

## **FINANCING WATER QUALITY MANAGEMENT AND INVESTMENT IN INFRASTRUCTURE**

### **The United States Revolving Fund Programs: Current, Emerging and Potential Practices to Address Water Quality and Potable Drinking Water Investment Needs**

Mr. Jim Gebhardt, USEPA Water Infrastructure and Resiliency Finance Center, Office of Economic Cooperation and Development

*Any opinions expressed herein are those of the author and do not necessarily reflect the views of the US Environmental Protection Agency. The author participated as a part of his official duties.*

#### *Executive Summary*

In 1987 Congress amended the Federal Water Pollution Control Act and in doing so created the EPA administered, state domiciled, Clean Water State Revolving Fund (the “CWSRF” or “SRF”) program to replace the EPA administered Construction Grants Program. For decades the federal government had provided grants to support local government efforts to improve the nation’s water quality. This new program was designed to replace direct federal assistance that had been provided in the form of grants in favour of a new funding model that offered states resources to operate a financial assistance program on behalf of local governments where dedicated resources would revolve in perpetuity. There were a number of objectives served by the change. First, it conformed to a long held federal view that local governments are ultimately responsible for funding projects needed to protect the nation’s water quality. Second, shifting day-to-day control for financial assistance to the states was thought to be a better delivery model for state and local governments. The change was also expected to reduce the claim on federal resources supporting municipally owned treatment works and expand the menu of eligible projects, including projects that address diffuse sources of pollution (“non-point sources”).

The program created authorized federal funding for a limited five year period. Federal funding was contingent on a 20% state match for every federal dollar appropriated. The law provided that funds could support a number of financial assistance options including loans, the purchase of debt obligations, to use as pledged security for municipal bond transactions, financial guarantees and investment.

Since its creation, states have used the CWSRF financial assistance authority to support more than \$110 billion in financial assistance. Such assistance has largely been delivered as loans, debt obligation purchases and bond security. Through 2015, financial assistance has leveraged federal investment by 280%. The early success of the CWSRF encouraged Congress to create the Drinking Water SRF (the “DWSRF”) as part of the 1996 amendments to the Safe Drinking Water Act. Through 2015, the DWSRF had leveraged federal investment 171% and delivered \$30 billion in financial assistance to public water systems.

The programs have exhibited enormous flexibility. States have been able to shape their programs to their specific needs, characteristics and capabilities. All states have used program equity to make below market direct loans some of which have been offered to disadvantaged communities with deep subsidies. The majority of states have leveraged federal and state investment by entering the bond market to boost program capacity. Bond financings undertaken on behalf of multiple local governments have merited

triple-A ratings due to the level of equity overcollateralization and loan portfolio diversification. Under most SRF credit structures the net loan rate to the borrowers is a function of the over-collateralized cashflows. This is, in turn, a function of federal tax law which limits investment to the related tax-exempt bond issues' cost of funds.

Today the combined SRF balance sheet strength and large cash positions are creating new opportunities for SRFs to expand financial assistance capacity and to use its investment authority to expand the scope of program related initiatives that can further boost environmental and public health benefits. These opportunities underscore a shift in thinking about SRF management. First, SRFs now have the ability to leverage SRF balance sheets to support a meaningful volume of guarantee products that can invigorate newly emerging environmental markets without subtracting from its aggregate lending capacity. In addition to the loan volume generated it is estimated that SRFs could add as much as \$50 billion in guarantee capacity that could be put to work in support of water quality and public health infrastructure funding initiatives. Second, the growth of cash balances that exhibit a high degree of stability (meaning that cash balances have little to no variability below a certain threshold) presents opportunities for SRF managers to invest more aggressively for capital growth and to also consider more strategic investment that can further serve program policy objectives.

Twenty five years in and the attributes of the SRF increasingly look like that of an endowment. Endowments are designed to operate in perpetuity as are the SRFs. Endowment models are expected to provide investment returns over long investment horizons that will generate monetary returns sufficient to both operate the endowment and to serve its mission. The CW and DWSRFs are currently in a position to not only meet its mission objectives as presently understood. Most SRFs are also in a position to expand its product offerings to support new water quality and public health funding solutions while employing endowment investment strategies to grow the capital base. For these opportunities to be realized, EPA and the SRF administrators need to reconsider existing legal and institutional frameworks that present barriers to higher program performance. It also requires a more concerted effort to engage stakeholders in productive conversation and experimentation in regard to the SRFs' true capabilities.

#### *Establishment of US Water Quality and Safe Drinking Water Goals/Standards*

The first major effort in the United States to address water quality was the enactment of the Rivers and Harbors Act in 1899. Its' intent was to protect the nation's navigable waters by making it a misdemeanor to discharge refuse matter, to excavate, fill, or alter the course, condition, or capacity of any port, harbor, channel, or other areas without a permit. Congress assigned the US Army Corp of Engineers responsibility for administering the Act. Portions of the Act that remain in force today continue to be administered by the Corp. The purpose was to assure that navigable waters remained accessible for commerce, transportation and recreational purposes. Although the responsibility of the states, in 1911, the Corp recommended that wastewater treatment facilities be mandated by the federal government.<sup>1</sup>

Although early federal legislation empowered the U.S. Health Service to study health issues attributable to sanitation, sewage and water pollution, it was not until 1948 that Congress passed the *Federal Water Pollution Control Act*. The Act created a comprehensive set of water quality programs and provided some funding for state and local governments. Enforcement was limited to interstate waters. The Public Health Service was assigned responsibility for financial and technical assistance. In 1965, Congress amended the Act to require states to establish interstate water quality standards. The Act also established the Federal Water Pollution Control Administration to set standards where states failed to do so.

---

<sup>1</sup> Folsom, Marion B. "Water Pollution Control," *The Military Engineer*, November-December 1958

Congress completely rewrote the 1948 Act with amendments that became law in 1972. Commonly known as the Clean Water Act, Its objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. The amendments established a permit system for the regulation of point sources of pollution. The amended Act also established technology based standards that could be equitably applied. Congress exempted certain categories of pollution from the point source definition. These categories, later designated as nonpoint sources, became subject to regulation with amendments that were enacted in 1987. The Act also transferred responsibility for administration to the then newly formed U.S. Environmental Protection Agency (“EPA”)

### *Federal Policy Regarding Support for Infrastructure Improvements Needed to Meet National Goals*

It has been a consistent tenant of federal policy that water pollution control infrastructure is a state and local priority. Consistent with this tenant, federal funding has always been predicated on such support being temporary. However, since 1956 it has been deemed necessary to provide federal support to address persistent increases in water quality degradation despite prior federal, state and local investment. In this section of the report, we will highlight the federal investment programs that preceded the creation of the SRFs as well as the SRF models.

### **Early Federal Funding Initiatives**

The 1948 Federal Water Pollution Control Act included the first federal assistance to states for planning and design of pollution control facilities. Amendments enacted in 1956 authorized \$50 million a year in grant dollars for municipalities. Grant money were allocated to states on the basis of population and income levels. The Act provided that grants be made available by states to municipalities for up to the lessor of 30% of project costs or \$250,000. These levels were increased by subsequent amendments.<sup>2</sup>

### **Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500)**

Recognising that despite state and local investment, that water quality impairment was growing, Congress passed the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500). The Amendments stipulated broad national objectives to restore and maintain the chemical, physical, and biological integrity of the Nation's waters ([33 U.S.C. 1251](#)). To achieve these objectives the Congress greatly expanded federal government investment in local pollution control infrastructure by creating the Municipal Construction Grants Program.

Title II of P.L. 92-500 authorized grants to states for wastewater treatment plant construction under a program administered by EPA. Federal funds were provided through annual appropriations under a state-by-state allocation formula contained in the act itself. States used their allotments to make grants to cities to build or upgrade wastewater treatment plants and thus to achieve the overall objectives of the act. The federal share of project costs, originally 75% under P.L. 92-500, was reduced to 55% in 1981.<sup>3</sup>

At its zenith, the program was the largest non-military public works programs since the Interstate Highway System. During the federal budget challenges of the 1980s the grants program became a target of the Reagan Administration as it sought to redirect budgetary priorities. Justification was tied to the generational debate about the appropriate roles of federal, state, and local governments in a number of

---

<sup>2</sup> Folsom, Marion A., “Water Pollution Control,” *The Military Engineer*, November-December 1958

<sup>3</sup> Copeland, Claudia, “Water Infrastructure Financing: History of EPA Appropriations,” Congressional Research Service, April 5, 2012

domestic policy areas, including water pollution control. The Administration's rationale for ending the program included the following points.

- The original intent of the program to address the backlog of sewage treatment needs had been virtually eliminated by the mid-1980s;
- Most remaining projects (such as small, rural systems) were believed to pose little environmental threat and were not appropriate federal responsibilities; and
- State and local governments, in the Administration's view, were fully capable of running construction programs and have a clear responsibility to construct treatment capacity to meet environmental objectives.<sup>4</sup>

### **1987 Water Quality Act Creates the Clean Water State Revolving Fund**

Many states and localities supported the idea of phasing out the grants program. According to Copeland, "many were critical of what they viewed as burdensome rules and regulations that accompanied the federal grant money." However, as a policy response they sought a longer transition and ample flexibility to set up long-term financing mechanism to promote state and local self-sufficiency.

Congress' response to this debate was contained in 1987 Amendments to the Act (P.L. 100-4). It authorized \$18 billion over nine years for sewage treatment plant construction, through a combination of the Title II grants program and a new State Water Pollution Control Revolving Funds ("SRF") program.<sup>5</sup> Under the new program, in Title VI of the act, federal grants would be provided as seed money to capitalize a state-administered financial assistance program to build sewage treatment plants and other water quality projects.<sup>6</sup> Repayments of obligations to the state by eligible recipients of SRF financial assistance would provide for build-up of a renewable source of capital for future investments. Under the Amendments, the SRF program was phased in beginning in FY1989 (in FY1989 and FY1990, appropriations were split equally between Title II and Title VI grants) and entirely replaced the previous Title II program in FY1991. The intention was that states would have flexibility to set priorities and administer funding. Federal appropriations were scheduled to end after FY1994.<sup>7</sup> Contrary to the initial plan, Congress has continued to provide national appropriations to the SRF each year since 1989.

### **1996 Safe Drinking Water Act and the Drinking Water SRF**

Prior to 1996 the federal government had not provided funding support for drinking water systems. Inclusion of language in the 1996 amendments to the Safe Drinking Water Act (P.L. 104-182) to authorize the creation of a Drinking Water SRF modelled on the Clean Water SRF was based on the following:

- Growing populations had altered land use sufficiently to elevate risks of nutrient contamination of drinking water supplies;

---

<sup>4</sup> Copeland, Claudia, "Water Infrastructure Financing: History of EPA Appropriations," Congressional Research Service, April 5, 2012.

<sup>5</sup> The program is known today as the Clean Water State Revolving Fund or CWSRF.

<sup>6</sup> The 1987 Amendments greatly expanded the types of water quality projects eligible for assistance. However, it limited financial assistance for point sources to publicly owned facilities. The Amendments provide for nonpoint source projects to be either publicly or privately owned.

<sup>7</sup> Copeland, Claudia, "Water Infrastructure Financing: History of EPA Appropriations," Congressional Research Service, April 5, 2012.

- The necessary growth in the number of regulated contaminants that required large investments in treatment technology to meet regulatory requirements; and
- Policy concerns that many of the nation’s 52,000 small community water systems were likely to lack the financial capacity to meet the rising costs of SDWA compliance.

The Table below provides a complete history of federal support for pollution control and water infrastructure investment. It shows both the construction grant funding that was made available for projects and the grant dollars made available to the states to capitalize the Clean Water and Drinking Water SRFs.

**Table 1**  
**U.S. Federal Water Infrastructure Funding**  
**Millions of U.S. Dollars**

<b>Fiscal Years</b>	<b>Construction Grants</b>	<b>Clean Water SRF</b>	<b>Drinking Water SRF</b>	<b>Totals</b>
<b>1951-60</b>	\$187			\$187
<b>1961-70</b>	1,881			1,881
<b>1971-1980</b>	36,636			36,636
<b>1981-90</b>	20,397	\$2,074		22,471
<b>1991-95</b>	141	6,896		
<b>1996-00</b>	106	5,705	\$2,732	15,580
<b>2001-05</b>	70	6,501	4,033	
<b>2006-10</b>	39	8,085	7,574	26,302
<b>2011-15</b>	66	10,328	3,611	14,005
<b>Totals</b>	\$59,523	\$39,589	\$17,500	\$117,062

*Clean Water and Drinking Water State Revolving Fund: Capabilities,*

*Design and Performance*

Federal appropriation made to states for both programs are subject to states providing state matching funds equal to 20% of each state’s annual appropriation. Grant awards made by the EPA are subject to states demonstrating that they will provide for the requisite state match. States have complied with this requirement from legislative appropriations or the proceeds of state match bonds. State allocations of the Clean Water SRF national appropriation is based on a percentage allocation formula that is provided in the Act.<sup>8</sup> The Safe Drinking Water Act sets state allocations of Drinking Water SRF appropriations on the basis of a periodic needs survey required to be administered by EPA at five year intervals.

The programs are designed to be a sustainable source of funds to provide low cost financial assistance that is not dependent on the priorities of future legislative bodies. The longer that federal appropriations and state match dollars are made available the more resilient and less dependent the SRFs are on future appropriations to sustain robust support to eligible financial assistance recipients. This breeds financial resilience that benefits all stakeholders, including contract project developers and equipment vendors.

---

<sup>8</sup> The most recent amendments to the Act, the 2014 Water Resources Reform and Development Act (“WRRDA”) included instructions requiring EPA to review the current CWSRF allocation formula and report its findings to Congress.

**Forms of Financial Assistance** - When created the states were granted the authority to use the SRF funds to provide a number of different forms of financial assistance (see Appendix A for the financial assistance provisions of the respective statutes). Generally, available financial assistance options consists of:

- Loans, with certain prescribed limitations,
- The purchase of municipal debt obligations,
- The use of program equity to over collateralize bonds issued by the SRF for the purpose of funding financial assistance obligations,
- The use of the SRF balance sheet to guarantee the obligations where proceeds fund eligible projects or to provide loan guarantees revolving funds established by local governments or intergovernmental agencies; and
- The investment of funds to grow the equity of the program.

The Acts also require that such assistance be provided at or below market rates. In 2009, the American Recovery and Reinvestment Act allowed a percentage of the federal investment to be used as a source of principal forgiveness. This change deepened the value of financial assistance to recipients. This feature has now become a staple of the programs (see below; ***Vehicle for Economic Stimulus and Disaster Recovery***).

**Grant Disbursement** – Appropriated SRF grant dollars appropriated to states are not made available upfront. Grant dollars are made available pursuant to a Letter of Credit (“LOC”) arrangement with the federal government. Draws on the LOC occur as project costs are incurred. Recipients submit requisition requests which are vetted by SRF staff. Once approved, instructions are sent to the SRF Trustee who will request a draw under the LOC to the extent federal dollars are needed to satisfy the payment requisition. Once dollars are received, they are released to the recipient to make payments owed to project vendors.<sup>9</sup>

### **Framework of the Federal-State Revolving Fund Governing Partnership**

Under the federal-state governance framework responsibilities are shared as follows. States have day-to-day management responsibilities for:

- The Intended Use Plans (“IUPs”) that are required by the Acts which establish, for stakeholders, the basis for the setting of project priorities and the criteria and methodologies for ranking projects.
- The processes by which loan applications are solicited, vetted, approved and funded.
- Assurance that program requirements (e.g., wage rate and American Iron and Steel requirements) are followed.
- Setting the policies for the financial terms that they make available in accord with federal and state laws.

EPA Region Offices:

- Award and oversee the federal capitalization grants to the states
- Review states’ IUPs and project priority lists
- Conduct detailed reviews of state program performance
- Communicate national policies to states
- Enforce grant requirements

---

<sup>9</sup> Before draws can be made to the state, the state must have deposited to the SRF the minimum 20% of state match.

EPA National Office:

- Develops and disseminates national program policy
- Oversee regions and state programs
- Partner with Regions on program issues
- Engage with the Administration, Congress and stakeholders on issues of national importance

### **State Revolving Fund Operational Framework**

Setting up the SRF programs at the state level required each state to adopt enabling legislation that set up the state's institutional framework – such as identifying the federal grant recipients, the state entity(s) responsible for running the programs and, consistent with the federal language, the operational authority granted by the state. The actions taken by the states have produced two basic operating models for the program. The first model comes with two variants; programs operated by the state environmental agency with responsibility for only non-program fund investment residing with the state treasurer or responsibility for debt issuance and non-program fund investment residing with the state treasurer. This model is dominant. The second model describes programs where oversight is provided by the state environmental agency, as grant recipient, and program operations to a degree (larger or smaller) are shared between the agency and an independent state authority and its governing board.

Massachusetts is an example of the first model. The Department of Environmental Protection is responsible for its Intended Use Plan and project selection but relies on the Office of the State Treasurer for financial and investment management services. The legislature created the Massachusetts Water Pollution Abatement Trust which houses fund assets and is the obligor on SRF bonds issued to capitalize the Trust. The Office of the State Treasurer is responsible for all aspects of financial and investment management. The Office of Finance and Administration is responsible for budget and oversight.<sup>10</sup>

New York State (“NYS”) is an example of the second model. In 1989, the NYS legislature amended its environmental conservation laws as well as its public authority laws to accommodate the Clean Water SRF. The NYS Department of Environmental Conservation was designated as the federal grant recipient and was given authority to sign off on the State's Annual Intended Use Plan (required by the CWA) which governs project selection. The NYS Environmental Facilities Corporation, which had been created years before to be a financing conduit for private industry to access tax-exempt financing for environmental infrastructure projects, was authorized to manage all financial aspects of the program. Principal responsibilities include the IUP, loan development and origination, loan servicing, bond issuance, managing the investments of the fund and all budget and financial accounting functions.

### **Financial Assistance Delivery Mechanisms**

States have opted for a variety of mechanisms for the delivery of financial assistance to program eligible recipients. How these mechanisms have been deployed reflects a number of factors. Principal among them have been the state-by-state distribution of available resources versus in-state needs. The percentage allocation for the CWSRF range from the statutory minimum allocation of 1% to 11.2%. States receiving a larger percentage of the national appropriation benefited from the economies of scale that came with the allocation. The Acts initially allowed up to 4% of the federal allocation to be drawn to pay for administrative expenses. For states with larger allocations this presented meaningful advantages in setting up the financial assistance delivery mechanism. States with more limited resources opted initially to limit

---

<sup>10</sup> [www.mass.gov/treasury/docs/mwpat/cafr/final-2013-cafr.pdf](http://www.mass.gov/treasury/docs/mwpat/cafr/final-2013-cafr.pdf).

loan originations to direct financings funded solely from the federal and state investment. States with higher allocations tended to be more aggressive making early entries into the bond market on behalf of eligible recipients.

Generally speaking, smaller largely rural states have limited financial assistance to direct loan programs where federal and state dollars are lent directly to eligible recipients. Repayments of principal and interest are simply recycled and become a part of a future IUP's resources that are available for additional lending for eligible projects. Through 2015, 22 states have limited their SRF financial assistance activity to direct lending.

The remaining 28 states have used federal and state dollars to secure additional funds from the U.S. tax-exempt bond markets. This is commonly referred to as leveraging. States have leveraged program equity with the sale of SRF bonds on behalf of single or multiple recipients. The Leveraging factors vary by state and are generally informed by the below market rate targeted by the state. Basic security for SRF bond issues consists of pledges of loans funded from bond proceeds and equity that is pledged to secure the transaction or from equity invested in a dedicated reserve that is invested in securities that meet rating agency requirements for the target bond rating.

Because federal tax law limits returns on pledged equity to the cost of tax-exempt funds it is common practice for SRFs to over-collateralize their bond issues in proportion to the interest subsidy target. This means that a 50% interest subsidy target translates into a 50% equity allocation for a given project. The deeper the subsidy target the greater the excess coverage can be expected to be versus the rating target for loan portfolios of like quality.

In the early years of the program it was recognized by leveraging states that a master financing indenture would be the best delivery vehicle for a revolving fund program. A master financing indenture establishes all of the critical contract terms that secure the interests of investors. SRF bonds are issued in accord with the master indenture and a specific supplemental indenture that establishes the contract terms for the specific bond issue. Periodic issuance of bonds under the master, in association with pledges of program equity, and the funding of loans from bond proceeds to eligible recipients produced, established over a fairly short period, a diverse loan portfolio. The combination of a diverse and growing loan portfolio, over-collateralized with program equity, resulted in triple-A rating designations from each of the major rating services - Moody's, S&P and Fitch Investors - for most state SRF programs by 1995.<sup>11</sup>

Consistent with one of the objectives of the program to assure market access to eligible recipients and minimize financing costs achieving triple-A ratings provided states and program participants with access to least cost funds which in many states sets the basis for the interest subsidy benefit.

***Lending to Disadvantaged Communities*** – Many states have established criteria by which eligible recipients of financial assistance qualify to receive added financial benefits which generally consisted of deeper interest subsidies that could be as low as 0%. The 1996 SDWA amendments, creating the DWSRF, expanded financial assistance options for disadvantaged communities by authorizing states to implement a discretionary subsidy program for “disadvantaged communities” as defined by the state based on publicly-reviewed criteria approved by EPA. Under this provision, states could decide to provide a subsidy to those

---

<sup>11</sup> For bonds issued to fund loans to large standalone borrowers, ratings remain heavily dependent on the credit quality of the underlying borrower. The actual rating assigned is a function of the credit strength of the borrower and pledge of the oversized SRF reserve. Rating services refer to this as a bottom up analysis. For the over-collateralized multi-borrower pooled financings, the ratings are driven largely by program factors with underlying borrower factors being of secondary importance. Rating services refer to this as a top down analysis.

communities of up to 30% of the grant in the form of negative interest rates, principal forgiveness or loan-term extension. Nineteen states opted to use this capability.<sup>12</sup>

Criteria for disadvantaged communities is made available in state annual Intended Use Plans. Today, funding packages for entities that qualify as disadvantaged may receive assistance that includes 0% interest and principal forgiveness. For states that, as a policy matter, limit principal repayment to 20 years from project completion, may offer loans to disadvantaged communities that can be repaid over 30 years from origination.

### **Program Performance**

The premise behind the development of SRFs that states could better direct federal and state resources to projects that best reflect water quality and public health priorities, is supported by very strong results to date. These results reflect a balance in financial assistance delivered to local governments, representing populations large and small. The data also shows financial assistance delivered by project categories.

The following tables provide a breakdown of financial assistance delivery by population and projects for the Clean Water and Drinking Water SRF programs, respectively.<sup>13</sup>

**Table 2 Clean Water and Drinking Water SRFs: Populations Served  
(Billions of U.S. Dollars)**

<b>Total Population Served</b>	<b>CWSRF</b>	<b>DWSRF</b>
<b>Less than 3,500/3,300</b>	12.6	6.2
<b>3,500/3,300 – 9,999</b>	12.9	4.7
<b>10,000 – 99,999</b>	38.9	11.3
<b>100,000+</b>	46.8	7.8
<b>Totals</b>	111.2	30.0

**Table 3 Clean Water SRF: Projects Served  
(Billions of U.S. Dollars)**

<b>Project Type</b>	<b>Amounts</b>
<b>Wastewater Treatment</b>	106.6
<b>Secondary Treatment</b>	39.4
<b>Advanced Treatment</b>	21.4
<b>Sanitary Sewer Correction</b>	15.3
<b>New Sewers</b>	17.1
<b>Combined Sewer Overflow Correction</b>	11.6
<b>Storm Sewers</b>	1.0
<b>Recycled Water</b>	0.8
<b>Nonpoint Sources</b>	4.6
<b>Totals</b>	111.2

<sup>12</sup> USEPA, Utilization of Additional Subsidization Authority in the Clean Water and Drinking Water State Revolving Fund Programs, Report to Congress, April 2014.

<sup>13</sup> Data is from the CW National Information Management System (“NIMS”) (as of June 30, 2015)

See: [www.epa.gov/cwsrf/clean-water-state-revolving-fund-cwsrf-national-information-management-system-reports](http://www.epa.gov/cwsrf/clean-water-state-revolving-fund-cwsrf-national-information-management-system-reports). Drinking Water SRF data is from the DW National Information Systems (as of September 30, 2010) [www.epa.gov/drinkingwatersrf/drinking-water-state-revolving-fund-national-information-management-system-reports](http://www.epa.gov/drinkingwatersrf/drinking-water-state-revolving-fund-national-information-management-system-reports).



**Table 4 Drinking Water SRF: Projects Served  
(Billions of U.S. Dollars)**

Project Type	Amounts
<b>Construction</b>	30.0
<b>Treatment</b>	11.5
<b>Transmission &amp; Distribution</b>	11.9
<b>Source</b>	1.7
<b>Storage</b>	3.3
<b>Purchase of Systems</b>	0.3
<b>Restructuring</b>	0.1
<b>Land Acquisition</b>	0.1
<b>Other</b>	1.1

Through 2015 and 2010, the Clean Water and Drinking Water SRFs had received \$39.6 billion and \$14.3 billion, respectively in federal investment. The full breakdown of program resources is provided in Table 5 below.

**Table 5 Clean Water and Drinking Water SRFs: Funds Available for Projects  
(Billions of U.S. Dollars)**

	CWSRF	DWSRF
<b>Total Funds</b>	87.1	28.2
<b>Federal Capitalization Grant</b>	39.5	17.5
<b>State Match</b>	7.4	3.3
<b>Net Leveraged Bonds</b>	35.7	8.1
<b>Net Interest Earnings</b>	8.2	1.7
<b>Net Transfers between SRFs</b>	-0.3	
<b>Funds for Refundings</b>	-1.6	
<b>Administration Set Aside</b>	-1.6	-0.6
<b>Other Set Asides</b>		-2.1

For the Clean Water SRF the states had collectively originated or purchased 36,159 loans or debt obligations through June 30, 2015. Given total financial assistance of \$111.2 billion, this equates to average loan size of \$3.1 million. Included in these numbers was a small amount of financial assistance provided by SRF financial guarantees.

Drinking Water SRF over a much shorter period of operation (and measurement) through June 30, 2010 had originated or purchased 14,145 loans or debt obligations and total financial assistance of \$21.7 billion. This amounts to an average loan size of \$1.5 million.

**Vehicle for Economic Stimulus and Disaster Recovery**– In 2009, the American Recovery and Reinvestment Act (“ARRA”) included a \$6 billion appropriation for the SRFs - \$4 billion for the CWSRF and \$2 billion for the DWSRF. The existence of the federally sponsored and state administered SRFs provided a ready platform to quickly deliver funds to underwrite infrastructure projects. State CW and DW Intended Use Plans were a ready source of shovel ready projects which could absorb the funds which, by law, had to be committed within one year of ARRA’s enactment. In 2012, the SRFs were looked to again as a vehicle for delivering funds for infrastructure recovery. This time special appropriations were made to the states of New York and New Jersey to address extensive damage caused to water and wastewater treatment systems by Hurricane Sandy. For each of these initiatives, Congress waived the 20% state match requirement.

ARRA introduced new requirements to both the CWSRF and DWSRF communities. Of the \$6 billion appropriated to both programs, not less than 50 percent of a state's ARRA allotment had to be provided in the form of grants, principal forgiveness, or negative interest rate loans. These options have the effect of reducing the repayment amount or absolving the recipient obligation altogether. ARRA also introduced a Green Project Reserve to which states were required to commit 20% of federal resources. Projects eligible in this category included green infrastructure, and water and energy efficiency. Appropriations had to be contracted within a one-year time frame.<sup>14</sup> ARRA ultimately committed the full \$6 billion and funded 2,487 and 1,254 CW and DW projects, respectively. In response to Hurricane Sandy, the additional subsidization provisions made available in ARRA was also made available to New York and New Jersey.

In the years following ARRA, Congress used annual appropriation bills to authorize the continued use of additional subsidization by providing for up to 30% of a state's CWSRF appropriation to be allocated to additional subsidization. This benefit was no longer limited to disadvantaged communities. When Congress passed WRRDA, in 2014 it became a permanent part of the Clean Water Act.

### *Looking Ahead: SRF Challenges and Opportunities*

In the United States, The U.S. EPA estimates that the nation faces an infrastructure investment deficit of \$655 billion over the next 20 years.<sup>15</sup> We also recognize that in the next 20 years climate change will put increasing pressure on water resources and the infrastructure services that the public will demand to protect the quality and availability of such resources.

As part of a national strategy to address this challenge, the inherent potential of the SRFs must be harnessed to the maximum extent possible to help drive infrastructure investment. To date, SRFs have delivered tremendous value as a provider of below market rate financing provided from federal and state investment as well as the proceeds of SRF bonds and retained earnings. However, the current strength of SRF balance sheets affords SRF administrators the capacity to strategically use the guarantee and investment authority provided by the Acts to expand the reach of the SRFs in ways that can meaningfully bolster return on infrastructure investment.

### **Developing Public Private Partnership Interfaces**

There is nothing in current federal statutory language that precludes the use of SRF resources in conjunction with Public-Private Partnership arrangements. For the Clean Water SRF, the CWA requires that point source projects ("treatment works") be publicly owned. The length of P3 agreements with project owners does not violate the public ownership requirement. Non-point source projects can be privately owned and be eligible for CWSRF financial assistance. Under the SDWA, the Drinking Water SRF can provide financial assistance to both public and privately owned facilities provided that the owner is serving the public. At the state level, any SRF support for P3s depends on what is permitted by state law. This applies to state law in general, which may be permissive, and SRF enabling laws specifically which may not be.

---

<sup>14</sup> USEPA, Utilization of Additional Subsidization Authority in the Clean Water and Drinking Water State Revolving Fund Programs, Report to Congress, April 2014.

<sup>15</sup> US EPA, 2011 Drinking Water Needs Survey and Assessment, [www.epa.gov/tribaldrinkingwater/drinking-water-infrastructure-needs-survey-and-assessment-fifth-report-congress](http://www.epa.gov/tribaldrinkingwater/drinking-water-infrastructure-needs-survey-and-assessment-fifth-report-congress).

US EPA, 2012 Clean Water Needs Survey, [www.epa.gov/cwns](http://www.epa.gov/cwns).

## **Expanding the Use and Breadth of Financial Delivery Channels**

In 2014, aggregate CWSRF cash balance was \$12.0 billion. In 2015 year, \$5.8 billion in financial assistance was made available to eligible recipients. Discounting repayments, new federal and state commitments and dollars provide from bond proceeds would leave at the end of the year, cash and cash equivalents of \$ 6.2 billion. For the purpose of this discussion we are using this as a proxy for the SRF program float – that sum of dollars that approximates the minimum collective cash balance on SRF balance sheets after accounting for annual program activity. The net recycled cashflows of the CWSRF program in 2014, after providing for repayment of bond principal and interest, was \$2.75 billion.<sup>16</sup> The comparable numbers for the DWSRF is net cash and cash equivalents of \$1.5 billion and net recycled cashflows of \$472 million (the latest publicly available data is for the year ending 2009).

The aggregate cashflow and cash balances of the programs present opportunities for SRF administrators to think more expansively about their programs' inherent capabilities. The discussion that follows introduces some opportunities for SRF administrators to use these resources to open up new financial delivery channels that can create more mission related fund value that is not zero sum questions relative to existing lending capacity.

***Financial Guarantees*** - In 2014, the U.S. EPA Financial Advisory Board released a report that suggested SRFs had an inherent untapped guarantee capacity in a multiple of billions of dollars. The report's analysis concluded that with the establishment of a subordinate lien on program equity, released from the pledge of bond indentures, for every dollar released \$3 to \$14 dollars of guarantee capacity could be created.<sup>17</sup> Given CWSRF aggregate cashflows, estimated capacity was \$6 billion to \$28 billion. The range reflects financing terms of 5 to 20 years for guaranteed loans. If SRFs commit to cross-pledge CW and DWSRF assets, as is the case for SRF bond financing, these estimates would more than double. If there was 100% product absorption among the 50 SRF administrators capacity could be in excess of \$50 billion.

Thus far, SRFs have used the guarantee authority sparingly. Generally speaking, available resources, provided from new appropriations and dollars recycled from prior project commitments, are encumbered by new projects listed on the annual intended use plan. This drives a common perception that such encumbrances leave no resources that can be dedicated to expand SRF product offerings to additional forms of financial assistance such as financial guarantees. However, upon closer analysis we recognize that future project encumbrances are not a limitation on increased fund utilization. There are, in fact, ample SRF resources that could be pledged to support guarantees that would qualify for triple-A claims-paying designations from the rating services. First, most SRFs have pledged cashflows supporting triple-A ratings for their pooled bond indentures that are in excess of that needed to support such ratings when rating agency stressed loss assumptions are considered. This arises as a by-product of the interest subsidy targets established by a state. Because tax law limits returns on pledged equity to the cost of tax-exempt funds it is common practice for SRFs to over-collateralize their bond issues in proportion to the interest subsidy target. The deeper the subsidy target the greater the excess coverage can be expected to be for loan portfolios of like quality. Second, daily balances held in the equity account of the program can be pledged without arbitrage restriction, if the pledge is subject to availability (i.e. there is no specific dollar pledge).

In 2010, New York State repositioned its program credit structure to add an SRF guarantee product that serves both the Clean Water and Drinking Water programs. It replaced its original pooled bond financing indenture with a new indenture that added a subordinate lien to accommodate an SRF guarantee product for eligible projects that could best be served in this manner. The guarantee is also supported by a pledge

---

<sup>16</sup> [www.epa.gov/sites/production/files/2015-04/documents/cwsrf\\_2014\\_financial\\_statements.pdf](http://www.epa.gov/sites/production/files/2015-04/documents/cwsrf_2014_financial_statements.pdf).

<sup>17</sup> US EPA Financial Advisory Board, "Utilizing SRF Funding for Green Infrastructure Projects," January 2014, [www.epa.gov/envirofinance/publications#srf](http://www.epa.gov/envirofinance/publications#srf).

of program equity to the extent available. As proof of concept, in 2013, the Clean Water SRF guaranteed the New York State Energy Research and Development Authority's Residential Energy Efficiency Loan Program which benefited from the SRF guarantee's triple-A ratings.<sup>18</sup> Given the strength of the SRF balance sheet, New York State was not required to reserve capital to support its' guarantee.

Why is this important? The availability of triple-A guarantee support can offer financial assistance for new infrastructure solutions in development that would benefit from improved market access. Since the development of emissions trading schemes, first authorized in the U.S. under the 1990 Clean Air Act Amendments, public and private stakeholders have been actively developing market based models that can address pollution problems across environmental media. In recent years stakeholders have been actively seeking to establish price signals that will create economic incentives to reduce water pollution. Examples include the establishment of markets for trading nutrient credits that help limit effluent to levels below a watershed's natural absorptive capacity (i.e., its Total Maximum Daily Load), the bidding of projects that provide off-site mitigation or source water protection and the setting of dual price sewer fee structures that incentivize local property owners to develop on site distributed infrastructure solutions to manage stormwater that must otherwise be managed by the municipal utility at significantly higher public cost. On the drinking water side this authority may be of value in supporting water efficiency initiatives and may have a particularly high value in improving project economics for agricultural producers or third-party project developers.

***SRF Investment Authority*** – SRF balance sheets are flush with cash, most of which is held in high quality short-term investments. The intent of state law governing the investment of SRF dollars when they are not invested in eligible projects is to (a) preserve the value of SRF assets while they are idle, and (b) assure that cash can be immediately available when needed to support new projects. Consequently, most states have established very conservative investment requirements in law and as a matter of investment policy. These laws and policies direct SRF investment managers to maintain high quality liquid investments such as U.S. Treasury Bills. Such investments are commonly referred to as “non-program investments” because the investments are not directly related to the mission of the program. However, over the first 25 years of SRF operations, cash balances have consistently grown as SRF resources have grown. This is producing a growing stable balance of investable dollars. In finance circles this is commonly referred to as “the float” – the minimum sum of dollars that are likely to be held as cash on the balance sheet given the structure of a business or a program's operating cashflows. (see discussion above regarding available SRF cash balances).

This would suggest that some percentage of these cash balances could be invested in ways that can support the mission of the programs without risking liquidity shortfalls in the face of project funding obligations. For example, one of the unique challenges that small to midsize water and wastewater systems face is a shortage of resources that can be invested in infrastructure planning and development. When the Drinking Water SRF language was crafted as part of the 1996 amendments to the SDWA, it included set aside provisions which gave discretion to states to allocate a portion of the federal grant dollars for technical assistance to small systems. Permitted uses include conducting project planning and development to assist system managers meet eligibility requirements for accessing SRF financial assistance. Because planning costs are SRF project eligible, the risk that any use of investment dollars to stimulate project preparation for SRF financing would not be repaid should be very small. It would require that (a) a project does not move forward to the funding stage and (b) the system fails to repay the investment made by the SRF. Given the SRF mission, these are risks that could be accepted with proper management and risk controls. An investment focus in this area should, in time, yield greater demand for SRF financial assistance. The

---

<sup>18</sup> This transaction qualified under the Clean Water SRF because residential energy efficiency projects meet the state's Clean Water Act, Section 319 water quality standards as a source reduction of nitrous oxide and mercury emissions thus mitigating their impairment on water bodies.

prospect for accelerating program participation merits a close look at the value of using cash float to support project planning and development. To fully capitalize on this investment strategy most states would need to amend statutory language. With limited exceptions, those states that do have greater investment discretion are not taking advantage of its cash balances to make more program related investments.<sup>19</sup>

The other opportunity that stable floats offer is to allow for longer duration investments specifically for the purpose of maximizing investment returns to accelerate fund growth over longer periods of time. An aggressive investment strategy is consistent with that employed by endowment and insurance companies which are managing for long term returns that correlate with long duration liabilities. In 2011, U.S. EPA's Financial Advisory Board reviewed SRF investment practices as well as the investment strategies adopted by the Texas Permanent School Fund, The Great Lakes Protection Fund and The Nature Conservancy that maximize investment returns on terms that are consistent with their long term objectives and concluded that SRF managers could pursue longer term investment strategies consistent with its goals of maximizing support for eligible projects.<sup>20</sup>

#### *Capacity of the SRFs to Support New Initiatives*

**Water Technology, Regulatory Review and Adoption** - In the U.S., the adoption of water technology advances are dependent on a number of factors. The technology must be tested and judged acceptable to regulatory oversight bodies. The technology must also be accepted by water system operators and it must demonstrate cost benefits that ideally can be sustained over project lifecycles. As climate effects accumulate the need to better manage our water resources will accelerate. If technology adoption can also accelerate in ways that positions the water sector to keep pace with - and get ahead of - the challenges posed by climate, it could yield enormous benefits to the water sector.

The availability of SRF resources to be used for long term investment could provide a unique opportunity to expand the dimensions of returns that the SRFs can deliver. Currently, SRFs deliver returns in three ways. First by incentivizing or inducing water and wastewater system managers to undertake needed infrastructure projects, second by reducing project financing costs and third by investing idle cash balances in short term interest bearing securities.

With the right strategy and management framework, SRF resources available for investment, could be targeted toward a mix of higher return investments including those that can capture both monetary returns, which can grow the capital base of the program, and have a direct beneficial impact on water infrastructure investment. This could be achieved by allocating a portion of the cash float directly in water technology investments. The objective would be to promote water technology advancement that can result in better performing, more highly resilient and cost effective infrastructure solutions. This would, in effect, multiply the beneficial reach of the SRFs across the water space. An OECD operating example is provided by the ability of Dutch Regional Water Boards to allocate a portion of revenue to water technology investment that has promise to improve public health<sup>21</sup> (see case study under urban water quality management of this document).

---

<sup>19</sup> The State of Pennsylvania is currently considering an investment in a State Treasury program that provides energy efficiency loans for residential homeowners.

<sup>20</sup> US EPA Financial Advisory Board, "The SRF Investment Function: Current Status and Prospect for Enhancing Sustainability," February 2011, [www.epa.gov/envirofinance/publications#srf](http://www.epa.gov/envirofinance/publications#srf).

<sup>21</sup> [www.pharmafilter.nl](http://www.pharmafilter.nl)

How realistic such an undertaking could be would depend on the investment model adopted to deliver the desired results.

***A Strategy for Putting SRF Resources into the Effort*** - In 1999, the U.S. Central Intelligence Agency developed an investment model that was designed to capture the benefits of private sector investment while avoiding process bottlenecks associated with traditional procurement practices. The objective was to help the Agency capture state-of-the-art technology innovations that would enable it to maintain effectiveness as an intelligence gathering enterprise.

The model was developed through the creation of a not-for-profit corporation, In-Q-Tel, that invested appropriated federal dollars alongside private capital in the most promising technologies<sup>22</sup>. In-Q-Tel's charge was to identify those investment opportunities that best tracked the expressed needs of the Agency. The strategy for investment deployment focused efforts on companies that were, in turn, focused on bringing commercial products to the marketplace. The use of a not-for-profit platform to manage the investment strategy provided the flexibility needed to involve smaller as well as large companies. Under traditional technology procurement, smaller companies' lack of scale tends to work against their focusing on the technology needs of government. The government's inability to appeal to talented innovators came from its procurement process, which appeared custom-made to discourage innovation. Government contracts often required small companies to develop technologies and products to meet a government specification—before that specification was ever written or published. The calculus was simply that the entry costs undermine small company economics. Consequently, the government was not effectively capturing the benefits of a valuable sector of the innovation marketplace.<sup>23</sup>

Given this short description of the not-for-profit investment channel created by CIA in partnership with commercial interests to serve the expressed technology needs of the intelligence community, is this a model that could serve the technology needs of the water sector and could the federal government create in partnership with a willing group of select states, a comparable model, that would rely in part on available SRF investment dollars? Given the challenges ahead this question may merit further discussion among policy makers. Any action on this idea would require concurrence among the willing states as to the design of a model that would need to put monetary returns front and center. Minimally, the monetary returns would need to be transparent. The technological returns should manifest in better performing, more highly resilient and cost effective infrastructure solutions. The opportunity is to invest millions with the prospect of saving billions in infrastructure funding needs.

### *Conclusion*

Over the last 25 years the United States has demonstrated the value of developing a sustainable infrastructure model. In 1987, Congress created the first of the two funds, the Clean Water SRF with the intention of capitalizing it with appropriations for no more than five years. The early success of the program brought broad political support for annual funding that continues to this day. Early program success also spawned political action to fund a second SRF, the Drinking Water SRF. The existence of the SRFs, capitalized with funds that can only be used for the purposes prescribed by law, underscores the resilient nature of the SRF as a reliable funding mechanism around which local governments and their contracting partners can plan eligible projects. Its value was also demonstrated during the 2008 financial crisis and in the aftermath of Hurricane Sandy in 2012 when SRFs were used as channels to quickly funnel resources to boost needed economic activity and remediate storm damaged facilities. Although annual

---

<sup>22</sup> A Non-Government Organization or “NGO” could serve the same purpose.

<sup>23</sup> Josh Lerner, Felda Hardyman, Ann Leamon, Kevin Book, “In-Q-Tel”, Harvard Business School, 9-804-146, May 25, 2005.

appropriations have continued to be a staple of the program, the SRFs are positioned to support infrastructure needs of local governments regardless of the political environment or level of appropriations.

The model as it has developed, has produced a scaling capability with respect to growth in lending capacity and recycled dollars that can stand behind a guarantee product that can be used in innovative ways to support market based solutions for distributed green infrastructure projects and ecosystem services that can provide protection for our watersheds. Investing available cash in program related areas such as predevelopment assistance that can assist communities to properly plan infrastructure needs presents opportunities to boost fund utilization in new and productive ways.

For these and the other opportunities presented in this paper to be realized, it will require a concerted effort to educate SRF managers and stakeholders. The need for education and stakeholder outreach is underscored primarily by state law that were written in 1987 and 1996 to manage the SRF model as first designed. Many states have laws that prescribe investment based solely on conservation of principal and liquidity. In the current environment characterized by highly liquid cash positions, an expansion of SRF investment authority to implement endowment like investment strategies that could accelerate returns based on general market investment and targeted investment strategies could yield both investment returns and technological advancement.

Any OECD states that may contemplate developing sustainable infrastructure financing mechanisms of their own would benefit from the experience of the United States and an understanding of the constraints that limits its ability to capitalize on current opportunities. With these lessons understood, they should benefit by positioning new generations of the model to fully maximize the value of the three financial delivery channels discussed in this report.

## **APPENDIX A**

### ***SRF Financial Assistance Authority Under the Clean Water Act***

#### **From Title VI, Section 603 (d)**

*Except as otherwise limited by State law, a water pollution control revolving fund of a State under this section may be used only—*

*(1) to make loans, on the condition that—*

*(A) such loans are made at or below market interest rates, including interest free loans, at terms not to exceed the lessor of 30 years and the projected useful life (as determined by the State) of the project to be financed with the proceeds of the loan;*

*(B) annual principal and interest payments will commence not later than 1 year after completion of any project and all loans will be fully amortized upon the expiration of the term of the loan;*

*(C) the recipient of a loan will establish a dedicated source of revenue for repayment of loans;*

*(D) the fund will be credited with all payments of principal and interest on all loans; and*

*(E) for a treatment works proposed for repair, replacement, or expansion, and eligible for assistance under subsection (c) (1), the recipient of a loan shall –*

*(i) develop and implement a fiscal sustainability plan...*

*(2) to buy or refinance the debt obligation of municipalities and intermunicipal and interstate agencies within the State at or below market rates, where such debt obligations were incurred after March 7, 1985;*

(3) to guarantee, or purchase insurance for, local obligations where such action would improve credit market access or reduce interest rates;

(4) as a source of revenue or security for the payment of principal and interest on revenue or general obligation bonds issued by the State if the proceeds of the sale of such bonds will be deposited in the fund;

(5) to provide loan guarantees for similar revolving funds established by municipalities or intermunicipal agencies;

(6) to earn interest on fund accounts;

### **SRF Financial Assistance Authority Under the Safe Drinking Water Act**

Except as otherwise limited by State law, the amounts deposited into a State loan fund under this section may be used only—

(1) to make loans, on the condition that-

(A) the interest rate for each loan is less than or equal to the market interest rate, including an interest free loan;

(B) principal and interest payments on each loan will commence not later than 1 year after completion of the project for which the loan was made, and each loan will be fully amortized not later than 20 years after the completion of the project, except that in the case of a disadvantaged community (as defined in subsection (d)(3)), a State may provide an extended term for a loan, if the extended term—

(i) terminates not later than the date that is 30 years after the date of project completion; and (ii) does not exceed the expected design life of the project;

(C) the recipient of each loan will establish a dedicated source of revenue (or, in the case of a privately owned system, demonstrate that there is adequate security) for the repayment of the loan; and

(D) the State loan fund will be credited with all payments of principal and interest on each loan;

(2) to buy or refinance the debt obligation of a municipality or an intermunicipal or interstate agency within the State at an interest rate that is less than or equal to the market interest rate in any case in which a debt obligation is incurred after July 1, 1993;

(3) to guarantee, or purchase insurance for, a local obligation (all of the proceeds of which finance a project eligible for assistance under this section) if the guarantee or purchase would improve credit market access or reduce the interest rate applicable to the obligation;

(4) as a source of revenue or security for the payment of principal and interest on revenue or general obligation bonds issued by the State if the proceeds of the sale of the bonds will be deposited into the State loan fund; and

(5) to earn interest on the amounts deposited into the State loan fund.