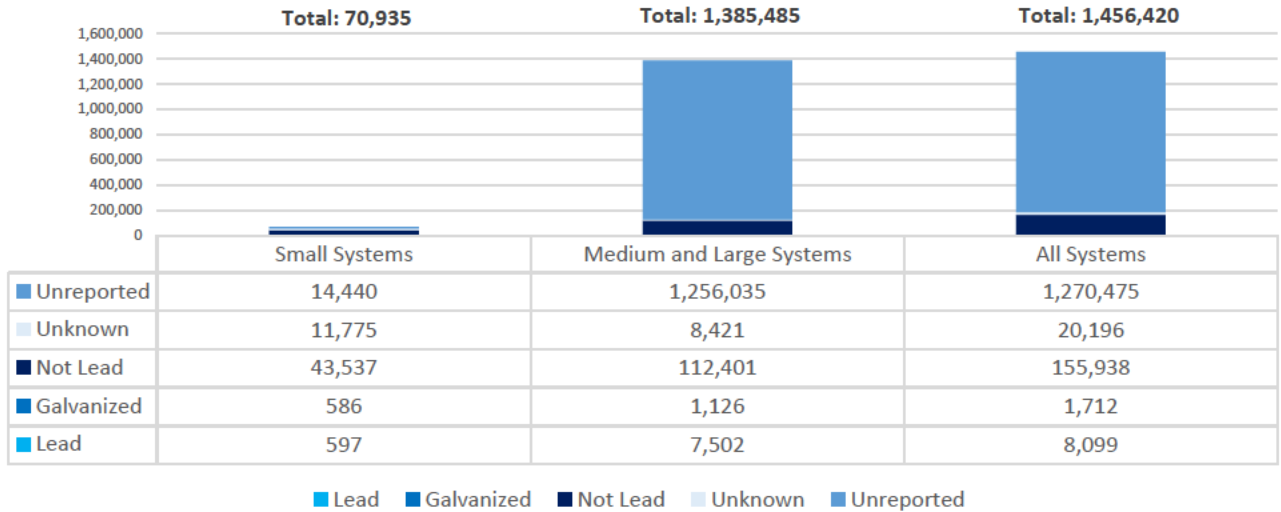
Maryland Total Need by System Size
(in millions; January 2021 dollars)



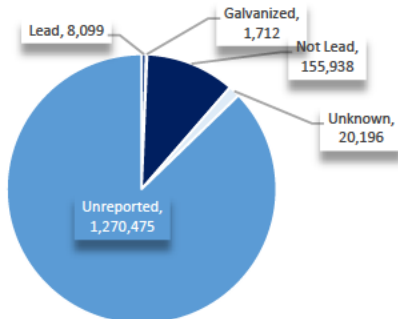
Maryland Total Need by Project Category
(in millions; January 2021 dollars)



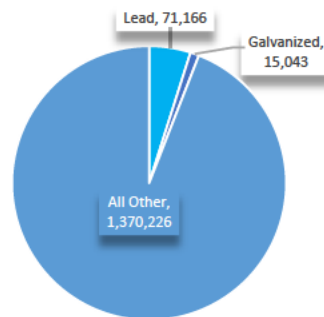
Maryland Estimated Service Lines by System Size



Maryland Service Lines - Estimated from Survey Responses

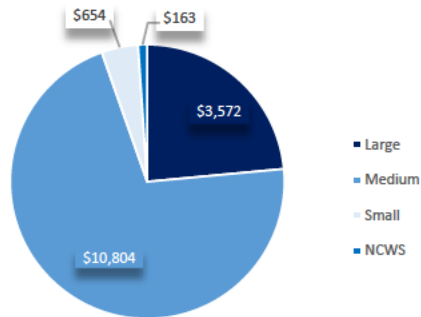


Maryland Projected Service Lines

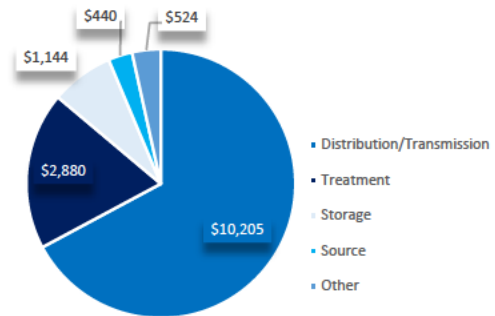


Massachusetts

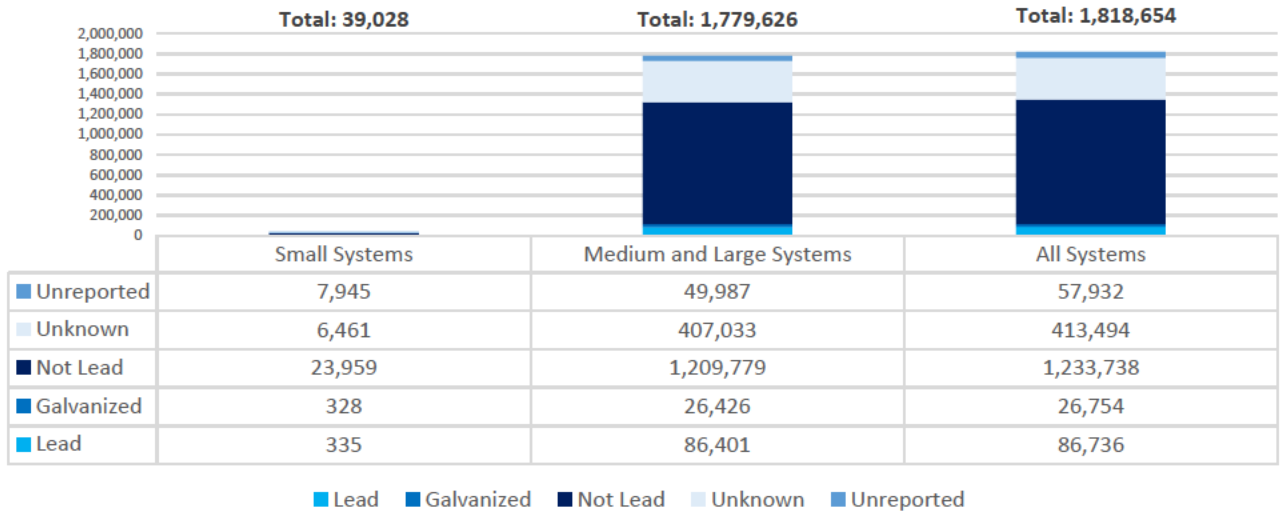
Massachusetts Total Need by System Size
(in millions; January 2021 dollars)



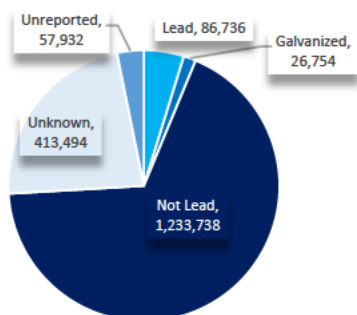
Massachusetts Total Need by Project Category
(in millions; January 2021 dollars)



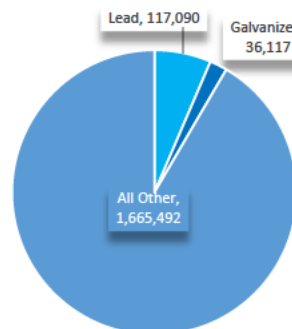
Massachusetts Estimated Service Lines by System Size



Massachusetts Service Lines - Estimated from Survey Responses

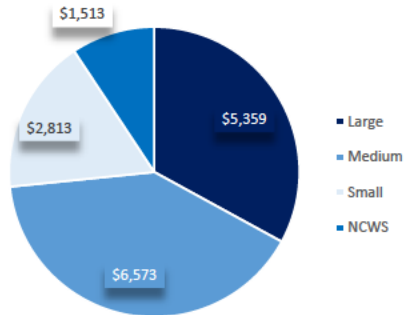


Massachusetts Projected Service Lines

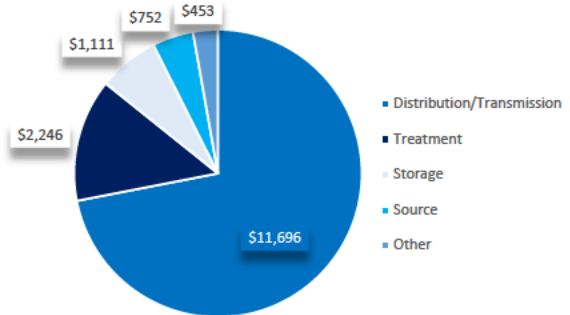


Michigan

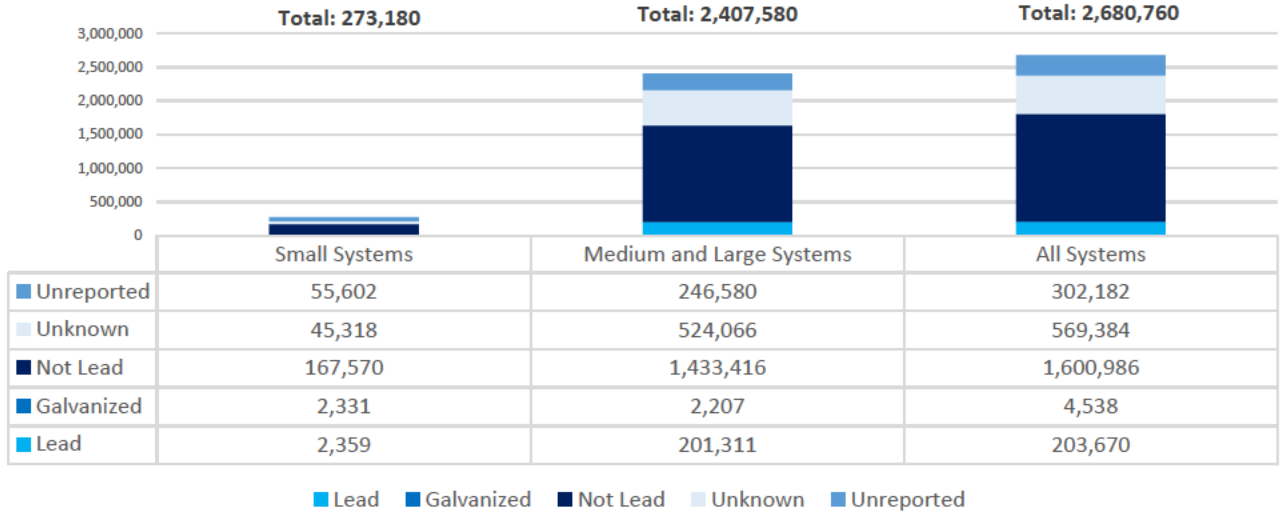
Michigan Total Need by System Size
(in millions; January 2021 dollars)



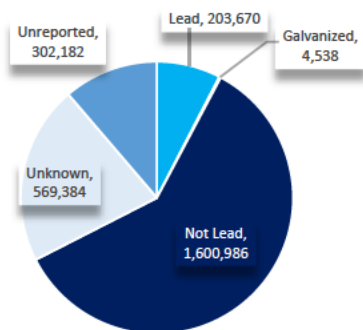
Michigan Total Need by Project Category
(in millions; January 2021 dollars)



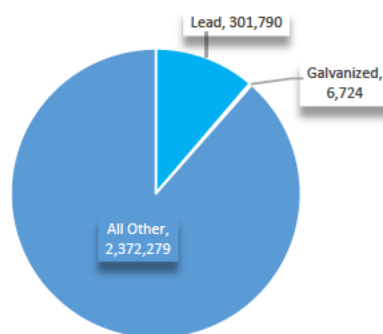
Michigan Estimated Service Lines by System Size



Michigan Service Lines - Estimated from Survey Responses

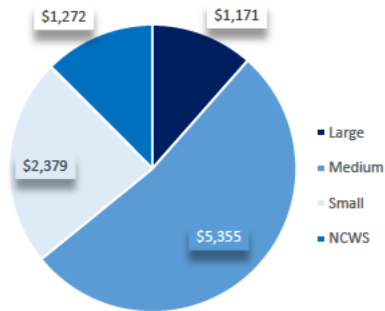


Michigan Projected Service Lines

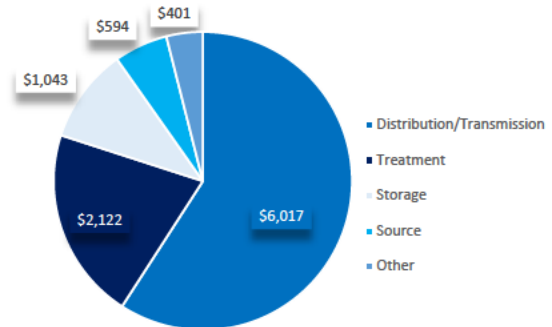


Minnesota

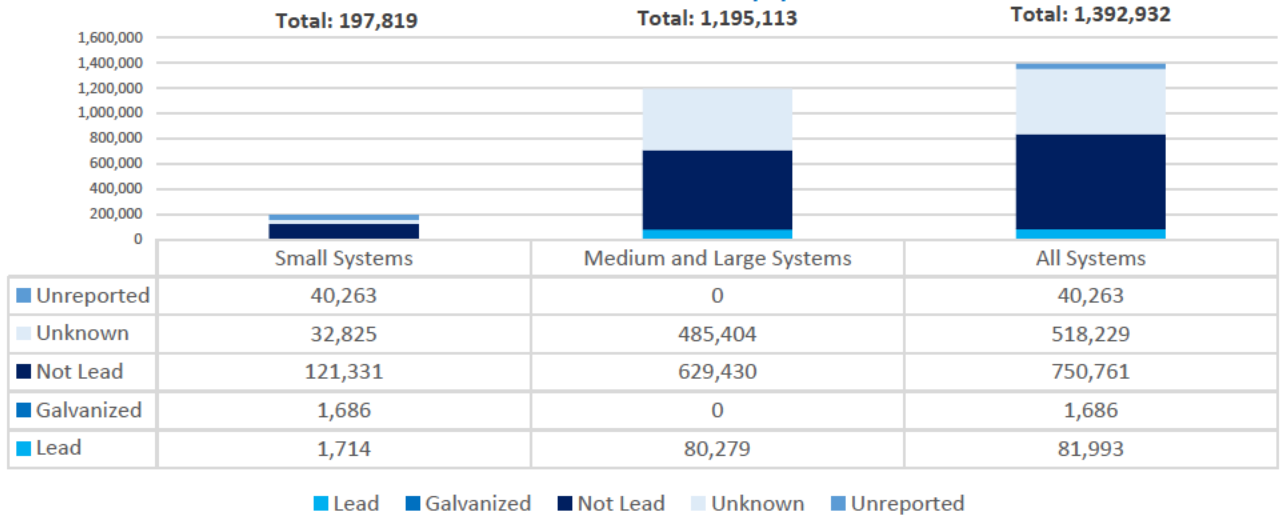
Minnesota Total Need by System Size
(in millions; January 2021 dollars)



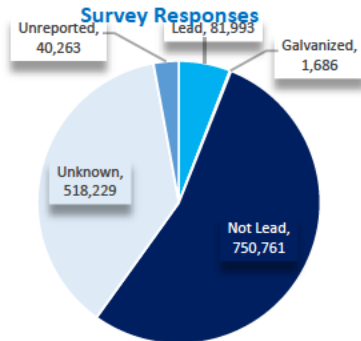
Minnesota Total Need by Project Category
(in millions; January 2021 dollars)



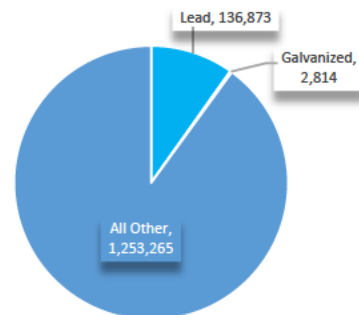
Minnesota Estimated Service Lines by System Size



Minnesota Service Lines - Estimated from Survey Responses

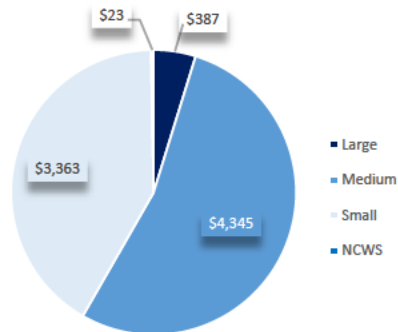


Minnesota Projected Service Lines

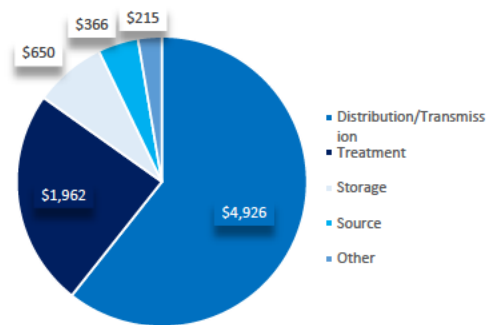


Mississippi

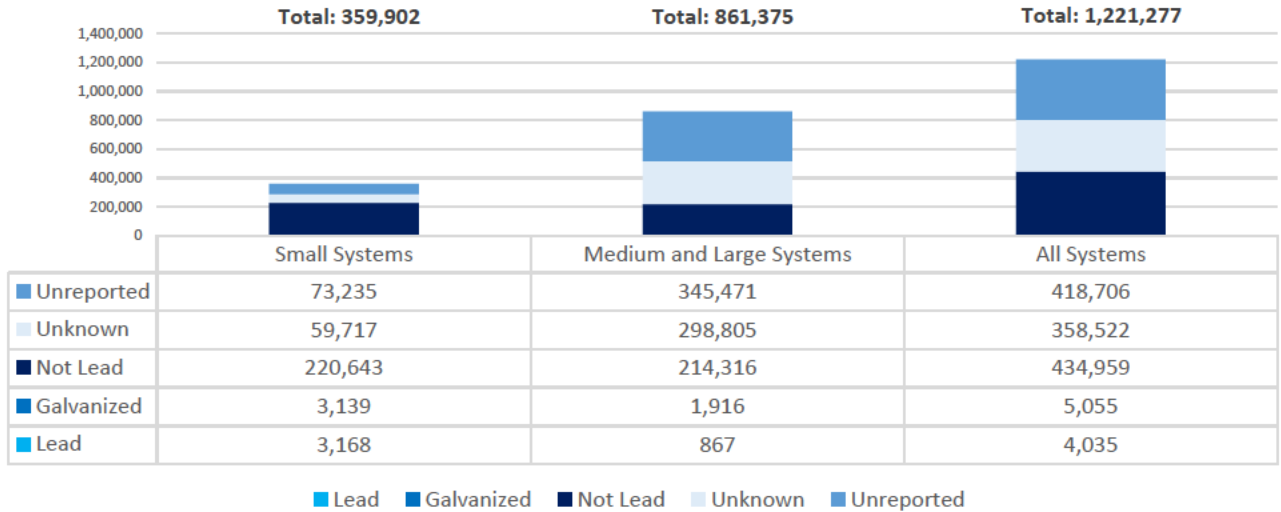
Mississippi Total Need by System Size
(in millions; January 2021 dollars)



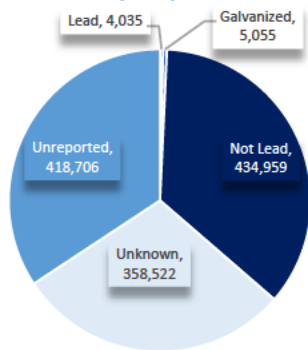
Mississippi Total Need by Project Category
(in millions; January 2021 dollars)



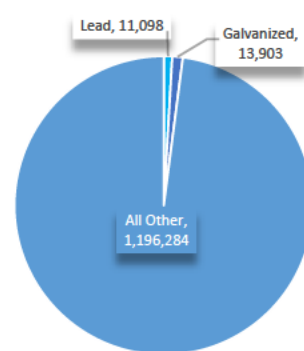
Mississippi Estimated Service Lines by System Size



Mississippi Service Lines - Estimated from Survey Responses

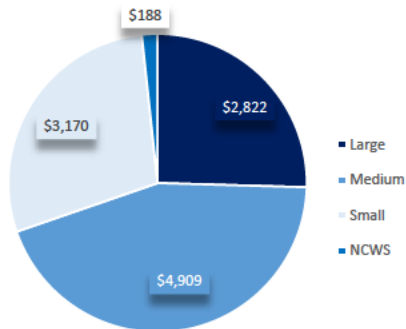


Mississippi Projected Service Lines

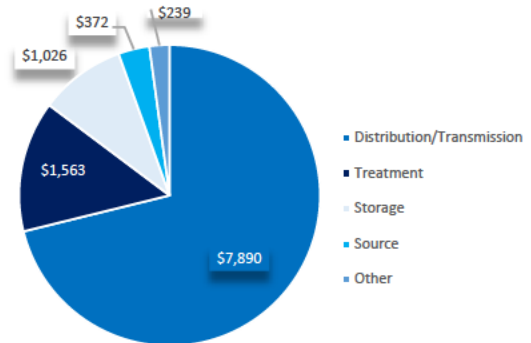


Missouri

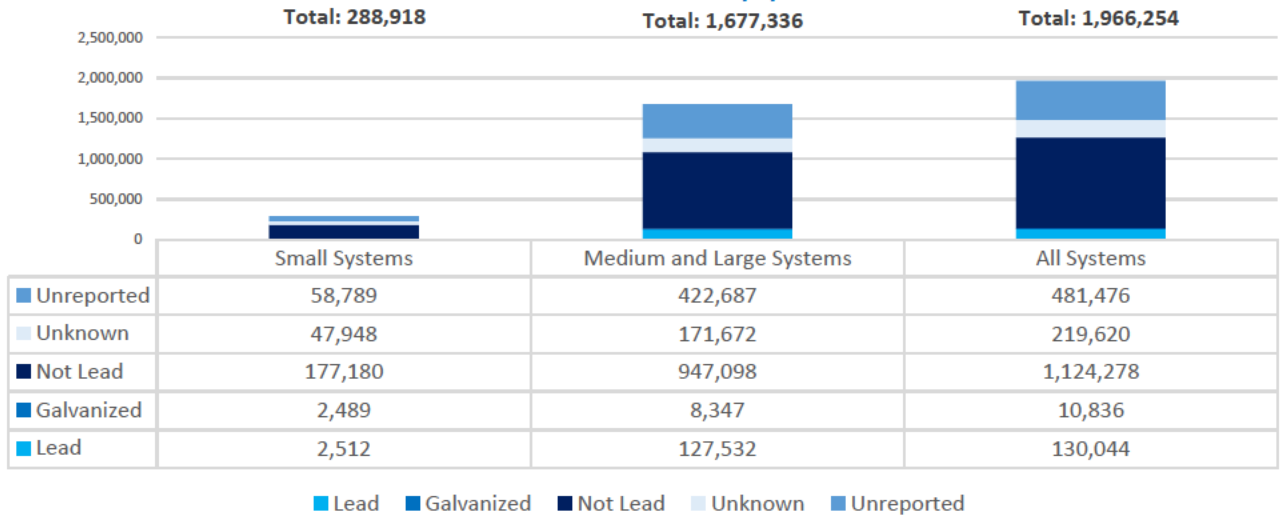
Missouri Total Need by System Size
(in millions; January 2021 dollars)



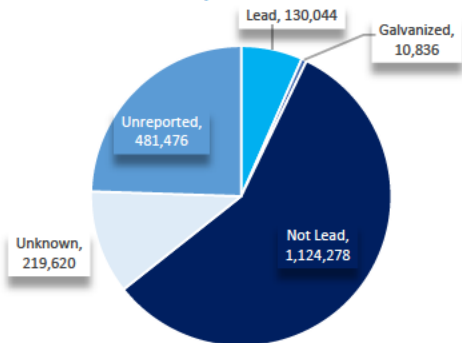
Missouri Total Need by Project Category
(in millions; January 2021 dollars)



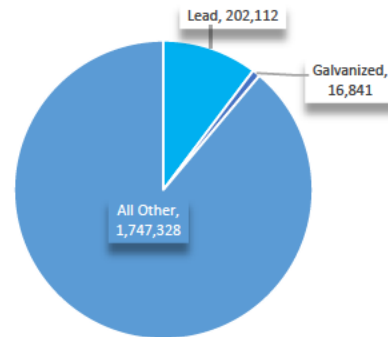
Missouri Estimated Service Lines by System Size



Missouri Service Lines - Estimated from Survey Responses

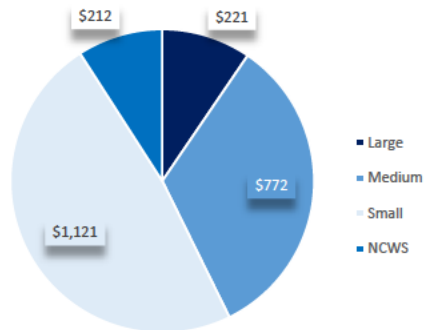


Missouri Projected Service Lines

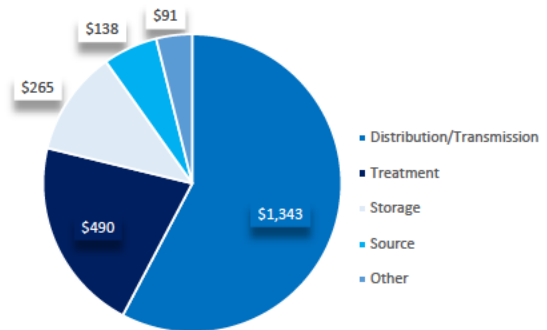


Montana

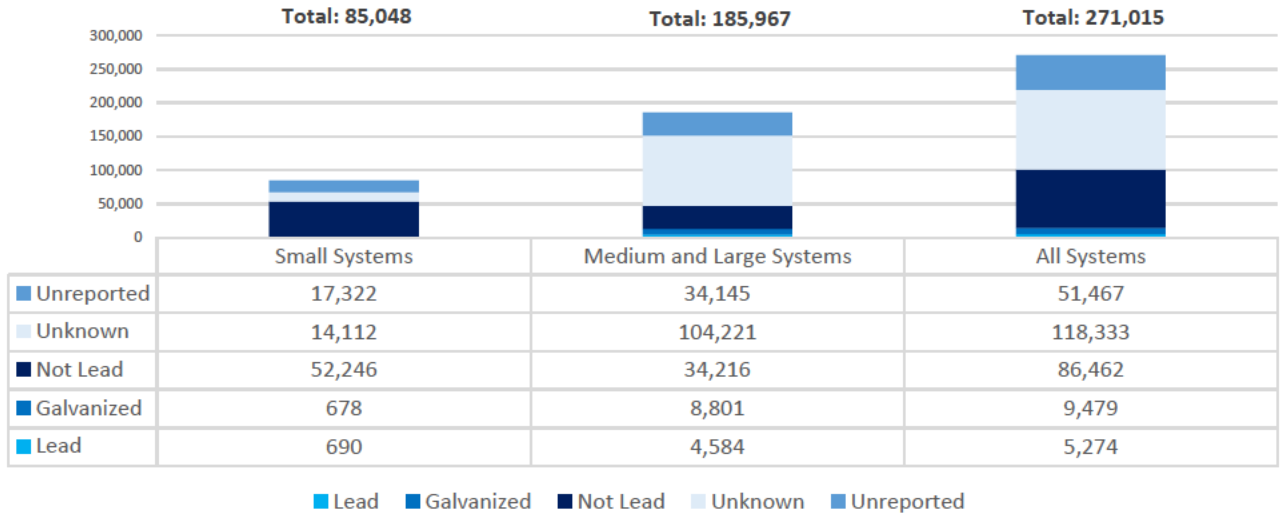
Montana Total Need by System Size
(in millions; January 2021 dollars)



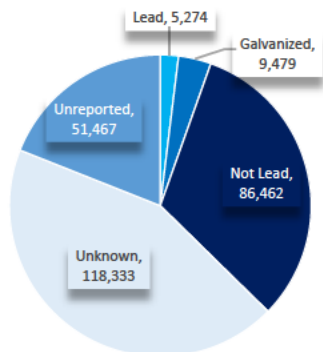
Montana Total Need by Project Category
(in millions; January 2021 dollars)



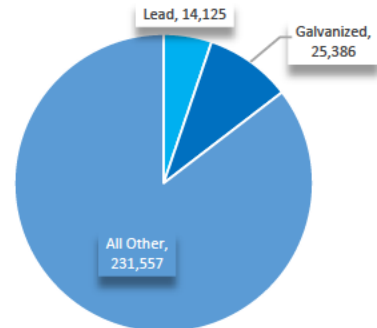
Montana Estimated Service Lines by System Size



Montana Service Lines - Estimated from Survey Responses

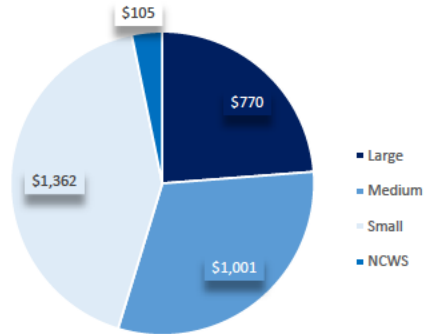


Montana Projected Service Lines

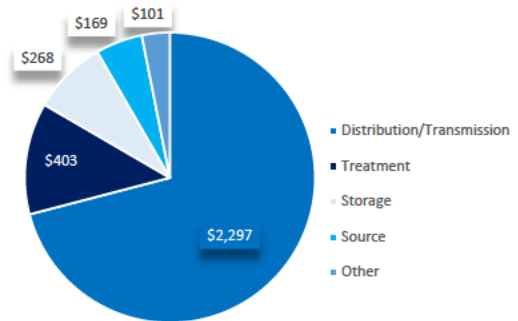


Nebraska

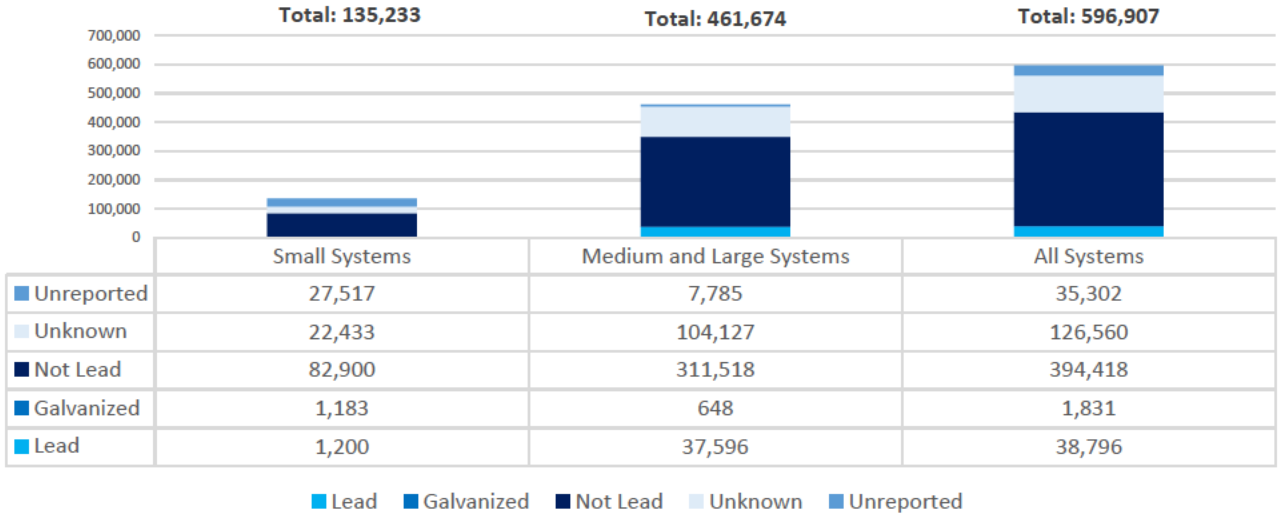
Nebraska Total Need by System Size
(in millions; January 2021 dollars)



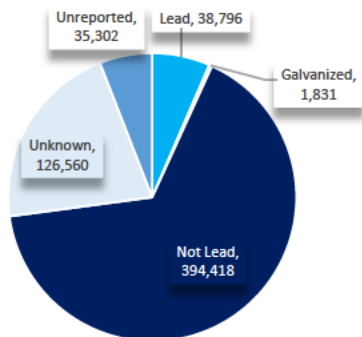
Nebraska Total Need by Project Category
(in millions; January 2021 dollars)



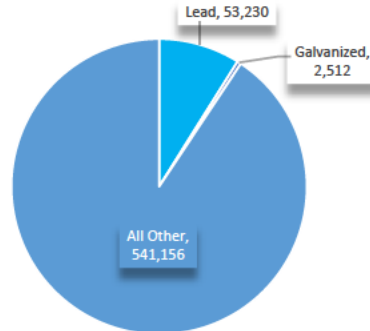
Nebraska Estimated Service Lines by System Size



Nebraska Service Lines - Estimated from Survey Responses

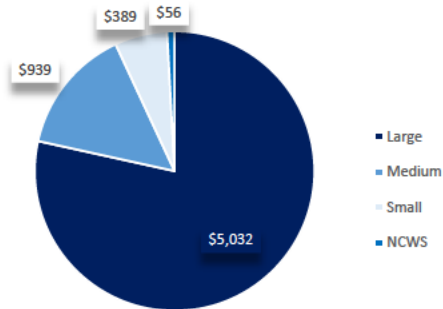


Nebraska Projected Service Lines

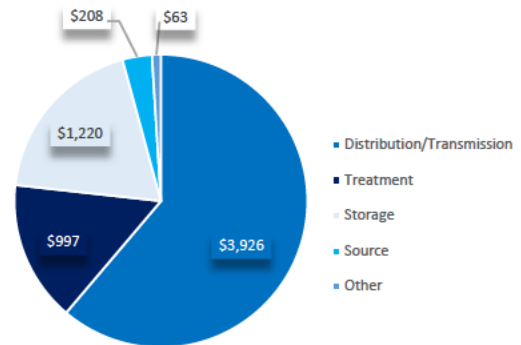


Nevada

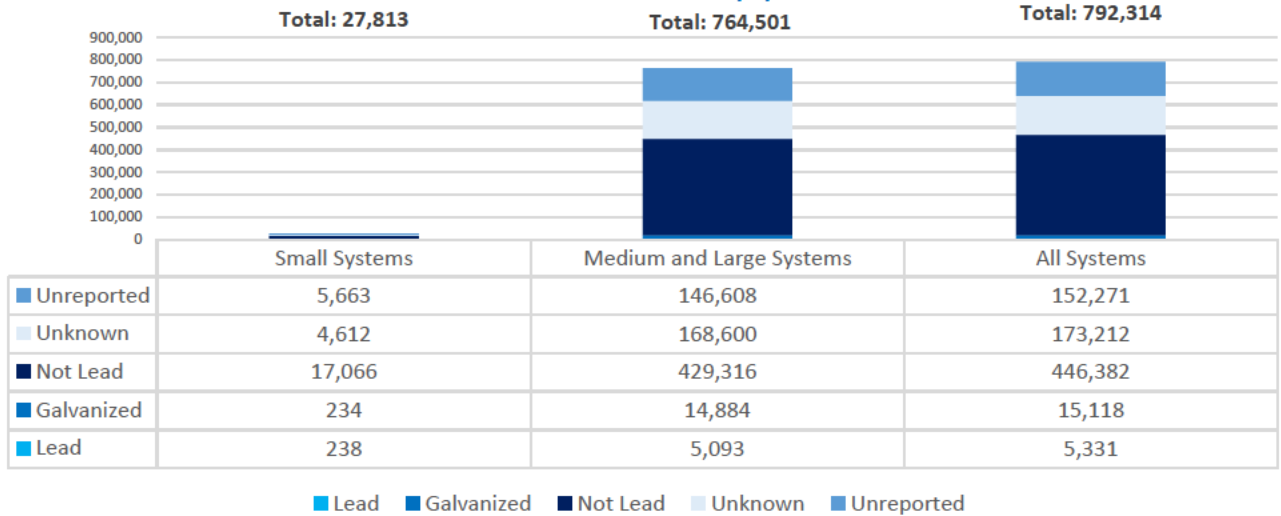
Nevada Total Need by System Size
(in millions; January 2021 dollars)



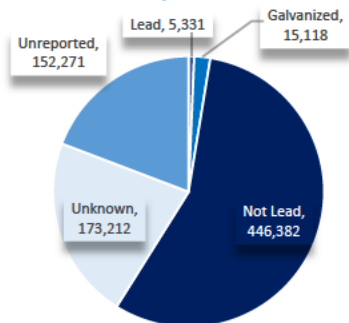
Nevada Total Need by Project Category
(in millions; January 2021 dollars)



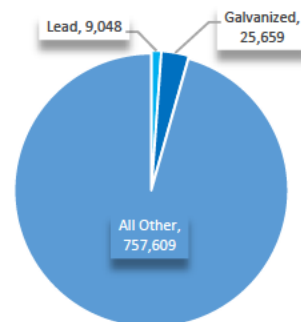
Nevada Estimated Service Lines by System Size



Nevada Service Lines - Estimated from Survey Responses

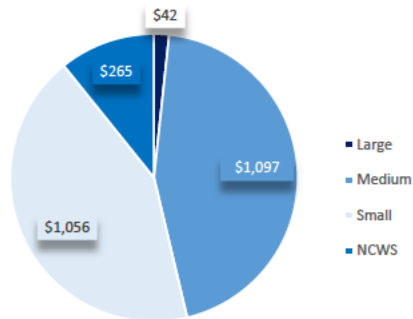


Nevada Projected Service Lines

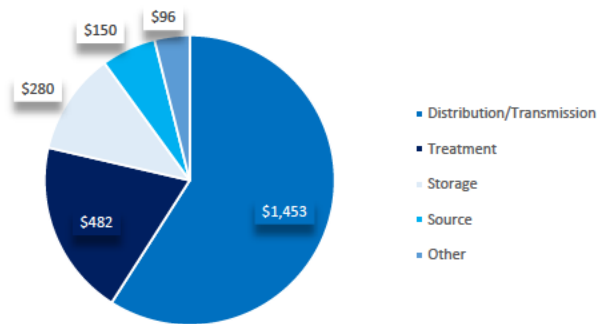


New Hampshire

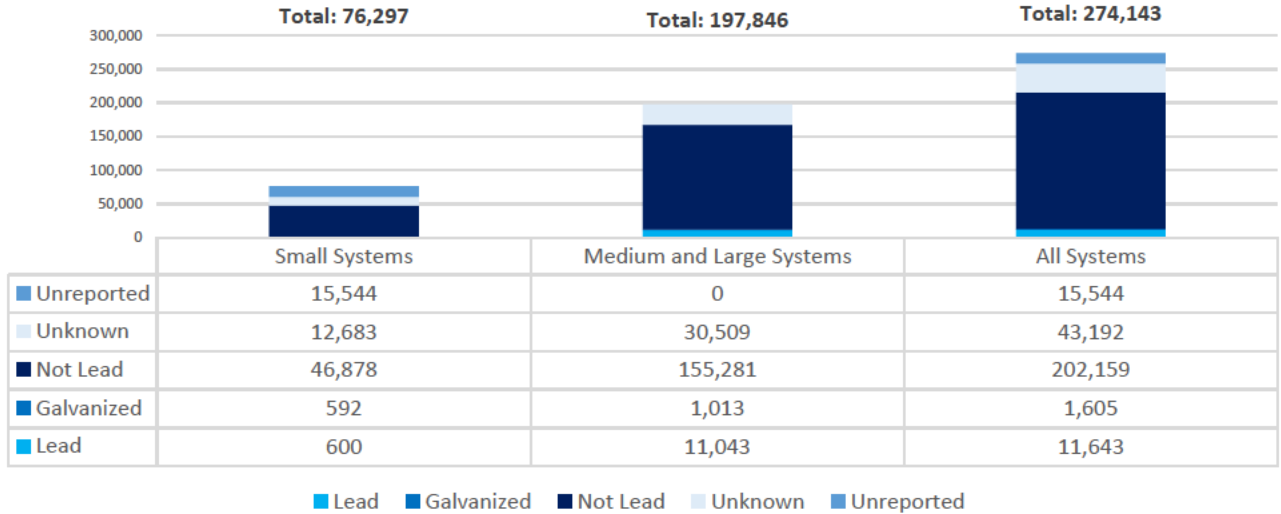
New Hampshire Total Need by System Size
(in millions; January 2021 dollars)



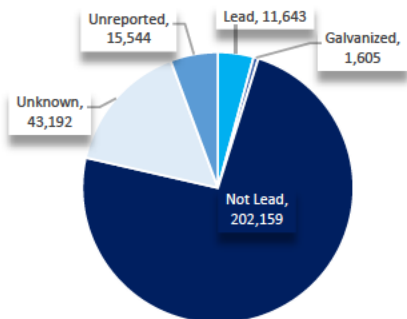
New Hampshire Total Need by Project Category
(in millions; January 2021 dollars)



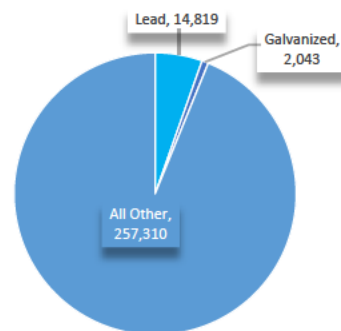
New Hampshire Estimated Service Lines by System Size



New Hampshire Service Lines - Estimated from Survey Responses

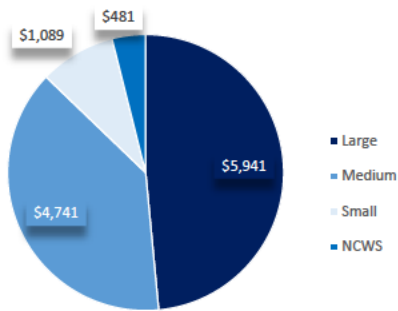


New Hampshire Projected Service Lines

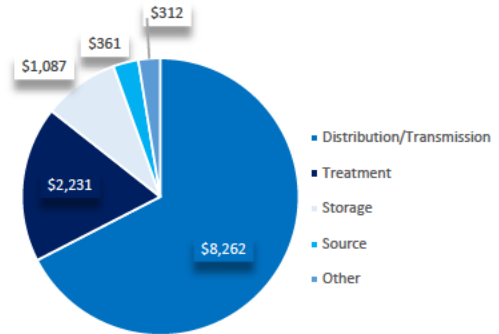


New Jersey

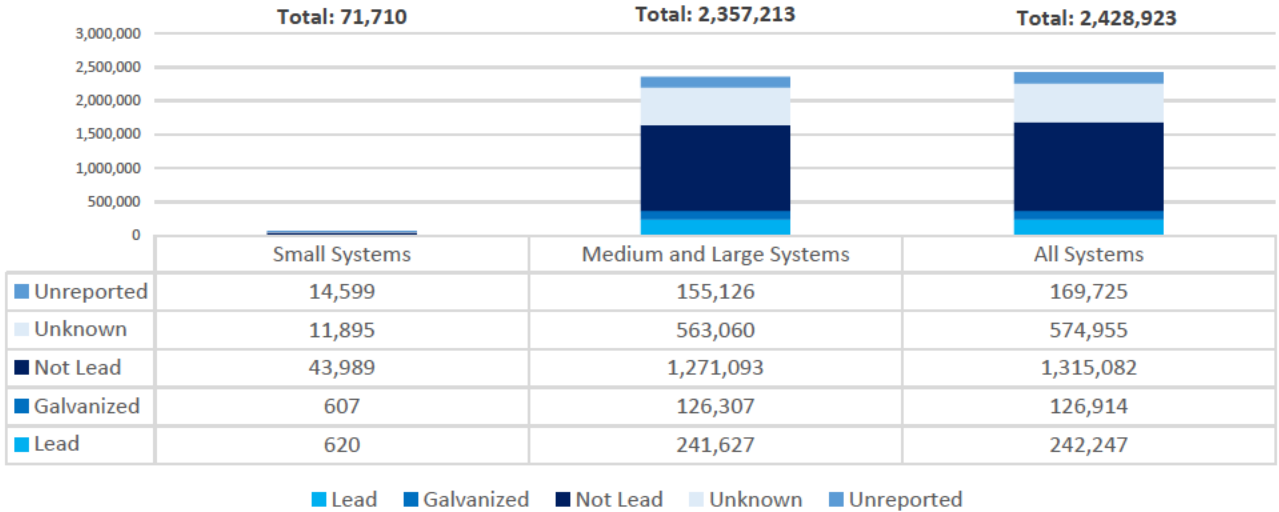
New Jersey Total Need by System Size
(in millions; January 2021 dollars)



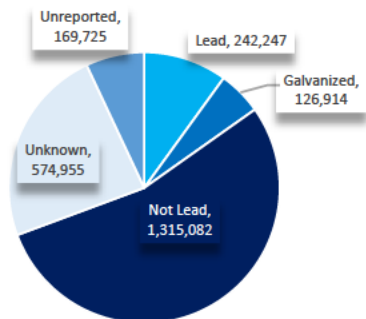
New Jersey Total Need by Project Category
(in millions; January 2021 dollars)



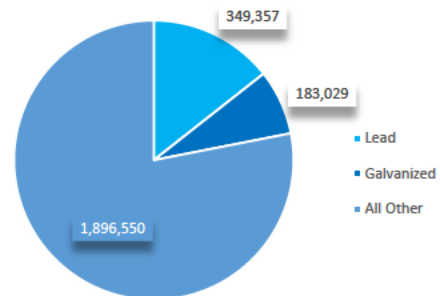
New Jersey Estimated Service Lines by System Size



New Jersey Service Lines - Estimated from Survey Responses

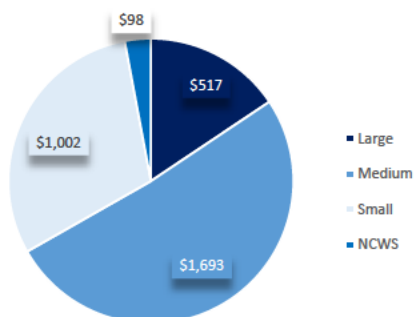


New Jersey Projected Service Lines

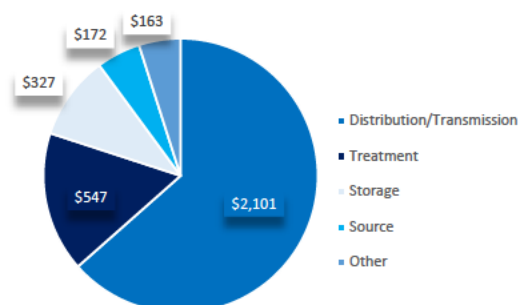


New Mexico

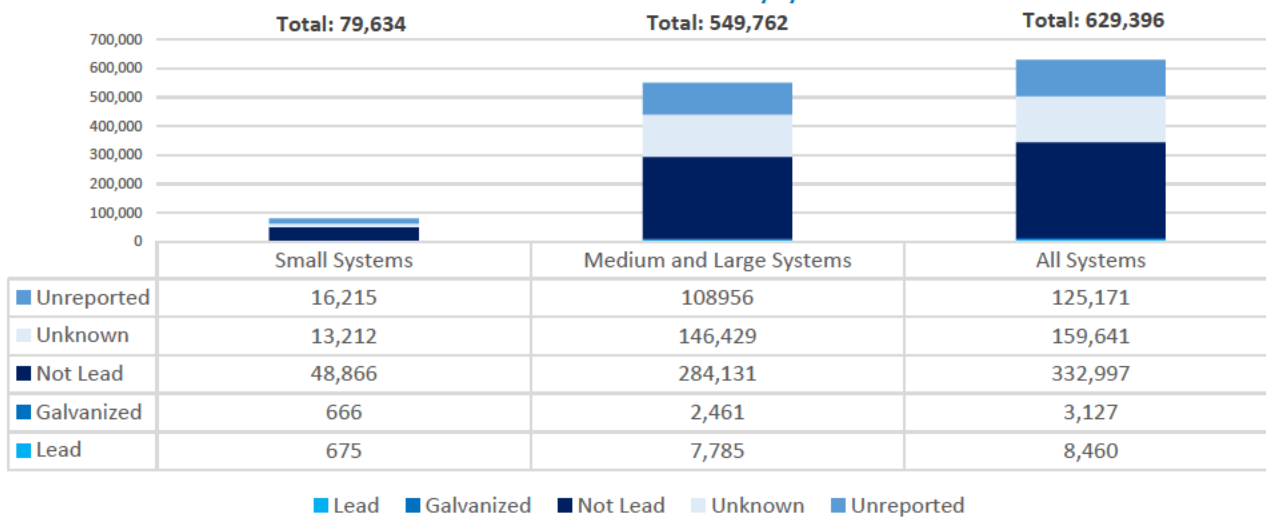
New Mexico Total Need by System Size
(in millions; January 2021 dollars)



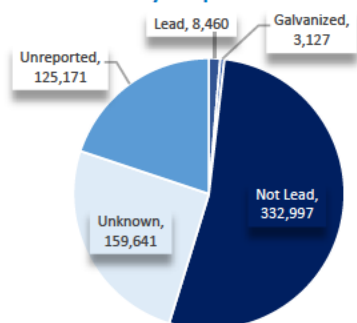
New Mexico Total Need by Project Category
(in millions; January 2021 dollars)



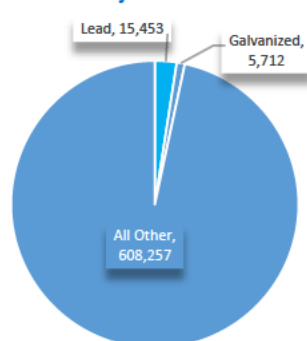
New Mexico Estimated Service Lines by System Size



New Mexico Service Lines - Estimated from Survey Responses

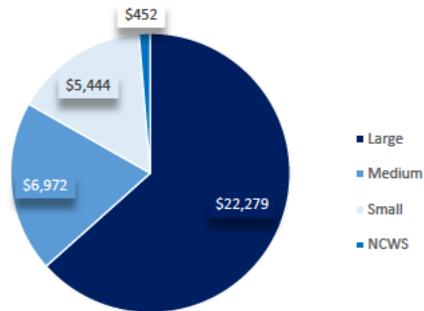


New Mexico Projected Service Lines

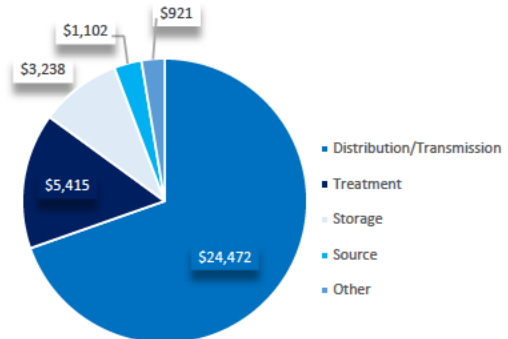


New York

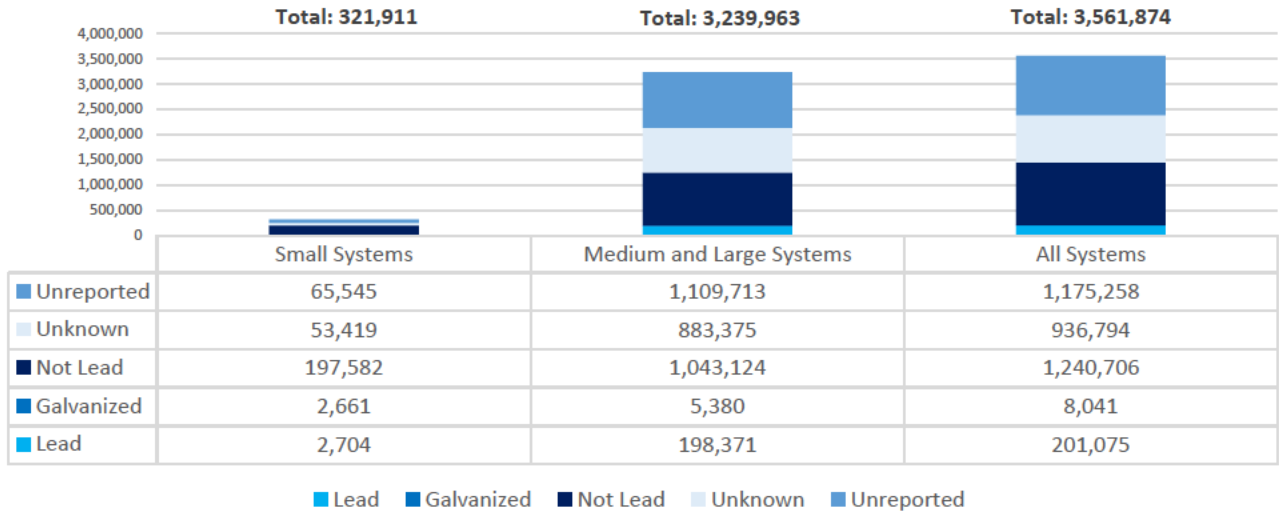
New York Total Need by System Size
(in millions; January 2021 dollars)



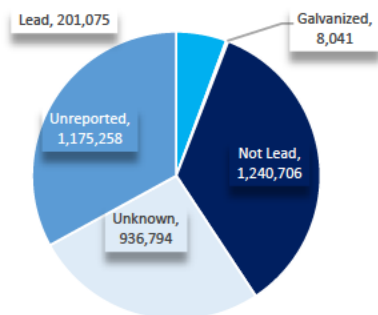
New York Total Need by Project Category
(in millions; January 2021 dollars)



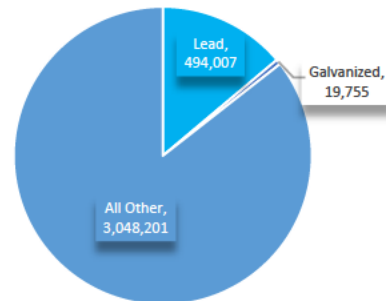
New York Estimated Service Lines by System Size



New York Service Lines - Estimated from Survey Responses

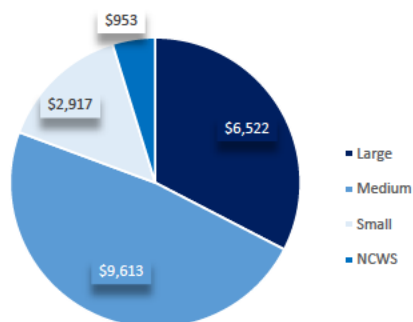


New York Projected Service Lines

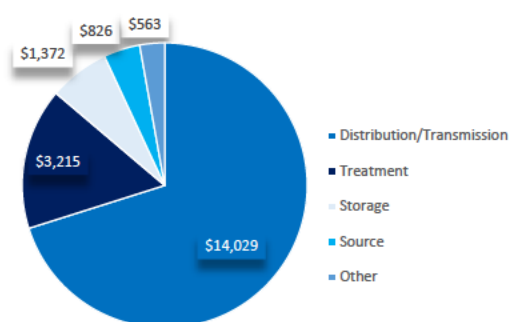


North Carolina

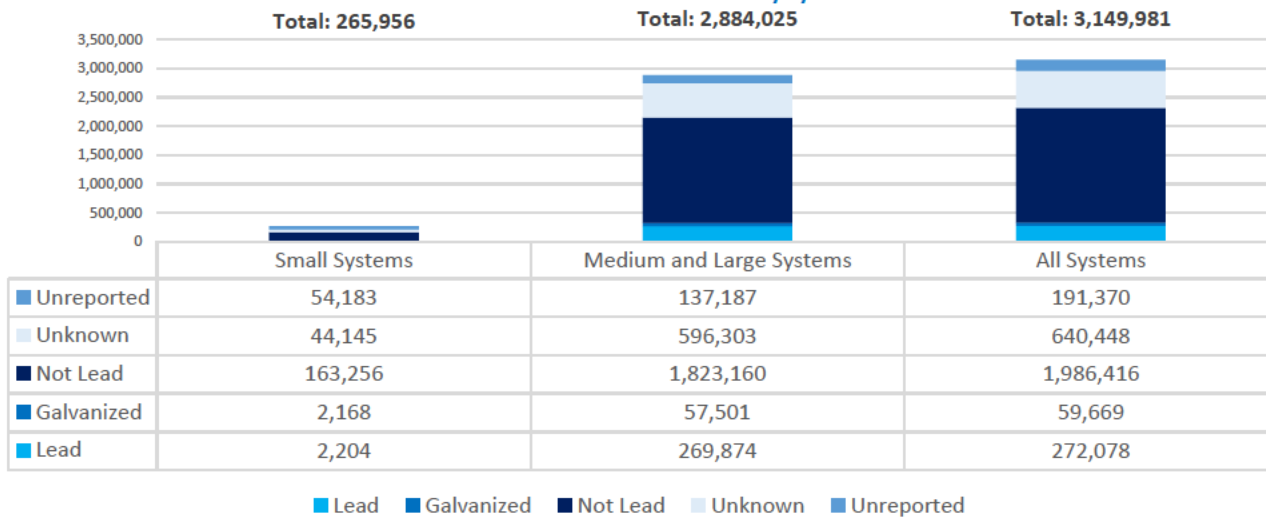
North Carolina Total Need by System Size
(in millions; January 2021 dollars)



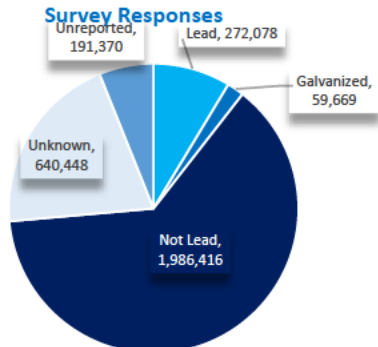
North Carolina Total Need by Project Category
(in millions; January 2021 dollars)



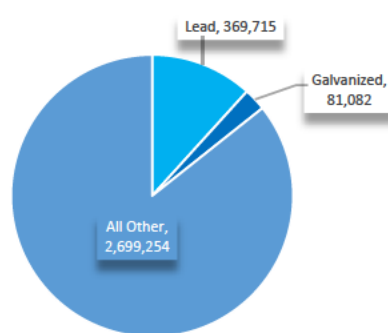
North Carolina Estimated Service Lines by System Size



North Carolina Service Lines - Estimated from Survey Responses

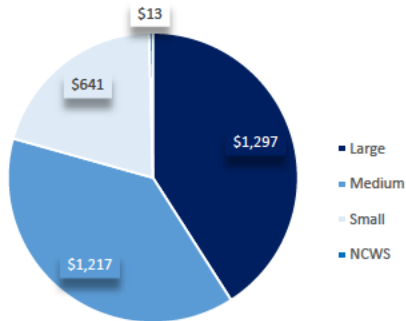


North Carolina Projected Service Lines

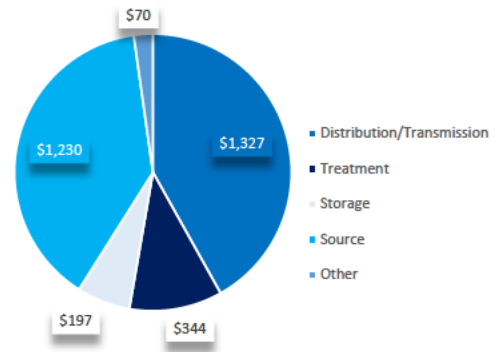


North Dakota

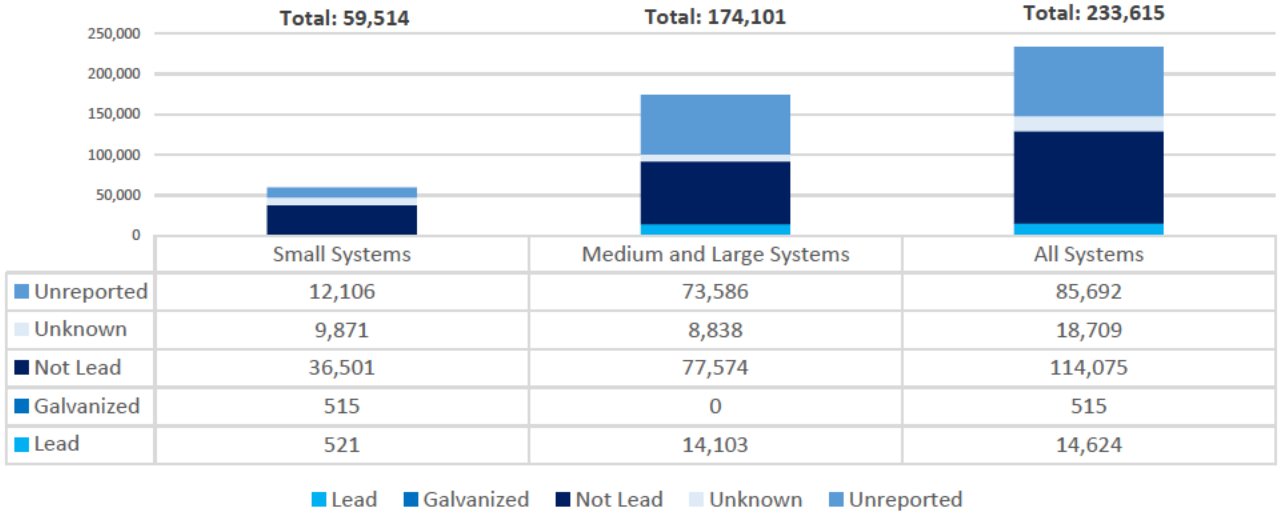
North Dakota Total Need by System Size
(in millions; January 2021 dollars)



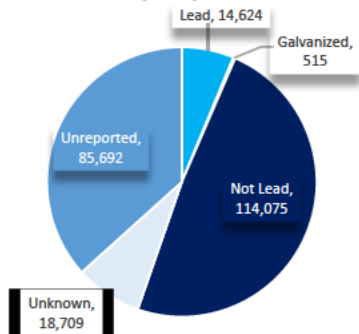
North Dakota Total Need by Project Category
(in millions; January 2021 dollars)



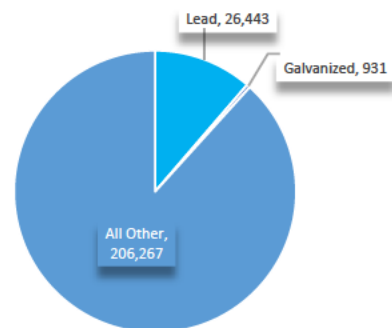
North Dakota Estimated Service Lines by System Size



North Dakota Service Lines - Estimated from Survey Responses

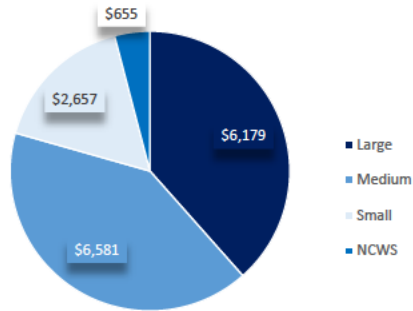


North Dakota Projected Service Lines

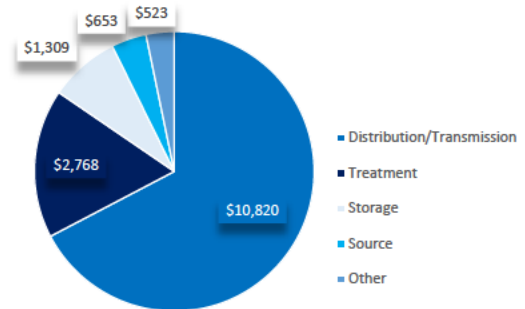


Ohio

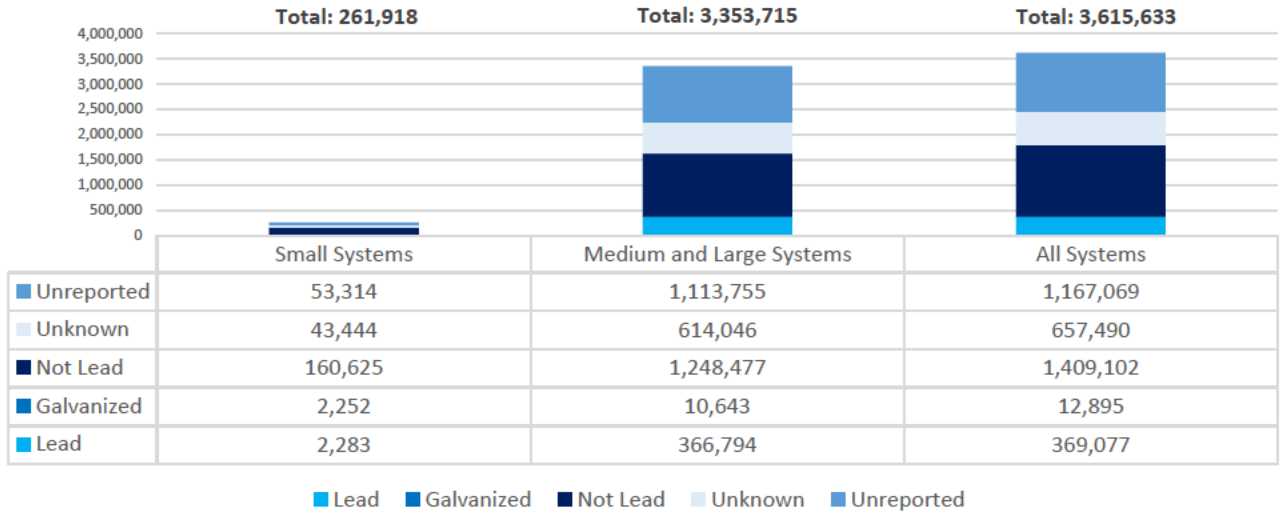
Ohio Total Need by System Size
(in millions; January 2021 dollars)



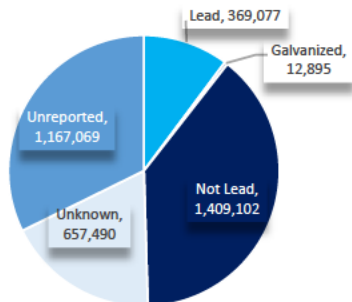
Ohio Total Need by Project Category
(in millions; January 2021 dollars)



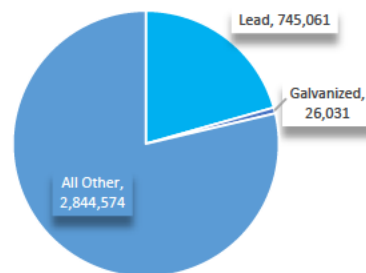
Ohio Estimated Service Lines by System Size



Ohio Service Lines - Estimated from Survey Responses

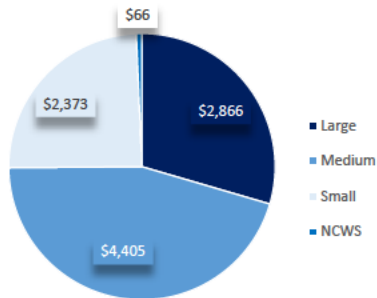


Ohio Projected Service Lines

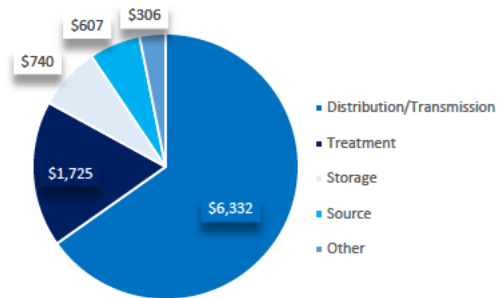


Oklahoma

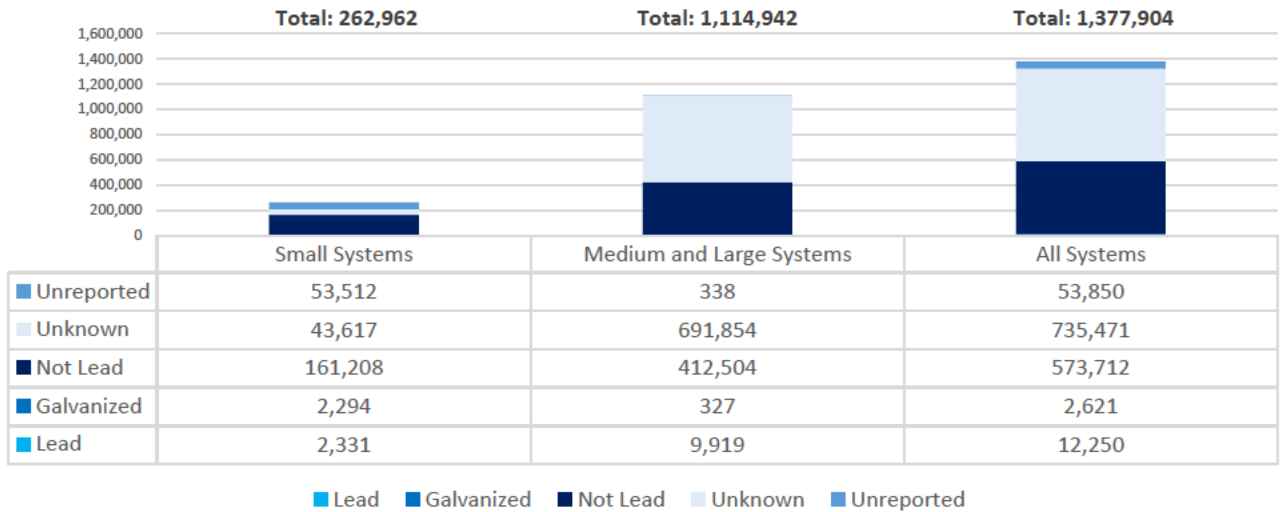
Oklahoma Total Need by System Size
(in millions; January 2021 dollars)



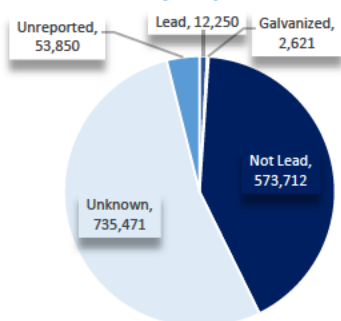
Oklahoma Total Need by Project Category
(in millions; January 2021 dollars)



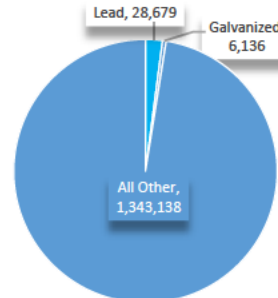
Oklahoma Estimated Service Lines by System Size



Oklahoma Service Lines - Estimated from Survey Responses

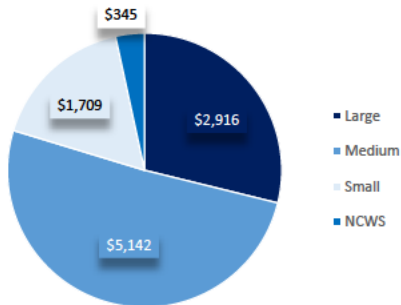


Oklahoma Projected Service Lines

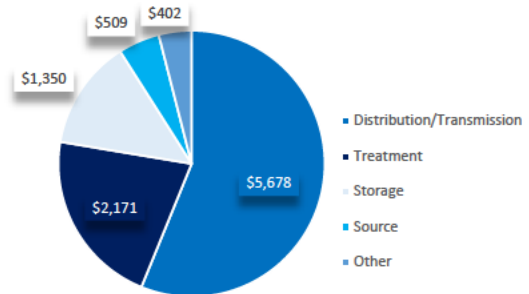


Oregon

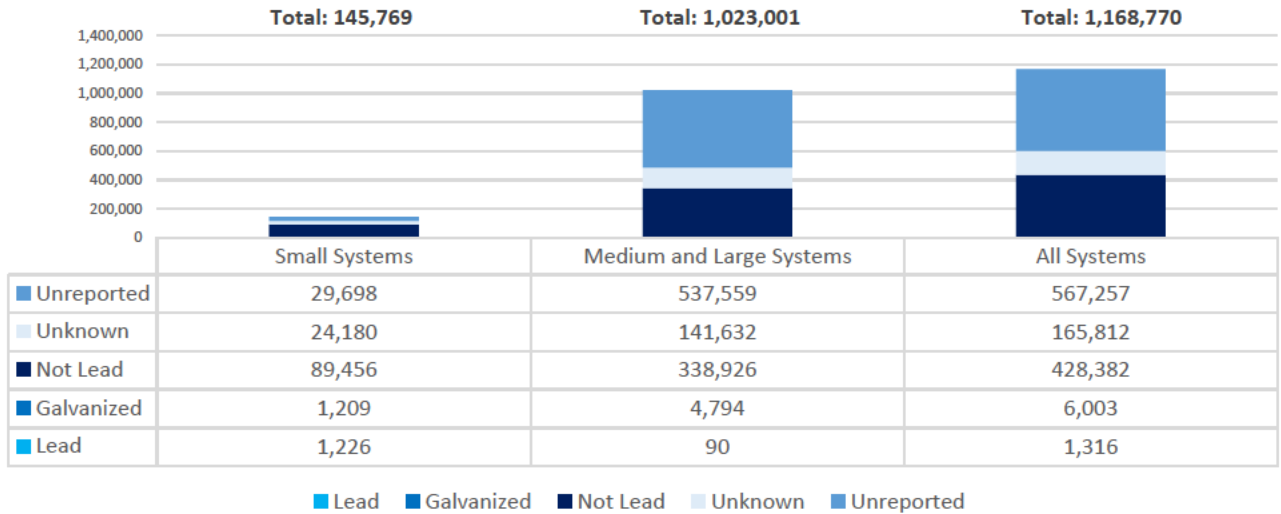
Oregon Total Need by System Size
(in millions; January 2021 dollars)



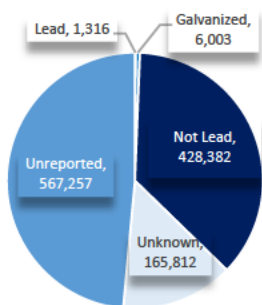
Oregon Total Need by Project Category
(in millions; January 2021 dollars)



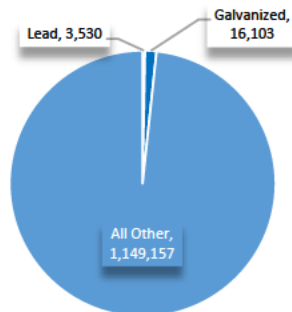
Oregon Estimated Service Lines by System Size



Oregon Service Lines - Estimated from Survey Responses

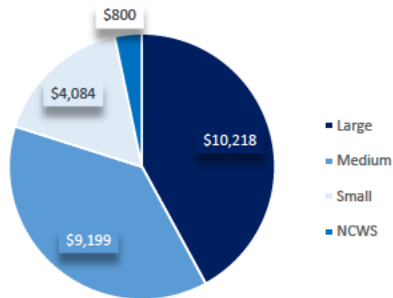


Oregon Projected Service Lines

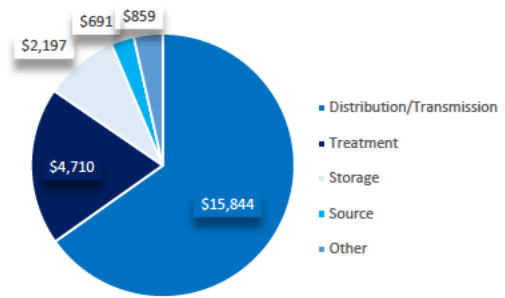


Pennsylvania

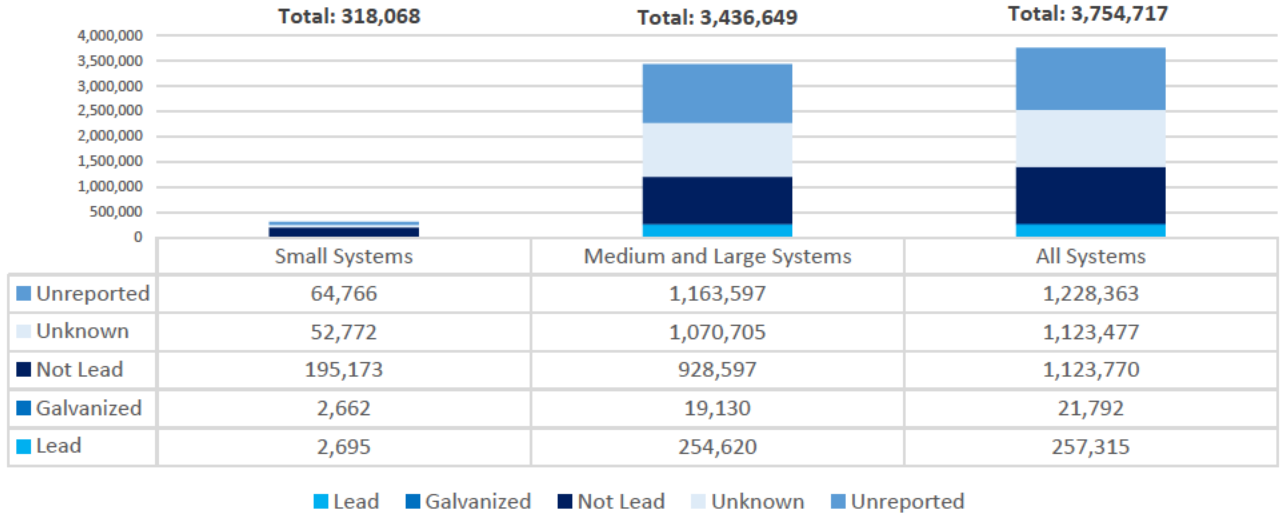
Pennsylvania Total Need by System Size
(in millions; January 2021 dollars)



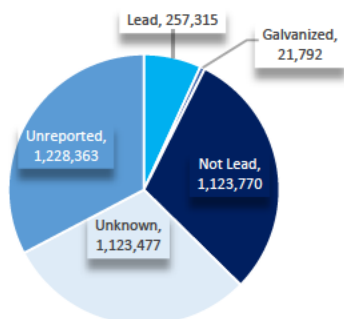
Pennsylvania Total Need by Project Category
(in millions; January 2021 dollars)



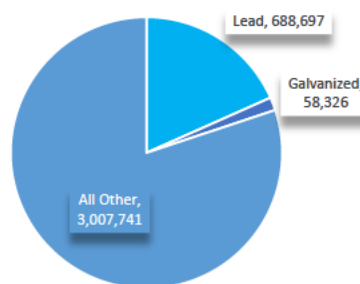
Pennsylvania Estimated Service Lines by System Size



Pennsylvania Service Lines - Estimated from Survey Responses

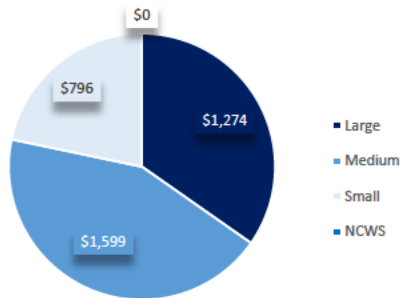


Pennsylvania Projected Service Lines

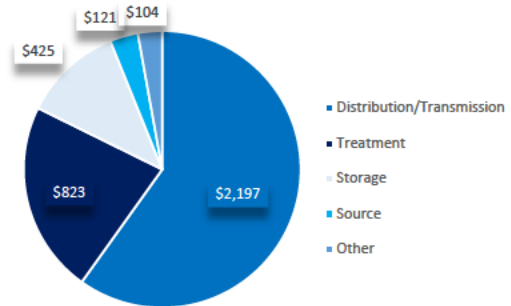


Puerto Rico

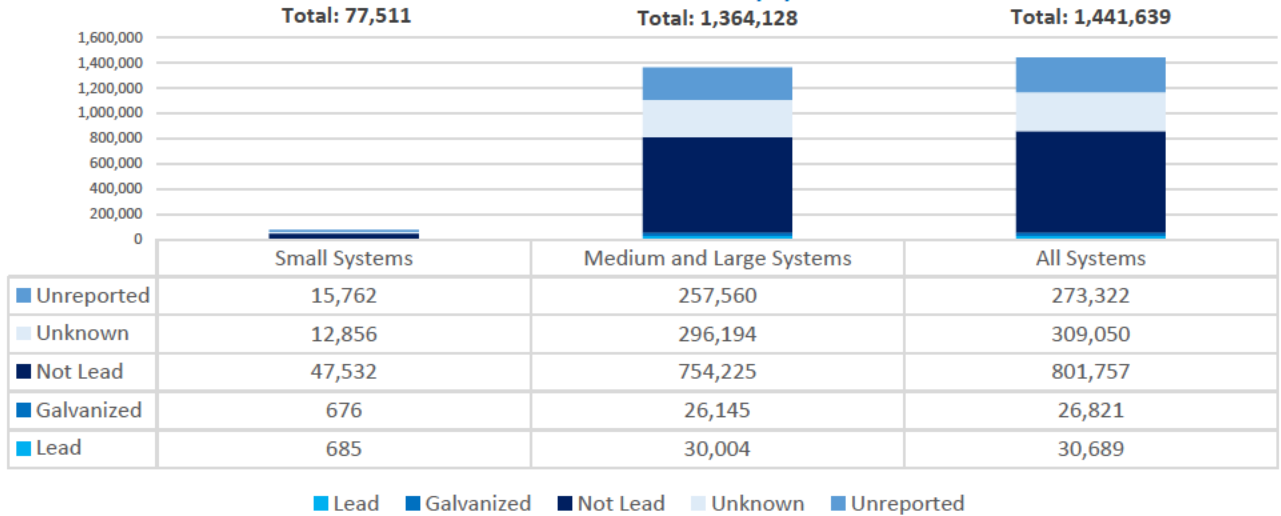
Puerto Rico Total Need by System Size
(in millions; January 2021 dollars)



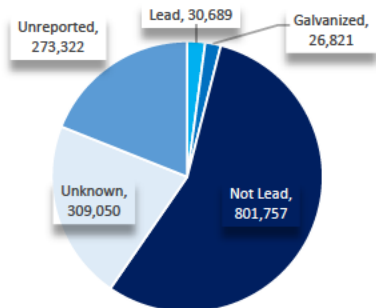
Puerto Rico Total Need by Project Category
(in millions; January 2021 dollars)



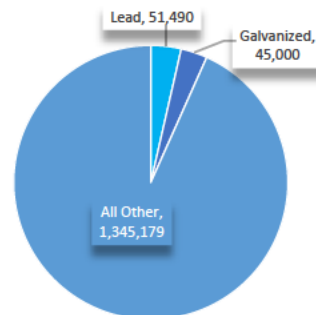
Puerto Rico Estimated Service Lines by System Size



Puerto Rico Service Lines - Estimated from Survey Responses

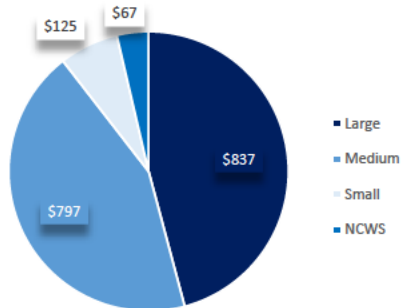


Puerto Rico Projected Service Lines

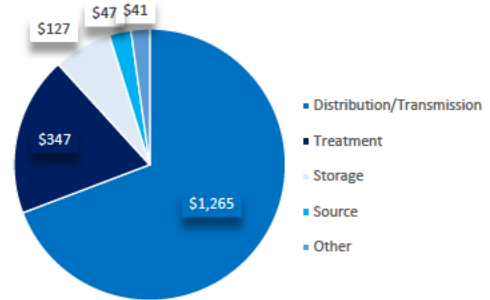


Rhode Island

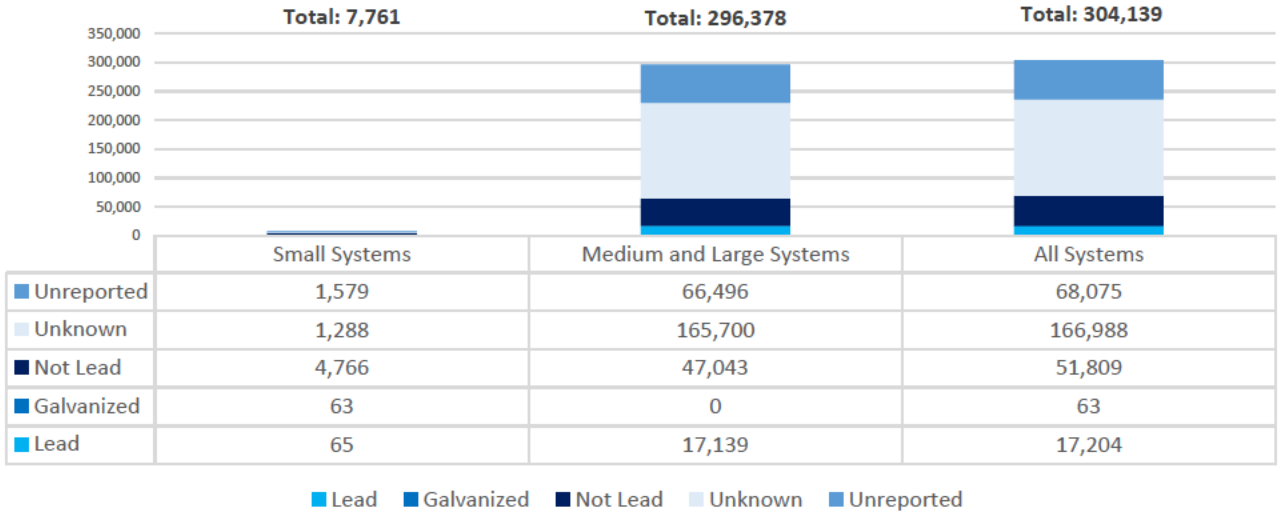
Rhode Island Total Need by System Size
(in millions; January 2021 dollars)



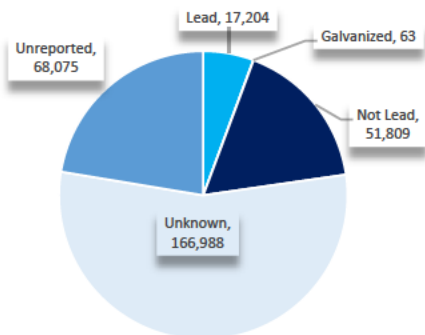
Rhode Island Total Need by Project Category
(in millions; January 2021 dollars)



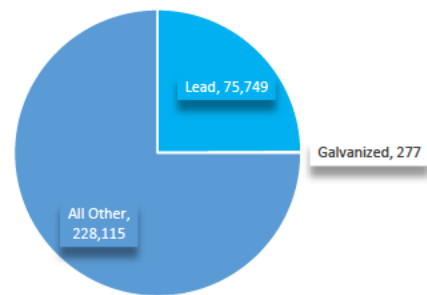
Rhode Island Estimated Service Lines by System Size



Rhode Island Service Lines - Estimated from Survey Responses

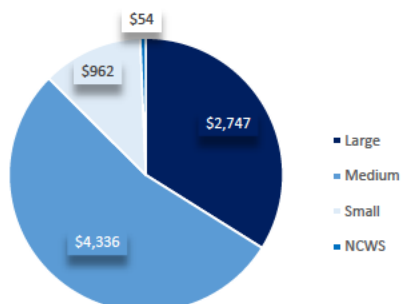


Rhode Island Projected Service Lines

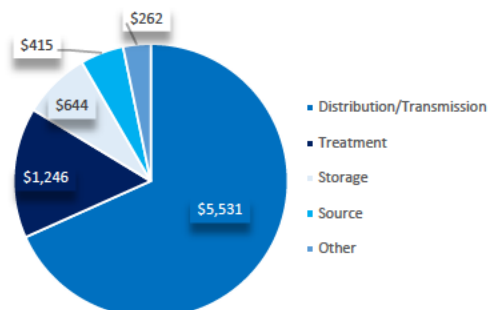


South Carolina

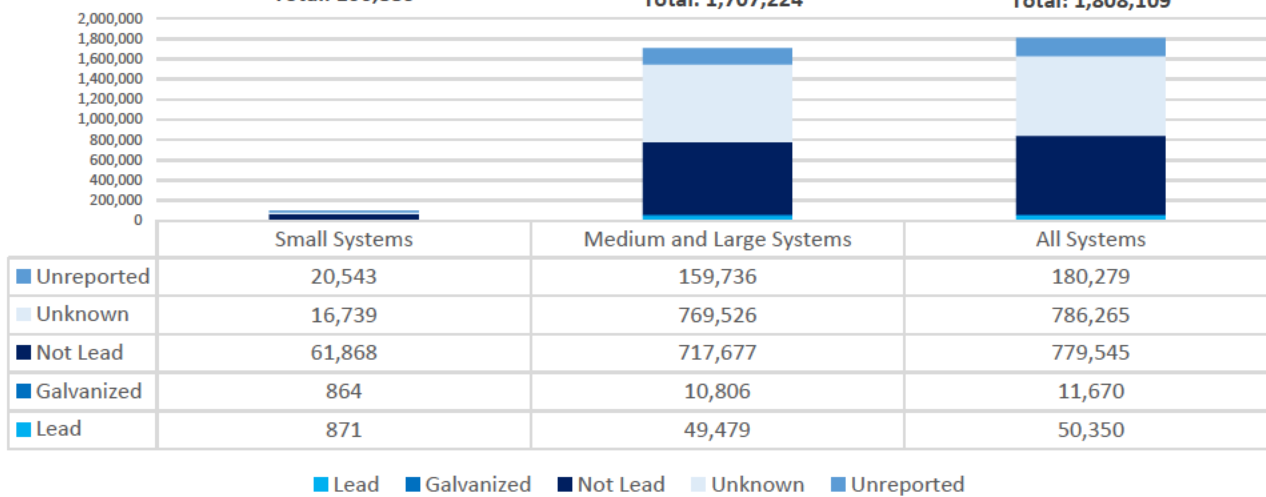
South Carolina Total Need by System Size
(in millions; January 2021 dollars)



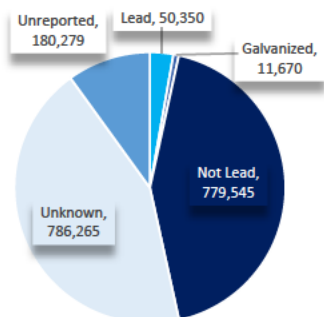
South Carolina Total Need by Project Category
(in millions; January 2021 dollars)



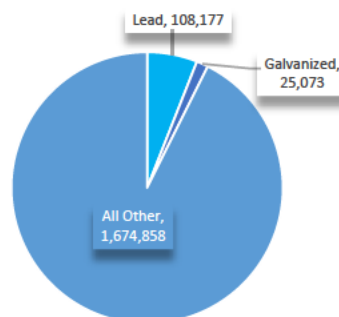
South Carolina Estimated Service Lines by System Size



South Carolina Service Lines - Estimated from Survey Responses

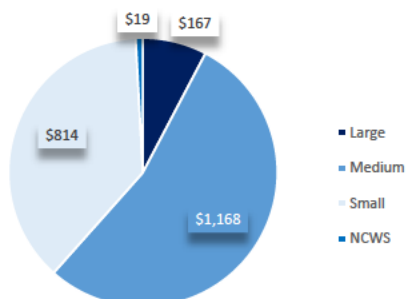


South Carolina Projected Service Lines

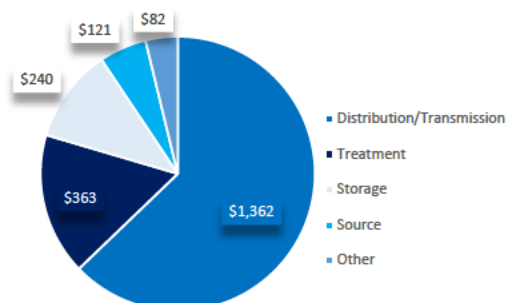


South Dakota

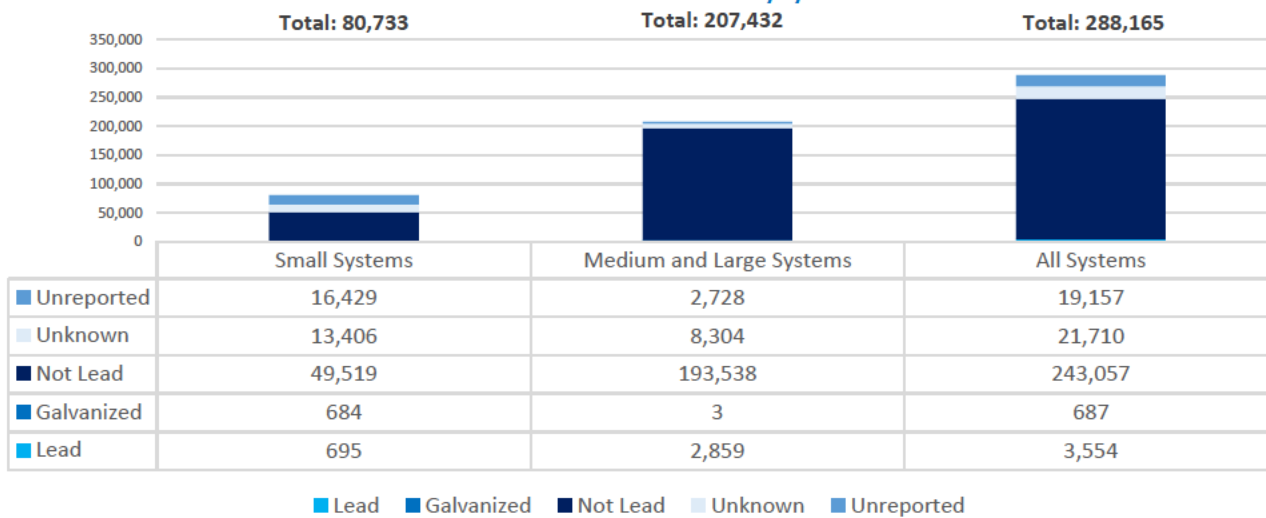
South Dakota Total Need by System Size
(in millions; January 2021 dollars)



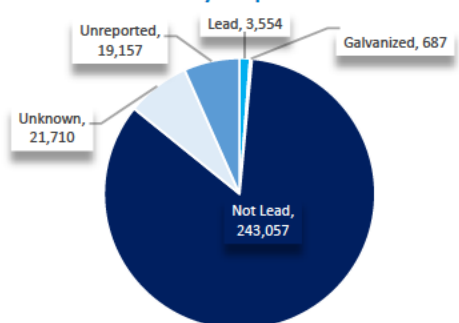
South Dakota Total Need by Project Category
(in millions; January 2021 dollars)



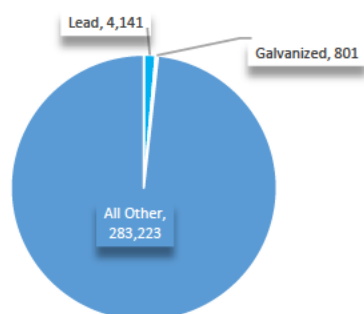
South Dakota Estimated Service Lines by System Size



South Dakota Service Lines - Estimated from Survey Responses

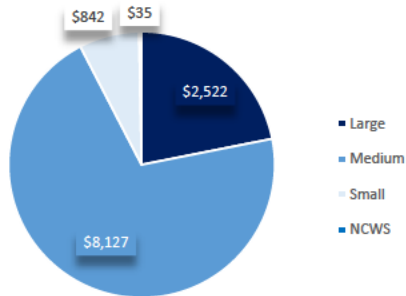


South Dakota Projected Service Lines

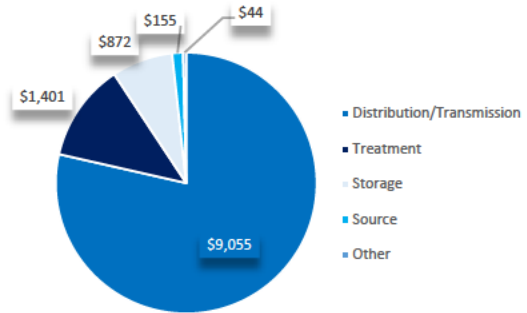


Tennessee

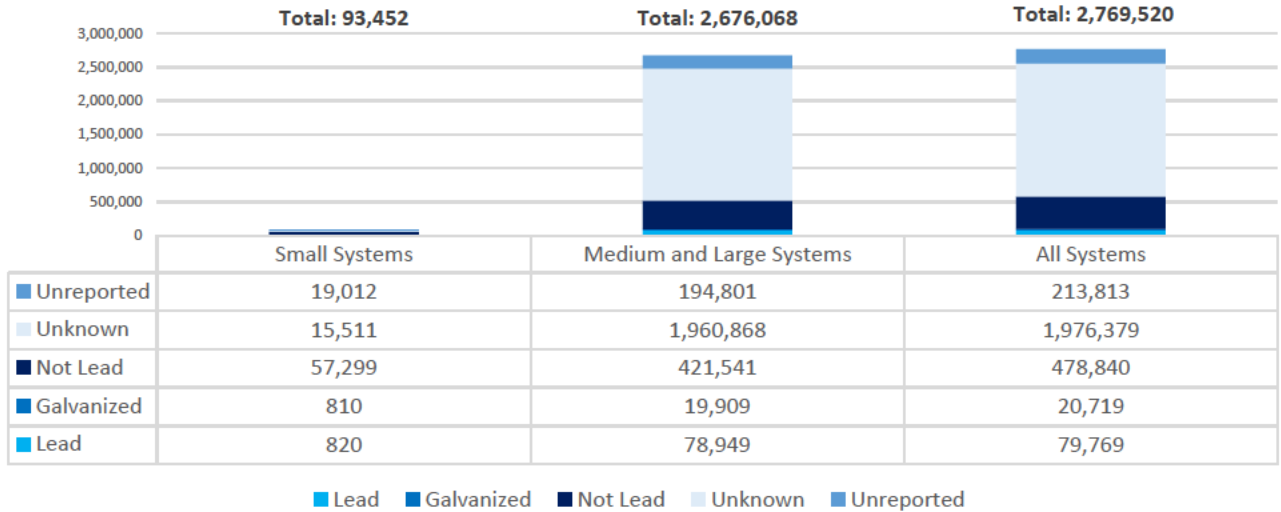
Tennessee Total Need by System Size
(in millions; January 2021 dollars)



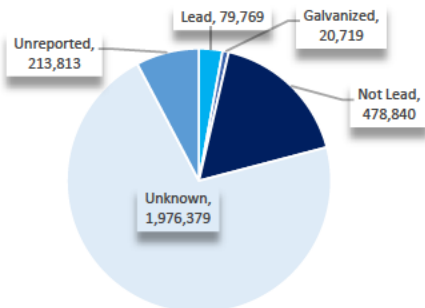
Tennessee Total Need by Project Category
(in millions; January 2021 dollars)



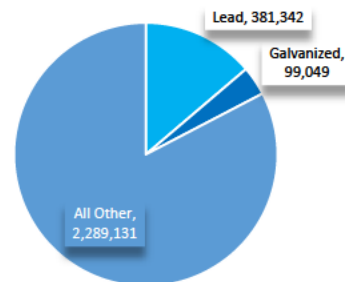
Tennessee Estimated Service Lines by System Size



Tennessee Service Lines - Estimated from Survey Responses

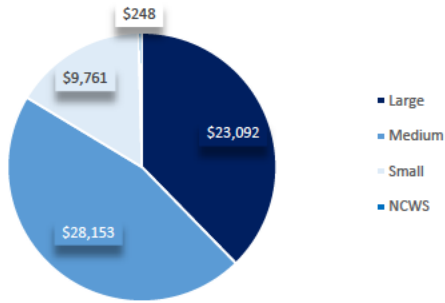


Tennessee Projected Service Lines

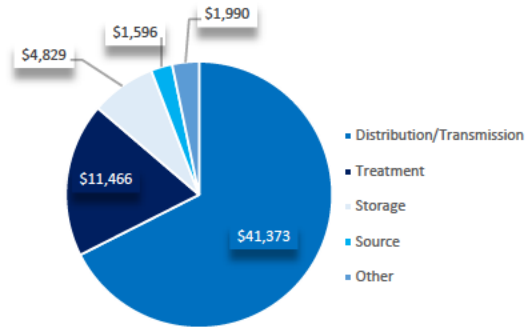


Texas

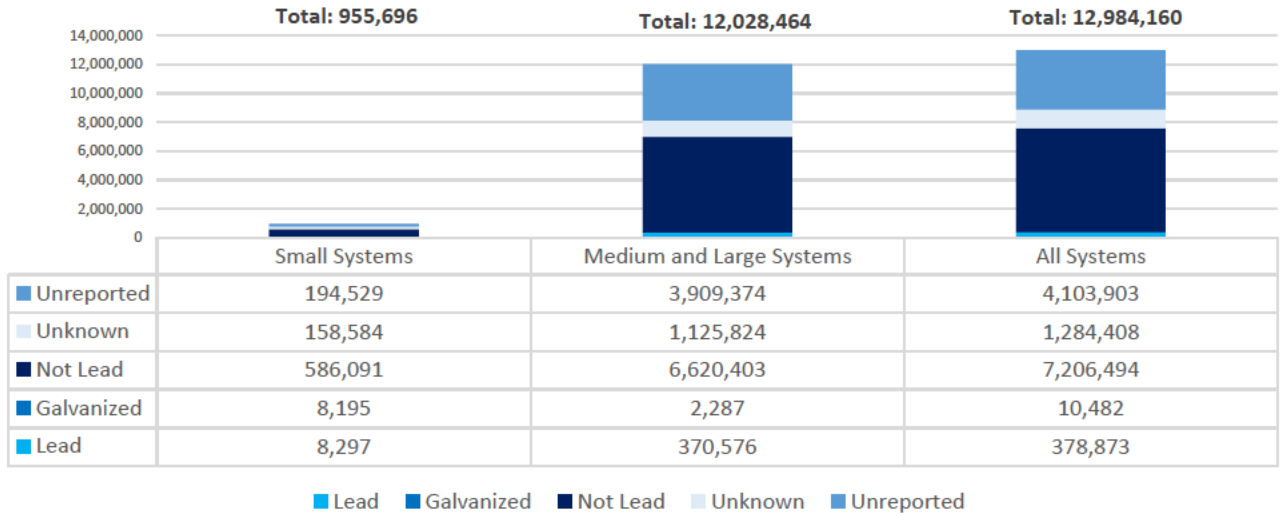
Texas Total Need by System Size
(in millions; January 2021 dollars)



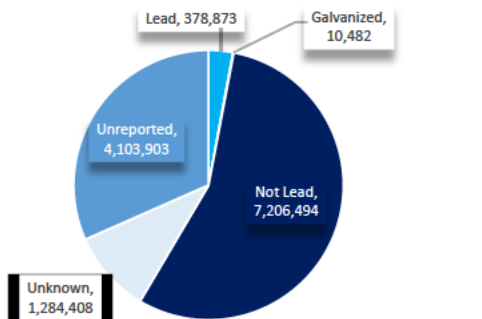
Texas Total Need by Project Category
(in millions; January 2021 dollars)



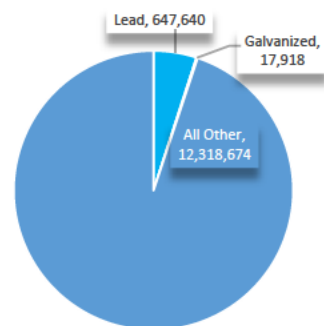
Texas Estimated Service Lines by System Size



Texas Service Lines - Estimated from Survey Responses

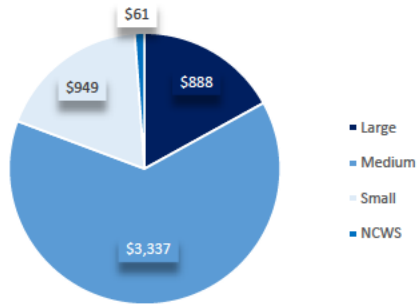


Texas Projected Service Lines

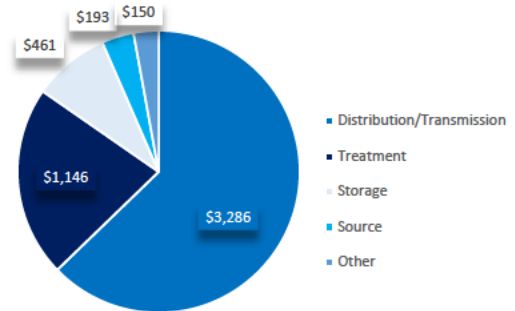


Utah

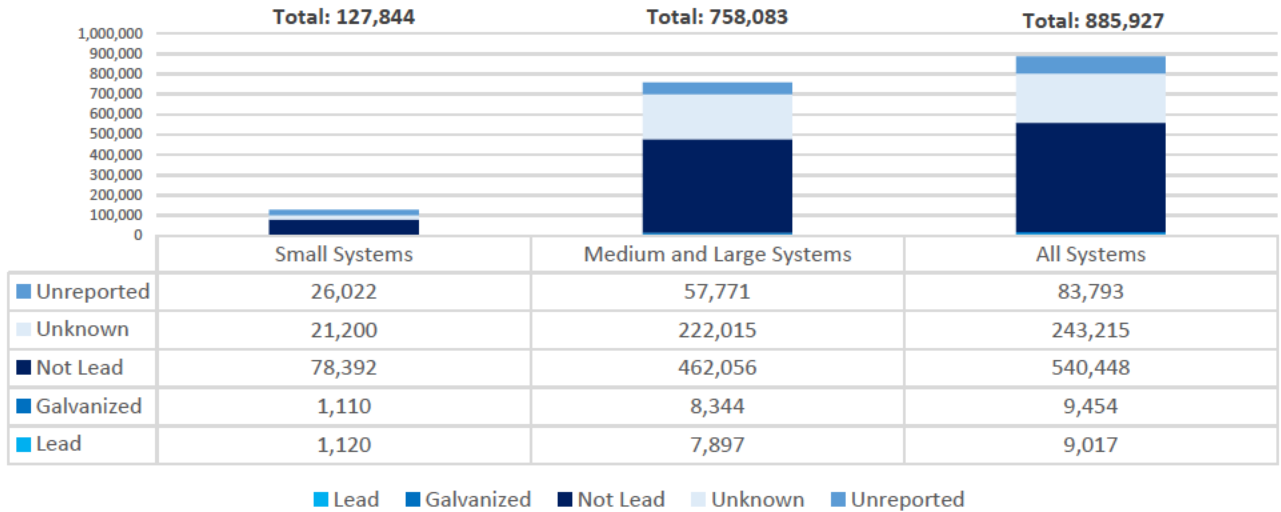
Utah Total Need by System Size
(in millions; January 2021 dollars)



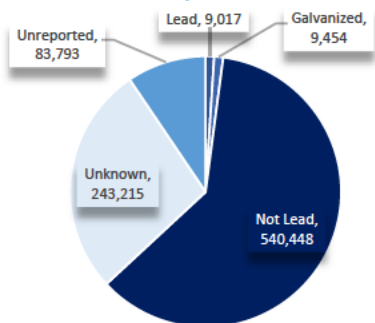
Utah Total Need by Project Category
(in millions; January 2021 dollars)



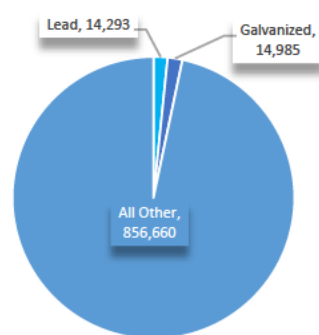
Utah Estimated Service Lines by System Size



Utah Service Lines - Estimated from Survey Responses

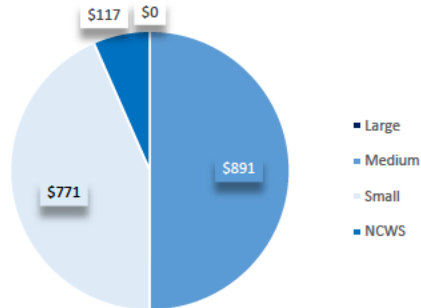


Utah Projected Service Lines

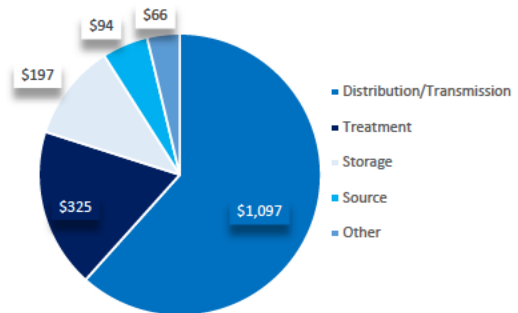


Vermont

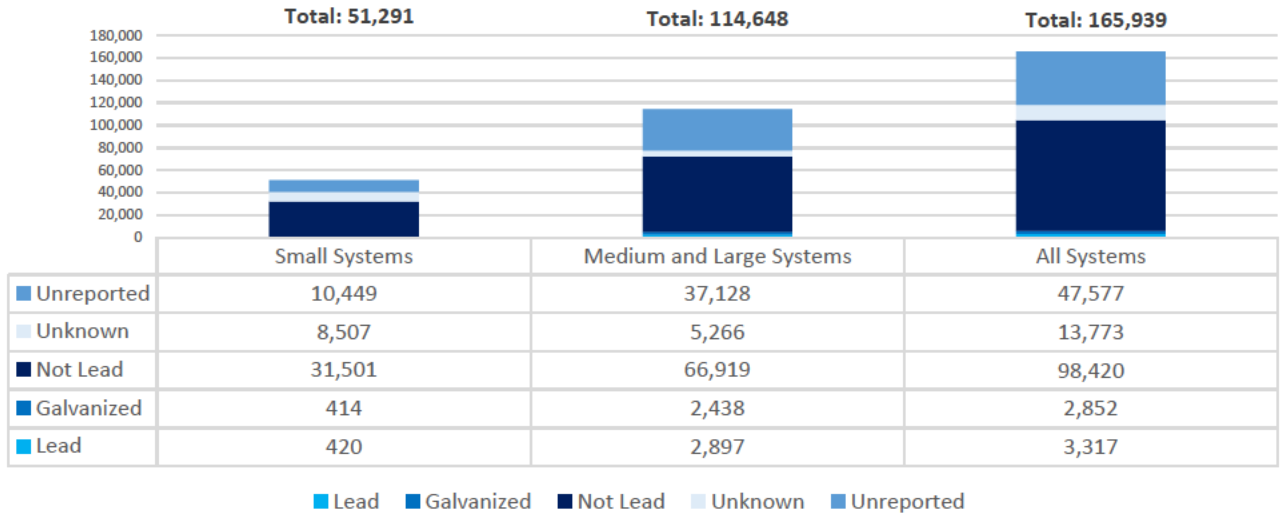
Vermont Total Need by System Size
(in millions; January 2021 dollars)



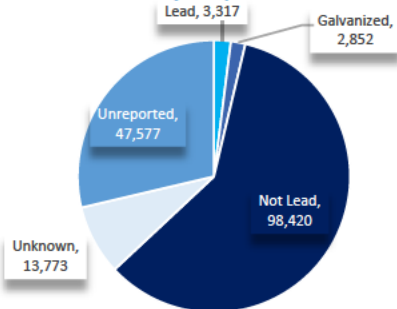
Vermont Total Need by Project Category
(in millions; January 2021 dollars)



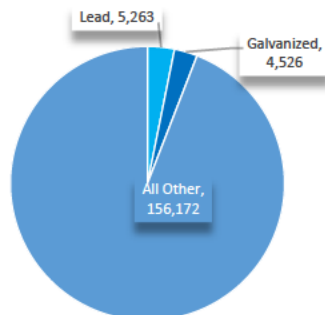
Vermont Estimated Service Lines by System Size



Vermont Service Lines - Estimated from Survey Responses

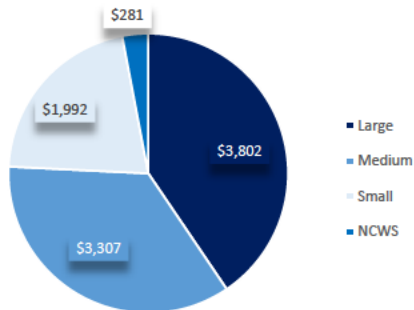


Vermont Projected Service Lines

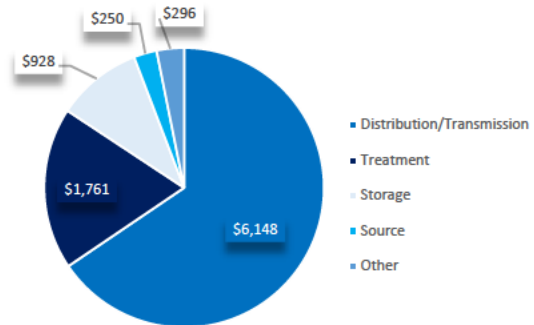


Virginia

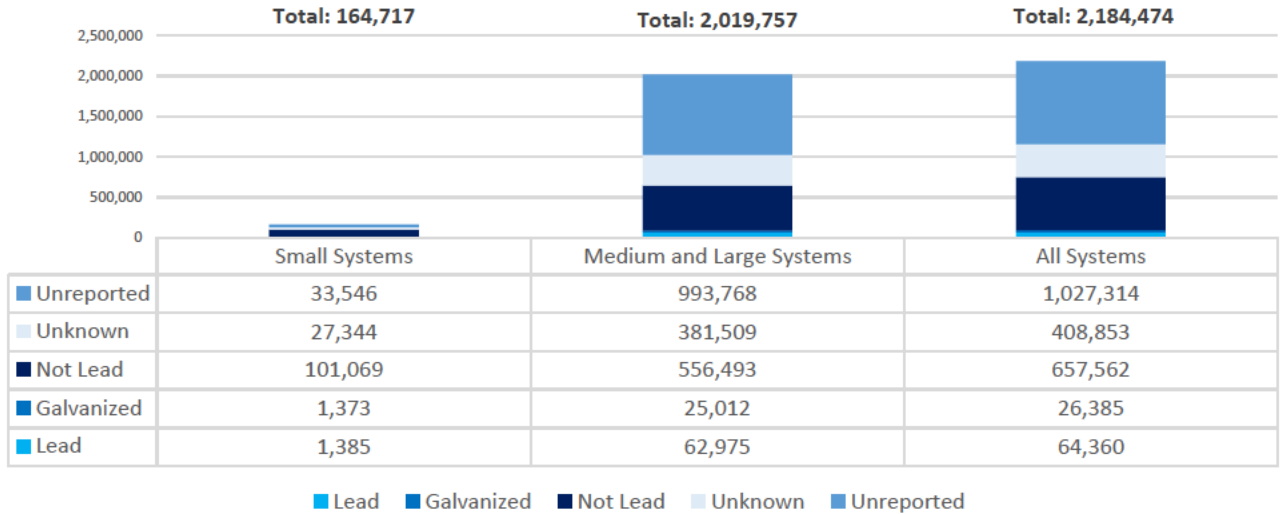
Virginia Total Need by System Size
(in millions; January 2021 dollars)



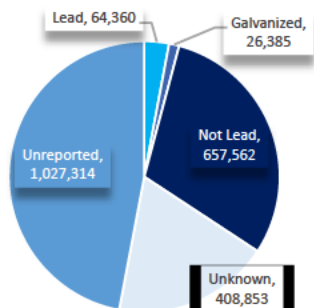
Virginia Total Need by Project Category
(in millions; January 2021 dollars)



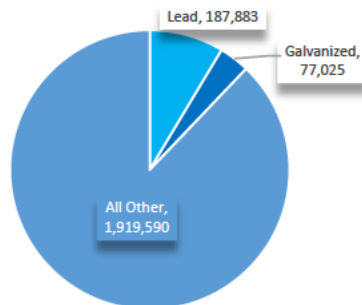
Virginia Estimated Service Lines by System Size



Virginia Service Lines - Estimated from Survey Responses

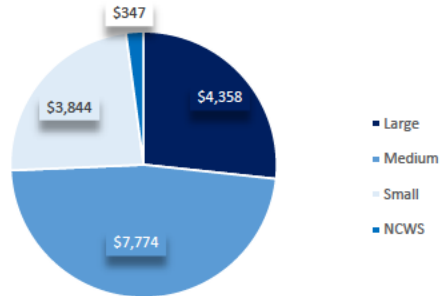


Virginia Projected Service Lines

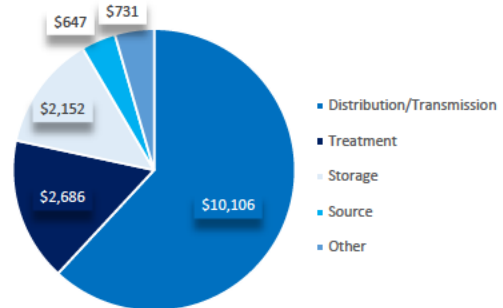


Washington

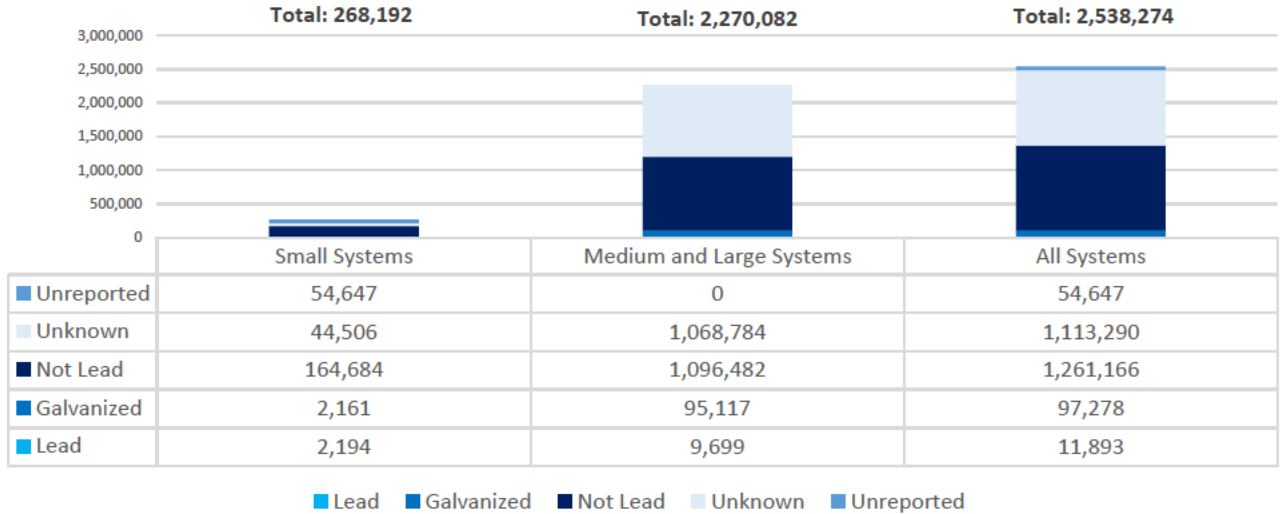
Washington Total Need by System Size
(in millions; January 2021 dollars)



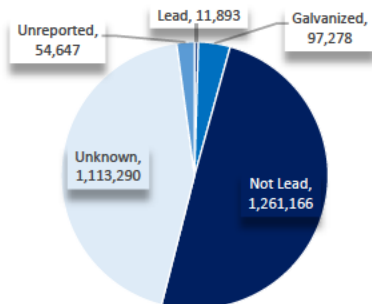
Washington Total Need by Project Category
(in millions; January 2021 dollars)



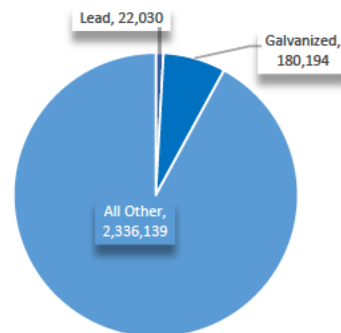
Washington Estimated Service Lines by System Size



Washington Service Lines - Estimated from Survey Responses

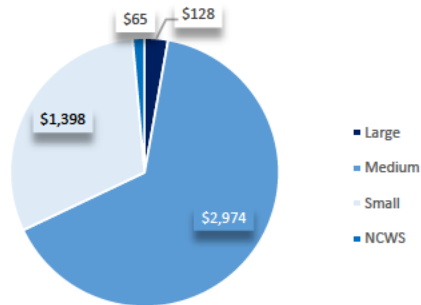


Washington Projected Service Lines

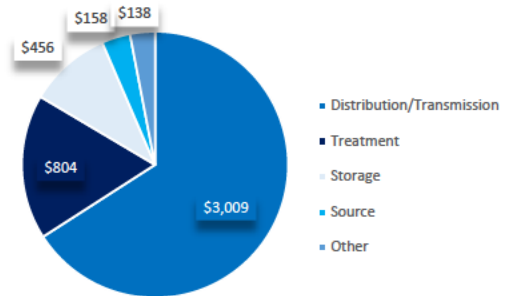


West Virginia

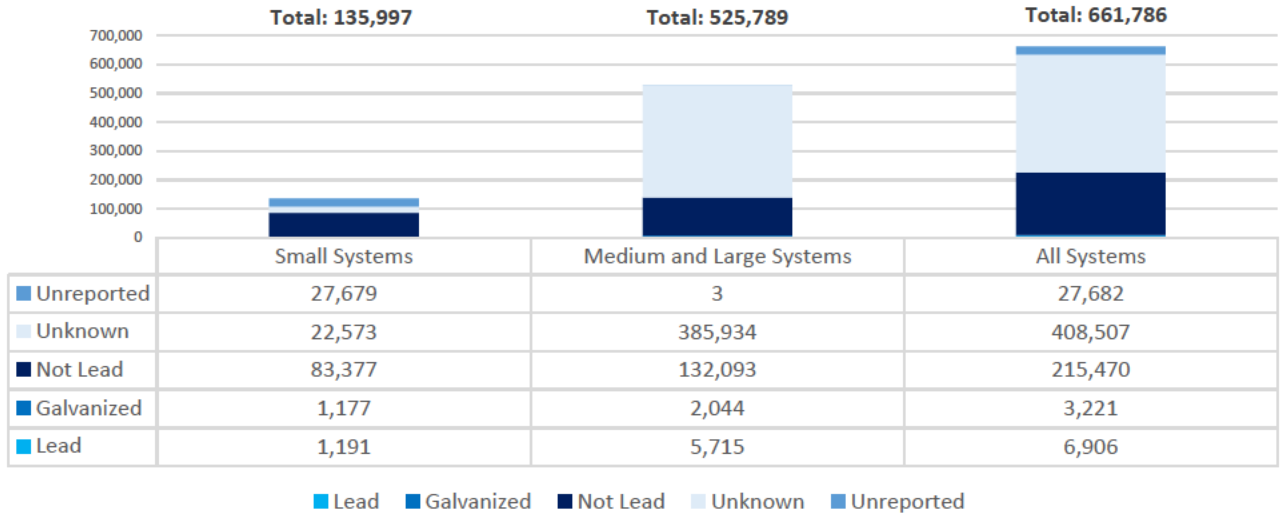
West Virginia Total Need by System Size
(in millions; January 2021 dollars)



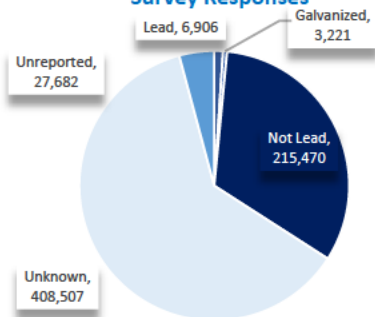
West Virginia Total Need by Project Category
(in millions; January 2021 dollars)



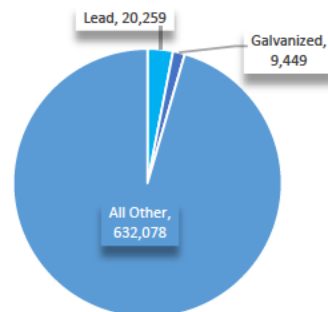
West Virginia Estimated Service Lines by System Size



West Virginia Service Lines - Estimated from Survey Responses

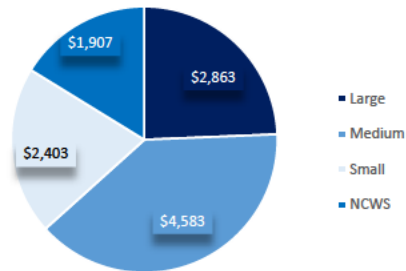


West Virginia Projected Service Lines

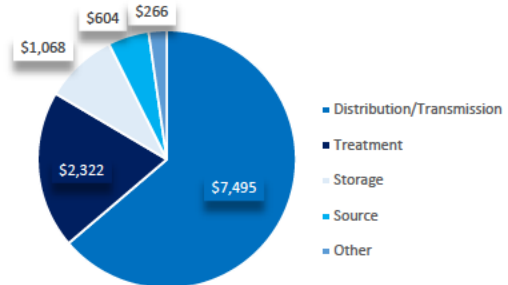


Wisconsin

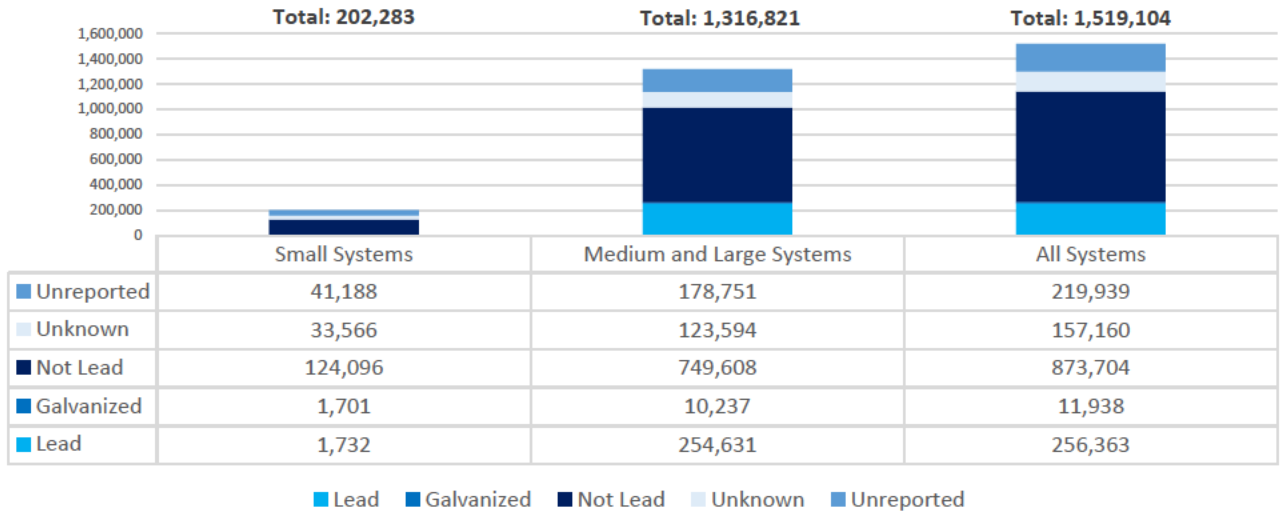
Wisconsin Total Need by System Size
(in millions; January 2021 dollars)



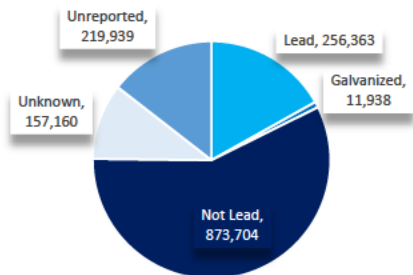
Wisconsin Total Need by Project Category
(in millions; January 2021 dollars)



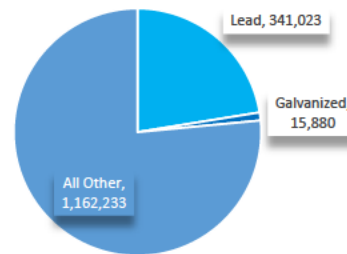
Wisconsin Estimated Service Lines by System Size



Wisconsin Service Lines - Estimated from Survey Responses

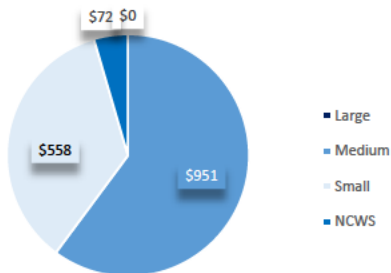


Wisconsin Projected Service Lines

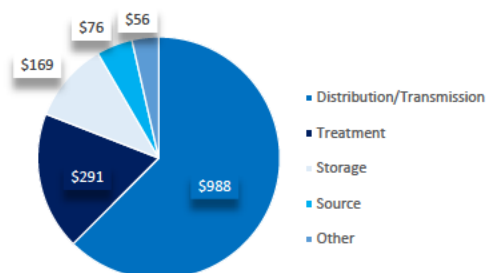


Wyoming

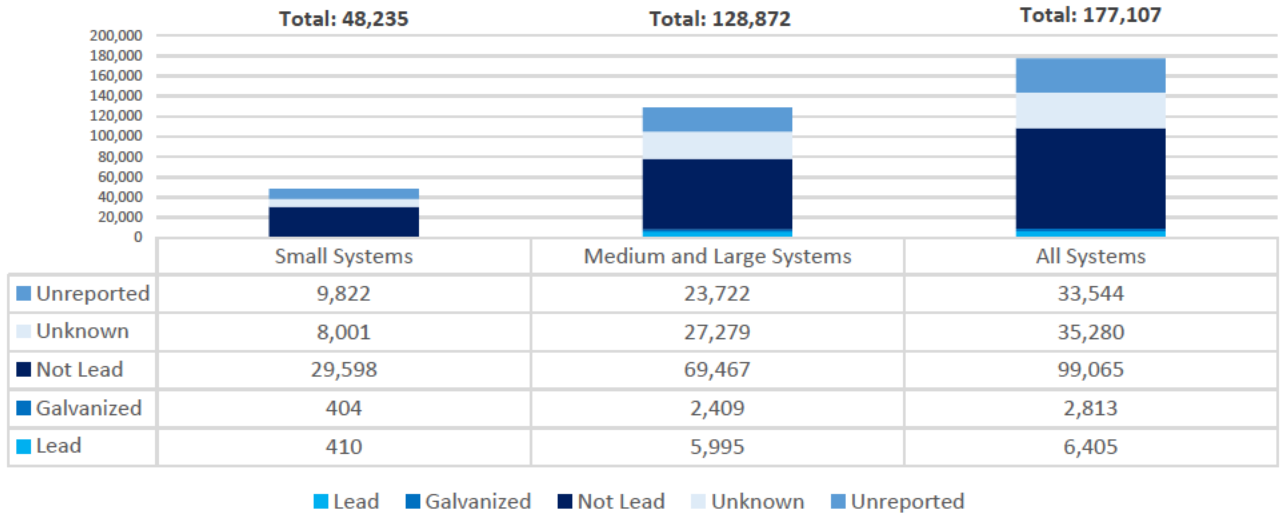
Wyoming Total Need by System Size
(in millions; January 2021 dollars)



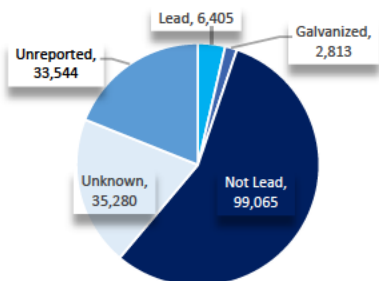
Wyoming Total Need by Project Category
(in millions; January 2021 dollars)



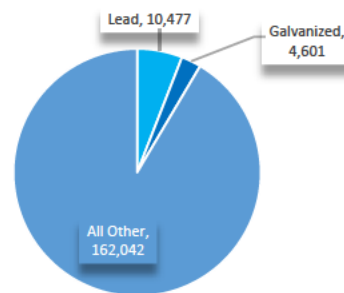
Wyoming Estimated Service Lines by System Size



Wyoming Service Lines - Estimated from Survey Responses

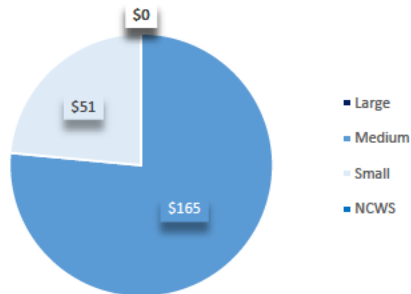


Wyoming Projected Service Lines

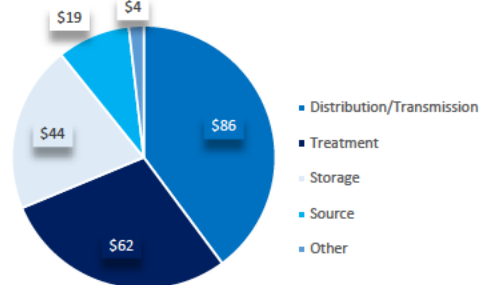


American Samoa

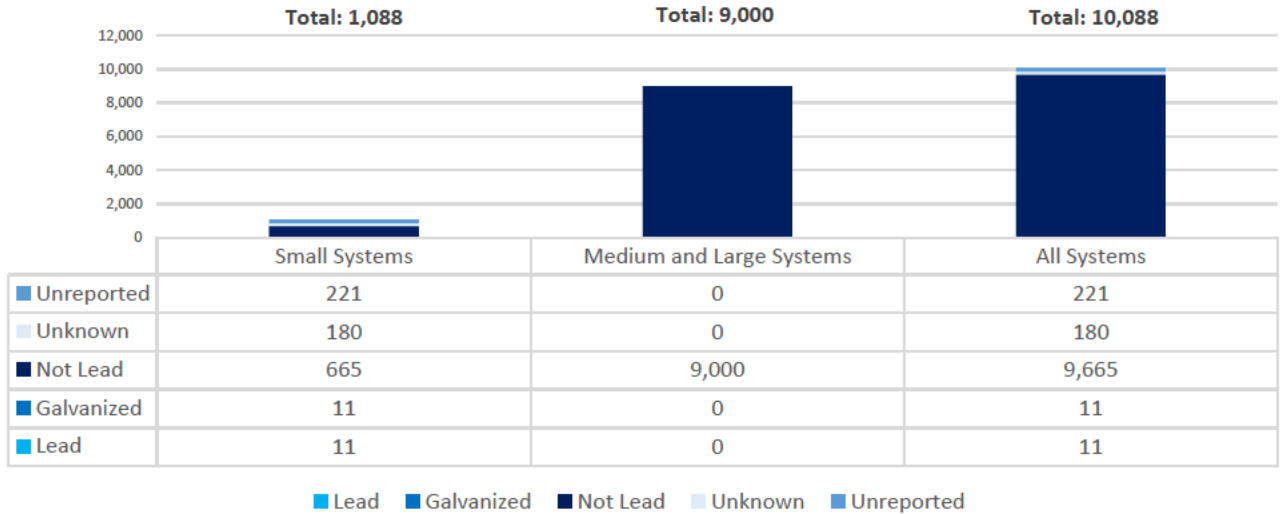
American Samoa Total Need by System Size
(in millions; January 2021 dollars)



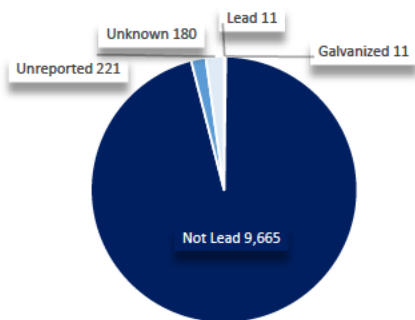
American Samoa Total Need by Project Category
(in millions; January 2021 dollars)



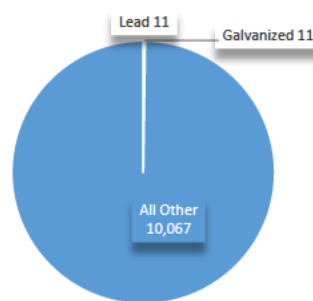
American Samoa Estimated Service Lines by System Size



American Samoa Service Lines - Estimated from Survey Responses

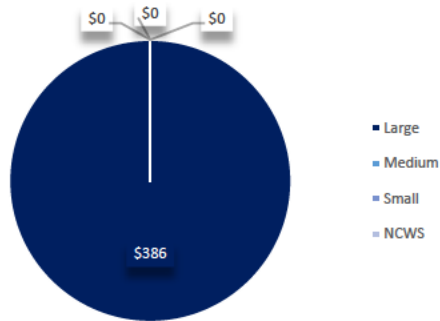


American Samoa Projected Service Lines

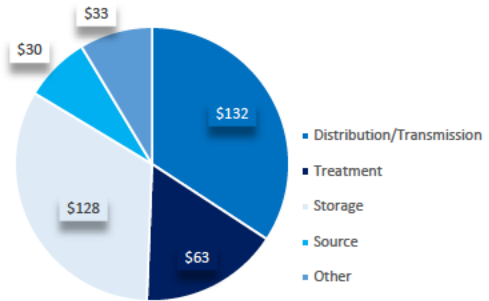


Guam

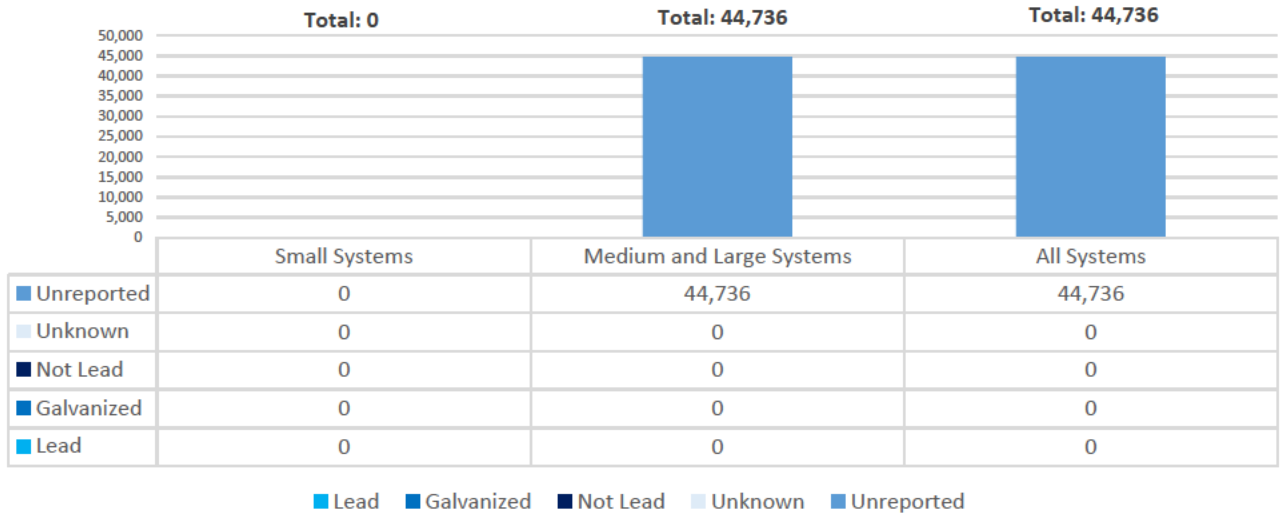
Guam Total Need by System Size
(in millions; January 2021 dollars)



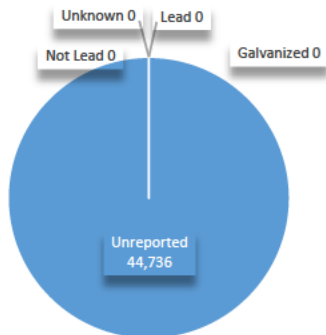
Guam Total Need by Project Category
(in millions; January 2021 dollars)



Guam Estimated Service Lines by System Size



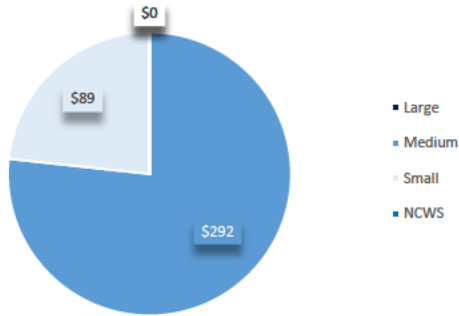
Guam Service Lines - Estimated from Survey Responses



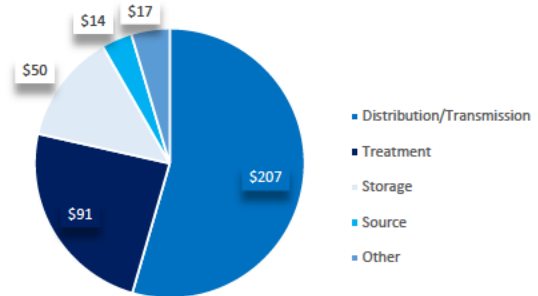
EPA projected no lead or galvanized lines because all service lines were unreported material for one large system in Guam.

Northern Mariana Islands

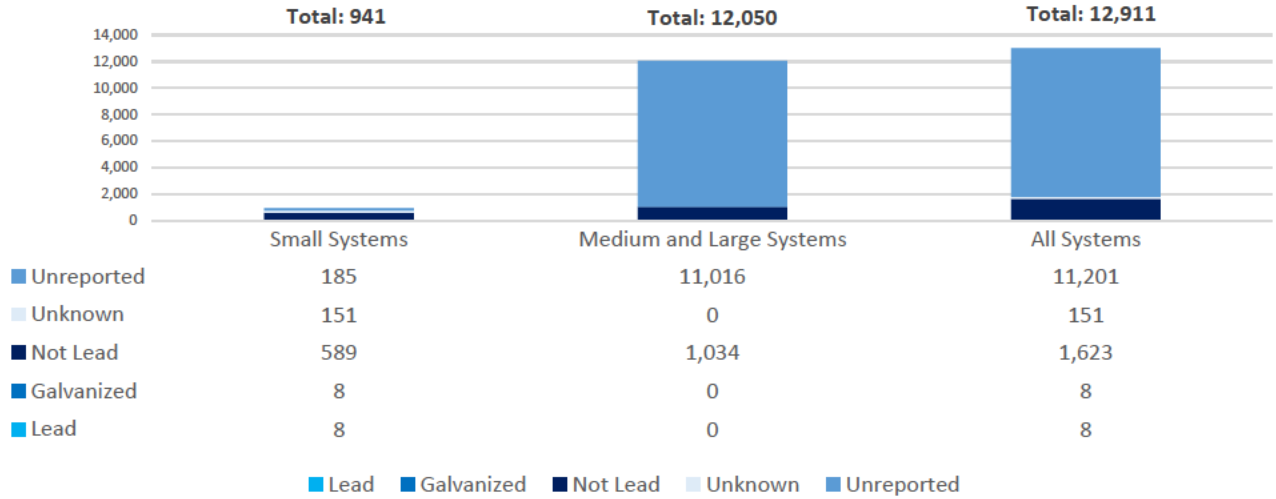
Northern Mariana Islands Total Need by System Size
(in millions; January 2021 dollars)



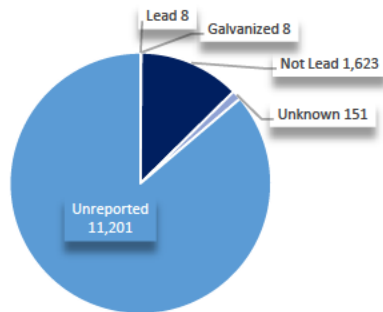
Northern Mariana Islands Total Need by Project Category
(in millions; January 2021 dollars)



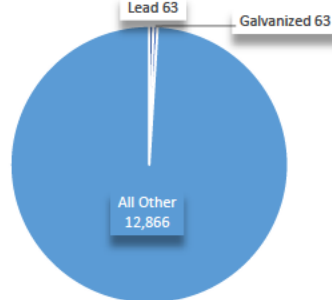
Northern Mariana Islands Estimated Service Lines by System Size



Northern Mariana Islands- Estimated from Survey Responses

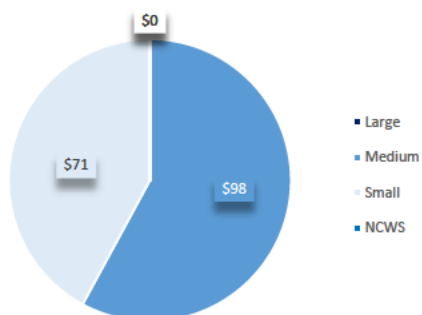


Northern Mariana Islands Projected Service Lines

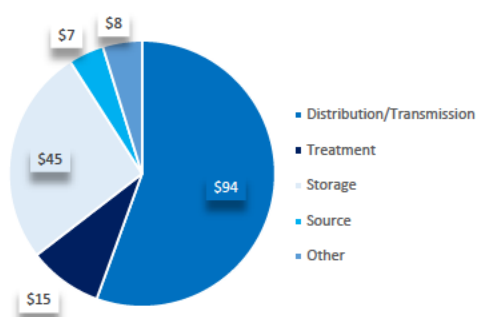


Virgin Islands

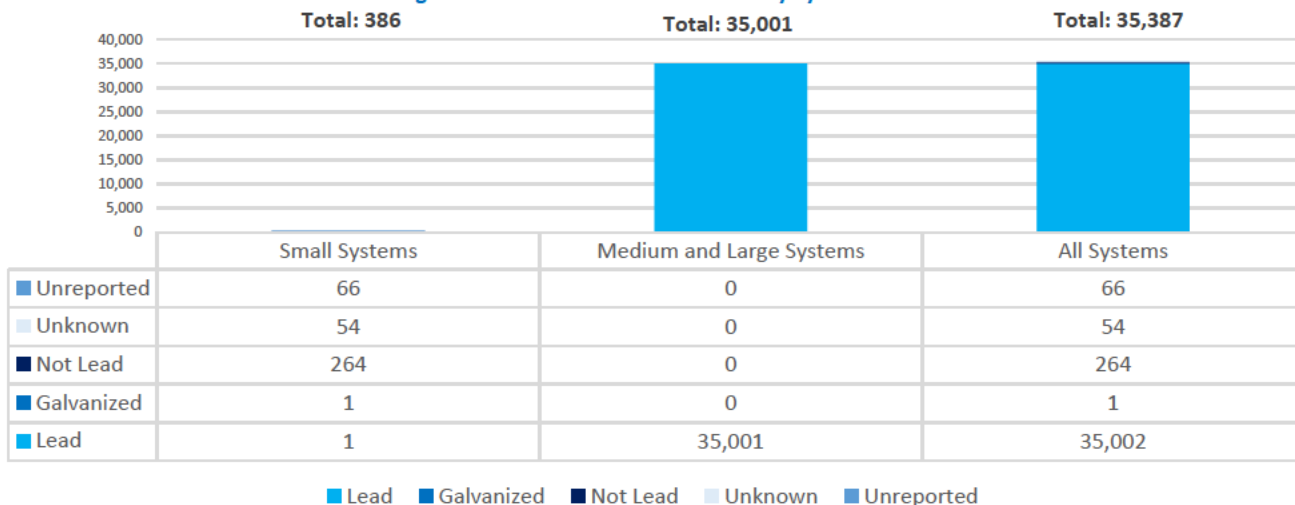
Virgin Islands Total Need by System Size
(in millions; January 2021 dollars)



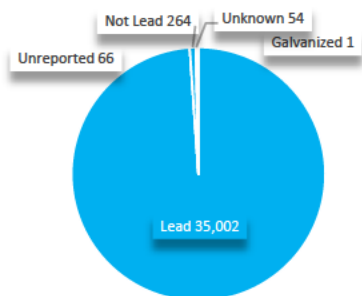
Virgin Islands Total Need by Project Category
(in millions; January 2021 dollars)



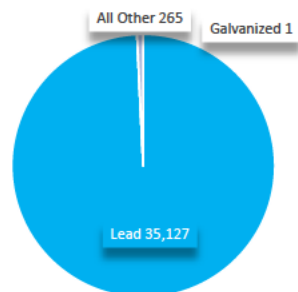
Virgin Islands Estimated Service Lines by System Size



Virgin Islands Service Lines - Estimated from Survey Responses



Virgin Islands Projected Service Lines





EPA Budget by National Program Manager and Major Office

Dollars in Thousands

NPM Major Office		FY 2026 Enacted Budget				FY 2027 President's Budget			
		Pay	Non-Pay	Total	FTE	Pay	Non-Pay	Total	FTE
AO	Office of the Administrator Immediate Office	\$6,719	\$664	\$7,383	23.8	\$3,430	\$748	\$4,178	19.0
	Office of Administrative Services & Performance Management	\$9,566	\$207	\$9,773	19.3	\$2,162	\$537	\$2,699	11.9
	Office of Civil Rights & Adjudication	\$12,479	\$1,043	\$13,522	58.8	\$11,765	\$922	\$12,687	58.6
	Office of Congressional & Intergovernmental Relations	\$8,201	\$967	\$9,168	45.4	\$6,157	\$654	\$6,811	34.0
	Office of Policy & Regulatory Management	\$26,580	\$8,259	\$34,839	119.5	\$26,279	\$18,059	\$44,338	115.9
	Office of National Security & Operations Coordination	\$4,737	\$2,350	\$7,087	23.2	\$4,098	\$1,397	\$5,495	20.0
	Office of External Affairs	\$20,996	\$8,893	\$29,889	72.3	\$9,037	\$335	\$9,372	48.4
	Office of Applied Science & Environmental Solutions	\$96,997	\$291,003	\$388,000	477.1	\$140,427	\$74,898	\$215,325	651.0
	Regional Resources	\$59,929	\$3,753	\$63,682	271.6	\$51,231	\$5,885	\$57,116	287.8
	AO TOTAL	\$246,204	\$317,139	\$563,343	1,111.0	\$254,586	\$103,435	\$358,021	1,246.6
OAR	Immediate Office	\$21,473	\$143,708	\$165,181	86.1	\$14,888	\$52,118	\$67,006	76.3
	Office of Clean Air Programs	\$58,289	\$31,472	\$89,761	296.0	\$47,736	\$9,868	\$57,604	259.7
	Office of State Air Partnerships	\$57,561	\$44,858	\$102,419	229.0	\$38,430	\$17,529	\$55,959	200.9
	Office of Transportation & Air Quality	\$60,761	\$128,213	\$188,974	262.0	\$44,458	\$36,056	\$80,514	229.8
	Office of Radiation & Indoor Air	\$34,085	\$18,671	\$52,756	138.0	\$22,634	\$14,565	\$37,199	121.1
	Regional Resources	\$112,216	\$192,505	\$304,721	571.6	\$91,112	\$17,185	\$108,297	489.5
	OAR TOTAL	\$344,385	\$559,427	\$903,812	1,582.7	\$259,259	\$147,321	\$406,580	1,377.3
OCSPP	Immediate Office	\$2,606	\$673	\$3,279	13.0	\$2,561	\$818	\$3,379	14.2
	Office of Pesticides Programs	\$87,640	\$16,867	\$104,507	416.0	\$85,149	\$18,991	\$104,140	437.5
	Office of Pollution Prevention & Toxics	\$63,605	\$17,260	\$80,865	326.3	\$55,785	\$19,247	\$75,032	254.5
	Office of Mission Critical Operations	\$44,539	\$3,298	\$47,837	225.0	\$42,338	\$3,172	\$45,510	241.9
	Regional Resources	\$22,004	\$31,289	\$53,293	100.2	\$11,028	\$1,067	\$12,095	55.2

		FY 2026 Enacted Budget				FY 2027 President's Budget			
NPM	Major Office	Pay	Non-Pay	Total	FTE	Pay	Non-Pay	Total	FTE
	OCSPP TOTAL	\$220,394	\$69,387	\$289,781	1,080.5	\$196,861	\$43,295	\$240,156	1,003.3
OECA	Immediate Office	\$2,349	\$387	\$2,736	9.4	\$1,227	\$457	\$1,684	7.0
	Office of Compliance	\$26,265	\$25,544	\$51,809	105.1	\$15,832	\$2,525	\$18,357	87.9
	Office of Civil Enforcement	\$30,688	\$9,158	\$39,846	122.8	\$17,816	\$1,129	\$18,945	102.1
	Office of Criminal Enforcement, Forensics, & Training	\$68,951	\$25,407	\$94,358	275.9	\$36,727	\$3,297	\$40,024	215.0
	Office of Program Management Operations	\$10,596	\$2,342	\$12,938	42.4	\$5,700	\$357	\$6,057	32.5
	Office of Site Remediation Enforcement	\$25	\$0	\$25	0.1	\$16	\$4	\$20	0.1
	Federal Facilities Enforcement Office	\$1,725	\$3,319	\$5,044	6.9	\$1,017	\$365	\$1,382	5.8
	Regional Resources	\$213,062	\$48,866	\$261,928	1,064.8	\$161,043	\$8,877	\$169,920	924.2
	OECA TOTAL	\$353,661	\$115,023	\$468,684	1,627.4	\$239,378	\$17,011	\$256,389	1,374.6
OFA	Immediate Office	\$3,544	\$80,006	\$83,550	12.7	\$3,408	\$4,205	\$7,613	15.0
	Office of Budget & Performance	\$14,928	\$7,642	\$22,570	66.3	\$14,348	\$2,350	\$16,698	78.2
	Office of Financial Operations & Management	\$34,043	\$1,998	\$36,041	149.2	\$32,719	\$22,617	\$55,336	176.0
	Office of Resources & Information	\$18,472	\$2,252	\$20,724	83.0	\$17,767	\$4,027	\$21,794	98.1
	Office of the Chief Facilities & Security Officer	\$27,996	\$252,536	\$280,532	114.0	\$26,920	\$324,257	\$351,177	134.4
	Office of the Chief Grants Officer	\$16,258	\$4,099	\$20,357	65.4	\$15,625	\$2,993	\$18,618	77.1
	Office of the Chief Human Capital Officer	\$35,416	\$6,229	\$41,645	164.8	\$34,035	\$6,424	\$40,459	192.7
	Office of the Chief Information Officer	\$37,343	\$118,764	\$156,107	150.4	\$35,887	\$74,990	\$110,877	177.4
	Office of the Chief Procurement Officer	\$33,489	\$4,945	\$38,434	144.5	\$32,203	\$5,987	\$38,190	170.4
	Regional Resources	\$103,327	\$50,927	\$154,254	452.0	\$108,428	\$40,173	\$148,601	587.5
	OFA TOTAL	\$324,816	\$529,398	\$854,214	1,402.2	\$321,340	\$488,023	\$809,363	1,706.8
OGC	Immediate Office	\$2,406	\$238	\$2,644	10.0	\$2,406	\$238	\$2,644	11.2
	Air & Radiation Law Office	\$10,991	\$1,006	\$11,997	33.0	\$9,238	\$916	\$10,154	43.0
	Pesticides & Toxic Substances Law Office	\$4,661	\$462	\$5,123	18.0	\$4,661	\$462	\$5,123	21.7
	Solid Waste & Emergency Response Law Office	\$3,093	\$306	\$3,399	12.0	\$3,093	\$306	\$3,399	14.4

NPM	Major Office	FY 2026 Enacted Budget				FY 2027 President's Budget			
		Pay	Non-Pay	Total	FTE	Pay	Non-Pay	Total	FTE
	Water Law Office	\$4,662	\$462	\$5,124	20.0	\$4,663	\$462	\$5,125	21.7
	Resource Management Office	\$3,008	\$298	\$3,306	12.0	\$3,008	\$298	\$3,306	14.0
	Civil Rights & Finance Law Office	\$4,662	\$462	\$5,124	19.0	\$4,662	\$462	\$5,124	21.7
	General Law Office	\$5,220	\$517	\$5,737	20.0	\$5,221	\$517	\$5,738	24.3
	Ethics Office ²	\$0	\$0	\$0	0.0	\$0	\$0	\$0	0.0
	National Freedom of Information Act Office ²	\$0	\$0	\$0	0.0	\$323	\$32	\$355	1.5
	Cross-Cutting Issues Law Office	\$3,652	\$362	\$4,014	15.0	\$3,652	\$362	\$4,014	17.0
	Regional Resources	\$25,449	\$717	\$26,166	101.9	\$26,978	\$742	\$27,720	127.3
	OGC TOTAL	\$67,804	\$4,830	\$72,634	260.9	\$67,905	\$4,797	\$72,702	317.8
OIG	Immediate Office	\$1,610	\$228	\$1,838	8.5	\$1,334	\$125	\$1,459	7.7
	Office of Audit	\$16,350	\$1,175	\$17,525	94.5	\$15,616	\$882	\$16,498	94.4
	Office of Congressional & Public Affairs	\$481	\$80	\$561	2.5	\$676	\$87	\$763	2.0
	Office of Counsel	\$1,953	\$113	\$2,066	11.0	\$1,797	\$99	\$1,896	9.6
	Office of Data, Analysis, & Technology	\$4,605	\$453	\$5,058	26.0	\$4,186	\$465	\$4,651	24.1
	Office of Investigations	\$11,024	\$3,577	\$14,601	62.5	\$9,992	\$2,598	\$12,590	60.3
	Office of Mission Support	\$2,624	\$486	\$3,110	15.0	\$2,399	\$351	\$2,750	14.0
	Office of Special Review & Evaluation	\$9,201	\$618	\$9,819	50.0	\$8,025	\$464	\$8,489	47.8
	OIG TOTAL	\$47,848	\$6,730	\$54,578	270.0	\$44,025	\$5,071	\$49,096	259.9
OITA	Immediate Office	\$2,141	\$109	\$2,250	6.0	\$1,380	\$87	\$1,467	6.0
	American Indian Environmental Office	\$3,146	\$1,515	\$4,661	15.0	\$5,473	\$737	\$6,210	23.8
	Office of International Affairs	\$5,474	\$1,108	\$6,582	21.6	\$2,230	\$911	\$3,141	9.7
	Office of Management & International Services	\$2,292	\$1,043	\$3,335	9.0	\$2,989	\$909	\$3,898	13.0
	Regional Resources	\$11,540	\$74,591	\$86,131	52.5	\$8,795	\$74,407	\$83,202	48.8
	OITA TOTAL	\$24,593	\$78,366	\$102,959	104.1	\$20,867	\$77,051	\$97,918	101.3
OLEM	Immediate Office	\$11,428	\$24,434	\$35,862	31.4	\$5,713	\$429	\$6,142	32.0
	Office of Resource Conservation & Recovery	\$32,713	\$19,363	\$52,076	142.3	\$23,403	\$10,591	\$33,994	113.6
	Office of Superfund & Emergency Management	\$16,121	\$20,825	\$36,946	51.8	\$13,795	\$17,849	\$31,644	62.8

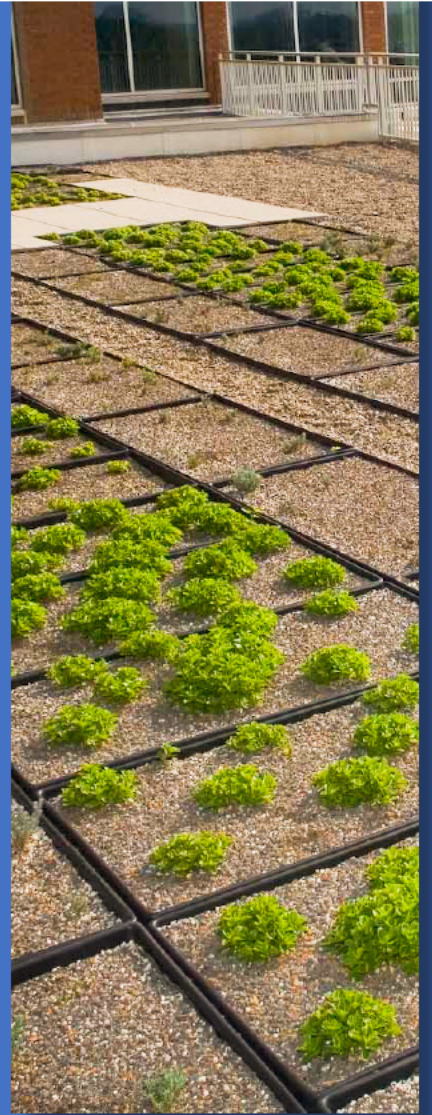
		FY 2026 Enacted Budget				FY 2027 President's Budget			
NPM	Major Office	Pay	Non-Pay	Total	FTE	Pay	Non-Pay	Total	FTE
	Office of Underground Storage Tanks	\$5,005	\$1,366	\$6,371	21.6	\$2,894	\$960	\$3,854	15.9
	Office of Brownfields & Land Revitalization	\$3,777	\$10,938	\$14,715	17.1	\$3,184	\$6,605	\$9,789	12.8
	Office of Mountains, Deserts, & Plains	\$821	\$32	\$853	2.9	\$1,159	\$163	\$1,322	5.9
	Regional Resources	\$164,771	\$355,775	\$520,546	787.1	\$146,903	\$145,165	\$292,068	768.9
	OLEM TOTAL	\$234,636	\$432,733	\$667,369	1,054.2	\$197,051	\$181,762	\$378,813	1,011.9
OW	Immediate Office	\$29,460	\$11,641	\$41,101	97.0	\$19,422	\$23,256	\$42,678	104.2
	Office of Ground Water & Drinking Water	\$39,767	\$89,276	\$129,043	179.9	\$36,151	\$66,138	\$102,289	198.7
	Office of Wastewater Management	\$40,705	\$154,082	\$194,787	232.6	\$41,293	\$85,238	\$126,531	221.6
	Office of Wetlands, Oceans, & Watersheds	\$40,605	\$19,746	\$60,351	177.0	\$29,136	\$21,403	\$50,539	157.1
	Regional Resources	\$222,036	\$4,109,270	\$4,331,306	1,141.3	\$219,579	\$992,005	\$1,211,584	1,237.4
	OW TOTAL	\$372,573	\$4,384,015	\$4,756,588	1,827.8	\$345,581	\$1,188,040	\$1,533,621	1,919.0
	Subtotal Agency Resources	\$2,236,914	\$6,497,048	\$8,733,962	10,320.8	\$1,946,853	\$2,255,806	\$4,202,659	10,318.5
	Legacy Central Accounts ³	\$82,926	\$0	\$82,926	0.0	\$0	\$0	\$0	0.0
	Reimbursable & Other Non-Appropriated FTE ⁴				1,991.4				2,181.5
	Total Agency Resources	\$2,319,840	\$6,497,048	\$8,816,888	12,312.2	\$1,946,853	\$2,255,806	\$4,202,659	12,500.0

¹ This chart does not include resources from the IIJA, IRA, or other supplementals. All amounts are best estimates.

² The Office of General Counsel has reimbursable FTE in both the Ethics Office and National FOIA Office.

³ Legacy accounts include closeout resources for offices no longer operating. These offices are not allocated resources in FY 2027.

⁴ This includes FTE that are funded by Superfund Tax receipts and other fee-funded FTE, for example e-Manifest, TSCA, and FIFRA, which are supported by user fees collected from industry. These FTE support regulatory, compliance, and other core programmatic work.



2022 Clean Watersheds Needs Survey Report to Congress

April 2024

EPA 832-R-24-002

Acknowledgments

The success of the 2022 Clean Watersheds Needs Survey Report to Congress is the result of the hard work and dedication of many people. Thank you to everyone listed below for their active support, perseverance, and continuing effort. State coordinators are denoted by asterisks (*) next to their names below. This is not an exhaustive list: the EPA would also like to thank all the non-governmental staff who contributed toward data collection, including contractors, industry groups, and other interested parties.

Note that acknowledgement of the contributions of those listed below does not represent endorsement of the results and analysis contained in this Report.

Region 1: Katie Marrese

Connecticut: Christopher Bellucci,* Karriem Kazu Folger, Ivonne Hall,* Stacy Pappano, Nisha Patel, Abigail Winter

Maine: Breanne Blaisdell, Camden Clark, Jeff Dennis, Sarah Hansen, Robert Hartley,* Kathy Hoppe, Zoe LeBlanc, Jonathan Rice

Massachusetts: Addis Abebe, Ashraf Gabour,* Michael McGrath, Robin McNamara, Maria Pinaud,* Judy Rondeau, Meghan Selby, Martha Walters, Ping Yee

New Hampshire: Stephen Landry, Deborah Loiselle, Lisa Loosigian,* Zachary Lorch, Eliza Morrison, Sharon Nall,* Ethan Widrick, Katherine Zink

Rhode Island: Sean McCormick,* Thomas Saccoccio

Vermont: Lynnette Claudon,* Rodrigo Figueiredo Gelio

Region 2: Mike Shaw

New Jersey: Kyle Carlson,* Paul Hauch, Charles Jenkins, Christina Luchansky, Luba Parada, Ketan Patel,* Mary Pearsall

New York: Jonathan Amos, Dwight Brown, Alexander Brunelle, Maire Cunningham, Haley Gallo, Ian Goller, Mark Howard, Natasha Motielal, Liz Ricci,* Edward Sziklas

Puerto Rico: Javier Verardi Matos*

Virgin Islands: Mary Stiehler*

Region 3: Ken Pantuck

Delaware: Michael Fleming, Keith Kooker,* Reza Moqtaderi, Davison Mwale, Greg Pope*

District of Columbia: Andrew Oetman*

Maryland: Yen-Der Cheng, Paul Emmart, Jeffrey Fretwell,* Matt Rowe, Walid Saffouri, Greg Sandi

Pennsylvania: Robert Boos, Andrew Gaul,* Jay Patel,* Jill Whitcomb, Richard Wright*

Virginia: Miranda Jaroneski, Matthew Link,* Lauren Linville,* Sabine Vora

West Virginia: John Giroir*

Region 4: Amy Kuhs, Matthew Lagod

Alabama: Stanton Shirley*

Florida: Gregory Alfsen, Andrew Briscoe, Michael Chase, Chelsea Chitty, Robert Holmden, Katie Lewis, Eric Meyers, Thomas Montgomery,* Catherine Murray, Peyton Piotrowski

Georgia: Amanda Carroll*

Kentucky: Lori Dials,* Brittany Ditmer, Jason Lambert, Christopher Luffy, Russell Neal,* Mark Rasche,* Ryan Reed, Nia Rivers, Darby Small, Robin Snider

Mississippi: Peter Daschbach, Greg Eiler*

North Carolina: James Baltzer,* Connie Brower, Julia Byrd, Trupti Desai, Ishwar Devkota, Ken Pohlig, Sushama Pradhan

Tennessee: Sara Hoang*

Region 5: Steffanie Crossland

Illinois: Heidi Allen,* Chris Covert, Jeffrey Edstrom, Bryan Smith, Kim Van Pelt

Indiana: Amy Henninger*

Michigan: Mark Conradi,* Luke Hurley, Peter Vincent

Minnesota: Bill Dunn,* Christopher Lundeen, Lisa McCormick, Cara Omana, Cindy Osborn, Casey Scott, Brandon Smith

Ohio: Jonathan Bernstein,* Kerri Cheng, Kathleen Courtright, Peter Dittrich, Sean Driscoll, Sara Hise, Ryan Laake,* Steve Malone, Tabitha Straub, Yun Yi Thomas

Wisconsin: Sarah Bolitho, Sophie Hammond, Elizabeth Higgins, Matthew Kaelin, Amy Minser, Casey Sweeney*

Region 6: Miranda Penn

Arkansas: Debra Dickson*

Louisiana: William Barlett,* Mostafa Maghsoodi, Coty Rabalais,* Scott Templet*

New Mexico: Rhonda Holderman,* Judi Kahl*

Oklahoma: Lori Johnson,* Myles Mungle*

Texas: Chris Clary,* Marvin Cole-Chaney,* Daphne McCann

Region 7: Kelly Beard-Tittone

Iowa: George Antoniou, Satya Chennupati,* Henry Croll, Steve Hopkins, Paul Miller, Say Kee Ong, James Oppelt,* Tracy Scebold, Mike Sullivan, Benjamin Yen Kit Lee

Kansas: Cara Hendricks,* Sydney Hohn

Missouri: Patrick Anderson, Stacia Bax,* Conrad (Joe) Blume, Shane Graupman

Nebraska: Andrew Klescewski,* Jian Li*

Region 8: Jennifer (Jenn) Berig

Colorado: Mark Henderson,* Erick Worker*

Montana: Michele Marsh*

North Dakota: Ryan Allery, Shawn Martin, Elizabeth Tokach Duran,* Evan Wahl

South Dakota: Kristopher Dozark,* Abbey Larson*

Utah: Harry Campbell,* Ken Hoffman,* Glen Lischeske, George Meados

Wyoming: Brian Friel,* Matt Mullins*

Region 9: D. Isaiah Larsen

American Samoa: Kris Mcphee*

Arizona: Lindsey Jones,* Samantha Lemke,* Michael Vidaure

California: Salem Alyafeai, Melky Calderon,* Sierra Cheslick, Travis Comstock, Joshua Eldridge, Jovana Grano-Sanchez, Jocelyn Salvador, Laura Wadsworth

Guam: Maricar Quezon, Joseph Tadeo*

Hawaii: Chane Hayashida,* Jonathan Nagato,* Domciely Oda

Nevada: Jennie Johnson, Elizabeth Kingsland,* Charles Wolf

Region 10: David Carcia

Alaska: Kevin De Michelis*

Idaho: Garrett Deegear, LaDonn Kaylor,* Bonnie Ricord, Darcy Sharp

Oregon: Jennifer Maglinte-Timbrook, Julie Ulibarri*

Washington: Emma Hanson,* Kim Prisock

Contents

1. Introduction	1
2. Scope and Methods	3
Policies	4
Documentation	4
Planning Documents	5
State-Specific Approaches	5
Cost Estimation Tools	5
Small Community Form	5
3. Data Quality Assurance	6
Technical Data Review	7
Needs Data Review	7
4. Results: National Needs	7
5. Changes Since 2012	14
6. 2022 Needs by CWNS Category	16
Secondary Wastewater Treatment (Category I)	16
Highlights	16
Discussion	17
Advanced Wastewater Treatment (Category II)	18
Highlights	18
Discussion	18
Conveyance System Repair (Category III) and New Conveyance Systems (Category IV)	19
Highlights	19
Discussion	20
Combined Sewer Overflow Correction (Category V)	20
Highlights	20
Discussion	21
Stormwater Management (Category VI)	21
Highlights	21
Discussion	22
Nonpoint Source Control (Category VII)	23
Highlights	23
Discussion	23

Water Reuse (Category X)	25
Highlights	25
Discussion.....	25
Decentralized Wastewater Treatment Systems (Category XII)	26
Highlights	26
Discussion.....	27
Desalination (Category XIV).....	27
Highlights	27
Discussion.....	28
7. Urban and Rural Area Needs.....	28
Small Community Wastewater Needs	29
Appendix A: 2022 CWNS Needs Categories Definitions	A-1
Appendix B: 2022 CWNS Reported Needs by Category.....	B-1
Appendix C: Total Needs by State for 2008, 2012, and 2022	C-1
Appendix D: 2012 CWNS Reported Needs by Category	D-1

List of Figures

Figure 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions).....	8
Figure 2. Distribution of Total Reported Needs by State (January 2022 Dollars in Billions)	10
Figure 3. Distribution of Per Capita Reported Needs by State (January 2022 Dollars/Person)	11
Figure 4. Total Reported Needs Nationwide for the 2008–2022 CWNS by Category (January 2022 Dollars in Billions)	16
Figure 5. Percent of Stormwater Needs by Subcategory in 2012 and 2022	22
Figure 6. Number of Reported Reuse Discharge Types in 2022 and 2042 ¹⁷	26
Figure 7. Population Served by POTWs for Select Years Between 1940 and 2022 and Projected (If All Needs Are Met) by Treatment Level	32

List of Tables

Table 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions).....	9
Table 2: Total and Per Capita Reported Needs by State	12
Table 3. 2008–2022 CWNS Total Needs by Survey Year (January 2022 Dollars in Billions).....	15
Table 4. NPS Control Needs by Subcategory	24
Table 5. 2022 CWNS Small Community Wastewater Needs by Category (January 2022 Dollars in Billions)....	29
Table 6. Changes over Time in POTW Discharge to Surface Water	33
Table A-1. 2022 CWNS Needs Categories Definitions	A-1
Table B-1. 2022 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions).....	B-1
Table B-2. 2022 CWNS Reported Needs for Wastewater Subcategories by Category and State (January 2022 Dollars in Millions).....	B-4
Table B-3. 2022 CWNS Reported Needs for Stormwater Management by Category and State (January 2022 Dollars in Millions).....	B-7
Table B-4. 2022 CWNS Reported Needs for NPS Control by Category and State (January 2022 Dollars in Millions)	B-9
Table C-1. 2008, 2012, and 2022 CWNS Reported Needs by State (January 2022 Dollars in Millions)	C-1
Table D-1. 2012 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)	D-1

List of Abbreviations

BMP	best management practice	MS4	municipal separate storm sewer system
BOD₅	5-day biochemical oxygen demand	NEP	National Estuary Program
CET	cost estimation tool	NPS	nonpoint source
CIP	capital improvement plan	NR	not reported
CSO	combined sewer overflow	P.L.	Public Law
CWA	Clean Water Act	POTW	publicly owned treatment works
CWNS	Clean Watersheds Needs Survey	SSO	sanitary sewer overflow
CWSRF	Clean Water State Revolving Fund	U.S.	United States
DEP	data entry portal	U.S.C.	United States Code
EPA	U.S. Environmental Protection Agency	WRRDA	Water Resources Reform and Development Act
I/I	inflow and infiltration		
IIJA	Infrastructure Investment and Jobs Act		

1. Introduction

The U.S. Environmental Protection Agency (EPA) has prepared this 2022 Clean Watersheds Needs Survey (CWNS) Report to Congress in compliance with Clean Water Act (CWA) section 516(b)(1)(B) as well as CWA section 609, which was added by the Infrastructure Investment and Jobs Act (IIJA), P.L. 117-58, November 15, 2021.¹ This Report summarizes the results of the EPA's 17th survey since the CWA was enacted in 1972.

As directed by Congress, the CWNS provides an assessment of the capital investments necessary for states, the District of Columbia, and U.S. territories (herein referred to as “states”) to meet the CWA water quality goals over the subsequent 20 years. These needs include projects and related infrastructure costs for wastewater publicly owned treatment works (POTWs), stormwater, nonpoint source (NPS) control, and decentralized wastewater treatment.² State participation is instrumental in surveys because the EPA relies on state programs to collect and submit data. In addition to needs data, respondents are encouraged to submit technical data for POTWs even if they do not have needs so the EPA can analyze national trends in wastewater treatment and improve future data collection. For the 2022 survey presented here, a detailed breakdown of the needs and technical data for wastewater treatment plants is available on the 2022 CWNS Data Dashboard.

Needs and Technical Data

For this Report:

- A “need” is defined as a currently unfunded project (or portion of a project) and the associated capital cost that addresses a water quality problem—or a public health problem related to water quality—existing as of January 1, 2022, or that is expected to occur within the next 20 years.³
- “Technical data” refers to data collected for each CWNS submission not related to infrastructure needs. Such data include wastewater or stormwater flow; population served; and descriptive data on discharge, effluent, unit processes, and utility management.

Access 2022 CWNS Data Online

An online companion to this Report is available at www.epa.gov/cwns. It contains the following:

- The 2022 CWNS Data Dashboard, which features interactive maps and charts of both needs data and wastewater technical data. The 2022 CWNS dataset can also be downloaded here, as a set of CSV files or Access database.
- A copy of this Report.
- A detailed explanation of the scope and methods used for this survey.
- The 2012, 2008, 2004, and 2000 CWNS reports and data.

¹ CWA section 516(b)(1)(B), 33 U.S.C. § 1375; CWA section 609, 33 U.S.C. § 1389.

² The Water Resources Reform and Development Act (P.L. 113-121, June 10, 2014) expanded Clean Water State Revolving Fund eligibilities by adding eight areas of eligibility, allowing states to fund a broader range of non-traditional projects nationwide. The IIJA (2021) amended the CWA by adding section 609, which directs the EPA to align the CWNS data collection with the Fund eligibilities, including the ones added in 2014.

³ Classification in this report as a “need” does not suggest a lack of funding from local, state, or federal sources (including collected rates, bonds, loans, or grants) for these projects, and should not be construed as a request for additional federal funding.

The nation's total reported needs for clean water infrastructure are \$630.1 billion.⁴ This is a 73 percent increase in total reported needs since the previous CWNS. Several factors contributed to the significant increase:

- The previous CWNS did not include the NPS Control and Decentralized Wastewater Treatment Systems categories. These categories were added to the survey scope as directed by Congress in the IIJA. If only the categories collected in both 2012 and 2022 are compared, the reported needs increased by 37 percent.
- Aging infrastructure and climate change pose ongoing challenges to clean water infrastructure nationwide.⁵
- More documentation was available online, and the 2022 data entry portal (DEP) supported more efficient and accurate reporting.
- To help states document their needs, the EPA updated existing wastewater infrastructure cost estimation tools (CETs) and developed new CETs for stormwater management and NPS control projects related to agriculture cropland and silviculture.

More information can be found in Section 5, “Changes Since 2012.”



Solar array providing power at the Town of Taos wastewater treatment plant. *Photo credit to New Mexico Environment Department.*

4 All needs amounts in this Report are shown in January 2022 dollars. Costs were adjusted from the documented cost year basis using the U.S. Bureau of Labor Statistics Consumer Price Index.

5 <https://www.epa.gov/arc-x/climate-adaptation-and-water-utility-operations>.

The overall needs presented in this Report are significant; however, the total likely underestimates the true nationwide need for a variety of reasons:

- This Report does not include Tribal wastewater needs, which are documented by a separate survey conducted by the Indian Health Service.⁶
- The CWNS encompasses a 20-year planning horizon, but most documentation submitted to the survey describes projects that will be completed in the near term (within 5–10 years). For example, 44 percent of 2022 CWNS needs were documented using municipal or utility capital improvement plans (CIPs) that typically only document projects included in shorter-term plans.
- Several challenges affected data collection and survey reporting. Many states reported difficulties in obtaining documentation with sufficient detail to substantiate project costs or had competing priorities and limited resources that affected their ability to collect the required data. States also encountered difficulty communicating with small communities and coordinating across a wide variety of agencies, public and private institutions, and local governments. Finally, resources allocated to data collection varied across states; some states had small data entry teams of one or more in-house staff while others had external resources at their disposal.

Despite these limitations, the 2022 CWNS represents the most comprehensive and robust report on clean water infrastructure needs in the United States. The CWNS is fundamental in helping the EPA and states assess potential gaps between the need for and the availability of funding for clean water infrastructure from all sources. No other national assessment exists on this scale. Unprecedented funding from the IJJA has given states the resources to help communities accelerate these needed investments, and the results of this Report show that substantial needs exist. Continuity and full participation in the survey is key to ensure that opportunities for investment are not being overlooked in historically underserved communities. The EPA remains committed to continually improving the CWNS and collaborating across the clean water sector to move toward a more sustainable future.

2. Scope and Methods

The CWNS is a voluntary, non-statistical sample survey, completed by the states in collaboration with the EPA. The survey described in this Report was designed to capture needs as of January 1, 2022, that are expected to occur within the next 20 years. Each state designates representatives, referred to as state coordinators, to complete the survey on the state's behalf. During the data entry period of March 1, 2022, to May 3, 2023, the EPA hosted and maintained an online DEP that allowed state coordinators to enter technical and needs data for more than 30,000 wastewater, stormwater, NPS control, and decentralized wastewater treatment submissions. Each submission represented some form of infrastructure. For example, a wastewater submission could represent a single collection system or a whole town's wastewater infrastructure, including the collection system, pump stations, and treatment plant.

⁶ The needs for capital investment in wastewater infrastructure on Tribal reservations and in Alaskan Native Villages are based on the Sanitation Deficiency System within the IHS Sanitation Tracking and Reporting System (<http://wstars.ihs.gov>).

Policies

Before the data entry period began, the EPA collaborated with three CWNS State Coordinating Committees to establish survey policies and improve on the data collection methodologies used during prior surveys. Based on committee input and review of past surveys, the EPA refined prior CWNS policies to improve clarity for the user, data quality, and survey response rates.

To be included in the survey, a project must be eligible to receive funding from the Clean Water State Revolving Fund (CWSRF) under section 1383(c) of the CWA, which defines projects and activities eligible for CWSRF assistance. The needs included in this Report were based on federal eligibilities, but some state programs have more restrictive requirements.

Examples of projects and costs that are not CWSRF-eligible are:

- Any project for a federally owned facility.
- Any project without a water quality benefit.
- Planning activities that are not reasonably expected to result in a capital project (e.g., water quality monitoring plan).
- Non-capital costs (e.g., operation and maintenance, municipality payroll).
- Land acquisition that is not part of an eligible project.

Finally, to be included in the survey, a project must have been unfunded as of January 1, 2022. For the CWNS, a project was considered funded if construction had started or external funds (e.g., a grant or loan) were committed to it. Projects included in this report may already be part of a municipality's plans, even if funding has not been committed and construction has not yet started. Inclusion in the CWNS does not necessarily mean that funding from local, state, or federal sources will not be available for the reported projects.

The following projects and costs were not included in the CWNS:

- Any costs for a CWSRF-eligible project starting before January 1, 2022, or that is planned for after December 31, 2041.
- Portions of costs based on escalation or inflation.
- Projects on Tribal lands and in Alaska Native Villages; these needs are reported separately by the Indian Health Service.

Needs in this Report are summarized using the categories defined in Appendix A.

Documentation

The CWNS policies require documentation to support the existence of needs. This can be done with any of the following:

- An approved planning document with the project description and cost.
- An approved state-specific approach.
- The EPA's CETs.
- A small community form.

Planning Documents

Most commonly, states documented needs with planning documents, such as a CIPs or long-term control plans. States could use documents designated by the EPA as pre-approved to support projects and costs, or they could request approval for documents not on the list.

State-Specific Approaches

As in past surveys, the EPA allowed states without planning documents to develop methodologies using state-specific data to document and assess needed projects and/or estimate costs. The EPA evaluated all approaches to ensure that the methods used were current and based on robust, relevant data; the EPA then approved each method for use before a state submitted the resulting project(s) and cost(s) through the DEP.

Cost Estimation Tools

As in past surveys, the EPA developed CETs to estimate costs for certain types of documented projects without cost estimates available in the supporting documentation. These DEP-based tools assign a dollar value for projects based on documented inputs provided by the state, such as the project location and design specifications. The CETs were developed using both external data sources (such as state loan data and proprietary models) and project data from past surveys. Each CET has maximum sizes or capacities based on the range of the data used to build the tool.

The EPA was unable to develop CETs for all project types due to lack of sufficient high-quality national datasets. In 2022, the EPA developed or updated CETs for:

- Secondary and advanced wastewater treatment (Categories I and II).
- Wastewater conveyance (Categories III and IV).
- Combined sewer overflow (CSO) correction (Category V).
- Stormwater management (Category VI).
- NPS control (Subcategories VII-A [Agriculture (Cropland)] and VII-C [Silviculture]).
- Decentralized wastewater treatment systems (Category XII).

Small Community Form

The EPA developed an online survey form for communities with populations of 10,000 or fewer. State coordinators could send this form via email to officials (e.g., mayor, public works manager, operator) to document needs when other documentation did not exist. The small community form provided two options for documenting project costs:

- Through the EPA's CETs, using inputs provided by the local staff.
- By the local staff entering their own cost estimates and having a state or local professional engineer certify the costs.

EPA Program Highlight

For more information on how the EPA supports small and rural communities, visit <https://www.epa.gov/small-and-rural-wastewater-systems>.

3. Data Quality Assurance

The EPA conducted quality assurance and quality control reviews of the data presented in this Report to ensure their precision and accuracy. Throughout these reviews, the EPA followed a quality assurance project plan, which it developed in keeping with its Information Quality Guidelines and the *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5, EPA/240/B-01/003).

The DEP allows states to directly enter needs and technical data and upload the required supporting documentation. The EPA developed the DEP to include automated checks of expected entries and value ranges to minimize incorrect or incompatible data entry. In addition, the EPA followed specific, documented protocols for reviewing technical and needs data submitted by states. These quality control checks were focused on technical data for wastewater submissions in addition to needs data for all infrastructure types. Data were reviewed throughout the data entry period as they were submitted and underwent additional checks at the close of data entry.



Pumps part of the aquifer storage and restoration project to remove excess nitrogen. *Photo credit to City of Hastings, NE.*

Technical Data Review

The EPA reviewed each wastewater submission to identify inconsistencies such as miscategorized infrastructure, unusual discharge locations, inconsistent effluent treatment levels, or incomplete sewersheds (e.g., a collection system not discharging to a treatment plant). At the end of data entry, the EPA summed the reported populations and compared them against the 2012 CWNS data and the 2020 Census data for each state to check for potential double-counting or misreporting. The EPA also checked for duplicate submissions and out-of-state locations for all infrastructure types (wastewater, stormwater, NPS control, and decentralized wastewater treatment) and worked with the states to correct any errors.

Needs Data Review

The EPA created a tiered review plan for the over 15,000 submissions with needs. Submissions received in-depth review if they either had high-value projects (i.e., projects totaling above \$40 million) or were supported by documentation that may not have included the required costs and detailed project descriptions. This included verifying that the cost reported by the state coordinators in the DEP matched the cost reported in the documentation, as well as confirming that the project type and needs category aligned. In situations where a project could be reasonably assigned to multiple categories, state coordinators chose either a single category or split the costs between categories. For all other submissions, the EPA performed quarterly audits of a random selection of approximately 5 percent of submissions from each state to confirm that costs were properly documented. The review results were used to make minor adjustments to a subset of the state's overall needs.

4. Results: National Needs

The total nationwide reported clean water infrastructure needs identified as of January 1, 2022 were \$630.1 billion for the period between January 1, 2022, and December 31, 2041 (shown by category in Table 1 and Figure 1). About 55 percent of these needs were for wastewater infrastructure—treatment plant improvements, conveyance system repairs, new conveyance systems, CSO correction, recycled water distribution, and desalination. Stormwater infrastructure had the next highest needs, at 18 percent of the overall total. Classification in this report as a “need” does not suggest a lack of funding from local, state, or federal sources (including collected rates, bonds, loans, or grants) for these projects, and should not be construed as a request for additional federal funding.

Figure 2 displays the geographic distribution of the total reported needs by state. New York and California each had needs exceeding \$50 billion, and Florida, Virginia, Louisiana, and Georgia each had needs exceeding \$25 billion. Together, these six states reported 42 percent of the total nationwide needs. Twenty-eight states each reported less than one percent of the total needs. Appendix B presents the total reported needs for all categories by state.

Figure 3 displays reported needs per capita by state. Northern Mariana Islands (\$7,203), West Virginia (\$6,182), New Mexico (\$5,799), Louisiana (\$5,776), and Virginia (\$5,303) reported the highest needs per capita.

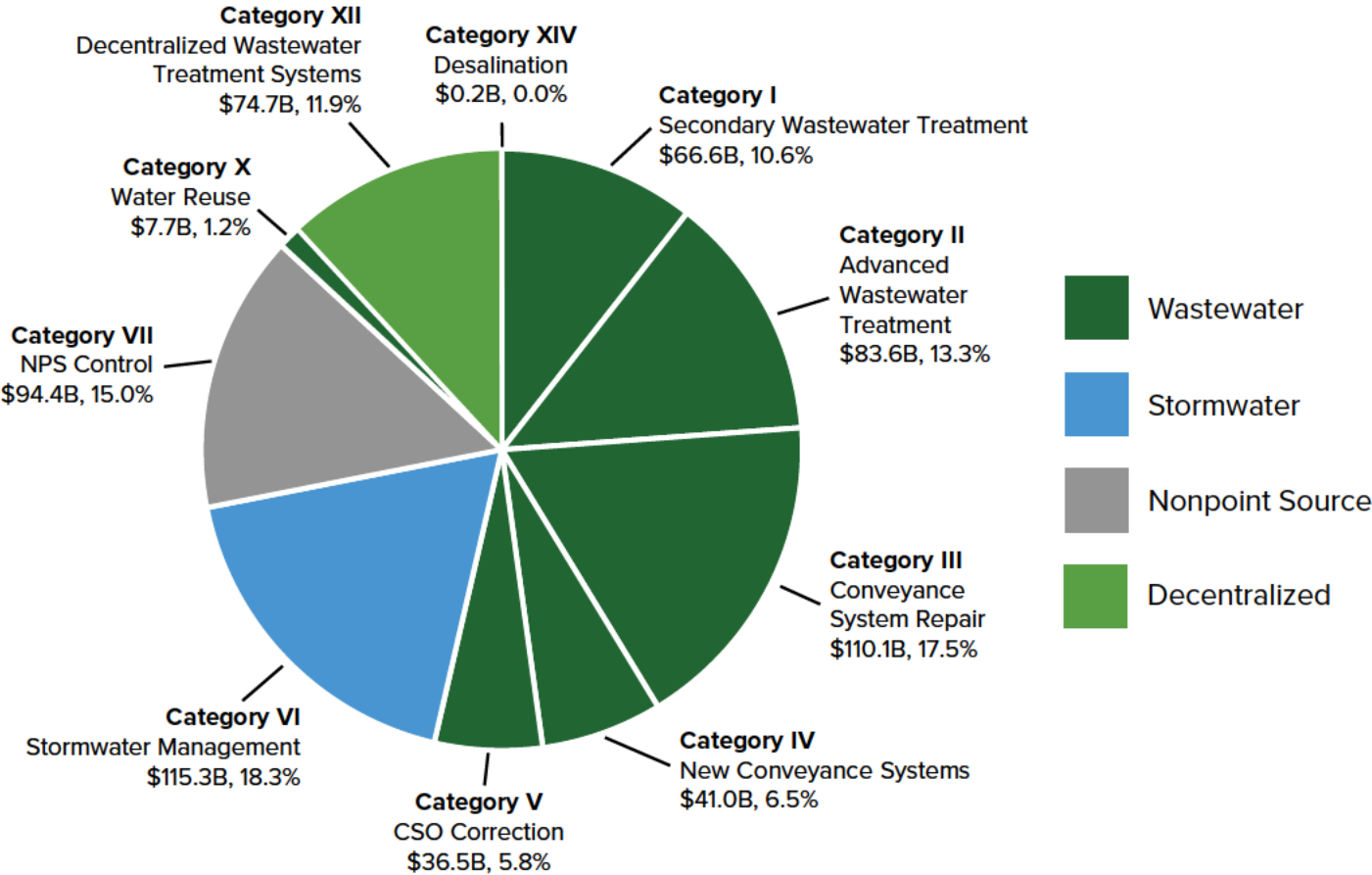


Figure 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)

Table 1. 2022 CWNS Total Reported Needs by Category (January 2022 Dollars in Billions)

Category Number	Category Name	National Needs	
		\$Billion	Percent
I	Secondary Wastewater Treatment	\$66.6	10.6%
II	Advanced Wastewater Treatment	\$83.6	13.3%
III	Conveyance System Repair	\$110.1	17.5%
IV	New Conveyance Systems	\$41.0	6.5%
V	CSO Correction	\$36.5	5.8%
VI	Stormwater Management	\$115.3	18.3%
VII	NPS Control	\$94.4	15.0%
X	Water Reuse	\$7.7	1.2%
XII	Decentralized Wastewater Treatment Systems	\$74.7	11.9%
XIV	Desalination	\$0.2	0.0% ^a
Total		\$630.1	100.0%

^a Estimate is less than 0.1 percent.



Storm grate with leaves. Photo Credit: Flickr.

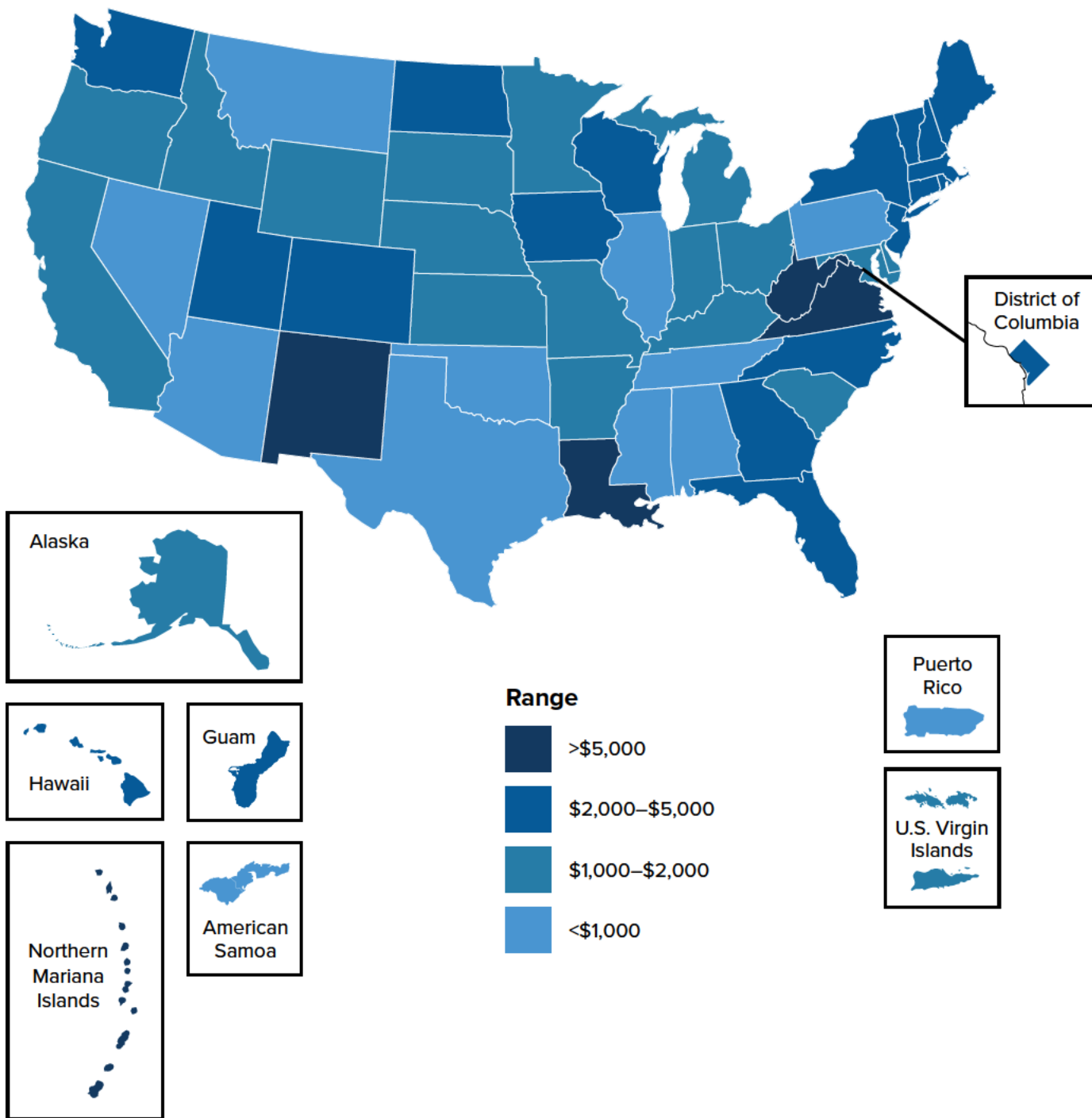


Figure 3. Distribution of Per Capita Reported Needs by State (January 2022 Dollars/Person)

Table 2: Total and Per Capita Reported Needs by State

State	Total Reported Needs (January 2022 Dollars Rounded to the Nearest Million)	Per Capita Reported Needs (January 2022 Dollars per Person)
Alabama	\$4,026,000,000	\$801
Alaska	\$775,000,000	\$1,057
American Samoa	\$30,000,000	\$604
Arizona	\$4,784,000,000	\$669
Arkansas	\$5,453,000,000	\$1,811
California	\$65,533,000,000	\$1,657
Colorado	\$19,170,000,000	\$3,320
Connecticut	\$9,825,000,000	\$2,725
Delaware	\$1,265,000,000	\$1,278
District of Columbia	\$2,220,000,000	\$3,220
Florida	\$46,559,000,000	\$2,162
Georgia	\$25,569,000,000	\$2,387
Guam	\$479,000,000	\$3,113
Hawaii	\$3,336,000,000	\$2,292
Idaho	\$2,586,000,000	\$1,406
Illinois	\$11,375,000,000	\$888
Indiana	\$10,132,000,000	\$1,493
Iowa	\$12,299,000,000	\$3,855
Kansas	\$4,239,000,000	\$1,443
Kentucky	\$7,483,000,000	\$1,661
Louisiana	\$26,904,000,000	\$5,776
Maine	\$3,995,000,000	\$2,932
Maryland	\$10,657,000,000	\$1,725
Massachusetts	\$21,710,000,000	\$3,088
Michigan	\$15,072,000,000	\$1,496
Minnesota	\$6,716,000,000	\$1,177
Mississippi	\$1,933,000,000	\$653
Missouri	\$9,102,000,000	\$1,479
Montana	\$347,000,000	\$320
Nebraska	\$3,171,000,000	\$1,617
Nevada	\$531,000,000	\$171

State	Total Reported Needs (January 2022 Dollars Rounded to the Nearest Million)	Per Capita Reported Needs (January 2022 Dollars per Person)
New Hampshire	\$4,287,000,000	\$3,112
New Jersey	\$19,352,000,000	\$2,083
New Mexico	\$12,280,000,000	\$5,799
New York	\$53,917,000,000	\$2,669
North Carolina	\$21,136,000,000	\$2,025
North Dakota	\$2,621,000,000	\$3,364
N. Mariana Islands	\$341,000,000	\$7,203
Ohio	\$20,555,000,000	\$1,742
Oklahoma	\$3,436,000,000	\$868
Oregon	\$5,541,000,000	\$1,308
Pennsylvania	\$12,765,000,000	\$982
Puerto Rico	\$2,711,000,000	\$825
Rhode Island	\$2,485,000,000	\$2,264
South Carolina	\$7,351,000,000	\$1,436
South Dakota	\$1,116,000,000	\$1,258
Tennessee	\$3,852,000,000	\$557
Texas	\$18,857,000,000	\$647
Utah	\$9,728,000,000	\$2,973
Vermont	\$2,104,000,000	\$3,272
Virgin Islands	\$157,000,000	\$1,800
Virginia	\$45,770,000,000	\$5,303
Washington	\$18,627,000,000	\$2,417
West Virginia	\$11,089,000,000	\$6,182
Wisconsin	\$12,013,000,000	\$2,038
Wyoming	\$699,000,000	\$1,213

5. Changes Since 2012

Between the 2012 and 2022 surveys, reported needs rose significantly from \$336.0 billion⁷ to \$630.1 billion. Many factors contributed to this large change. Two infrastructure categories were added in the 2022 total needs, the number of planned water quality projects addressing aging infrastructure and climate change adaptation increased, and an improved online portal simplified data collection and led to robust participation—all states participated in the 2022 CWNS.⁸ Additionally, costs based on escalation or inflation are not permitted in the survey, which may lead to an underestimate of future project costs. A comparison of needs reported in the last three surveys can be found in Appendix C.

Several legislative changes have affected the CWSRF program since the 2012 Report. The Water Resources Reform and Development Act (WRRDA, P.L. 113-121, June 10, 2014) expanded CWSRF eligibilities by adding eight areas of eligibility, allowing states to fund a broader range of non-traditional projects nationwide. The IIJA (P.L. 117-58, November 15, 2021) amended the CWA by adding section 609, which directs the EPA to align the CWNS data collection with the CWSRF eligibilities, including the expanded eligibilities added in 2014. Due to these changes, this Report includes reported needs in two categories that were not included in the 2012 total: \$94.4 billion in NPS Control (Category VII) and \$74.7 billion in Decentralized Wastewater Treatment Systems (Category XII).

Some modifications for the 2022 CWNS that did not affect the total reported needs include adjustments to the needs categories. The EPA condensed Stormwater Management (Category VI) from four subcategories in 2012 into three subcategories in 2022 (gray, green, and general stormwater management), renamed Recycled Water Distribution (Category X) to Water Reuse, and added Desalination (Category XIV) as its own category. Categories VIII (Confined Animal [Point Source]), IX (Mining [Point Source]), XI (Estuary Management), and XIII (Planning) have been excluded from data collection since 2004.

The three categories with the largest changes in reported needs from 2012 to 2022 are as follows:

- **Stormwater Management (Category VI)** increased by \$91.5 billion, a 385 percent increase from 2012. Legislative changes since 2012 have increased the types of stormwater projects eligible for CWSRF funding. In addition, stormwater management requirements have expanded in many urban areas since 2012, which has likely triggered construction and planning for new stormwater facilities.⁹ Heavy precipitation events can overwhelm previously adequate storm sewer infrastructure and, according to the Fifth National Climate Assessment,¹⁰ the frequency and intensity of these events is projected to increase over the 21st century. Additional impervious cover leads to increased runoff from storm events and necessitates expansion of existing systems to protect human health and water quality.¹¹

Reported Dollars

All needs amounts in this Report are shown in January 2022 dollars. Costs were adjusted using the U.S. Bureau of Labor Statistics Consumer Price Index.

7 2012 reported needs totaled \$336.0 billion in January 2022 dollars, converted from \$271 billion in January 2012 dollars. Appendix D presents the total 2012 reported needs for all categories by state in January 2022 dollars.

8 The 2012 CWNS did not include needs from South Carolina, American Samoa, and the Northern Mariana Islands.

9 <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources-resources>.

10 <https://doi.org/10.7930/NCA5.2023.CH1>.

11 <https://www.epa.gov/sourcewaterprotection/urbanization-and-stormwater-runoff>.

- **Advanced Wastewater Treatment (Category II)** increased by \$22.1 billion, a 36 percent increase from 2012. States have implemented more stringent discharge treatment standards to improve water quality in receiving waters. For example, many states have adopted standards for nitrogen and phosphorus since 2012 that secondary treatment processes would not meet.¹²
- **CSO Correction (Category V)** decreased by \$23.0 billion, a 39 percent decrease from 2012. Many combined sewer communities have made extensive investments in the last ten years to reduce their CSO discharges.¹³ Strategies such as integrated planning and smart sewer technology have also helped communities more cost-efficiently manage, reduce, or eliminate their CSOs.

EPA Program Highlight

For more information on the EPA's CSO program, visit <https://www.epa.gov/npdes/combined-sewer-overflows-csos>.

Table 3 and Figure 4 present a comparison of needs by category for the 2008, 2012, and 2022 surveys in billions of dollars (adjusted to January 2022 dollars). Note that there is no comparison for Desalination (Category XIV) needs, as they were not reported in a separate category in previous surveys.

Table 3. 2008–2022 CWNS Total Needs by Survey Year (January 2022 Dollars in Billions)

Category Number	Category Name	Survey Year			Change 2012 to 2022	
		2008	2012	2022	\$Billion	Percent Change
I	Secondary Wastewater Treatment	\$79.7	\$64.9	\$66.6	\$1.7	3%
II	Advanced Wastewater Treatment	\$60.3	\$61.5	\$83.6	\$22.1	36%
III–IV	Conveyance System Repair and New Conveyance Systems	\$109.9	\$118.7	\$151.1	\$32.4	27%
V	CSO Correction	\$84.5	\$59.5	\$36.5	-\$23.0	-39%
VI	Stormwater Management	\$56.2	\$23.8	\$115.3	\$91.5	385%
VII	NPS Control	\$30.3	NR	\$94.4	\$94.4	NA
X	Water Reuse	\$5.9	\$7.5	\$7.7	\$0.2	3%
XII	Decentralized Wastewater Treatment Systems	\$31.8	\$27.4	\$74.7	\$47.3	172%
XIV	Desalination	NR	NR	\$0.2	\$0.2	NA
Total	Total Needs for Categories I to XIV	\$458.6^a	\$363.4^a	\$630.1	\$266.7	73%
I–II	Wastewater Treatment Subtotal	\$139.9	\$126.4	\$150.2	\$23.8	19%
I–V	Wastewater Subtotal	\$334.5	\$304.7	\$337.8	\$33.1	11%

NA = not applicable; NR = not reported.

^a Includes NPS Control (Category VII) and/or Decentralized Wastewater Treatment Systems (Category XII) needs that were not included in the total needs since they were not specifically identified in CWA section 516(b)(1)(B). Since 2012, both the CWSRF eligibilities and CWNS data collection requirements have been amended in the CWA.

¹² <https://www.epa.gov/system/files/documents/2022-04/compendium-of-npdes-nutrient-permitting-approaches.pdf>.

¹³ <https://www.epa.gov/npdes/combined-sewer-overflow-program-progress>.

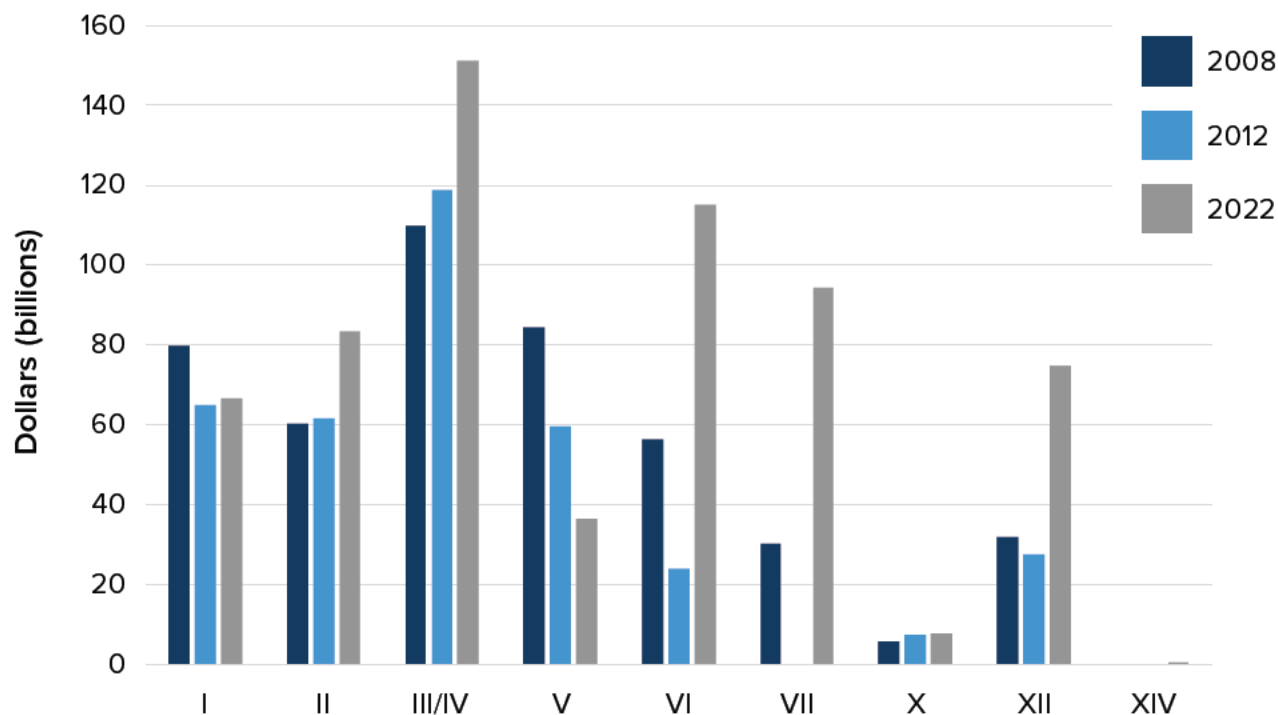


Figure 4. Total Reported Needs Nationwide for the 2008–2022 CWNS by Category (January 2022 Dollars in Billions)

6. 2022 Needs by CWNS Category

The following subsections present summaries and trends for each category in the 2022 survey. Appendix A contains detailed definitions of the categories.

Secondary Wastewater Treatment (Category I)

Highlights

- Category definition: The capital costs for wastewater treatment plants to meet secondary treatment standards.
- Total needs: \$66.6 billion.
- Change in total needs from 2012: Increase of 3 percent (\$1.7 billion).
- Number of states reporting needs: 54.
- States with the highest reported needs: New York (\$16.0 billion), California (\$7.0 billion), New Jersey (\$4.6 billion), Washington (\$4.3 billion), and Texas (\$4.0 billion).
- States with the largest per capita needs: Northern Mariana Islands (\$2,010), Guam (\$1,863), New York (\$794), Hawaii (\$693), and Kentucky (\$643).

Discussion

This category encompasses three types of need (with reporting varying by state): needs for treatment plants that meet secondary standards, some needs for primary and secondary unit processes at advanced treatment plants, and needs for treatment plants that provide less-than-secondary-treated effluent (although this is relatively rare in the United States, as discussed later in this Report). Category I needs increased by 3 percent compared to 2012 needs. As discussed in the Advanced Wastewater Treatment section, the more substantial increase for wastewater treatment needs was associated with advanced treatment.

The vast majority of the costs were documented with planning documents, with less than one percent (\$583 million) estimated using the EPA's CETs. Sixty-four percent of the needs under this category (\$42 billion) were supported by CIPs.



Interior of the biosolids reuse processing facility at the Village Creek Water Reclamation Plant in Fort Worth, TX. *Photo Credit: Texas Water Development Board.*

Advanced Wastewater Treatment (Category II)

Highlights

- Category definition: The capital costs for wastewater treatment plants to attain or maintain a level of treatment that is more stringent than secondary treatment.
- Total needs: \$83.6 billion.
- Change in total needs from 2012: Increase of 36 percent (\$22.1 billion).
- Number of states reporting needs: 50.
- States with the highest reported needs: Florida (\$13.9 billion), California (\$10.8 billion), Georgia (\$7.1 billion), Colorado (\$5.6 billion), and North Carolina (\$4.1 billion).
- States with the largest per capita needs: Utah (\$1,070), Colorado (\$976), Iowa (\$973), Georgia (\$661), and Florida (\$644).

Discussion

Needs for Category II increased by 36 percent compared to 2012 needs. As discussed in the Secondary Wastewater Treatment section, some states reported all needs for a treatment plant providing advanced treatment under this category, while other states reported only the needs for the unit processes contributing to advanced treatment.

Fifty out of 56 states reported needs in this category; states that did not report Category II needs were Alaska, American Samoa, Guam, Northern Mariana Islands, Virgin Islands, and Wyoming. Although Alaska and Wyoming did report having treatment plants with advanced effluent, there were no reported Category II needs for these plants. Advanced treatment needs continued to be highest in Florida, California, and North Carolina, with Georgia and Colorado also in the top five states reporting needs.

Advanced treatment needs constituted a higher percentage of wastewater treatment plant needs in 2022 (56 percent) as compared to 2012 (49 percent). Sixty-two percent of the needs under this category (\$51.6 million) were supported by CIPs. Three percent (\$2.9 billion) were estimated using the EPA's CETs.

Of the 17,544 treatment plants reported as existing in 2022, 6,705 currently provide advanced treatment. By the end of the survey period, 7,576 of the 17,679 total treatment plants are expected to provide advanced treatment. Of those, 161 were reported as newly planned treatment facilities to be constructed within the survey period.

Needs of Note

The Milwaukee (Wisconsin) Metropolitan Sewerage District reported Category II needs to increase the capacity of the District's Jones Island Water Reclamation Facility to use landfill gas, a natural byproduct of decomposition in the city's Metro Landfill, in place of natural gas. The landfill gas will be used as a source of energy to help power the treatment plant and will also be used to produce biosolids-based commercial fertilizer that is sold across the country. This Category II project will build infrastructure to treat gas from the landfill and deliver it to the district's landfill gas pipeline.

Conveyance System Repair (Category III) and New Conveyance Systems (Category IV)

Highlights

- Category definitions: The capital costs to rehabilitate and replace existing conveyance systems and install new ones.
- Total needs: \$151.1 billion.
- Change in total needs from 2012: Increase of 27 percent (\$32.4 billion).
- Number of states reporting needs: 55.
- States with the highest reported needs: New York (\$18.9 billion), California (\$15.0 billion), Florida (\$10.6 billion), Ohio (\$9.8 billion), and North Carolina (\$7.3 billion).
- States with the largest per capita needs: Northern Mariana Islands (\$5,147), District of Columbia (\$1,932), Virgin Islands (\$1,681), Hawaii (\$1,448), and West Virginia (\$1,266).



Construction on the Christina River Force Main that conveys wastewater to the Wilmington Water Pollution Control Facility in DE. *Photo credit to Delaware Department of Natural Resources and Environment Control.*

Discussion

Needs for the nation's wastewater conveyance systems continued to increase. Categories III and IV include the costs to: correct inflow and infiltration (I/I) problems; rehabilitate and replace structurally deteriorating sanitary or combined sewers for existing pipe; and construct new collector and interceptor sewers, pump stations, and appurtenances. The 27 percent increase from \$118.7 billion in 2012 to \$151.1 billion in 2022 is likely due to a combination of factors, including the aging of the nation's conveyance systems, system expansion to accommodate population growth, and installation of new conveyance systems in areas served by failing decentralized wastewater treatment systems.

All states except for American Samoa reported needs in Categories III and/or IV. Reported needs continued to be highest in New York, California, Florida, and Ohio, with North Carolina moving into the top five states reporting needs. Sixty-six percent of the needs under this category (\$99.8 billion) were documented in CIPs.

Sanitary Sewer Overflow Correction

Sanitary sewer overflows (SSOs) are untreated or partially treated releases of sewage from sanitary sewer systems before it reaches the POTW treatment plant. Of the \$26.6 billion reported needs to eliminate SSOs (8 percent of the total wastewater need), the majority (81 percent) was reported under Categories III and IV for corrections to collection systems (e.g., eliminating basement backups, repairing collection systems, adding system capacity). The remaining \$5.2 billion was for wastewater treatment, such as treatment plant expansion, including \$2.5 billion for needs in the Secondary Wastewater Treatment category (Category I) and \$2.6 billion for needs in the Advanced Wastewater Treatment category (Category II).¹⁴

Combined Sewer Overflow Correction (Category V)

Highlights

- Category definition: The capital costs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater that occur when the capacity of a sewer system is exceeded during a wet weather event.
- Total needs: \$36.5 billion.
- Change in total needs from 2012: Decrease of 39 percent (\$23.0 billion).
- Number of states reporting needs: 35.
- States with the highest reported needs: New York (\$6.0 billion), Pennsylvania (\$4.4 billion), New Jersey (\$3.6 billion), Connecticut (\$2.9 billion), and Indiana (\$2.9 billion).
- States with the largest per capita needs: West Virginia (\$922), Connecticut (\$817), District of Columbia (\$575), Rhode Island (\$534), and Indiana (\$431).

¹⁴ State coordinators designated which needs in Categories I–IV were for SSO correction at the needs category level, not at the project level. Therefore, some projects may not be included, if only a portion of the category needs were for correcting an SSO.

Discussion

Category V needs continued to decline, with a 39 percent (\$23.0 billion) decline since 2012, following the 33 percent decline from 2008 to 2012.¹⁵ Changes in CSO control best practices have likely contributed to this continuing trend. Strategies such as integrated planning and smart sewer technology have helped communities more cost-efficiently manage, reduce, or eliminate their CSOs. The majority (55 percent or \$20.1 billion) of needs under this category were supported by CIPs, which typically have a five-year planning horizon. These short-term planning documents likely do not represent the full 20-year needs as compared to longer-term planning documents, such as long-term control plans. These longer-term planning documents only supported 13 percent (\$4.9 billion) of Category V needs in 2022 but were used to document a higher percentage of needs in previous surveys; this shift in use of longer-term plans may have also contributed to the decline. Reported needs continued to be highest in New Jersey, New York, and Indiana, with Pennsylvania and Connecticut moving into the top five states reporting needs.

EPA Program Highlight

For more information on integrated planning, visit <https://www.epa.gov/npdes/integrated-planning-municipal-stormwater-and-wastewater>.

EPA Program Highlight

The EPA's Sewer Overflow and Stormwater Reuse Municipal Grant Program, also referred to as the Overflow Stormwater Grant Program, awards grants to the states to provide sub-awards to eligible municipalities or municipal entities for the planning, design, and construction of eligible projects to address infrastructure needs for CSOs, SSOs, and stormwater management. For more information, visit <https://www.epa.gov/cwsrf/sewer-overflow-and-stormwater-reuse-municipal-grants-program>.

Stormwater Management (Category VI)

Highlights

- Category definition: The capital costs to plan and implement structural and nonstructural measures to control the runoff water resulting from precipitation (stormwater) in National Pollutant Discharge Elimination System Phase I, Phase II, and nontraditional municipal separate storm sewer systems (MS4s), as well as unregulated communities.
- Total needs: \$115.3 billion.
- Change in total needs from 2012: Increase of 385 percent (\$91.5 billion).
- Number of states reporting needs: 51.
- States with the highest reported needs: Virginia (\$30.2 billion), California (\$16.2 billion), Florida (\$12.0 billion), Massachusetts (\$7.7 billion), and Michigan (\$6.0 billion).
- States with the largest per capita needs: Virginia (\$3,495), Massachusetts (\$1,096), Vermont (\$982), New Mexico (\$877), and Colorado (\$764).

¹⁵ Due to inconsistencies in how states categorize gray versus green CSO infrastructure projects, these projects' needs were entered together under a single category in 2022 (in 2012, the needs were entered in separate subcategories).

Discussion

Category VI needs increased by 385 percent (\$91.5 billion) due to many factors. Most importantly, WRRDA expanded CWSRF eligibilities for stormwater projects under CWA section 603(c). This broadened the types of stormwater projects eligible for inclusion in this survey compared to 2012. As discussed in section 5, other factors include changing stormwater management requirements, an increase in the frequency and intensity of heavy precipitation events due to climate change, and an increase in impervious surfaces; all of these have contributed to the significant increase in reported needs. State participation also increased from 35 states in 2012 to 51 states in 2022.

EPA Program Highlight

The EPA estimates there are 855 Phase I MS4s and 6,695 Phase II MS4s nationwide; however, 1,327 Phase I MS4s and 5,528 Phase II MS4s reported needs in the survey.¹⁶ For more information, visit <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources>.

As shown in Figure 5, the growth in green infrastructure needs was a substantial portion of this category’s increase since 2012. Needs continued to be high in California, with Virginia, Florida, Massachusetts, and Michigan moving into the top five states reporting needs.

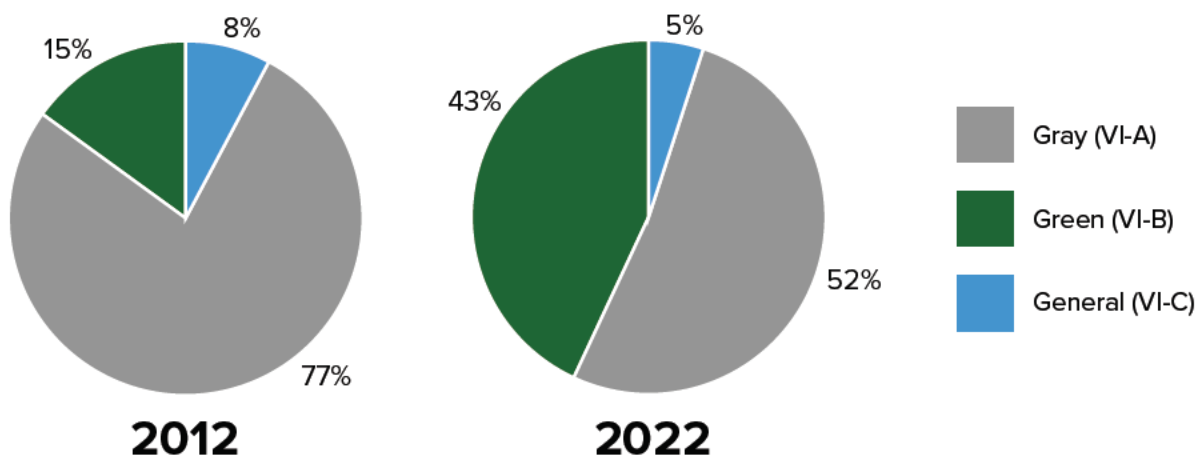


Figure 5. Percent of Stormwater Needs by Subcategory in 2012 and 2022

Forty percent of the needs under this category (\$45.8 billion) were supported by CIPs, and 29 percent (\$33.0 billion) were supported by watershed-based plans. The majority of the \$33.0 billion was for nutrient reductions in the Chesapeake Bay watershed, with \$30.2 billion reported in Virginia and \$1.7 billion in Pennsylvania.

Needs of Note

Virginia applied the Chesapeake Assessment Scenario Tool (CAST) to estimate needed stormwater best management practices (BMPs) and associated costs to reach the objectives of Virginia’s Total Maximum Daily Load (TMDL) Phase III Watershed Implementation Plan.

¹⁶ The CWNS review process did not include verifying the existence of MS4s.

Nonpoint Source Control (Category VII)

Highlights

- Category definition: The capital costs to manage and/or treat NPS pollution, which is any source of water pollution that does not meet the legal definition of “point source,” per CWA section 502(14). NPS pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.
- Total needs: \$94.4 billion.
- Change in total needs from 2012: Not reported in 2012.
- Number of states reporting needs: 50.
- States with the highest reported needs: Louisiana (\$22.0 billion), California (\$9.2 billion), New Mexico (\$7.1 billion), Colorado (\$4.9 billion), and West Virginia (\$4.8 billion).

Discussion

Category VII needs constituted 15 percent of the 2022 needs. While Category VII was not included in the 2012 Report, it was reported in prior surveys and has been historically underrepresented. To more fully account for these needs in the 2022 CWNS, the EPA investigated methods for improving state reporting and developed CETs for two of the Category VII subcategories (VII-A Agriculture [Cropland] and VII-C Silviculture), which had near national coverage. The EPA investigated creating additional NPS CETs but could not implement them due to the site-specificity of many NPS practices and the lack of current, national-level datasets. Table 4 presents the needs and the number of states reporting needs by subcategory.

The five states with the highest needs in this category (see above) account for over 50 percent of the reported NPS needs. Louisiana alone documented \$22.0 billion of the Category VII needs using its *Comprehensive Master Plan for a Sustainable Coast*, which outlines a plan to respond to the loss of coastal land due to climate change and human impacts. Documentation for the remaining needs included \$24.1 billion estimated using the CETs and \$31.0 billion reported through state-specific approaches.

The \$94.4 billion in Category VII needs encompasses more larger-scale and longer-term needs than wastewater and stormwater categories. Needs were primarily documented by state-specific approaches and statewide CETs that cover a large geographic area. These documents also included longer-term planning needs compared to what is typically included in municipal or utility budget documents (e.g., five-year CIPs). Although the EPA’s CETs estimated five-year needs for consistency with other planning documentation, state-specific approaches and other documentation used to support these needs may align better with the 20-year survey period.

Needs of Note

Michigan reported needs in Category VII-G (Resource Extraction) to address the buildup of “stamp sands” in Lake Superior and restore water quality in the lake’s Buffalo Reef, a critical trout and whitefish spawning habitat. The stamp sands are 23 million tons of copper mining tailings that were dumped in the watershed about a century ago and moved by lake currents to the Buffalo Reef area. The project would remove these deposits and place them in a newly built landfill near the lake.

Table 4. NPS Control Needs by Subcategory

Subcategory Number	Category Name	2022 Needs (\$Billion)	Number of States Reporting Needs
VII-A	Agriculture (Cropland)	\$27.6	43
VII-B	Agriculture (Animals)	\$2.0	21
VII-C	Silviculture	\$15.8	29
VII-E	Groundwater Protection (Unknown Source)	\$0.5	10
VII-F	Marinas	<\$0.05	4
VII-G	Resource Extraction	\$3.1	7
VII-H	Brownfields/Superfund	\$0.8	8
VII-I	Storage Tanks	\$0.3	6
VII-J	Sanitary Landfills	\$0.8	17
VII-K ^a	Hydromodification	\$33.5	35
VII-M	Other Estuary Management Activities	\$9.9	10

^a Due to the broad nature of Subcategory VII-K, needs included projects to address conventional hydromodification (altering the hydrological characteristics of coastal and non-coastal waters) as well as other NPS Control projects whose tie to hydromodification was not clear but that were related to wetland or riparian area protection or restoration.

Identifying projects and assessing the cost to implement them continues to be a challenge across all NPS Control subcategories. Some state coordinators decided to focus their limited resources on gathering needs for wastewater and stormwater infrastructure because acceptable cost documentation was harder to obtain for Category VII projects. Additionally, not all state CWSRF programs fund NPS control projects, so some states may not have this information readily available.



Riparian restoration project to return Squalicum Creek to its natural conditions in WA. *Photo credit: Washington Department of Ecology.*

Water Reuse (Category X)

Highlights

- Category definition: The capital costs associated with conveyance of treated wastewater that is being reused, including associated rehabilitation/replacement needs.
- Total needs: \$7.7 billion.
- Change in total needs from 2012: Increase of 3 percent (\$0.2 billion).
- Number of states reporting needs: 31.
- States with the highest reported needs: California (\$3.8 billion), Florida (\$951 million), Virginia (\$710 million), Texas (\$659 million), and New Mexico (\$340 million).

Discussion

Water Reuse (previously named “Recycled Water Distribution”) needs increased slightly (3 percent) between 2012 and 2022, with the number of states reporting needs increasing from 25 to 31. Reported needs continued to be highest in California and Florida, with Virginia, Texas, and New Mexico moving into the top five states reporting needs. Note that this category only captures needs associated with conveying treated wastewater intended for reuse. The needs associated with improving effluent water quality to a level sufficient for reuse are reported under Category II.

Figure 6 shows the reuse discharge types that states reported for treatment plants in 2022 and expected in 2042. The most prevalent reuse discharge types reported are irrigation (landscape- and agriculture-related) and environmental restoration/groundwater discharge. Other reuse discharge types such as impoundments, industrial, potable, and other centralized non-potable reuse were reported less often but are expected to grow over the next 20 years.

Needs of Note

The Sacramento Regional County Sanitation District in California reported \$441.4 million in needs to develop infrastructure to deliver recycled water to agricultural lands as part of the district’s Harvest Water program. The program, which aims to irrigate over 16,000 acres, would sustain prime agricultural areas while promoting groundwater recharge. The hydrologic restoration would provide habitat for threatened species and support a longer salmon migration window, among other ecological benefits.

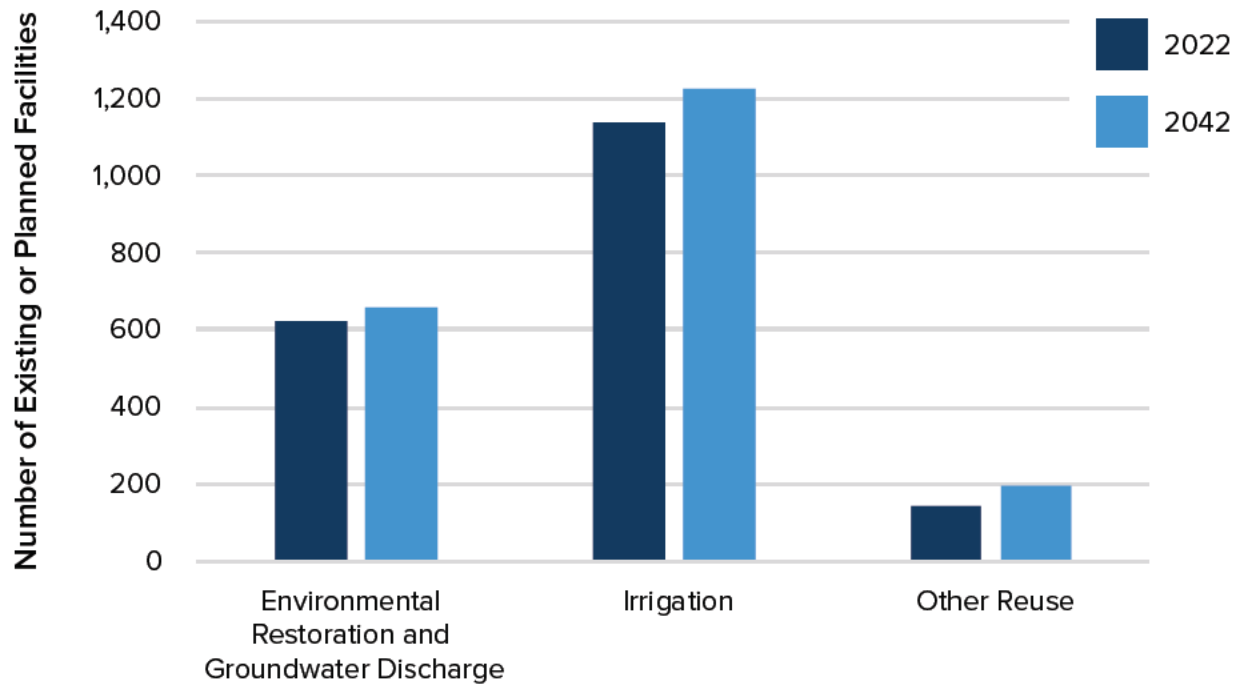


Figure 6. Number of Reported Reuse Discharge Types in 2022 and 2042¹⁷

Decentralized Wastewater Treatment Systems (Category XII)

Highlights

- Category definition: The capital costs associated with the rehabilitation, replacement, or new installation of on-site (individual) or clustered (community) systems.
- Total needs: \$74.7 billion.
- Change in total needs from 2012: Increase of 172 percent (\$47.3 billion).
- Number of states reporting needs: 43.
- States with the highest reported needs: Florida (\$8.3 billion), Texas (\$7.2 billion), New York (\$6.7 billion), Georgia (\$6.0 billion), and North Carolina (\$5.2 billion).
- States with the largest per capita needs: Maine (\$1,254), New Hampshire (\$909), Iowa (\$743), Wisconsin (\$603), and Georgia (\$562).

¹⁷ These numbers represent the number of reuse discharge types; because some treatment plants may discharge to more than one type of reuse, the number of treatment plants may be double counted.

Discussion

Decentralized wastewater treatment systems include both individual on-site septic systems and clustered systems. Examples of clustered systems include small collection systems that feed into a common septic tank and drainfield, as well as small package treatment plants. (The needs for these package treatment plant systems may be included elsewhere in this Report, since it was up to the state coordinator to determine whether a project constituted a Category XII decentralized system or a Category I or II POTW.)

Needs of Note

Alabama used the *Black Belt Region Wastewater Funding Needs* report, developed by the Universities of Alabama and South Alabama, to document \$1.4 billion in Category XII needs. The report details decentralized wastewater needs in 16 Alabama counties that are all characterized by low population density, low economic development, and impermeable clay soils in which conventional septic systems do not work. The report identifies the locations and cost estimates for both clustered and traditional decentralized systems in each of the 16 counties.

The needs for the rehabilitation, replacement, or new installation of decentralized wastewater treatment systems increased by 172 percent (\$47.3 billion) since 2012.¹⁸ One key factor in this increase was the number of states reporting needs, which rose from 27 in 2012 to 43 in 2022. The EPA also developed a CET to assign costs for documented decentralized projects without detailed cost estimates. About 80 percent (\$60.0 billion) of the costs for Category XII were generated using the EPA's CET.

The EPA also saw an increase in the use of state-specific approaches to document needs in this category. Eighty-eight percent (\$66.1 billion) of the needed projects were supported by these approaches, many of which used septic system installation permit data in conjunction with the EPA's CETs to estimate a 20-year need.

Reported decentralized needs continued to be highest in Florida, with Texas, New York, Georgia, and North Carolina moving into the top five states reporting needs. As with Category VII, many states did not have data on the number of needed decentralized wastewater treatment systems and did not have statewide databases of construction costs. Also, some state CWSRF programs do not fund decentralized projects and therefore may not have reported these needs.

Desalination (Category XIV)

Highlights

- Category definition: The capital costs associated with the treatment and disposal of brine, desalination of brackish water to augment water supply, aquifer recharge using desalinated sea water, and treatment/reinjection of brackish groundwater.
- Total needs: \$201 million.
- Change in total needs from 2012: Not reported in 2012.
- Number of states reporting needs: 2.
- States with reported needs: Texas (\$201 million, representing 99 percent of the need) and New Jersey.

¹⁸ Category XII needs were reported in Appendix D of the 2012 Report rather than the main body since they were not specifically identified in CWA section 516(b)(1)(B). Since that time, both the CWSRF eligibilities and CWNS data collection requirements have been amended in the CWA.

Discussion

Category XIV needs have not been reported in a separate category in previous surveys; they may have been included in Categories I or II. Investments in desalination were relatively low compared to investments in other categories; only Texas and New Jersey reported Category XIV needs, with the vast majority in Texas.

Needs of Note

Texas' Brackish Carrizo-Wilcox Project plans to treat brackish groundwater to augment drinking water supplies in Guadalupe and Wilson counties. The project includes a 17.1 million gallon per day treatment plant with desalination, along with new drinking water infrastructure and additional wastewater infrastructure. The resulting brine wastes will be injected into five approved injection wells for disposal of desalination concentrate.

7. Urban and Rural Area Needs

Data from the 2022 CWNS and the U.S. Census Bureau were used to classify reported needs in urban¹⁹ and rural areas in the United States. NPS Control (Category VII) and Decentralized Wastewater Treatment Systems (Category XII) needs presented in this Report are not included in this section because many were reported at the state or county level. Therefore, the EPA could not reasonably determine the distribution of urban and rural needs for Categories VII and XII.

The distribution of urban and rural total reported needs for wastewater and stormwater infrastructure is \$404.0 billion (88 percent) urban and \$57.0 billion (12 percent) rural. Total urban needs for wastewater treatment and collection (Categories I through V) equal \$300.0 billion (89 percent). Total rural needs for these categories equal \$37.8 billion (11 percent).

The majority of the needs in urban areas (67 percent) were in the following three categories: Conveyance System Repair (Category III) at \$98.1 billion, Stormwater Management (Category VI) at \$97.6 billion, and Advanced Wastewater Treatment (Category II) at \$74.8 billion. For rural areas, most of the needs (68 percent) were in the following three categories: Stormwater Management (Category VI) at \$17.7 billion, Conveyance System Repair (Category III) at \$12.0 billion, and Secondary Wastewater Treatment (Category I) at \$9.0 billion. Notably, both the Stormwater Management and Conveyance System Repair needs categories were in the top three for both urban and rural areas. Reported needs for Advanced Wastewater Treatment were proportionally greater in urban areas than in rural areas, but needs for Decentralized Wastewater Treatment Systems made up a greater proportion of the needs in rural areas.

¹⁹ The 2020 Census defines an "urban area" as "a densely settled core of census blocks that meet minimum housing unit density and/or population density requirements. This includes adjacent territory containing non-residential urban land uses. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,000 housing units or have a population of at least 5,000." Previously, the minimum was 2,500 people. All areas not classified as urban by the U.S. Census Bureau were considered rural for this Report.

Small Community Wastewater Needs

The small percentage of total national needs that were reported in rural areas may be due in part to the lack of responses from small communities. For the purposes of the CWNS, small communities are defined as those with populations of 10,000 or fewer. (States designated submissions as serving small communities using a checkbox during data entry. The EPA also included communities in the small-community analysis based on the reported population served.^{20,21})

Over 60 percent (14,457) of wastewater submissions (e.g., collection systems, treatment plants, pump stations) were for communities identified as small. The needs captured by those submissions apply to only 12 percent (32.8 million people) of the U.S. population and account for \$47.1 billion in wastewater needs. This represents 14 percent of the \$345.7 billion total reported wastewater needs. Table 5 presents small community wastewater needs by category.

Table 5. 2022 CWNS Small Community Wastewater Needs by Category (January 2022 Dollars in Billions)

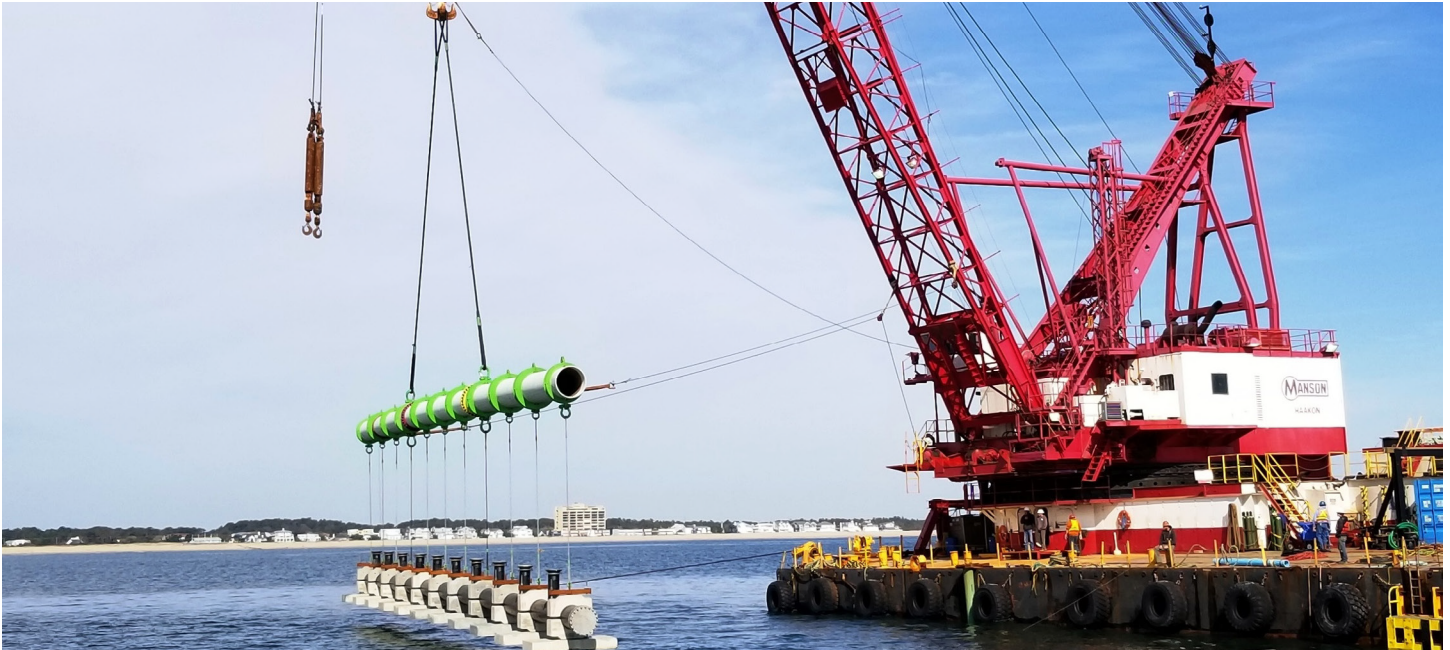
Category Number	Category Name	\$Billion
I	Secondary Wastewater Treatment	\$11.5
II	Advanced Wastewater Treatment	\$12.1
III and IV	Conveyance System Repair and New Conveyance Systems	\$21.9
V	CSO Correction	\$1.2
X	Water Reuse	\$0.4
Total		\$47.1

The states with the highest reported needs for communities identified as small were Utah (\$5.2 billion), West Virginia (\$2.6 billion), New York (\$2.3 billion), Massachusetts (\$2.1 billion), and Wisconsin (\$1.9 billion). These states accounted for about 30 percent of the small community wastewater needs.

As with previous surveys, the reported needs likely underestimate the actual need in small communities. Of the 14,457 wastewater submissions meeting the survey's criteria for such communities, only 41 percent (5,976 submissions) reported needs. State coordinators indicated that eliciting small community responses to the survey was difficult due to insufficient staff capacity in such communities, potential distrust of the EPA, and lack of understanding of the survey's purpose. In anticipation of these challenges, and because many communities lack the capacity for capital improvement planning, the EPA developed an online form specifically for small communities that would serve as an alternative form of documentation. Despite this resource and additional outreach, only 6 percent of the small community forms sent out by state coordinators were returned. Some state coordinators also noted that they focused their limited resources on collecting data for larger communities with readily available documentation and higher potential needs per project, to the detriment of small community needs collection. Given that most small communities are in rural areas, this underestimation of wastewater needs in small communities affects the proportion of rural needs.

20 While population served by centralized wastewater treatment can approximate a community's population, it does not account for any population served by decentralized wastewater treatment such as individual septic systems.

21 Needs for wastewater submissions serving populations of 10,000 or fewer that were part of larger sewersheds were not included: the EPA presumed that these treatment plants were serving parts of large communities.



Construction of an ocean outfall pipe as part of upgrades to the local wastewater treatment plant to eliminate discharges to the Lewes and Rehoboth Canal in DE. *Photo Credit: Delaware SRF.*

8. Trends in the Nation's Ability to Provide Wastewater Treatment

As of January 1, 2022, submitted survey data indicated that 17,544 POTWs served 270.4 million Americans, or 82 percent of the population.²² Of the total U.S. population, about 70 percent are served by POTWs with secondary or advanced treatment (233.6 million people). Table 6 presents the level of centralized treatment provided based on the data presented in both this Report and in past surveys. This table does not include populations served by decentralized wastewater treatment, such as private septic systems, or the estimated population of 2.2 million people without access to basic running water or indoor plumbing.

Centralized Wastewater Treatment in 2022

- 17,544 publicly owned treatment works
- 270.4 million Americans served
- 82 percent of the population

Since the passage of the CWA in 1972, the level of wastewater treatment provided to the public has vastly improved. The number of people served by advanced wastewater treatment grew from 7.8 million in 1972 to an estimated 139.3 million in 2022 (Figure 7). Furthermore, the population served by less-than-secondary treatment has decreased from almost 60 million (28 percent of total population) in 1972 to an estimated 3.8 million in 2022 (one percent of the total population).

²² Total population from the 2020 U.S. Census: <https://www2.census.gov/programs-surveys/decennial/2020/data/apportionment/apportionment-2020-table02.xlsx>.

Based on current data trends, the nation continues to make progress toward eliminating raw and less-than-secondary-treated effluent discharged to the nation's surface water bodies. The number of facilities that provide less-than-secondary treatment is projected to decline from 65 to 58, although the populations served by these facilities are projected to increase slightly from 3.8 million to 4.0 million people over the next 20 years. As mentioned in the introduction, most of the reported needs (and associated technical data) came from documents with 5- to 10-year planning horizons. The projected number of new treatment plants may therefore be undercounted. Overall, projections based on the survey data suggest that a total of 17,679 operational facilities will serve a future population of 287.4 million people in 2042.

In addition to effluent treatment level, the 2022 CWNS collected data on discharge methods. Some facilities split their effluent between surface water and non-discharging, while other facilities were 100 percent non-discharging. ("Non-discharging" refers to effluent that is not discharged to surface waters but instead is evaporated or reused for beneficial purposes—e.g., spray irrigation, groundwater recharge.) The population served by facilities that are fully or partially non-discharging increased from 16 million in 2012 to 33.0 million—or 10 percent of the U.S. population—in 2022. Of the 2,543 facilities that are 100 percent non-discharging, one percent currently provide less-than-secondary treatment, 78 percent provide secondary treatment, and 21 percent provide advanced treatment. Survey results indicate that if the wastewater treatment needs (Categories I and II) reported in the survey are met and water reuse becomes more widely adopted, the number of non-discharging facilities is projected to increase from 2,543 to 2,710 and the population served by those facilities is projected to increase by 21 percent (8.8 million people).

EPA Program Highlight

The EPA and U.S. Department of Agriculture Rural Development, in collaboration with states, are partnering on the Closing America's Wastewater Access Gap Community Initiative. They will jointly leverage technical assistance resources to help historically underserved communities identify, and pursue, federal funding opportunities to address their wastewater needs. For more information, visit <https://www.epa.gov/water-infrastructure/closing-americas-wastewater-access-gap-community-initiative>.



Repairs underway on the Hampton Roads Sanitation District wastewater system in VA. *Photo Credit: Virginia Department of Environmental Quality.*

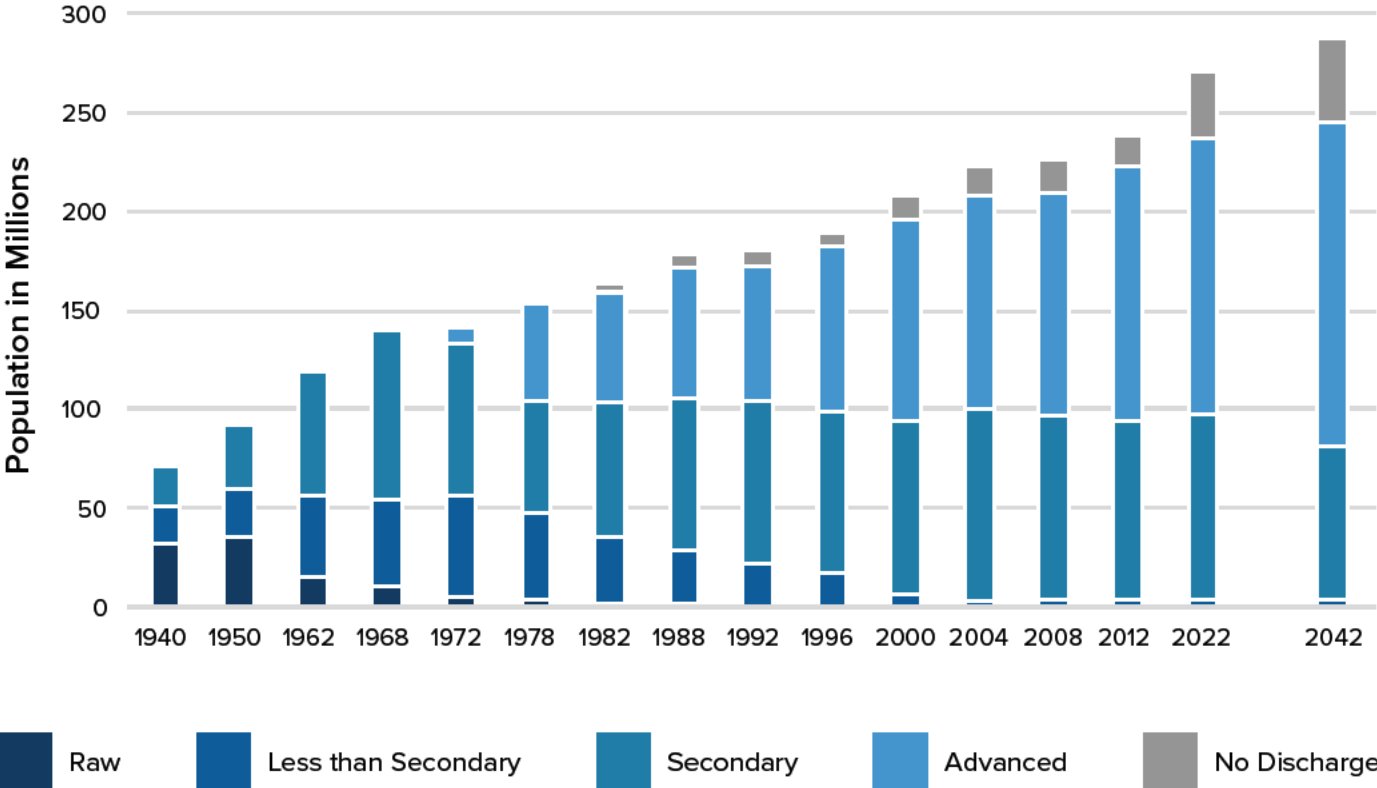


Figure 7. Population Served by POTWs for Select Years Between 1940 and 2022 and Projected (If All Needs Are Met) by Treatment Level

Table 6. Changes over Time in POTW Discharge to Surface Water

Treatment Level and Discharge Location ^a	Population Served in Millions (Number of Facilities)				Population Change 2012–2022	Projected Population Change 2022–2042
	2008	2012	2022	2042		
Less-than-secondary discharge to surface water	3.8 (30)	4.1 (34)	3.8 (65)	4.0 (58)	-7%	4%
Secondary discharge to surface water ^b	92.7 (7,417)	90.4 (7,397)	94.3 (8,769)	77.1 (8,058)	4%	-22%
Advanced discharge to surface water	113.0 (5,072)	127.7 (5,036)	139.3 (6,167)	164.6 (6,853)	8%	15%
No discharge to surface water ^c	16.9 (2,251)	16.0 (2,281)	33.0 (2,543)	41.8 (2,710)	52%	21%
Total	226.4 (14,770)	238.2 (14,748)	270.4 (17,544)	287.4 (17,679)	12%	6%

^a This table includes survey response data as well as best available information for states that did not have the resources to update the data for all facilities. For the latter, information for this table was taken from previous surveys.

^b Includes facilities reported as “Partial Treatment” in previous surveys. Data indicate that these were primarily facilities that discharged to other facilities.

^c The number of “No Discharge” facilities represents only treatment plants that are 100 percent non-discharging. Facilities that partially discharge to surface water and are partially non-discharging are included under the surface water discharge entries. However, the population served by these partial discharge/partial non-discharge facilities is accounted for proportionally under each entry based on percent of flow. Therefore, neither the number of facilities nor populations are double counted.

Appendix A: 2022 CWNS Needs Categories Definitions

Table A-1. 2022 CWNS Needs Categories Definitions

2022 Category Number	Category Name	Description
I	Secondary Wastewater Treatment	<p>This category includes needs for meeting secondary treatment criteria. Secondary treatment typically requires a treatment level that produces an effluent quality of 30 milligrams per liter of both 5-day biochemical oxygen demand (BOD₅) and total suspended solids. (Secondary treatment levels required for some lagoon systems may be less stringent.) In addition, the secondary treatment must remove 85 percent of BOD₅ and total suspended solids from the influent wastewater.</p> <p>This category also includes facilities granted waivers of secondary treatment for marine discharges under section 301(h) of the CWA and “honey bucket lagoons,” though they do not provide secondary treatment.</p>
II	Advanced Wastewater Treatment	<p>This category includes needs for attaining or maintaining a level of treatment that is more stringent than secondary treatment or producing a significant reduction in nonconventional or toxic pollutants in the wastewater treated by a facility. A facility is considered to have advanced wastewater treatment if it achieves one or more of the following: BOD₅ less than 20 milligrams per liter, nitrogen removal, phosphorus removal, ammonia removal, metal removal, or synthetic organic removal.</p>
III-A	I/I Correction	<p>This category includes needs for correction of sewer system I/I problems. For infiltration, this includes controlling the penetration of water into a sanitary or combined sewer system from the ground through defective pipes or manholes. For inflow, it includes controlling the penetration of water into the system from drains, storm sewers, and other improper entries. It also includes costs for preliminary sewer system analysis and detailed sewer system evaluation surveys.</p>
III-B	Sewer Replacement/ Rehabilitation	<p>This category includes needs for the maintenance (above and beyond ongoing operations and maintenance), reinforcement, or reconstruction of structurally deteriorating sanitary or combined sewers. The corrective actions must be necessary to maintain the structural integrity of the system.</p>

2022 Category Number	Category Name	Description
IV-A	New Collector Sewers and Appurtenances	This category includes needs for new pipes used to collect wastewater from a sanitary or industrial wastewater source and carry it to an interceptor sewer that will convey it to a treatment facility.
IV-B	New Interceptor Sewers and Appurtenances	This category includes needs for constructing new interceptor sewers and pumping stations to convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. Needs for relief sewers are included in this category.
V	CSO Correction	This category includes needs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater (CSOs) that occur when the capacity of a sewer system is exceeded during a wet weather event. This category does not include needs for overflow control allocated to flood control, drainage improvement, or the treatment or control of stormwater in separate storm systems.
VI-A	Gray Infrastructure	This category includes needs for stormwater management program activities associated with the planning, design, and construction of stormwater conveyance structures (e.g., pipes, inlets, roadside ditches, and other similar mechanisms). This category also includes needs associated with the planning, design, and construction of structural BMPs that treat stormwater (e.g., wet ponds, dry ponds, manufactured devices).
VI-B	Green Infrastructure	This category includes needs for stormwater management program activities associated with the planning, design, and construction of low-impact development and green infrastructure (e.g., bioretention, constructed wetlands, permeable pavement, rain gardens, green roofs, cisterns, rain barrels, vegetated swales, restoration of riparian buffers and flood plains).
VI-C	General Stormwater Management	This category includes needs for activities associated with implementing a stormwater management program. These needs can include geographic information systems and tracking systems, equipment (e.g., street sweepers, vacuum trucks), stormwater education program startup costs (e.g., setting up a stormwater public education center, building a traveling stormwater education display), and stormwater management plan development.

2022 Category Number	Category Name	Description
VII-A	NPS Control: Agriculture (Cropland)	This category includes costs to address NPS pollution control needs associated with agricultural activities related to croplands. These activities include plowing, pesticide spraying, irrigation, fertilizing, planting, and harvesting. Examples of BMPs used to address these needs are conservation tillage, nutrient management, and irrigation water management.
VII-B	NPS Control: Agriculture (Animals)	This category includes all costs that address NPS pollution control needs associated with agricultural activities related to animal production (e.g., confined animal facilities and grazing). Some typical BMPs used to address agriculture (animal) needs are animal waste storage facilities, animal waste nutrient management, composting facilities, and planned grazing. Any costs associated with facilities or measures that address point source pollution discharges are not reported in this category.
VII-C	NPS Control: Silviculture	This category includes all costs that address NPS pollution control needs associated with forestry activities, such as removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for tree planting. Some typical BMPs used to address silviculture needs are pre-harvest planning, streamside buffers, road management, revegetation of disturbed areas, structural practices (e.g., sediment control structure), and equipment (e.g., timber harvesting equipment).
VII-E	NPS Control: Groundwater Protection (Unknown Source)	This category includes all costs that address groundwater protection NPS pollution control needs, such as wellhead and recharge area protection activities. Any need that can be attributed to a specific cause of groundwater pollution, such as leaking storage tanks, soil contamination in a brownfield, or leachate from a sanitary landfill, is reported in the appropriate specific category.
VII-F	NPS Control: Marinas	This category includes all costs that address NPS pollution control needs associated with boating and marinas, such as poorly flushed waterways; boat maintenance activities; discharge of sewage from boats; and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. Some typical BMPs used to address needs at marinas are bulk heading, pump-out systems, and oil containment booms.

2022 Category Number	Category Name	Description
VII-G	NPS Control: Resource Extraction	This category includes all costs that address NPS pollution control needs associated with mining and quarrying activities. Some typical BMPs used to address resource extraction needs are detention berms, adit (mine entrance) closures, and seeding or revegetation. Any costs associated with facilities or measures that address point source discharges are not reported in this category.
VII-H	NPS Control: Brownfields/Superfund	This category includes all costs that address NPS pollution control needs associated with 1) abandoned industrial sites that might have residual contamination (brownfields) and 2) hazardous waste sites covered under the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund sites). All costs for work at brownfield or Superfund sites, regardless of the activity, should be included in this category. Some typical BMPs used to address needs at brownfield or Superfund sites are excavation, removal, and disposal of contaminated sediment/soil; cleanup of contaminated groundwater or surface water; and capping of wells to prevent stormwater infiltration.
VII-I	NPS Control: Storage Tanks	This category includes all costs that address NPS pollution control needs associated with tanks designed to hold gasoline, other petroleum products, or chemicals. The tanks may be above or below ground level. Some typical BMPs used to address storage tank needs are spill containment systems; in situ treatment of contaminated soils and groundwater; and upgrade, rehabilitation, or removal of petroleum/chemical storage tanks. If these facilities or measures are part of addressing NPS needs at brownfields, the costs go in Category VII-H, "NPS Control: Brownfields/Superfund."
VII-J	NPS Control: Sanitary Landfills	This category includes all costs that address NPS pollution control needs associated with sanitary landfills. Some typical BMPs used to address needs at landfills are leachate collection, on-site treatment, gas collection and control, capping, and closure.

2022 Category Number	Category Name	Description
VII-K	NPS Control: Hydromodification	<p>This category includes needs to address the degradation of water resources as a result of altering the hydrological characteristics of coastal and non-coastal waters. For a stream channel, hydromodification is the process of the stream bank being eroded by flowing water, typically resulting in the suspension of sediments in the watercourse. Examples of such hydromodification activities include channelization and channel modification, dams, and stream bank and shoreline erosion. Some typical BMPs used to address hydromodification needs are conservation easements, swales, filter strips, shore erosion control, wetland development or restoration, and bank or channel (grade) stabilization. This category includes any work involving wetland or riparian area protection or restoration.</p>
VII-M	NPS Control: Other Estuary Management Activities	<p>This category is only used for management activities in the study areas of the 28 National Estuary Programs (NEPs) designated under section 320 of the CWA. It includes costs associated with a limited number of estuary management activities that may not be appropriately included in other need categories. Some typical estuary BMPs are habitat protection for aquatic species; fishery, oyster bed, and shellfish restocking and restoration; fish ladders; rejuvenation of submerged aquatic vegetation; artificial reef establishment; control of invasive vegetative and aquatic species; and water control structures for flow regime and salinity. Point source technologies included in the NEP's Comprehensive Conservation and Management Plans should not be included in this category.</p>
X	Water Reuse	<p>This category includes needs associated with conveyance of treated wastewater that is being reused, including associated rehabilitation/replacement needs. Examples are pipes to convey treated water from the wastewater facility to the drinking water distribution system or the drinking water treatment facility and equipment for application of effluent on publicly owned land.</p> <p>The needs associated with additional unit processes to increase the level of treatment to potable—or less than potable but greater than the level normally associated with surface discharge needs—are reported in Category II.</p>

2022 Category Number	Category Name	Description
XII	Decentralized Wastewater Treatment Systems	<p>This category includes needs associated with the rehabilitation, replacement, or new installation of on-site wastewater treatment systems or clustered (community) systems. It also includes the treatment portion of other decentralized sewage disposal technologies. Costs related to the development and implementation of on-site management districts are included (but not the costs of ongoing operations of such districts). Costs could also include the limited collection systems associated with the decentralized system. Public ownership is not required for decentralized systems.</p> <p>This category does not include the needs to change a service area from decentralized wastewater treatment to a publicly owned centralized treatment system. Needs to construct a publicly owned centralized collection and treatment system should be reported in Category I and/or Category II. Needs to install sewers to connect the service area to an existing collection system are reported in Category IV-A and Category IV-B.</p>
XIV	Desalination	<p>This category includes needs for treatment and disposal of brine, desalination of brackish water to augment water supply, aquifer recharge using desalinated sea water, and treatment/reinjection of brackish groundwater.</p>

Appendix B: 2022 CWNS Reported Needs by Category

Table B-1. 2022 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)

State	Needs Category										
	Total	I	II	III	IV	V	VI	VII	X	XII	XIV
Alabama	\$4,026	\$782	\$51	\$1,127	\$350	NR	\$59	\$277	NR	\$1,380	NR
Alaska	\$775	\$287	NR	\$233	\$181	NR	\$56	\$19	<\$0.5	<\$0.5	NR
American Samoa	\$30	\$30	NR	NR	NR	NR	NR	NR	NR	NR	NR
Arizona	\$4,784	\$64	\$1,584	\$1,572	\$553	NR	\$757	NR	\$227	\$27	NR
Arkansas	\$5,453	\$545	\$913	\$1,310	\$397	NR	\$811	\$942	\$3	\$533	NR
California	\$65,533	\$7,024	\$10,776	\$12,506	\$2,528	\$126	\$16,219	\$9,215	\$3,757	\$3,382	NR
Colorado	\$19,170	\$602	\$5,633	\$2,675	\$804	\$8	\$4,410	\$4,921	\$117	NR	NR
Connecticut	\$9,825	\$76	\$2,220	\$1,415	\$317	\$2,947	\$1,335	\$46	\$2	\$1,468	NR
Delaware	\$1,265	\$160	\$142	\$650	\$170	\$9	\$16	\$110	\$7	NR	NR
District of Columbia	\$2,220	NR	\$429	\$1,332	NR	\$397	\$62	NR	NR	NR	NR
Florida	\$46,559	NR	\$13,863	\$5,306	\$5,266	NR	\$12,039	\$871	\$951	\$8,264	NR
Georgia	\$25,569	\$1,037	\$7,081	\$4,458	\$2,308	\$255	\$3,985	\$259	\$167	\$6,017	NR
Guam	\$479	\$287	NR	\$192	NR	NR	NR	NR	NR	NR	NR
Hawaii	\$3,336	\$1,008	\$33	\$1,715	\$392	\$38	NR	\$74	\$76	NR	NR
Idaho	\$2,586	\$754	\$871	\$419	\$117	NR	\$33	\$370	\$22	NR	NR
Illinois	\$11,375	\$404	\$4,070	\$2,071	\$392	\$571	\$640	\$3,227	NR	NR	NR
Indiana	\$10,132	\$230	\$1,279	\$1,126	\$846	\$2,927	\$531	\$2,006	NR	\$1,187	NR
Iowa	\$12,299	\$313	\$3,105	\$391	\$311	\$116	\$1,966	\$3,727	NR	\$2,370	NR
Kansas	\$4,239	\$110	\$1,279	\$353	\$225	\$107	\$183	\$1,082	\$8	\$892	NR
Kentucky	\$7,483	\$2,897	\$111	\$1,503	\$1,126	\$891	\$48	\$886	\$1	\$21	NR
Louisiana	\$26,904	\$306	\$446	\$1,203	\$449	NR	\$1,344	\$22,032	NR	\$1,125	NR

State	Needs Category										
	Total	I	II	III	IV	V	VI	VII	X	XII	XIV
Maine	\$3,995	\$513	\$274	\$498	\$93	\$311	\$275	\$322	NR	\$1,709	NR
Maryland	\$10,657	\$27	\$2,711	\$2,686	\$916	\$483	\$1,384	\$2,211	\$2	\$236	NR
Massachusetts	\$21,710	\$2,400	\$1,215	\$2,462	\$3,633	\$1,451	\$7,702	\$2,571	\$1	\$275	NR
Michigan	\$15,072	\$980	\$181	\$2,012	\$32	\$588	\$5,953	\$3,755	NR	\$1,572	NR
Minnesota	\$6,716	\$1,230	\$514	\$1,353	\$186	\$2	\$47	\$254	NR	\$3,131	NR
Mississippi	\$1,933	\$83	\$642	\$405	\$163	\$12	NR	\$628	NR	NR	NR
Missouri	\$9,102	\$93	\$2,847	\$916	\$916	\$2,213	\$840	\$1,273	NR	\$5	NR
Montana	\$347	\$45	\$107	\$62	\$88	\$3	\$22	\$18	NR	\$1	NR
Nebraska	\$3,171	\$128	\$838	\$413	\$236	\$459	\$107	\$990	NR	NR	NR
Nevada	\$531	\$15	\$120	\$50	\$59	NR	\$4	\$6	\$273	\$3	NR
New Hampshire	\$4,287	\$501	\$349	\$763	\$251	\$358	\$768	\$37	\$9	\$1,252	NR
New Jersey	\$19,352	\$4,615	\$284	\$2,039	\$1,169	\$3,605	\$2,812	\$1,875	\$38	\$2,916	<\$0.5
New Mexico	\$12,280	\$267	\$800	\$603	\$341	NR	\$1,858	\$7,134	\$340	\$938	NR
New York	\$53,917	\$16,045	\$810	\$15,046	\$3,882	\$5,988	\$5,199	\$252	\$6	\$6,689	NR
North Carolina	\$21,136	\$1,096	\$4,142	\$5,185	\$2,125	NR	\$2,142	\$1,201	\$86	\$5,160	NR
North Dakota	\$2,621	\$213	\$80	\$462	\$129	NR	\$198	\$1,256	\$45	\$239	NR
N. Mariana Islands	\$341	\$95	NR	\$156	\$87	NR	NR	NR	\$2	NR	NR
Ohio	\$20,555	\$3,905	\$637	\$8,355	\$1,428	\$1,507	\$911	\$1,606	\$7	\$2,199	NR
Oklahoma	\$3,436	\$681	\$47	\$364	\$562	\$1	\$181	\$325	\$1	\$1,273	NR
Oregon	\$5,541	\$1,386	\$590	\$1,554	\$177	\$1	\$417	\$1,291	\$94	\$33	NR
Pennsylvania	\$12,765	\$2,230	\$80	\$1,065	\$403	\$4,433	\$1,947	\$2,561	NR	\$46	NR
Puerto Rico	\$2,711	\$1,127	\$109	\$668	\$548	NR	\$18	\$12	NR	\$229	NR
Rhode Island	\$2,485	\$265	\$4	\$312	\$369	\$586	\$442	\$58	NR	\$449	NR
South Carolina	\$7,351	\$343	\$1,604	\$2,574	\$548	NR	\$190	\$338	\$2	\$1,753	NR

State	Needs Category										
	Total	I	II	III	IV	V	VI	VII	X	XII	XIV
South Dakota	\$1,116	\$292	\$59	\$136	\$16	NR	\$16	\$597	NR	NR	NR
Tennessee	\$3,852	\$503	\$611	\$1,502	\$381	NR	\$258	\$596	NR	\$2	NR
Texas	\$18,857	\$4,032	\$596	\$2,518	\$669	\$12	\$1,543	\$1,407	\$659	\$7,222	\$201
Utah	\$9,728	\$155	\$3,501	\$2,388	\$869	NR	\$1,431	\$55	NR	\$1,329	NR
Vermont	\$2,104	\$265	\$39	\$77	\$32	\$173	\$631	\$789	NR	\$98	NR
Virgin Islands	\$157	\$5	NR	\$111	\$36	NR	\$6	NR	NR	NR	NR
Virginia	\$45,770	\$351	\$3,637	\$4,244	\$2,054	\$653	\$30,168	\$902	\$710	\$3,052	NR
Washington	\$18,627	\$4,334	\$156	\$4,292	\$619	\$2,427	\$2,205	\$2,753	\$110	\$1,730	NR
West Virginia	\$11,089	\$931	\$149	\$1,697	\$574	\$1,654	\$415	\$4,758	NR	\$912	NR
Wisconsin	\$12,013	\$327	\$1,946	\$1,316	\$727	\$1,191	\$683	\$2,270	NR	\$3,553	NR
Wyoming	\$699	\$234	NR	\$212	NR	NR	\$35	\$206	\$12	\$1	NR
Total U.S.	\$630,067	\$66,623	\$83,567	\$110,053	\$41,048	\$36,505	\$115,297	\$94,367	\$7,735	\$74,670	\$201

Categories:

- | | | | | | |
|-----|--------------------------------|-----|-----------------------|-----|------------------------------------|
| I | Secondary Wastewater Treatment | V | CSO Correction | X | Water Reuse |
| II | Advanced Wastewater Treatment | VI | Stormwater Management | XII | Decentralized Wastewater Treatment |
| III | Conveyance System Repair | VII | NPS Control | XIV | Desalination |
| IV | New Conveyance Systems | | | | |

Notes:

NR = not reported.

Table B-2. 2022 CWNS Reported Needs for Wastewater Subcategories by Category and State (January 2022 Dollars in Millions)

State	Needs Category							
	I	II	III-A	III-B	IV-A	IV-B	V	Total I-V
Alabama	\$782	\$51	\$118	\$1,010	\$262	\$88	NR	\$2,310
Alaska	\$287	NR	\$3	\$230	\$174	\$6	NR	\$700
American Samoa	\$30	NR	NR	NR	NR	NR	NR	\$30
Arizona	\$64	\$1,584	\$1	\$1,571	\$435	\$117	NR	\$3,773
Arkansas	\$545	\$913	\$494	\$816	\$270	\$126	NR	\$3,165
California	\$7,024	\$10,776	\$46	\$12,460	\$576	\$1,952	\$126	\$32,960
Colorado	\$602	\$5,633	\$342	\$2,333	\$213	\$591	\$8	\$9,722
Connecticut	\$76	\$2,220	\$334	\$1,080	\$315	\$3	\$2,947	\$6,975
Delaware	\$160	\$142	\$13	\$637	\$136	\$34	\$9	\$1,132
District of Columbia	NR	\$429	NR	\$1,332	NR	NR	\$397	\$2,158
Florida	NR	\$13,863	\$465	\$4,841	\$4,622	\$644	NR	\$24,434
Georgia	\$1,037	\$7,081	\$306	\$4,153	\$1,483	\$825	\$255	\$15,140
Guam	\$287	NR	NR	\$192	NR	NR	NR	\$479
Hawaii	\$1,008	\$33	\$291	\$1,424	\$107	\$285	\$38	\$3,186
Idaho	\$754	\$871	\$33	\$386	\$115	\$2	NR	\$2,161
Illinois	\$404	\$4,070	\$657	\$1,414	\$245	\$147	\$571	\$7,508
Indiana	\$230	\$1,279	\$170	\$956	\$716	\$130	\$2,927	\$6,409
Iowa	\$313	\$3,105	\$64	\$326	\$172	\$139	\$116	\$4,236
Kansas	\$110	\$1,279	\$47	\$306	\$52	\$173	\$107	\$2,075
Kentucky	\$2,897	\$111	\$298	\$1,205	\$867	\$258	\$891	\$6,528
Louisiana	\$306	\$446	\$327	\$876	\$401	\$48	NR	\$2,404
Maine	\$513	\$274	\$42	\$456	\$83	\$10	\$311	\$1,689
Maryland	\$27	\$2,711	\$625	\$2,061	\$866	\$50	\$483	\$6,824

State	Needs Category							Total I-V
	I	II	III-A	III-B	IV-A	IV-B	V	
Massachusetts	\$2,400	\$1,215	\$628	\$1,834	\$2,599	\$1,034	\$1,451	\$11,160
Michigan	\$980	\$181	\$76	\$1,936	\$17	\$14	\$588	\$3,792
Minnesota	\$1,230	\$514	\$146	\$1,207	\$131	\$55	\$2	\$3,285
Mississippi	\$83	\$642	\$24	\$381	\$23	\$141	\$12	\$1,305
Missouri	\$93	\$2,847	\$300	\$615	\$530	\$386	\$2,213	\$6,985
Montana	\$45	\$107	\$5	\$57	\$49	\$40	\$3	\$306
Nebraska	\$128	\$838	\$36	\$377	\$80	\$156	\$459	\$2,074
Nevada	\$15	\$120	\$5	\$46	\$59	NR	NR	\$245
New Hampshire	\$501	\$349	\$36	\$726	\$147	\$104	\$358	\$2,221
New Jersey	\$4,615	\$284	\$315	\$1,724	\$885	\$284	\$3,605	\$11,712
New Mexico	\$267	\$800	\$4	\$599	\$329	\$12	NR	\$2,010
New York	\$16,045	\$810	\$599	\$4,447	\$3,643	\$239	\$5,988	\$41,771
North Carolina	\$1,096	\$4,142	\$282	\$4,904	\$725	\$1,400	NR	\$12,548
North Dakota	\$213	\$80	\$96	\$366	\$36	\$92	NR	\$884
N. Mariana Islands	\$95	NR	\$4	\$153	\$87	NR	NR	\$339
Ohio	\$3,905	\$637	\$3,315	\$5,040	\$550	\$877	\$1,507	\$15,832
Oklahoma	\$681	\$47	\$4	\$360	\$57	\$505	\$1	\$1,656
Oregon	\$1,386	\$590	\$113	\$1,441	\$176	<\$0.5	\$1	\$3,707
Pennsylvania	\$2,230	\$80	\$41	\$1,023	\$263	\$140	\$4,433	\$8,210
Puerto Rico	\$1,127	\$109	\$9	\$660	\$548	NR	NR	\$2,452
Rhode Island	\$265	\$4	\$17	\$295	\$311	\$58	\$586	\$1,536
South Carolina	\$343	\$1,604	\$6	\$2,568	\$448	\$100	NR	\$5,069
South Dakota	\$292	\$59	\$18	\$118	\$5	\$12	NR	\$503
Tennessee	\$503	\$611	\$294	\$1,208	\$50	\$332	NR	\$2,997

State	Needs Category							Total I–V
	I	II	III-A	III-B	IV-A	IV-B	V	
Texas	\$4,032	\$596	\$253	\$2,265	\$212	\$458	\$12	\$7,827
Utah	\$155	\$3,501	\$83	\$2,305	\$703	\$166	NR	\$6,913
Vermont	\$265	\$39	\$3	\$74	\$32	NR	\$173	\$585
Virgin Islands	\$5	NR	NR	\$111	\$36	NR	NR	\$151
Virginia	\$351	\$3,637	\$604	\$3,640	\$1,367	\$687	\$653	\$10,939
Washington	\$4,334	\$156	\$202	\$4,091	\$471	\$148	\$2,427	\$11,828
West Virginia	\$931	\$149	\$392	\$1,305	\$506	\$67	\$1,654	\$5,005
Wisconsin	\$327	\$1,946	\$50	\$1,266	\$248	\$479	\$1,191	\$5,508
Wyoming	\$234	NR	NR	\$212	NR	NR	NR	\$446
Total U.S.	\$66,623	\$83,567	\$12,638	\$97,416	\$27,433	\$13,616	\$36,505	\$337,796

Categories:

I Secondary Wastewater Treatment

III-B Sewer Replacement/Rehabilitation

IV-B New Interceptor Sewers and Appurtenances

II Advanced Wastewater Treatment

IV-A New Collector Sewers and Appurtenances

V CSO Correction

III-A I/I Correction

Notes:

NR = not reported.

Table B-3. 2022 CWNS Reported Needs for Stormwater Management by Category and State (January 2022 Dollars in Millions)

State	Needs Category			
	VI-A	VI-B	VI-C	Total VI
Alabama	\$17	\$1	\$41	\$59
Alaska	\$51	\$5	<\$0.5	\$56
American Samoa	NR	NR	NR	NR
Arizona	\$697	\$57	\$3	\$757
Arkansas	\$745	\$59	\$7	\$811
California	\$9,042	\$6,943	\$233	\$16,219
Colorado	\$4,169	\$133	\$109	\$4,410
Connecticut	\$207	\$1,073	\$55	\$1,335
Delaware	NR	NR	\$16	\$16
District of Columbia	\$61	NR	\$1	\$62
Florida	\$11,366	\$118	\$556	\$12,039
Georgia	\$2,679	\$1,190	\$116	\$3,985
Guam	NR	NR	NR	NR
Hawaii	NR	NR	NR	NR
Idaho	NR	NR	\$33	\$33
Illinois	\$437	\$198	\$5	\$640
Indiana	\$497	\$34	NR	\$531
Iowa	\$303	\$1,586	\$76	\$1,966
Kansas	\$136	\$14	\$33	\$183
Kentucky	NR	\$16	\$32	\$48
Louisiana	\$1,017	\$192	\$135	\$1,344
Maine	\$20	\$239	\$16	\$275
Maryland	\$605	\$703	\$76	\$1,384
Massachusetts	\$604	\$3,371	\$3,726	\$7,702
Michigan	\$5,856	\$97	<\$0.5	\$5,953
Minnesota	\$5	\$39	\$2	\$47
Mississippi	NR	NR	NR	NR
Missouri	\$745	\$93	\$2	\$840
Montana	\$22	NR	NR	\$22
Nebraska	\$57	<\$0.5	\$49	\$107
Nevada	\$4	NR	NR	\$4

State	Needs Category			
	VI-A	VI-B	VI-C	Total VI
New Hampshire	\$489	\$206	\$73	\$768
New Jersey	\$2,388	\$172	\$252	\$2,812
New Mexico	\$1,790	\$18	\$50	\$1,858
New York	\$4,950	\$236	\$12	\$5,199
North Carolina	\$1,790	\$258	\$93	\$2,142
North Dakota	\$194	\$1	\$3	\$198
N. Mariana Islands	NR	NR	NR	NR
Ohio	\$845	\$62	\$5	\$911
Oklahoma	\$152	NR	\$29	\$181
Oregon	\$355	\$54	\$8	\$417
Pennsylvania	\$394	\$1,504	\$50	\$1,947
Puerto Rico	NR	\$4	\$14	\$18
Rhode Island	\$92	\$347	\$3	\$442
South Carolina	\$89	\$49	\$52	\$190
South Dakota	\$16	NR	NR	\$16
Tennessee	\$159	\$31	\$67	\$258
Texas	\$1,460	\$81	\$2	\$1,543
Utah	\$1,400	\$31	<\$0.5	\$1,431
Vermont	\$631	NR	NR	\$631
Virgin Islands	\$6	NR	NR	\$6
Virginia	\$1,055	\$29,108	\$4	\$30,168
Washington	\$1,215	\$902	\$89	\$2,205
West Virginia	\$381	\$27	\$6	\$415
Wisconsin	\$547	\$69	\$66	\$683
Wyoming	\$28	\$6	NR	\$35
Total U.S.	\$59,769	\$49,329	\$6,199	\$115,297

Categories:

VI-A Gray Infrastructure

VI-B Green Infrastructure

VI-C General Stormwater Management

Notes:

NR = not reported.

American Samoa, Guam, Hawaii, Mississippi, and Northern Mariana Islands did not submit stormwater needs.

Table B-4. 2022 CWNS Reported Needs for NPS Control by Category and State (January 2022 Dollars in Millions)

State	Needs Category											Total VII
	VII-A	VII-B	VII-C	VII-E	VII-F	VII-G	VII-H	VII-I	VII-J	VII-K	VII-M	
Alabama	\$269	NR	\$8	NR	NR	NR	NR	NR	NR	NR	NR	\$277
Alaska	NR	NR	NR	NR	\$2	NR	NR	\$4	\$12	NR	NR	\$19
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Arizona	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Arkansas	\$657	\$99	\$6	NR	NR	NR	NR	NR	NR	\$179	NR	\$942
California	\$406	\$27	\$6,625	\$1	<\$0.5	NR	NR	NR	NR	\$1,013	\$1,143	\$9,215
Colorado	\$141	\$11	\$4,444	\$18	NR	\$1	NR	\$22	\$5	\$276	\$3	\$4,921
Connecticut	\$2	\$7	NR	NR	NR	NR	\$5	NR	\$9	NR	\$23	\$46
Delaware	\$110	NR	<\$0.5	NR	NR	NR	NR	NR	NR	NR	NR	\$110
District of Columbia	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Florida	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$854	\$17	\$871
Georgia	\$10	\$4	NR	NR	NR	NR	NR	NR	\$14	\$232	NR	\$259
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hawaii	NR	NR	NR	\$52	NR	NR	NR	NR	\$22	NR	NR	\$74
Idaho	\$370	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$370
Illinois	\$3,213	NR	\$1	NR	NR	NR	NR	NR	NR	\$12	NR	\$3,227
Indiana	\$1,977	NR	\$3	NR	NR	NR	\$19	NR	NR	\$7	NR	\$2,006
Iowa	\$2,685	\$86	NR	NR	NR	NR	NR	NR	\$54	\$902	NR	\$3,727
Kansas	\$1,081	NR	NR	\$1	NR	NR	NR	NR	NR	NR	NR	\$1,082
Kentucky	\$882	NR	\$3	NR	NR	NR	NR	NR	NR	NR	NR	\$886
Louisiana	\$310	NR	\$4	NR	NR	NR	NR	NR	NR	\$13,324	\$8,395	\$22,032
Maine	\$74	\$226	\$15	NR	NR	NR	NR	NR	\$7	NR	NR	\$322
Maryland	\$279	\$26	\$3	NR	NR	\$14	NR	NR	NR	\$1,888	NR	\$2,211

State	Needs Category											Total VII
	VII-A	VII-B	VII-C	VII-E	VII-F	VII-G	VII-H	VII-I	VII-J	VII-K	VII-M	
Massachusetts	<\$0.5	\$63	<\$0.5	NR	NR	NR	NR	\$58	\$7	\$2,443	NR	\$2,571
Michigan	\$622	\$102	\$9	NR	NR	\$1,476	NR	NR	NR	\$1,546	NR	\$3,755
Minnesota	\$80	\$16	\$12	<\$0.5	NR	NR	NR	NR	NR	\$146	NR	\$254
Mississippi	\$623	NR	\$5	NR	NR	NR	NR	NR	NR	NR	NR	\$628
Missouri	\$1,146	<\$0.5	NR	NR	NR	NR	NR	NR	\$3	\$123	NR	\$1,273
Montana	\$15	NR	NR	NR	NR	NR	NR	NR	\$1	\$2	NR	\$18
Nebraska	\$941	NR	NR	NR	NR	NR	NR	\$49	NR	NR	NR	\$990
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$6	NR	\$6
New Hampshire	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$37	NR	\$37
New Jersey	\$113	NR	NR	\$384	\$23	NR	\$656	\$1	\$432	\$266	NR	\$1,875
New Mexico	\$763	\$32	\$4,254	NR	NR	\$1,547	\$4	\$143	\$13	\$379	NR	\$7,134
New York	\$50	\$94	NR	\$22	NR	NR	NR	NR	\$1	\$78	\$7	\$252
North Carolina	\$870	NR	\$20	NR	NR	NR	NR	NR	NR	\$311	NR	\$1,201
North Dakota	\$917	\$38	NR	NR	NR	NR	\$8	NR	\$15	\$279	NR	\$1,256
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ohio	\$1,600	NR	\$6	NR	NR	NR	NR	NR	NR	NR	NR	\$1,606
Oklahoma	\$268	NR	\$1	NR	NR	NR	NR	NR	NR	\$56	NR	\$325
Oregon	\$1,126	\$1	\$11	NR	NR	NR	\$4	NR	NR	\$148	<\$0.5	\$1,291
Pennsylvania	\$858	\$968	\$1	NR	NR	\$8	NR	NR	NR	\$726	NR	\$2,561
Puerto Rico	\$1	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$11	\$12
Rhode Island	NR	NR	NR	\$9	NR	NR	\$3	NR	\$32	\$11	\$2	\$58
South Carolina	\$338	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	\$338
South Dakota	\$593	NR	<\$0.5	NR	NR	NR	NR	NR	NR	\$3	NR	\$597
Tennessee	\$593	NR	\$2	NR	NR	NR	NR	NR	NR	NR	NR	\$596

State	Needs Category											Total VII
	VII-A	VII-B	VII-C	VII-E	VII-F	VII-G	VII-H	VII-I	VII-J	VII-K	VII-M	
Texas	\$1,319	NR	NR	NR	NR	NR	NR	NR	NR	\$87	NR	\$1,407
Utah	\$6	\$4	\$1	NR	NR	\$8	NR	NR	NR	\$37	NR	\$55
Vermont	\$293	NR	\$220	NR	NR	NR	NR	NR	NR	\$276	NR	\$789
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virginia	\$185	\$165	\$68	NR	NR	NR	NR	NR	NR	\$484	NR	\$902
Washington	\$72	\$48	\$59	\$4	<\$0.5	NR	NR	NR	NR	\$2,264	\$305	\$2,753
West Virginia	NR	NR	\$1	NR	NR	\$58	NR	NR	NR	\$4,700	NR	\$4,758
Wisconsin	\$1,748	\$24	\$7	NR	NR	NR	\$108	NR	\$6	\$377	NR	\$2,270
Wyoming	\$31	NR	NR	\$20	NR	NR	NR	NR	\$137	\$18	NR	\$206
Total U.S.	\$27,635	\$2,042	\$15,792	\$513	\$26	\$3,111	\$807	\$275	\$771	\$33,490	\$9,906	\$94,367

Categories:

VII-A Agriculture (Cropland)

VII-B Agriculture (Animals)

VII-C Silviculture

VII-E Groundwater Protection (Unknown Source)

VII-F Marinas

VII-G Resource Extraction

VII-H Brownfields/Superfund

VII-I Storage Tanks

VII-J Sanitary Landfills

VII-K Hydromodification

VII-M Other Estuary Management Activities

Notes:

NR = not reported.

NR = not reported.

American Samoa, Arizona, District of Columbia, Guam, Northern Mariana Islands, and Virgin Islands did not submit Category VII needs.

Appendix C: Total Needs by State for 2008, 2012, and 2022

Table C-1. 2008, 2012, and 2022 CWNS Reported Needs by State (January 2022 Dollars in Millions)

State	2008 Reported Needs	2012 Reported Needs	2022 Reported Needs
Alabama	\$5,885	\$3,835	\$4,026
Alaska	NR	\$246	\$775
American Samoa	NR	NR	\$30
Arizona	\$6,955	\$8,403	\$4,784
Arkansas	\$625	\$886	\$5,453
California	\$39,780	\$32,535	\$65,533
Colorado	\$1,958	\$5,821	\$19,170
Connecticut	\$4,751	\$5,742	\$9,825
Delaware	\$295	\$255	\$1,265
District of Columbia	\$3,385	\$3,469	\$2,220
Florida	\$26,024	\$22,844	\$46,559
Georgia	\$118	\$3,372	\$25,569
Guam	\$484	\$495	\$479
Hawaii	\$2,337	\$2,687	\$3,336
Idaho	\$1,831	\$1,710	\$2,586
Illinois	\$23,279	\$8,106	\$11,375
Indiana	\$9,470	\$8,880	\$10,132
Iowa	\$4,561	\$3,023	\$12,299
Kansas	\$4,317	\$4,671	\$4,239
Kentucky	\$2,816	\$7,744	\$7,483
Louisiana	\$5,363	\$5,533	\$26,904
Maine	\$1,371	\$1,203	\$3,995
Maryland	\$11,265	\$12,309	\$10,657
Massachusetts	\$10,575	\$10,357	\$21,710
Michigan	\$4,941	\$2,575	\$15,072
Minnesota	\$5,466	\$2,963	\$6,716
Mississippi	\$1,885	\$2,523	\$1,933
Missouri	\$7,648	\$11,917	\$9,102
Montana	\$781	\$450	\$347

State	2008 Reported Needs	2012 Reported Needs	2022 Reported Needs
Nebraska	\$4,285	\$3,184	\$3,171
Nevada	\$ 3,874	\$3,814	\$531
New Hampshire	\$1,661	\$2,453	\$4,287
New Jersey	\$43,236	\$21,677	\$19,352
New Mexico	\$ 137	\$397	\$12,280
New York	\$39,521	\$38,984	\$53,917
North Carolina	\$8,713	\$6,567	\$21,136
North Dakota	NR	\$271	\$2,621
N. Mariana Islands	\$28	NR	\$341
Ohio	\$18,914	\$18,088	\$20,555
Oklahoma	\$1,726	\$2,989	\$3,436
Oregon	\$5,025	\$4,821	\$5,541
Pennsylvania	\$23,859	\$8,618	\$12,765
Puerto Rico	\$6,321	\$3,746	\$2,711
Rhode Island	NR	\$2,383	\$2,485
South Carolina	\$753	NR	\$7,351
South Dakota	\$141	\$206	\$1,116
Tennessee	\$1,814	\$2,144	\$3,852
Texas	\$15,347	\$14,668	\$18,857
Utah	\$3,909	\$1,044	\$9,728
Vermont	\$290	\$191	\$2,104
Virgin Islands	NR	\$47	\$157
Virginia	\$9,108	\$8,095	\$45,770
Washington	\$6,998	\$5,050	\$18,627
West Virginia	\$4,009	\$4,040	\$11,089
Wisconsin	\$8,460	\$7,848	\$12,013
Wyoming	\$207	\$113	\$699
Total U.S. (2022 Dollars)	\$ 396,501	\$335,996	\$630,067
Total U.S. (Base Year Dollars)	\$ 298,121	\$270,964	\$630,067

Appendix D: 2012 CWNS Reported Needs by Category

Table D-1. 2012 CWNS Reported Needs by Category and State (January 2022 Dollars in Millions)

State	Total	Needs Category									
		I	II	III-A	III-B	IV-A	IV-B	V	Total VI	X	Total I-V
Alabama	\$3,835	\$880	\$634	\$444	\$1,076	\$490	\$310	NR	NR	\$2	\$3,834
Alaska	\$246	\$168	NR	\$1	\$72	\$6	NR	NR	NR	NR	\$246
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Arizona	\$8,403	\$334	\$4,079	<\$0.5	\$807	\$1,154	\$763	NR	\$52	\$1,213	\$7,137
Arkansas	\$886	\$153	\$209	\$145	\$126	\$113	\$132	NR	\$7	NR	\$879
California	\$32,535	\$9,750	\$3,180	\$165	\$7,884	\$1,502	\$2,047	\$438	\$4,866	\$2,704	\$24,965
Colorado	\$5,821	\$1,795	\$1,560	\$90	\$1,136	\$170	\$311	NR	\$715	\$45	\$5,061
Connecticut	\$5,742	\$230	\$1,145	\$298	\$161	\$102	\$124	\$3,682	NR	NR	\$5,742
Delaware	\$255	\$96	\$65	NR	\$61	\$32	\$2	NR	NR	NR	\$255
District of Columbia	\$3,469	\$182	\$229	\$74	\$637	NR	\$11	\$2,337	NR	NR	\$3,469
Florida	\$22,844	NR	\$14,047	\$340	\$1,758	\$1,282	\$2,193	NR	\$619	\$2,606	\$19,619
Georgia	\$3,372	\$113	\$2,390	\$1	\$348	\$43	\$468	NR	NR	\$10	\$3,362
Guam	\$495	\$206	NR	\$11	\$171	\$101	\$5	NR	NR	NR	\$495
Hawaii	\$2,687	\$1,079	\$20	\$191	\$785	\$73	\$444	NR	NR	\$96	\$2,591
Idaho	\$1,710	\$520	\$759	\$48	\$131	\$124	\$99	NR	\$27	\$1	\$1,682
Illinois	\$8,106	\$3,579	\$277	\$286	\$1,104	\$316	\$412	\$2,024	\$109	NR	\$7,998
Indiana	\$8,880	\$1,070	\$802	\$347	\$527	\$838	\$1,069	\$4,027	\$200	NR	\$8,681
Iowa	\$3,023	\$391	\$781	\$186	\$809	\$161	\$168	\$457	\$68	\$3	\$2,952
Kansas	\$4,671	\$737	\$1,241	\$752	\$476	\$40	\$684	\$679	\$62	<\$0.5	\$4,609
Kentucky	\$7,744	\$1,089	\$518	\$491	\$1,745	\$1,957	\$670	\$1,171	\$104	NR	\$7,640
Louisiana	\$5,533	\$2,054	\$135	\$161	\$1,650	\$1,074	\$259	NR	\$198	\$2	\$5,332

State	Total	Needs Category									
		I	II	III-A	III-B	IV-A	IV-B	V	Total VI	X	Total I-V
Maine	\$1,203	\$265	\$14	\$44	\$184	\$149	\$83	\$465	NR	NR	\$1,203
Maryland	\$12,309	\$1,237	\$1,594	\$227	\$2,863	\$1,608	\$395	\$427	\$3,935	\$23	\$8,351
Massachusetts	\$10,357	\$974	\$2,466	\$55	\$1,754	\$3,548	\$72	\$1,211	\$250	\$27	\$10,080
Michigan	\$2,575	\$856	\$3	\$95	\$776	\$26	\$34	\$378	\$407	NR	\$2,168
Minnesota	\$2,963	\$938	\$53	\$142	\$1,251	\$135	\$411	NR	\$31	NR	\$2,932
Mississippi	\$2,523	\$376	\$535	\$73	\$540	\$559	\$440	NR	NR	NR	\$2,523
Missouri	\$11,917	\$2,575	\$368	\$1,421	\$431	\$60	\$2,816	\$4,225	\$20	NR	\$11,897
Montana	\$450	\$161	\$119	\$29	\$55	\$55	\$8	NR	\$23	NR	\$427
Nebraska	\$3,184	\$411	\$157	\$12	\$93	\$20	\$332	\$2,109	\$51	NR	\$3,134
Nevada	\$3,814	\$13	\$2,130	NR	\$356	\$149	\$281	NR	\$815	\$71	\$2,928
New Hampshire	\$2,453	\$389	\$455	\$54	\$173	\$149	\$143	\$751	\$337	NR	\$2,116
New Jersey	\$21,677	\$2,023	\$6,266	\$365	\$1,063	\$718	\$338	\$9,922	\$922	\$60	\$20,695
New Mexico	\$397	\$132	\$85	<\$0.5	\$68	\$77	\$19	NR	NR	\$16	\$380
New York	\$38,984	\$13,824	\$2,727	\$334	\$6,076	\$5,960	\$333	\$6,364	\$3,366	NR	\$35,618
North Carolina	\$6,567	\$319	\$2,646	\$326	\$599	\$857	\$1,551	\$2	NR	\$268	\$6,300
North Dakota	\$271	\$124	\$2	\$14	\$74	\$21	NR	NR	\$32	\$3	\$236
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ohio	\$18,088	\$1,586	\$457	\$214	\$3,880	\$683	\$896	\$9,269	\$1,103	NR	\$1,6985
Oklahoma	\$2,989	\$410	\$1,321	\$144	\$303	\$595	\$216	NR	NR	NR	\$2,989
Oregon	\$4,821	\$1,683	\$417	\$145	\$962	\$431	\$283	\$166	\$685	\$49	\$4,087
Pennsylvania	\$8,618	\$1,526	\$951	\$602	\$898	\$954	\$183	\$3,505	NR	\$NR	\$8,618
Puerto Rico	\$3,746	\$842	\$150	\$526	\$138	\$1,543	\$519	\$29	NR	NR	\$3,746
Rhode Island	\$2,383	\$191	\$221	\$29	\$106	\$516	\$235	\$1,013	\$72	NR	\$2,311
South Carolina	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

State	Total	Needs Category									
		I	II	III-A	III-B	IV-A	IV-B	V	Total VI	X	Total I-V
South Dakota	\$206	\$39	\$49	\$8	\$55	<\$0.5	\$18	NR	\$36	NR	\$170
Tennessee	\$2,144	\$276	\$274	\$360	\$284	\$52	\$25	\$648	\$226	\$1	\$1,917
Texas	\$14,668	\$4,036	\$1,075	\$619	\$3,091	\$1,277	\$1,285	NR	\$3,206	\$79	\$11,383
Utah	\$1,044	\$262	\$178	NR	\$36	\$277	\$258	NR	NR	\$32	\$1,012
Vermont	\$191	\$84	\$31	\$1	\$15	\$43	\$11	\$6	NR	NR	\$191
Virgin Islands	\$47	<\$0.5	NR	<\$0.5	\$47	NR	NR	NR	NR	NR	\$47
Virginia	\$8,095	\$1,269	\$2,019	\$960	\$1,394	\$822	\$637	\$862	\$99	\$32	\$7,963
Washington	\$5,050	\$915	\$656	\$86	\$838	\$425	\$77	\$1,577	\$274	\$202	\$4,574
West Virginia	\$4,040	\$444	\$254	\$34	\$685	\$410	\$274	\$1,771	\$167	NR	\$3,872
Wisconsin	\$7,848	\$2,298	\$1,769	\$412	\$1,559	\$328	\$782	\$7	\$694	NR	\$7,154
Wyoming	\$113	\$23	NR	NR	\$62	\$1	\$15	NR	\$12	<\$0.5	\$100
Total U.S. (2022 Dollars)	\$335,996	\$64,923	\$61,514	\$11,364	\$52,168	\$32,026	\$23,142	\$59,523	\$23,790	\$7,546	\$304,660
Total U.S. (2012 Dollars)	\$270,964	\$52,357	\$49,608	\$9,165	\$42,071	\$25,828	\$18,663	\$48,002	\$19,186	\$6,085	\$245,693

Categories:

I	Secondary Wastewater Treatment	III-B	Sewer Replacement/Rehabilitation	V	CSO Correction
II	Advanced Wastewater Treatment	IV-A	New Collector Sewers and Appurtenances	VI	Stormwater Management
III-A	I/I Correction	IV-B	New Interceptor Sewers and Appurtenances	X	Water Reuse

Notes:

NR = not reported.

South Carolina, American Samoa, and Northern Mariana Islands did not participate in the 2012 CWNS.

Category X, Water Reuse, was named "Recycled Water Distribution" in 2012.

EXCLUSIVE

Catastrophic sewage spill followed years of delay on repairs, Post review finds

A Washington Post investigation reveals that a prolonged environmental review pushed back work on the Potomac Interceptor that was initially proposed in 2018.

April 2, 2026



By [Aaron C. Davis](#)

The D.C.-area utility responsible for a massive sewer line that failed catastrophically in January had planned to reinforce the aging section years ago but repeatedly delayed construction as federal officials studied potential environmental impacts, including risks to a blue wildflower and an endangered bat species, a Washington Post investigation found.

D.C. Water asked the National Park Service for permission to fast-track repairs in 2018, after inspectors found widespread corrosion and detached rebar in one area of the six-foot-wide concrete pipe that runs under federal parkland in Maryland, records show. The utility sought to strengthen a three-quarter-mile section that included the point that later ruptured.

Left unaddressed, it warned, the corrosion could “result in a catastrophic failure leading to the release of raw sewage into soil, groundwater, and waterways,” records show.

But the National Park Service’s environmental review dragged on for years and was still not complete when the pipe collapsed — a delay that experts said appeared to flout a 2020 federal rule requiring such examinations be done within one year.

“That’s a process gone wrong,” said Eric Beightel, a former director of the Federal Permitting Improvement Steering Council, a body formed by Congress to streamline approvals for the nation’s largest infrastructure projects.

A review by The Post of more than 2,600 public utility documents reveals how concerns about the removal of trees and vegetation, along with other environmental impacts, postponed repairs to the Potomac Interceptor. The pipe continued to degrade for more than seven years before it failed on Jan. 19 and released one of the largest spills of untreated wastewater in U.S. history. Enough raw sewage to fill 364 Olympic-size swimming pools flushed into the Potomac River north of the nation’s capital, exacting an ecological toll that scientists are still trying to calculate.

National Park Service spokeswoman Christiana Hanson acknowledged the review process was lengthy but blamed D.C. Water for repeatedly proposing changes to its repair plans, which forced the Park Service each time to restart its environmental assessment, or EA.

“The length of the EA process is not a reflection of delays on the part of NPS,” said Hanson, a Park Ranger for the C & O Canal National Historical Park, which controls the Maryland land where the pipe failed. “It’s really showing more that the project scope and design changed over time ... and that is set by D.C. Water.”


Records show D.C. Water initially underestimated the number of trees that would be impacted, contributing to the Park Service' decision in late 2021 not to fully track the repair and instead require a more in-depth environmental assessment.

D.C. Water spokesman John Lisle said in a statement that the utility has been working for years to address Park Service concerns. "D.C. Water has been following the EA process prescribed by NPS since 2021," he wrote.

Three environmental law experts told The Post the Park Service assessment should have been completed one year after the agency determined it was necessary in late 2021, even if there were subsequent design changes.

In response to questions from The Post, the Park Service did not directly address the experts' assertion.

President Donald Trump blamed "local Democrat leaders" for "gross mismanagement" of the sewer line in a Truth Social post in February, and he singled out Maryland Gov. Wes Moore (D). The documents show the Park Service review started during his first term, stretched through the Biden administration and continued after Trump's return to office. A White House spokesperson referred questions to the National Park Service.

 Dive deeper

Repairs finally began last fall on an 800-foot segment of pipe a half-mile upstream from the collapse site. That segment, D.C. Water warned the National Park Service in late 2024, had further degraded and become “a high priority task to prevent collapse,” records show.

The National Park Service had still not authorized repairs on the segment that failed when it ruptured on Jan. 19.

At public meetings since the disaster, D.C. Water chief executive David Gadis has said the utility was aware of corrosion or “thinning” of the concrete pipe at the point of the collapse. But he said the utility had graded the corrosion at that location as “moderate” and had seen no clear indication it was in immediate danger.

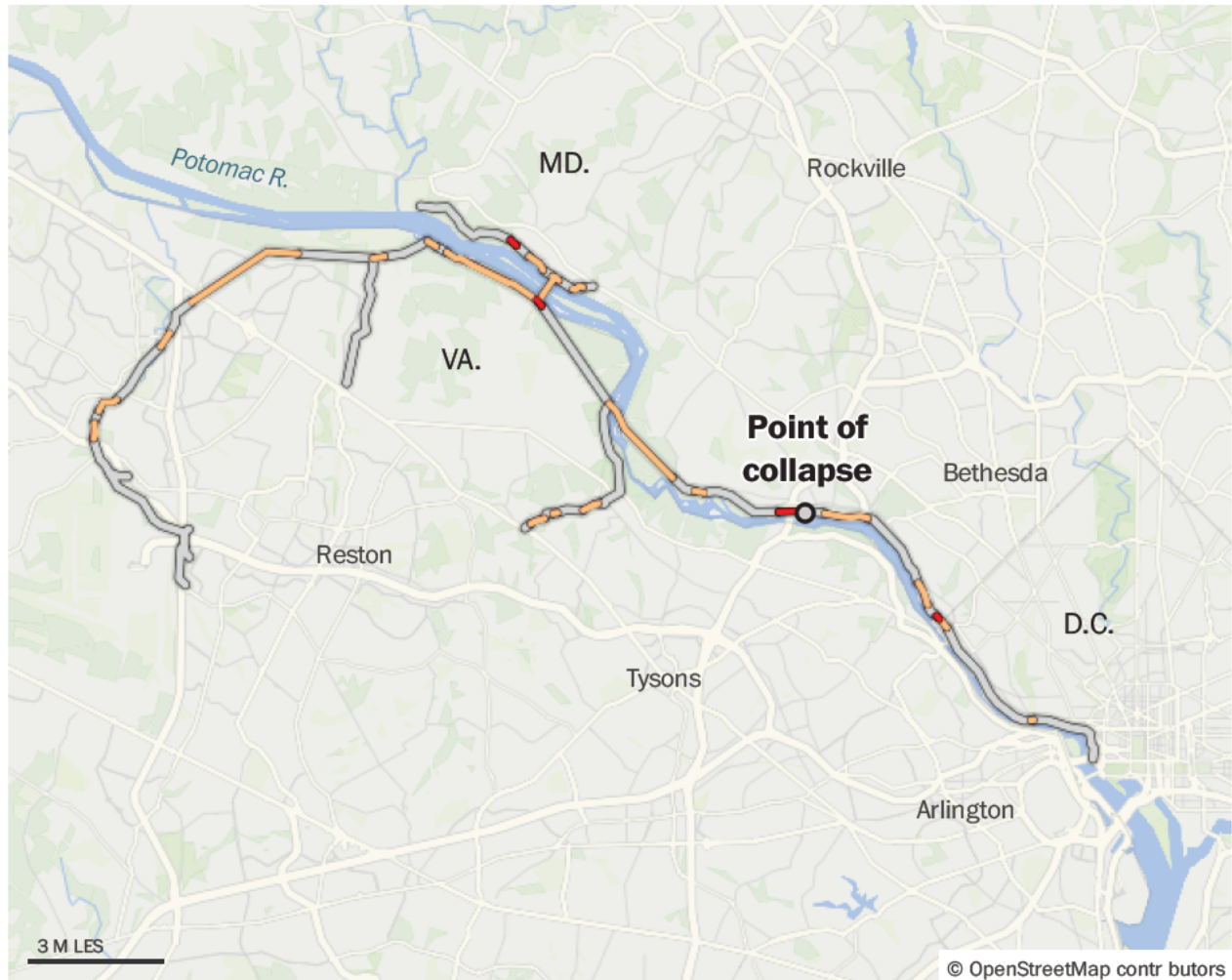
D.C. Water’s engineers have said they cannot yet determine if corrosion was a factor in the collapse, but they are investigating whether large boulders used to bury the pipe when it was constructed in 1962 created pressure points that precipitated its failure. The spill was exacerbated, Gadis said, by large rocks that fell into the pipe after it broke apart, blocking the flow of wastewater and forcing it to shoot up through a manhole. [✦ Dive deeper](#)

The documents reviewed by The Post — including construction proposals, committee reports, capital improvement plans, and correspondence between D.C. Water and the Park Service — also show the utility has identified corrosion in many other parts of the 54-mile sewer line that runs from Dulles Airport to D.C.’s wastewater treatment plant. Staffers briefed the utility’s executives 18 months ago on the need to complete repairs more efficiently, warning that the “current pipe status jeopardizes ability to deliver suburban flow” to D.C.’s treatment plant.

Troubled Sewer

Data presented to D.C. Water executives in 2024 showed widespread corrosion in the Potomac Interceptor.

- Segment had at least one point of "significant" corrosion.
- Segment with the most severe signs of age and corrosion
- Minor to moderate defects.



Source: DC Water 2024 reports, people familiar with the presentation

DYLAN MORRIS / THE WASHINGTON POST

Critical concerns

Conceived during the Eisenhower administration amid planning for what became Dulles Airport, the interceptor initially carried a modest amount of wastewater from homes and businesses. As the region grew, so did the waste. By 2018, the interceptor was moving about 60 million gallons of untreated sewage each day. Over time, the line began to show signs of serious strain, utility documents show.

D.C. Water conducted video inspections of the pipe in 2017 and 2018, and found corrosion and settled deposits. One of the most troubling spots was buried on the Maryland side of the Potomac, near where the Clara Barton Parkway intersects with the Capital Beltway, a section known on agency maps as LZ09.

In October 2018, during Trump's first term, a D.C. Water project engineer emailed a 100-page proposal to several counterparts at the National Park Service. It described rebar dangling in the six-foot-wide pipe and proposed relining a roughly 3,700-foot section with polyester resin or spray-on concrete, which the document said would protect the section for another 50 years.

The utility asked the National Park Service to exempt the repair work from an extensive National Environmental Policy Act review, which can sometimes go on for years.

The utility argued that a less intensive and quicker review, known as a "categorical exclusion," was justified because the repair work would only temporarily disrupt the canal area frequented by joggers and hikers, and the pipe reinforcement was critical for public health. It warned that further deterioration could lead to catastrophic failures.

D.C. Water also said it could limit environmental impacts. It estimated that it would have to cut down just three trees and said it would devise a plan to protect the threatened buttercup scorpionweed, a blue wildflower unique to the Mid-Atlantic that thrives along that stretch of the C & O Canal.

As the Park Service began considering the request for a speedy review, D.C. Water placed the project on its 10-year capital improvement plan. It also allocated initial funding for an engineering study and set 2022 as a target date to complete the repair, which the utility estimated would take six months.

But it soon became clear the Park Service review would take longer than expected. A staff report to D.C. Water's finance and budget committee almost a year later, on Sept. 26, 2019, listed the project as 255 days behind schedule. It cited the ongoing Park Service evaluation: "Slipped due to extended review by NPS." At the end of 2019, the Park Service preliminarily approved the project, allowing on-the-ground design work to begin, records show.

The covid pandemic delayed the design work, Lisle said. But the utility completed detailed construction plans by the spring of 2021, records show, and set a new target completion date: Dec. 28, 2024.

Within months, however, that revised goal was under threat.

In September 2021, during President Joe Biden's first year in office, the utility informed the Park Service that the project would probably require removing not three trees, but about 260. The utility promised to replant hundreds of trees, replacing the diameter of those lost, inch-for-inch.

Park Service officials replied that they had "critical concerns" about the trees, partly because they might serve as a habitat for the endangered northern long-eared bat.

The bat typically lives in caves and mines but can rest in shaggy bark and crevices of trees along the C & O Canal in warmer months.

D.C. Water quickly proposed a fix. It would cut down the trees in the winter, when the bats wouldn't be active.

But the Park Service raised a bigger problem. Under federal law, it would have to consider the environmental impact of the repairs to LZO9 with those from another stretch the utility had already asked to rehab downstream in D.C. because the two projects shared the same goal.

Evaluating the two sections together compounded the disruption to vegetation, according to documents the two agencies exchanged at the time. On the Maryland side, the pipeline construction zone was expected to impact about 2,000 buttercup scorpionweed plants; on the D.C. side, more than 138,000.

D.C. Water argued the sections should be evaluated separately, saying less than a half-acre of buttercup scorpionweed habitat would be impacted in Maryland and promising to replant the wildflower afterward.

Park Service officials were not persuaded.

"The environmental impact will be too great," a Park Service official wrote on Sept. 23, 2021, adding that the more extensive review, known as an environmental assessment, would be required.

"Don't be too alarmed," the National Park Service staffer wrote, calling the change "a minor lift" that would "save D.C. Water a lot of time down the road."

A one-year limit

By the end of 2021, D.C. Water continued warning that a combined review could cause critical delays. According to minutes from a virtual meeting in January 2022, water utility staffers told Park Service officials that the pipeline section LZO9 "has serious degradation which continues to get worse."

D.C. Water staffers worked into the spring to complete a 294-page report required under the more intensive review process.

The Park Service opened a two-week public comment period that summer but never published further updates.

The three environmental law experts told The Post that under a federal rule put in place during Trump's first term and made into law under Biden, the Park Service should have completed the in-depth environmental review within one year after informing D.C. Water in the fall of 2021 that it was necessary. The experts said the one-year clock should have started on what the law describes as "the date the agency decides to prepare an EA."

Beightel, who directed the permitting council under Biden and leads federal strategy for the firm Environmental Science Associates, said he sympathized with Park Service officials, but they did not meet their obligation under the law. “They have a slightly more difficult mission because they are approving work for areas that are our most treasured landmarks,” Beightel said. “But an EA [environmental assessment] is supposed to take a year, and no more.”

Jasmine Shanti, a spokeswoman for the Park Service’s national capital region, wrote in an email that the federal agency “determines the start of the environmental assessment timeline based on when a complete and actionable proposal is available for review.” She said NPS had not received such a plan until December of last year.

The documents reviewed by The Post do not fully explain what delayed the environmental assessment after the Park Service sought public comment in 2022. Lisle said meetings between D.C. Water and the Park Service continued monthly, with more issues to work through, including design refinements requested by the Park Service, tribal consultations and “coordinating on archaeological, cultural, and natural resource impacts.”

By late 2024, three years after the Park Service required the more exhaustive review, D.C. Water was still waiting for approval, documents show.

Utility officials by then recognized they needed a broader strategy to rehabilitate other sections of the Potomac Interceptor. At the rate they were progressing, it could take decades to repair the entire aging line, current and former D.C. Water officials said.

On Sept. 26, 2024, D.C. Water’s engineers presented executives a slide showing more than 20 sections of the Potomac Interceptor, scattered across D.C., Maryland and Virginia colored in orange or red — areas where video inspections had identified at least one spot containing “significant” corrosion, according to people familiar with the presentation. It did not indicate which sections already had concrete casings, which would make the internal deterioration less worrisome. But the slide came with a dire warning: along most of the line there were no backup systems should the pipe fail.

After the presentation, D.C. Water began yet another round of video inspections of key areas of the Potomac Interceptor, according to interviews and records. When the cameras passed through section LZ09 in October 2024, engineers learned they had a more serious problem, records show. The rebar seen dangling inside the pipe in prior years had washed away entirely, exposing gaskets that connected sections of pipe.

On Dec. 12, 2024, D.C. Water officials met with Park Service officials to deliver an urgent request, according to a D.C. Water presentation prepared for the meeting. The utility said it needed approval to begin repairs on the most critical 800 feet that appeared to be in imminent danger of failing.

The Potomac Interceptor “needs immediate repair in which the rapid degradation of the pipe has made it a high priority task to prevent collapse,” read the first item on the meeting agenda.

Seven months later, the Park Service agreed. On June 10, 2025, it issued a permit granting D.C. Water the go-ahead to reinforce the 800-foot section — part of the work it had first proposed nearly seven years earlier. In the fall, contractors got to work.

In early January, crews completed the emergency work while the Park Service was in the final phase of the in-depth review to determine how repairs on the rest of the section could proceed. D.C. Water officials hoped to resume work on the next segment this summer.

It was too late. In the dark on Jan. 19, a security camera trained on a manhole over that part of the pipe detected sewage flooding to the surface and toward the Potomac River.

Given the spill and the emergency repairs that followed, Hanson, the Park Service ranger, said D.C. Water would need to revise the environmental review yet again.

“Please note that with the current extenuating circumstances, that draft now needs to change,” Hanson wrote in an email to The Post. “D.C. Water is working on edits.”



Andrew Ba Tran, Dana Hedgpeth and Jenny Gathright contributed to this report.

What readers are saying

The comments on the article express frustration over the bureaucratic delays and inefficiencies that led to an environmental disaster involving a broken sewer pipe in D.C. Many commenters criticize the lengthy environmental review process, suggesting it prioritized minor... [Show more](#)

This summary is AI-generated. AI can make mistakes and this summary is not a replacement for reading the comments.

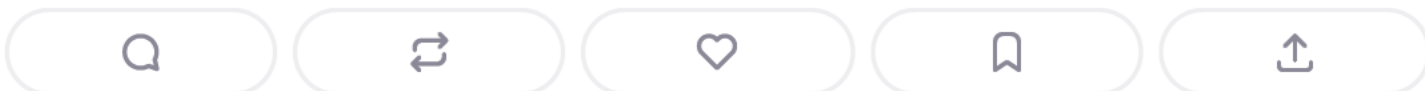


Donald J. Trump  
@realDonaldTrump

There is a massive Ecological Disaster unfolding in the Potomac River as a result of the Gross Mismanagement of Local Democrat Leaders, particularly, Governor Wes Moore, of Maryland. A sewer line breach in Maryland has caused millions of gallons of raw sewage to be dumped directly into the Potomac River, a result of incompetent Local and State Management of Essential Waste Management Systems. This is the same Governor who cannot rebuild a Bridge. It is clear Local Authorities cannot adequately handle this calamity. Therefore, I am directing Federal Authorities to immediately provide all necessary Management, Direction, and Coordination to protect the Potomac, the Water Supply in the Capital Region, and our treasured National Resources in our Nation's Capital City. While State and Local Authorities have failed to request needed Emergency Help, I cannot allow incompetent Local "Leadership" to turn the River in the Heart of Washington into a Disaster Zone. As we saw in the Palisades, the Democrat War on Merit has real consequences. The Federal Government has no choice, but to step in. FEMA, which is currently being defunded by the Democrats, will play a key role in coordinating the response. Thank you for your attention to this matter! PRESIDENT DONALD J. TRUMP

6.2k ReTruths **19.9k** Likes

Feb 16, 2026, 3:02 PM






← Truth Details



2610 replies



Donald J. Trump  

@realDonaldTrump

Maryland, Virginia, and Washington, D.C., who are responsible for the massive sewage spill in the Potomac River, must get to work, IMMEDIATELY. If they can't do the job, they have to call me and ask, politely, to get it fixed. The Federal Government is not at all involved with what has taken place, but we can fix it. But remember, even in that case, with the Democrat Shutdown, we'll have to bring in true Patriots to do the work because many are not working right now. These Democrat caused Disasters, both River and Shutdown, will only get worse. The two Governors and the Mayor of D.C. must act, IMMEDIATELY. This is a Radical Left caused Environmental Hazard. With all of their talk about carbon footprints and everything else, they're allowing hundreds of tons of sewage to pour into the Mighty Potomac, making it much less mighty. ACT FAST. I am awaiting your call. Thank you for your attention to this matter! PRESIDENT DONALD J. TRUMP

8.72k ReTruths **33.2k** Likes

Feb 17, 2026, 10:55 AM

