ENVIRONMENTAL FINANCIAL ADVISORY BOARD

JAN -2 2014

Honorable Gina McCarthy
Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. McCarthy:

The enclosed report, "Utilizing SRF Funding for Green Infrastructure Projects" was prepared after considering the historic agreement between EPA and the City of Philadelphia to meet clean water goals with state-of-the-art green infrastructure project solutions and the limited involvement of the Clean Water State Revolving Funds (the "CWSRFs") in such projects. The purpose of the report is to analyze the potential of the CWSRFs to provide credit guarantees to green infrastructure projects within current program eligibilities and resources. This opportunity could be especially attractive for the larger state CWSRF programs and/or for states that leverage their CWSRF programs.

The federally sponsored CWSRFs have been providing financial assistance for clean water projects nationwide since 1990. Through the reporting year ended June 30, 2012, the CWSRFs had funded more than $89 billion in such projects. Despite these achievements, the nation continues to need additional capital to meet water quality needs. The findings in the enclosed report indicate that some CWSRFs have reached a point where they may have the capacity to expand funding for green infrastructure projects by offering credit guarantees at the same triple-A ratings enjoyed by most CWSRF loan programs. Based on the rating crite1ia of the credit rating agencies and using some conservative assumptions, ***we found that for each dollar of recycled CWSRF program equity, $3 to $14 of CWSRF guarantee capacity could be provided to fund green infrastructure projects in addition to current project funding levels. This translates into $6 billion to $28 billion in potential green infrastructure funding capacity nationwide.*** The report also discusses other program strengths that could more than double these capacity estimates. Finally, the report makes recommendations on the process needed to realize these potential program benefits.

Although the report specifically focuses on the use of the untapped financial capacity of the CWSRFs to support green infrastructure projects. this same untapped capacity could be used to support any clean water eligible project, based on each state's priorities or preferences. This would be in line with EPA State

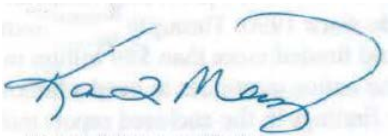
Revolving Fund Program Implementation Regulations that state unequivocally that as matter of policy and purpose that "the Agency intends to implement ... the program in a manner that preserves for states a high degree of flexibility for operating their revolving funds in accordance with each state's unique needs and circumstances."

The EPA-Philadelphia Green Cities/Clean Water Partnership was ground breaking and green infrastructure has now been institutionalized as an important Agency priority. Going forward, EPA has an opportunity to encourage the funding of similar green infrastructure projects across the nation within the highly successful CWSRF program and to do so with existing resources. U.S. EPA should inform states about this and other state-of-the-art solutions and help those with the requisite legal, pers01mel and financial resources to more fully use CWSRF financial assistance to address the vast unmet needs impacting water quality.

Finally, EFAB would be remiss if we did not recognize the contributions of a now former EFAB member, Jim Gebhardt, Chief Risk Officer with the Bond Factor Company in New York City. Jim was the driving force behind the identification of this financing opportunity and the development of this report in concert with other dedicated members of the Board and its Green Infrastructure Project Workgroup.

We hope this report is helpful to you and the U.S. EPA staff and would be pleased to discuss our analysis and summary in further detail.

Sincerely,



Karen Massey, Chair
Environmental Financial Advisory Board

Enclosure

cc: Robert Perciasepe., Deputy Administrator
Nancy Stoner, Acting Assistant Administrator, Office of Water
Mary Ann Froelich, Acting Chief Financial Officer
Michael Shapiro, EFAB Designated Federal Official
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Utilizing SRF Funding for Green Infrastructure Projects

January 2014

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U.S. EPA Environmental Financial Advisory Board

Utilizing SRF Funding for Green Infrastructure Projects

Tapping the SRF Programs' Financial Strength and Existing Federal Authority to Deliver Efficient Low Cost Funding for Section 212, 319 and 320 Designated Stormwater Mitigation Projects

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I. Executive Summary

This report highlights the opportunity that the United States Environmental Protection Agency ("U.S. EPA") and its state partners have to expand the benefits provided by the existing State Revolving Funds ("SRFs"). Specifically, this report presented by the U.S. EPA Financial Advisory Board (the "Board") evaluates the prospects for tapping the federal authority granted by Title VI, Section 603(d) of the Clean Water Act ("the Act") to provide financial assistance in the form of credit guarantees for Green Infrastructure ("GI") projects. We believe that this opportunity is especially attractive for the larger state SRF programs and/or for states that leverage their SRF programs.

The premise of the report is that, although SRF dollars (federal and state equity contributions as well as retained earnings) are dedicated to supporting direct financings and bonds issued to increase funds available for lending activity, the periodic repayment of such SRF dollars and the release of equity funded reserves from the pledge of SRF program liens, if applicable, are sufficiently robust to also support a top-rated SRF guarantee program.

There are two traditional models for leveraged SRF programs: (i) reserve fund leveraged programs that have reserves funded from program equity and (ii) cashflow leveraged programs that pledge SRF loan repayments. Since the early years of the Clean Water SRF Program ("CWSRF"), state level bonding agencies have benefited from top credit ratings with most SRF programs achieving triple-A ratings from the three major rating services. These top ratings depend on the pledge of SRF resources to cover scheduled bond payments in the absence of scheduled SRF loan repayments. This report proposes a guarantee structure that not only preserves the resources underlying the existing SRF programs and ratings but also enables SRF programs to implement GI credit support programs.

Currently, across the country, the CWSRF generates more than $2 billion in annual cashflow, which is comprised of equity dollars that are released from the SRF program liens and earnings that are retained net of interest subsidies paid out to eligible funding recipients. Given these sizeable cashflows and the growing size and strength of SRF balance sheets, this report contends that the SRFs may now be in a position to support additional SRF projects with the same resource base. This additional financial assistance is based on existing federal authority under Title VI, Section 603(d)(3), (4) and (5) to provide security to or guarantee loans for SRF eligible

projects or financing entities that fund SRF eligible projects. The report specifically focuses on the opportunity to use the Title VI, Section 603(d) authority to support market-based GI funding solutions that incorporate private sector project ownership and repayment responsibility. The analysis contained in this report includes a conservative assumption that the GI loans supported through such a guarantee program would be below investment grade, and thus, the results are a conservative estimate of the funding capacity that SRF Administrators could make available. Nevertheless, the analysis provided in the report demonstrates that after allocating SRF resources needed to assure the integrity of the existing SRF bonding and/or lending program, sufficient resources remain to support additional projects backed by an SRF financial guarantee. The analysis further demonstrates that for each dollar of annual SRF cashflows $3 to $14 dollars of triple-A rated funding capacity could be created for such projects. Based on $2 billion in annual cashflow, this translates into $6 to $28 billion in potential untapped funding capacity nationwide. Furthermore, additional tools that are available to SRF Administrators, such as access to secured letters of credit and the legal authority to cross-pledge resources between the Drinking Water SRF ("DWSRF") and CWSRFs, could more than double this estimate. The report also addresses concerns that providing financial assistance to below investment grade borrowers could undermine funding capacity for traditional forms of SRF financial assistance. These concerns could be mitigated through the use of loss reserves funded from non-SRF sources as well as the establishment of loan underwriting standards to protect SRF resources.

Partnering the guarantee authority provided by the Act with state-of-the art GI project and funding designs offers two collateral benefits. First, it offers a form of SRF financial assistance that would allow states to provide cost saving benefits to urban communities, and second, it can extend the reach of the CWSRF in support of a segment of the infrastructure marketplace that is more labor intensive, thereby supporting not only sustainable project designs but also sustainable employment opportunities.

We recognize that despite the opportunity to better utilize existing SRF resources, not all state laws governing SRF administration mimic the federal authority. Consequently, certain states may need to amend current enabling statutes before they can take advantage of this untapped program capacity. In addition, other institutional constraints may exist, including existing SRF guidance and policy as well as manpower and the necessary expertise needed for successful implementation and administration. However the report recommends that U.S. EPA take an

inventory of existing state legal authority, evaluate current guidance and policy with respect to project eligibility review and approvals and streamline regulatory requirements, as appropriate, to promote effective SRF use of the financial guarantee authority. The report also recommends that U.S. EPA take an active leadership role in facilitating states' use of the federal authority found in Section 603(d)(3), (4) and (5). Finally, we want to note that green infrastructure projects may be implemented using traditional means of SRF funding. The use of traditional funding for green infrastructure and guarantee opportunities are not mutually exclusive.

II. Background – Purpose and Scope of Report

Nationally, as cities attempt to meet U.S. EPA requirements for the management of stormwater, they are evaluating opportunities to implement GI as an alternative to traditional gray infrastructure. GI is being adopted as a lower-cost alternative that can also help create more livable communities. One specific example of a city that is implementing a substantial GI plan is Philadelphia, Pennsylvania. In April 2011, U.S. EPA and the City of Philadelphia signed the Green City, Clean Waters Partnership Agreement that established a plan to remediate stormwater runoff with the launch of a $2.4 billion capital investment program to retrofit approximately 10,000 impervious acres of public and private property over a 25-year period.[1] The plan calls for $1.67 billion in public funds to be invested directly in GI solutions while also leveraging private sector investment. The plan establishes a baseline for owners to remediate non-residential properties and manage an inch of runoff onsite. The economics of the plan required that the City's wastewater pricing mechanism be modified to account for the City's true cost of servicing stormwater flows for non-residential owners. In July 2010, the City began a phased implementation of the new pricing mechanism that set a price for stormwater removal services on the basis of impervious surface as a percentage of a property's total size; the smaller the impervious surface footprint, the lower the overall price for stormwater services. The intent was twofold: to better align stormwater mitigation service charges with the properties responsible for stormwater flows and to establish a price incentive for property owners to undertake stormwater GI investment that could cost less than the net present value of the impervious surface stormwater servicing charge.

[1] See U.S. EPA/City of Philadelphia Green City, Clean Waters Partnership Agreement, April 2012 and Administrative Order for Consent on Compliance entered into by the City of Philadelphia, the Philadelphia Department of Water and U.S. EPA Region III.

The Philadelphia Water Department has estimated that the GI remediation plan will save $8 billion in traditional point source investment, most of which would have required public funds to be raised in the capital markets. With these estimated savings and the creation of price incentives for private funding of GI, the plan has the immediate effect of: (i) reducing the City's capital expenditure projections and (ii) producing a financial benefit by shoring up existing bond credit ratings and budget estimates of future debt service costs. As such, these benefits are critically important to long-run prospects for sustaining system performance and keeping pace with state and national clean water goals. Given the estimated capital savings, the positive implications for broader implementation of this strategy as a national wastewater infrastructure gap closing measure are profound.

Financing mechanisms available to non-residential property owners for GI are variants of those in use in the energy retrofit sector. These include the following options: (i) direct owner funding from cash or from financing made available by traditional creditors where project and performance risk resides with the owner; (ii) third-party off-balance sheet financing whereby a project developer takes the project, performance and operating risks in exchange for annual payments representing a portion of the estimated fee savings; (iii) application of the Property Assessed Clean Energy ("PACE") financing model that involves non-recourse debt financing by a sponsoring municipality that is secured and repaid by an assessment on each property's GI improvement; and (iv) on-bill financing sponsored by water and sewer utility and/or third-party investors where on-bill collections are used to repay the sponsor's project financings.

The availability of these financing mechanisms provides a sound foundation for testing and scaling GI project development to meet the terms of U.S. EPA GI Partnership agreements with America's cities. The nation's CWSRF programs can be used to provide SRF financial assistance to GI projects. To date, SRF Administrators have delivered almost all funding assistance in the form of below market rate loans and the purchase of below market rate debt obligations funded from program equity and bond proceeds. Currently, the idea that SRF resources can simultaneously support below market rate direct financing and triple-A bond financing, as well as deliver triple-A rated credit enhancement to support market rate funding for additional SRF-eligible projects may not be well understood. For eligible SRF projects that cannot be supported by below market rate financing due to funding constraints, SRF financial assistance that can

meaningfully improve financing terms could be made accessible to eligible projects in the form of SRF credit enhancement. If this can be achieved, the economics should provide benefits to property owners in in the form of lower financing costs and to project developers in the form of higher returns on equity investment. The critical value of an SRF guarantee would be the improvement in project economics and the resulting increase in the number of projects that are successfully developed in the GI marketplace.

As of April 2013, market interest rates suggested that GI project owners and sponsors could realize meaningful cost savings from the assistance of a top rated triple-A SRF credit enhancement mechanism. Assuming a portfolio of 20-year GI project financings of minimum investment grade quality (triple-B), annual interest costs would approximate 5.75%. With the benefit of SRF financial assistance, interest costs would approximate 3.50%. This represents a savings of 225 basis points or 2.25%. On a percentage basis, the annual interest savings is 39%. A portfolio rated less than investment grade (below triple-B) would realize even greater savings.

Although the value of credit enhancement as a means of delivering interest cost savings to borrowers is well established, SRFs have used this authority sparingly. Through reporting year end June 30, 2012, U.S. EPA's Clean Water Benefits Reporting System reported cumulative SRF financial assistance of $52.6 billion. Of this amount only $5.5 million was categorized as SRF guarantee assistance for local debt obligations and another $15.2 million was categorized as guarantees for sub-SRF loans.[2]

The Act specifically identifies Section 212, 319 and 320 projects as eligible for SRF financial assistance. These include Section 319 and 320 non-point source projects which are privately owned. In areas where National Pollutant Discharge Elimination System ("NPDES") permits have been issued, such projects become subject to Section 212 provisions, which under the Act are eligible for SRF financial assistance if they are publicly owned.[3]

In this report, we will review GI project eligibility for SRF financial assistance under the Act, the forms of financial assistance permitted under the Act, and those forms of financial assistance that can be integrated into existing SRF programs to support GI development in ways that do

[2] U.S. EPA Clean Water Benefits Reporting System, June 30, 2012, www.water.epa.gov/grants_funding/cwsrf/cwnims_index.

[3] Where such permits exist we can expect such projects to score and rank high enough to benefit from below market rate financial assistance from SRF programs. However, certain state programs limit SRF below market rate lending assistance to smaller communities thereby leaving larger jurisdictions, including those with negotiated NPDES permits beyond the reach of the program.

not undermine current state priorities. The report will also explain how states can apply annual SRF free cashflows to design and implement top-rated credit structures and credit enhancement mechanisms that can: (i) minimize GI project costs, (ii) promote GI project value to third-party investors and (iii) support GI project funding aggregation at the local level and on a statewide basis. The report will also estimate the potential reach of the SRFs nationally to support GI funding at significantly lower cost.

III. SRF Project Funding Authority[4]

The Act establishes project eligibility for SRF financial assistance. Public and privately owned projects that fall under Sections 212, 319 and 320 are eligible for SRF financial assistance.

GI Project Eligibility for CWSRF Financial Assistance

GI projects that qualify for SRF financial assistance may be publicly or privately owned, as provided under Section 212, 319 and 320. GI projects that can receive assistance include green roofs, infiltration basins, curb cuts, bioswales, wetland protection and restoration and the promotion of low impact development practices that reduce stormwater discharge, including the removal of impervious pavement in favor of pervious surfaces. Below is a summary of these pertinent sections.

Section 212 – Publicly owned projects are SRF eligible. Under Section 212, the cost of land is only eligible if it is integral to the treatment process. U.S. EPA has stated that the acquisition cost of land integral to implementing stormwater best management practices qualifies as an eligible project cost under Section 212.

Section 319 – Publicly or privately owned projects, included in a 319 Non-Point Source Management Plan, are SRF eligible. These can include projects that are not specifically required by a draft or final NPDES permit. In areas subject to NPDES permits, U.S. EPA characterizes projects that fall into Section 319 as projects that go beyond the requirements of the NPDES permit.[5]

[4] Other than the Act, the source for most information and analysis provided in this section of the report can be found in "The Clean Water State Revolving Fund Program: Tapping Its Untapped Potential," U.S. EPA DRAFT, October 15, 2007.

[5] On March 22, 2013, U.S. EPA approved a New York State Environmental Facilities Corporation ("EFC") request to include the New

Section 320 - Projects that reside in a nationally designated estuary, as prescribed by Section 320(a), and are included in a Comprehensive Conservation Management Plan are eligible for SRF financial assistance. Under Section 320, privately owned and regulated stormwater projects are eligible, including GI.

Eligibility Issues and Remedies

Although Section 212 projects can be either publicly or privately owned, Section 603(c)(1) of Title VI, stipulates that only publicly owned Section 212 projects are eligible for SRF financial assistance. Another factor that drives eligibility is the NPDES Stormwater Permit Program. Stormwater projects that are specifically required by a draft or final NPDES permit become subject to the Act's Section 212 authority and, therefore, must be publicly owned to be eligible for SRF financial assistance. Projects that go beyond the minimum federal regulatory requirements defined in NPDES permits may be fundable as Section 319 non-point source projects even if they are privately owned. Section 320 projects, which fall under the CWSRF's authority to develop and implement Section 320 Comprehensive Conservation Management Plans, include privately owned projects that require NPDES permits. In this regard, Section 320 overrides the Section 603 public ownership requirement for NPDES permitted projects that would otherwise fall under Section 212.

IV. SRF Financial Assistance Authority

The Act identifies six distinct forms of financial assistance authority that SRF Administrators can rely upon. This authority is provided in Title VI, Section 603(d)(1) through (6), restated as follows:

York State Energy Research and Development Authority's ("NYSERDA") portfolio of Residential Energy Conservation Projects ("RECPs") as eligible 319 projects qualified for financial assistance by the CWSRF under Section 603 (c) (2) of the Act. This approval is conditioned on EFC and the NYSERDA explicitly mentioning in their operating agreement that the projects are intended to assist with the implementation of the State's program established under Section 319 of the Act. In July 2013, NYSERDA sold its Residential Energy Efficiency Financing Revenue Bonds, Series 2013A which were guaranteed by the NYS CWSRF pursuant to the terms of EFC's SRF 2010 Master Financing Indenture. The NY Nonpoint Source Management Program identifies atmospheric deposition from fossil fuel combustion as a significant source of water quality impairment and calls for additional controls over, and reductions in atmospheric deposition of such pollutants in NY's waters. RECPs are expected to reduce dependency on fossil fuel use within the State. Providing such assistance to projects that reduce fossil fuel reliance is consistent with U.S. EPA's eligible project policy guidance (see footnote 4 above).

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 20 years;

(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 not later than 20 years after project completion;

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

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

(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 Administrators have largely relied on Section 603 (d)(1), (2) and (4) - the loan provisions, the municipal debt obligation purchase authority and the bond security provisions – to deliver financial assistance in the form of loans to, or to fund the purchase of municipal debt obligations from, eligible assistance recipients. In such programs, most states have delivered financial assistance from fund equity or from the proceeds of revenue bonds that are secured by fund equity.

Projects funded have been drawn from the annual Intended Use Plans for each state in accordance with project priority score and project readiness. The funding capacity for projects has simply been a function of the sum total of projected SRF financing available, based on the

total of:

1. The state's allocation of the annual federal appropriation,
2. State match dollars,
3. Earned interest on fund accounts,
4. Loan repayments and releases from bond reserves funded from federal and state contributions, if any, and
5. Bond proceeds deposited in the fund;

Less:

1. Bond principal and interest payments, and
2. Administrative costs.

These available dollars are matched against project dollars to determine the extent of project funding that can be supported during the year. States that do not leverage their SRF federal appropriations and state contributions with bond proceeds have relatively fewer dollars to support projects in a given year. However, this may have minimal or no impact on the relative amount of SRF recycled dollars that can be made available to support a credit guarantee program. SRF cashflows, net of any bond debt service obligations, are available to support additional projects that can be funded pursuant to the authority granted in Section 603(d)(3), (4) and (5): the local obligation guarantee, bond security provisions and loan guarantees that can be made available to sub-SRFs established by municipalities or intermunicipal agencies. Nationally, CWSRF annual cashflows exceed $2 billion. To date, the additional financial assistance that these cashflows could support, relying on Section 603(d)(3), (4) and (5) authority, remains largely untapped. These financial assistance options and their potential role in supporting publicly and privately owned GI projects, which are not currently fundable based solely on the financial assistance authority found in Section 603(d)(1), (2) and (4), will be reviewed in the next section of the report.

V. Available SRF GI Funding Mechanisms Given Federal Authority

As granted in the Section 603(d), the federal assistance authority can be tapped to support public-private partnership initiatives in the GI space. What follows is a discussion of the multifaceted SRF financial assistance options that states and municipalities can tap in

partnership.

State Level GI Funding Mechanisms

Basic Structure - The SRF Administrator can develop a statewide funding mechanism to lend SRF credit support by relying on the authority provided in Section 603(d)(4) and obtaining and/or utilizing state legal authorization. In the case of non-leveraging states, this approach would require the creation of a financing indenture, and in the case of leveraging states, it would require an amended or new indenture that establishes a new security lien subordinated to any outstanding bond issues that would:

1. Fund eligible projects from the proceeds of bonds issued under the indenture;
2. Be secured, in the following priority order, by:
    a. Principal and interest payments on loans funded by and pledged to each bond financing;
    b. Loan loss reserve balances, funded by one or more third parties (see *Loss Reserves*, below);
    c. All or a portion of the available program cashflows provided from:
        i. Principal and interest payments on loans and purchased obligations funded from SRF equity;
        ii. Principal and interest payments on loans and purchased obligations pledged to bonds that are senior to the new subordinated indenture, net of bond debt service payments;
        iii. The release of any reserves, net of any bond principal paid on bond funded reserves; and
    d. Unencumbered balances, including earned interest on non-program investments.

Figures 1 and 2 provide generic flow of funds graphics for a state that currently leverages and a state that does not. As the graphics demonstrate, state legal authority notwithstanding, there is no inherent structural impediment in the current design of state level SRF financing programs that would preclude the development of a GI guarantee program. Projects funded from bond proceeds issued under a new indenture would be subject to prior listing or group categorization on the state's annual Intended Use Plan and approval by the SRF Administrator as SRF eligible

pursuant to the Act, Sections 212, 319 or 320. [6]

Benefits – A state level funding mechanism can aggregate financing for eligible projects from all jurisdictions within the state. A statewide universe of potential projects also promotes economies of scale. This should allow such a program to: (i) tap a higher percentage of its theoretical credit capacity (i.e., the level of project lending that could be supported under the indenture at given credit rating level) and (ii) leverage the credit diversity of the statewide portfolio to further extend credit capacity limits for any given credit rating target.

Constraints – At the state level, the work to determine project eligibility is handled by the resource or environmental regulatory body or is delegated to qualified staff employed by the SRF financing entity. How additional GI projects are processed for eligibility may have an impact on the success of a state level program. Manpower constraints imposed by budget limitations could undermine review processes with negative consequences for program effectiveness. SRF Administrators will need to address this issue by securing more resources, streamlining processes (where inefficiencies exist) or designing sub-state level processes that would allow local administrators to review and attest to project eligibility for projects in their jurisdictions. Implementing the third option may require U.S. EPA approval and/or general guidance on this subject that would standardize sub-state project eligibility review processes.

States that do not currently leverage may not have adopted SRF enabling legislation that included bonding authority or may, as a matter of policy or resource limitations, be averse to relying on debt issuance to leverage program equity. Those states without bonding and/or guarantee authority will need to amend their enabling legislation before a state level funding mechanism can be implemented. States may also need to hire internal staff with the expertise to manage the underwriting and credit risks inherent in a guarantee program.

Sub-state Level GI Funding Mechanisms

Basic Structure - SRF Administrators can utilize the guarantee authority granted in Section 603(d)(3) and (5) to support sub-state level programs undertaken by local municipalities and intermunicipal agencies. Whereas the Section 603(d)(4) authority is limited to state level bond issues where proceeds are deposited in the fund, the guarantee authority specifies that SRF

[6] See Federal Register 40 CFR Part 35, Section 35.3150.

Administrators can *"guarantee, or purchase insurance for, local debt obligations…."* (Section 603(d)(3)) and "... *provide loan guarantees for similar revolving funds established by municipalities or intermunicipal agencies"* (Section 603(d)(5)).

By relying on the guarantee authority, a state SRF could support local bonding efforts where proceeds are deposited in dedicated loan accounts for SRF projects. The basic elements of security would consist of:

1. Principal and interest payments on loans funded from proceeds of the local debt obligation;
2. Loan loss reserves funded from a portion of bond proceeds or equity contributions from the sponsor or third parties; and
3. SRF program cashflows, net of prior liens, and unencumbered SRF balances.

The SRFs could rely on the same resources – in the same order of priority - that would be used to secure a state level program, as discussed in the prior section.

Figure 3 provides generic flow of funds graphic depicting an SRF leveraged program in its capacity as guarantor of a local debt obligation and Figure 4 an SRF direct loan program as guarantor of loans of a similar revolving fund established by a municipality or intermunicipal agency. While the figures depict either a leveraged or a direct loan program, either structure could support both guarantee mechanisms. In each case, the established municipal or non-governmental organization would secure financing through the issuance of bonds, or be the recipient of bond proceeds issued on its behalf, and lend the proceeds to fund either public or private projects. [7]

Benefits – For states that delegate administrative authority to sub-SRF sponsors offering guarantee support could allow such sponsors to operate without being subject to the competing priorities of the state SRFs. Such delegation would entail vetting projects for SRF eligibility and qualifying recipients as both viable credit risks and SRF-eligible in accordance with Sections 212,

[7] An example of an entity established by a municipality that could qualify under Section 603(d)(5) is the Chicago Infrastructure Trust. The Trust was created by the Chicago City Council to act as an administrative body for the management of infrastructure projects and contracts. The Trust is an Illinois not-for-profit designed to attract private capital to assist in rebuilding the City's infrastructure. As a City of Chicago established and governed entity, it could be an eligible recipient of SRF support as a project developer or as a sub-state SRF Administrator.

319 and 320, as applicable. SRF implementation regulations recognize delegation of environmental reviews for all Section 212 projects receiving SRF assistance, subject to established legal foundation in state law and supporting administrative documents that specify the extent to which environmental review responsibilities will be delegated to local recipients and subject to state oversight.[8] Other than project listing on the state Intended Use Plan there is no specific guidance governing the screening of Section 319 and 320 projects for funding approval. With respect to credit reviews, SRFs would manage exposure to losses by setting baseline credit parameters, including loan underwriting standards and non-SRF funded loss reserve requirements. For any given rating objective, standards set tighter than the baseline could be beneficial where they would allow for the calibration of SRF supported credit capacity in line with the needs of the sponsor. The key item, however, would be local administration over project approvals. Local administration would address any state level resource issues that could negatively impact the effectiveness of locally directed programs.

Constraints - The extent to which states did not include the financial assistance language of Section 603(d)(3) and (5) in their SRF statutory provisions will preclude the use of this financing mechanism to promote GI solutions. For such states, statutory amendment will be a necessary prerequisite to implementation. Another issue involves the determination of SRF project eligibility by local revolving fund administrators. There is a risk that loans or bonds guaranteed by the SRF may later be determined to have funded projects out of compliance with SRF requirements and therefore ineligible, in whole or in part. SRF and sub-state level program Administrators will need to provide contingencies for removing loans for non-compliant projects from the SRF guaranteed sub-SRF portfolio if the violation(s) in question cannot be remedied. (See *Non-conforming Loans* below.)

Lending Standards

For an SRF guarantee supported program to succeed at the state or sub-state level, adherence to lending standards that establish a credible minimum credit for publicly issued debt obligations is critical. What loan standards are adopted must be guided by context. For SRF Administrators, the quality of lending standards are critical to protecting the unencumbered balances and SRF "free" cashflows pledged, first, to a guarantee program and, second, to new

[8] See Federal Register 40 CFR Part 35, Section 35.3140.

loans, debt purchases or new reserves (the “traditional uses”) all in support of higher priority projects. This is less important in terms of protecting the financial strength of the SRF credit than it is in protecting SRF lending capacity (i.e., the capacity to lend to SRF projects given available resources). The use of SRF resources to cover loan defaults incurred by the guarantee program will not impair ratings for bond financings. However, to the extent that default payments are not recovered, such losses will reduce SRF resources and future SRF funding capacity.

The overriding factors in setting these standards are the baseline loan security provisions, which depend in part on the funding model(s) adopted. At a minimum, lending standards must be compliant with the terms of Section 603(d)(1), which requires that loans be secured by a dedicated source of revenue. Introduced in Section I of this report, the models identified as suitable for funding and securing GI financing include:

- Direct owner funding sourced from owner equity or in combination with debt;
- Third-party off-balance sheet funding sourced from equity or in combination with debt;
- Application of the PACE financing model; and
- On-bill financing.

Each approach presents its own standard setting issues.

Direct owners, *as borrowers* - Direct owner funding exposes the SRF, as purchaser or guarantor, to the credit of the commercial property owner. This immediately presents managerial capacity issues for state level and sub-SRF Administrators that may not have the credit expertise necessary to evaluate the credit quality of commercial property owners. Developing the in-house expertise to handle this task will impose costs without certainty that adequate loan portfolio credit quality will be established to protect SRF objectives. It will require threshold credit standards to be set that rely on market proxies such as a minimum investment grade rating for the owner, a parent co-obligor or irrevocable letter of credit support. As most commercial property owners would not have a rating, an alternative threshold credit standard is needed. This could be provided by a letter of credit wrap from a bank that is acceptable to the SRF Administrator. SRF Administrators could also offer a list of approved third-party project owners that can satisfy the threshold credit standard (see following paragraph). Additional requirements in support of loan accreditation would include credit checks, including credit

scores, and documentation of any loan repayment histories.

Third-party project owners/operators, as borrowers – Third-party project ownership arises where a property owner assigns ownership rights to the developer of the GI remediation project who invests in and develops the project in exchange for a percentage of the savings realizable on the project investment. Third-party project ownership exposes the SRF, as purchaser or guarantor, to the credit of the third-party project owner. Although this also presents the same managerial capacity issues for state level and sub-SRF Administrators, third-party project owners, as a class, may be more likely to meet credit thresholds. Though lending underwriting standards would be the same, the attributes of third-party project owners, which benefit from operating with an established business model supported by an investment grade balance sheet, investor equity dedicated to the project(s) and/or bank credit lines that satisfy lending standards, can substitute, as applicable, for the commercial property owner's generally weaker credit.

Direct owner funding relying on the PACE model - The PACE model offers another option for GI project funding. The foundation of the model is a property assessment that is levied by the sponsoring municipality that provides funding to property owners that undertake GI to achieve stormwater mitigation. In relation to distributed GI projects, the levy would be set at the annual rate necessary to cover, as applicable, the debt service payments, returns on equity to third-party developers and related administrative costs on the project debt issued by the municipality to fund project costs. Under this model the municipality, including stormwater districts with taxing power, would qualify the project vendors that would implement GI for property owners. The property assessment would remain on each property with GI development until the municipality's project-related debt is retired. Twenty-seven states and the District of Columbia have adopted PACE legislation to promote energy retrofits on residential and commercial property. [9]A few of these statutes incorporate water related projects as PACE eligible. In most cases, however, legislation will be needed to apply the PACE Model to stormwater mitigation.

On-bill financing – The on-bill financing model is similar to the PACE model in that the sponsoring municipality structures an additional charge to participating utility ratepayers to service the cost of the ratepayer's project, including debt service on debt issued by the SRF or

[9] Legal challenges by the Federal National Mortgage Association and Federal Home Mortgage Loan Corporation have been limited to residential property liens.

sub-state sponsors, return on equity to third-party developers and administrative costs.

Loss Reserves

For each of the owner funding options, discussed above, it will be highly beneficial to state and sub-state level programs to fund a loss reserve that would be drawn on before the SRF guarantee is utilized. A loss reserve would be funded at a level necessary to establish: (i) an underlying credit quality standard by which the rating agencies will measure the exposure of the SRF, as guarantor, of non-recourse bonds or as purchaser of project owner loans and (ii) a margin of safety that minimizes risk to the SRF that funding capacity for "traditional" forms of financial assistance will be adversely impacted. In order for the program to achieve a rating benefit, the loss reserve will need to be funded from contributions and not bond proceeds. Potential sources of contributions include:

- Sub-SRF sponsors;
- The SRFs from available non-program income; and/or
- Third parties interested in supporting funding mechanisms for distributed GI.

Contributions from sponsoring municipalities would notably represent a claim on all system users within the jurisdiction and not just the beneficiaries of GI project funding. Nevertheless, the appropriation of unencumbered balances to fund a loss reserve can be justified given the implied "GI versus gray infrastructure" cost savings to each participating municipality that would benefit all users. SRFs, which have accumulated non-program income from the generation of administrative fees, invest such income until it is needed to fund future operations. For many SRF Administrators, the projected timing of using these funds for operations, versus current collection rates, provides a meaningful float that can be a funding source for loss reserves without risk to operations. Funding can also be provided from third parties, such as Non-governmental Organizations ("NGOs"), that are committed to the successful implementation of distributed GI.

The loss reserve would offset payment defaults and a percentage of monetary losses, net of any payment recoveries. The level of loss reserves needed to support the funding mechanism will depend on each SRF's underlying and credit enhancement rating targets, SRF program risk tolerance and, as modified in the long run by, GI project owner/developer payment

performance.

Non-recourse Obligations

For sub-state level programs that issue bonds to fund eligible projects on behalf of direct owners and third-party developers, bond security will, by necessity, be of a non-recourse nature – meaning, it will not be a general obligation of the sponsoring entity. As a non-recourse obligation, the underlying credit strength rests solely on the participants as secured by the loan repayment obligation, property assessment or on-bill charge. The SRF guarantee on the local debt obligation issued by the sponsoring municipality, intermunicipal agency or an entity established by the local entity would be secured, first, by its security interest in the pledged repayment stream and, second, by a loss reserve.

Non-SRF Eligible Projects and Non-conforming Loan Remedies

Any delegation of project eligibility reviews to sub-SRF Administrators introduces risk that SRF guarantee support will be extended to projects that are: (i) later found during an internal or external audit not to be SRF eligible or (ii) determined to be out of compliance with SRF lending standards. For those projects that are not or cannot be made compliant with SRF eligibility requirements or lending standards, alternative funding will be needed to replace the SRF supported funding. A short list of funding remedies may include a prepayment obligation of project owners that is backed by bank-secured takeout funding or a fee-based purchase obligation of the SRF Administrator. The first option, the commitment of creditworthy banks to purchase non-conforming obligations, would add cost to the credit enhancement program, thereby reducing some of the benefit. In lieu of securing a bank purchase commitment, the SRF Administrator could rely on non-program income to purchase ineligible obligations, subject to state investment limitations. Alternatively, U.S. EPA could establish a “safe harbor” and provide a non-conforming project allowance, or non-conforming obligations could be placed in a senior lien account within the GI funding indenture where they would be collateralized solely from the cashflows of other GI recipient obligations and not from SRF resources.

Loan Warehousing

Coordinating the roll out of funding for distributed GI projects will present logistical issues that will be problematic if not planned for at the creation of the SRF sponsored funding program.

These issues primarily have to do with project costs and costs of debt issuance. The project specific issues that present challenges include project cost and expenditure timing uncertainties relative to funding timing that risk: (i) an over or under issuance of SRF-supported debt obligations and/or (ii) project delays, which can impair contractor operations and returns on equity. The debt issuance cost issue arises if projects cannot be sufficiently aggregated to minimize the impact of issuance costs on financing terms extended to project owners.

The solution to each of these issues is to construct a short-term funding mechanism that can provide project funding during the period when projects are getting under way and cost estimates are fluid. Some SRFs have established short-term lending programs to fund projects in advance of long-term financing in order to address the very same issues identified above. SRFs could provide resources for early project funding from:

- The program liquidity provided by the average daily investment balances of the CWSRF and DWSRFs; [10]
- Average daily investment balances of administrative accounts holding non-program income; or
- Short-term market borrowings secured by subordinate liens[11] on program cashflows and available investment balances.

Although an SRF guarantee is designed to support market access to projects that cannot otherwise benefit from below-market-rate SRF funding, on a day-to-day basis, many SRFs carry sufficient investment balances to provide short-term financing at market or below market rates to eligible projects across the board, including those for which long-term assistance is limited to the guarantee. Although SRF Intended Use Plans encumber investment earnings, recycled dollars, federal appropriations and state match contributions to fund specific projects or to fund reserves pledged to SRF bonds, the buildup of stable balances from investment earnings and recycled dollars can be used to carry short-term funding commitments for periods of time before priority projects are ready for long-term funding. Conceptually, such balances are

[10] SRF Administrators in Massachusetts and New York have obtained U.S. EPA approval to invest CWSRF and DWSRF assets across programs to support lending demand for eligible projects.

[11] Security liens supporting short-term financing vehicles would reside below that of the SRF guarantee. However, because such obligations are repaid in the near term the credit stresses applied reflect exceedingly low immediate default stress probabilities resulting in top ratings for SRF subordinated lien short-term financing vehicles (see Section V, "Rating Agency SRF Criteria and Target Ratings").

referred to as the “float.”

Once committed to a short-term financing program, some SRFs have found it beneficial to develop short-term borrowing mechanisms to supplement the float and assure short-term funding availability prior to long-term financing. These mechanisms can be extended to commercially owned, distributed GI projects. An additional source of short-term funding could be provided directly by NGOs or private lenders to approved projects with such funding later taken out by SRF financing.

Relying on SRF resources, supplemented to the extent needed by short-term borrowing, SRF Administrators could warehouse loans for their own accounts or on behalf of sub-state programs until long-term borrowing needs are finalized and aggregated for long-term funding. Another source of loan warehousing funds could be sub-state SRF sponsors or participating municipalities. An SRF guarantee or purchase commitment would need to be in place at the time of origination to secure the loans.

VI. SRF Rating Agency Criteria and Rating Targets

SRF bond ratings are generally a function of: (i) the level and quality of resources pledged, (ii) the manner in which such resources are pledged (i.e., the credit structure), (iii) the credit quality of the underlying loan or obligor portfolio, including portfolio size and diversity, and (iv) strength of the SRF Administrator’s management. These factors provide the ingredients for “stressing” SRF portfolios, inclusive of outstanding and projected SRF recipient obligations. The key driver is the default tolerance analysis (or the cashflow stress testing) of the SRF portfolio given the credit quality of the recipient obligations. Prior to providing a bond rating on a new SRF financing, the rating agencies apply their ratings to the underlying obligations and stress the SRF portfolio by discounting expected cashflows to assess the ability of pledged SRF assets to meet bond debt service obligations. The assigned bond rating reflects the probability of a missed debt service payment. Since 1994, the rating agencies have consistently assigned top ratings to SRF bond issues, indicating a remote probability of a missed debt service payment and an extremely high likelihood that SRF bond security provisions will remain sufficient over the life of the bond financing program to maintain a high margin of safety relative to that required by the rating criteria.

For each leveraged program, the pledge of SRF equity reflects financial assistance targets. For example, a leveraging SRF that seeks to provide financial assistance in the form of interest subsidies at 50% of the market rate will pledge $1 of equity to the bond issue for every $2 of projects funded.[12] Consequently, the assignment of top bond ratings is simply a by-product of this arrangement suggesting a degree of excess or untapped credit capacity that can be put to work. Generally, the lower the leverage factor, the lower the below market rate and the higher the untapped credit capacity and vice-versa. The existence of excess or untapped credit capacity relative to SRF financing program ratings represents funds that can support highly-rated SRF guarantees of bonds or loans. For SRFs that currently do not leverage program equity to boost funding capacity, available credit capacity is likely to be even greater. A review of the written SRF criteria of the three nationally recognized statistical rating organizations ("NRSROs") that provide the bulk of SRF credit ratings – Moody's Investors Service ("Moody's"), Standard & Poor's ("S&P") and Fitch Ratings ("Fitch") – is provided in Appendix A. The SRF criteria of the NRSROs is applied in the following section to estimate the extent of excess program credit capacity that could support triple-A-rated SRF guarantee programs.

VII. Estimating Excess SRF Funding Capacity in the Context of NRSRO Rating Criteria

The review of the NRSRO SRF rating criteria allows us to assess the opportunity to expand SRF financial assistance capacity on terms consistent with current program structures and objectives. In this section of the report we will apply the rating agency's SRF criteria in looking at program cashflows and other available resources to gauge the credit potential and capacity of SRFs to successfully expand SRF financial assistance by applying the federal authority of Section 603(d)(3), (4) and (5).

SRF Program Free Cashflow

As used in this report the term "SRF Program Free Cashflow" refers to the dollars that recycle from financial assistance lending, reserves pledged to SRF bond issues and investment earnings on equity balances, net of bond principal and interest payments. SRF Program Free Cashflow is measured as the difference between annual cash inflows and outflows, net of annual federal

[12] For a comprehensive discussion of SRF leveraging models the reader should refer to "Relative Benefits of Direct and Leveraged Loans in State Revolving Fund (SRF) Programs," U.S. EPA Financial Advisory Board, August 2008, pgs. 27-32.

appropriations and state contributions. Federal appropriations and state contributions are excluded from the calculation because receipt of such funds has historically been for projects identified on state Intended Use Plans that will benefit from direct or bond-financed financial assistance and because paid-in resources are sufficient to support a guarantee mechanism without diverting the SRF resources from existing delivery mechanisms.

SRF Program Free Cashflow is calculated based on the following inflows and outflows:

SRF Cash Inflows:

- Gross SRF financing principal repayments;
- Gross SRF financing interest repayments; and
- Gross SRF investment earnings

SRF Cash Outflows:

- Leveraged bonds repaid;
- State match bonds repaid; and
- Interest paid on bonds.

The difference between the sum of SRF Cash Inflows ("Gross Receipts") and SRF Cash Outflows ("Total Payments") represents annual free cashflow of SRFs that is available to serve as a source of security for projects supported by the SRF's guarantee capacity. Figures 5 and 6, show each state's free cashflow as reported to the National Information Management System for reporting years ending June 2009 and 2010, respectively.[13] As shown in Figures 5 and 6, the free cashflow for these years was $2.1 billion and $2.4 billion, respectively. These amounts represent the SRF residual funding capacity as measured solely by free cashflow.

Rating Objectives and Excess Financing Capacity Limits

The premise of this report is that these cashflows provide a potentially significant untapped source of financial strength which can be used to expand the reach of the SRFs (if these cashflows are not needed for other eligible purposes). As has been discussed previously in this report, how much of this cash is actually available to build a resilient credit mechanism for this purpose depends on the credit quality of each state's portfolio of SRF financings, including the

[13] "Clean Water SRF Funds Available for Projects, Detail, By State", Reporting Years Ending June 30, 2009 and June 30, 2010, U.S. EPA.

DWSRF, average program cash balances (the "float") and non-program income. The analysis below tests for the untapped guarantee capacity of the program, represented solely by dollars recycled from CWSRF direct financing repayments, including such financings pledged to SRF bond issues. The analysis solves for GI funding capacity with a set of weighted average SRF credit quality assumptions for hypothetical state leveraged and direct financing portfolios that recycle, annually, $100 in SRF equity cashflow. For Leveraged programs, of those recycled funds, it is assumed that $25 is used for direct loans and the remaining $75 leveraged by a leveraging factor of 2:1 (representing $2 of project financing funded by $1 of equity and $1 of SRF bond proceeds or $150 in total leveraged loans), resulting in approximately 15% of the portfolio being direct financings not pledged to SRF bond issues (calculated as the direct loans divided by the sum of the direct loans and leveraged loans or $25/($25+$150)). For simplicity, the analysis assumes the use of bond financed market-rate and 0%-direct loans to achieve the subsidized interest rate provided to the borrowers. The credit quality of these direct loans is assumed to be slightly lower than the credit quality of the leveraged portfolio, as the recipients of direct loans are often the smaller and less credit-worthy borrowers. The assumed credit quality of the hypothetical cashflows is as follows:

For the hypothetical leveraged portfolio:

Double–A rated financings	10%
Single-A rated financings	45
Triple-B rated financings	40
Non-rated financings	5
Total leveraged	100%

For the hypothetical direct financing portfolio:

Double–A rated financings	0%
Single-A rated financings	30
Triple-B rated financings	50
Non-rated financings	20
Total direct	100%

With leveraged financings comprising 85% of the SRF portfolio and direct financings comprising 15% of the SRF portfolio, the weighted average credit quality for the hypothetical leveraging state is as follows:

Double-A rated financings	= 10% (.85) + 0% (.15)	= 8.50%
Single-A rated financings	= 45% (.85) + 30% (.15)	= 42.75%
Triple-B rated financings	= 40% (.85) + 50% (.15)	= 41.50%
Non-rated financings	= 5% (.85) + 20% (.15)	= 7.25%
Total financings		100.00%

Subjecting the state leveraged and direct financing portfolios to rating agency stress tests produces the risk adjusted or discounted free cashflow that provides the baseline for constructing an SRF credit enhancement mechanism. While the SRF Program Free Cashflow is pledged to the new SRF credit, this analysis assumes that the rating agencies will only credit the minimum available value from the stressed scenario toward the rating of the new credit. In the case of Moody's, this number is represented by the inverse of the breakeven default rate across all CWSRF financing programs, including the hypothetical GI portfolio. For S&P and Fitch, the minimum stressed value occurs in the fourth year of the stressed-portfolio defaults. In all cases there is no rating credit for repayment recoveries, which, in the case of S&P and Fitch criteria, are projected to commence in the fifth year. The analysis also does not assume any credit for GI loss reserves funded from non-SRF sources. (See *Loss Reserves* discussed previously.) The Moody's analysis is based on a repayment breakeven; while the S&P and Fitch analysis assumes default rates for a hypothetical SRF eligible GI portfolio based on double-B rated credits. Finally, in applying rating agency criteria, the analysis assesses GI funding capacity based on underlying GI financing terms of 7, 10, 15 and 20 years for Moody's and S&P and 5, 10 and 20 years for Fitch.

Funding capacity is sensitive to the weighted average interest rate of the hypothetical portfolio with higher rate assumptions shrinking capacity. In order to approximate state SRF portfolios, this analysis assumes the average life of the hypothetical leveraged and direct financing portfolios is 15 years. Interest rate assumptions range from 2.50% for a five-year maturity to 4.00% for a 20-year maturity. These rates are comparable to the triple-A market rates referenced in Section II of this report.

Results

Below, Tables 1 and 2 show comparative results after applying the three rating agencies' criteria for leveraged and non-leveraged SRF portfolios, respectively. The results clearly demonstrate

that both leveraging and direct financing SRF programs can, under the NRSRO's criteria, position resources to support GI project financing at the highest rating level. This would be consistent with the U.S. EPA/Philadelphia Green City, Clean Waters Partnership Agreement.

Table 1
Cashflows Available for GI Credit Support, Terms and Funding Capacity
After Applying Ratings Criteria for Triple-A Target Ratings Leveraged Model

		Moody's	S&P	Fitch
Annual Recycled Equity Cashflow Before Rating Agency Default Stress Test		$100	$100	$100
Maximum Capital Charge		($79.28)	($65.18)	($57.75)
Minimum Cashflows Available for GI Credit Support		$20.72	$34.82	$43.25
Term	***Interest Rate***	***GI Funding Capacity Post Stress Test***		
5	2.5%			$910
7	2.5%	$292	$473	
10	3.0%	$392	$540	$962
15	3.5%	$530	$624	
20	4.0%	$625	$676	$908

Table 2
Cashflows Available for GI Credit Support, Terms and Funding Capacity
After Applying Ratings Criteria for Triple-A Target Ratings
Direct Financing Model

		Moody's	S&P	Fitch
Annual Recycled Equity Cashflow Before Rating Agency Default Stress Test		$100	$100	$100
Maximum Capital Charge		($45.00)	($39.70)	($36.87)
Minimum Cashflows Available for GI Credit Support		$55.00	$60.30	$63.13
Term	***Interest Rate***	***GI Funding Capacity Post Stress Test***		
5	2.5%			$1,329
7	2.5%	$634	$819	
10	3.0%	$853	$935	$1,404
15	3.5%	$1,151	$1,801	
20	4.0%	$1,359	$1,170	$1,325

Based solely on the hypothetical $100 of annual CWSRF free cashflows, discounted for rating agency default assumptions, the results show that SRFs can produce sizeable annual free cashflow from leveraged and direct financing models. The leveraged model results, provided in

Table 1, show annual discounted free cashflow of $20.72 (Moody's), $34.82 (S&P) and $43.25 (Fitch) that converts to aggregate GI funding capacity over the forecast period of $292 to $625 (Moody's), $473 to $676 (S&P) and $908 to $962 (Fitch). Converting to ratios, the GI funding capacity factor for every recycled dollar ranges from 2.9 on the low end to 9 times on the high end. For SRFs that solely operate direct financing programs, the results are even more compelling. The direct financing model results, provided in Table 2, show annual discounted free cashflow of $55 (Moody's), $60.30 (S&P) and $63.13 (Fitch) that converts to aggregate GI funding capacity of $634 to $1,359 (Moody's), $819 to $1,170 (S&P) and $1,329 to $1,404 (Fitch). Converting these amounts into ratios, the GI funding capacity factor ranges from 7.7 times to 14 times each recycled dollar. These results assume that annual payment defaults within the GI portfolio are set at rates of 45% (Moody's) and, in accordance with the default rates based on assumed maturities, 46% to 70% (S&P) and 22% to 65% (Fitch), with no assumed repayment recoveries.

These results reflect the minimum stressed values of recycled equity cashflows. No analytical credit is given for repayment recoveries, which S&P and Fitch criteria assume to be 95% and 90%, respectively. To the extent that recoveries can be factored in, GI funding capacity would rise exponentially. There are at least two mechanisms that could be invoked to capture the value of assumed recoveries. These are the securing of bank lines of credit ("Letters of Credit" or "LOCs") or commitments extended by creditworthy NGOs (each of which could be collateralized by the assumed recoveries[14]), SRF non-program investment balances (the "float" referred to earlier in this report) and/or future free cashflow, including net investment income. The expense of maintaining bank lines could be covered by non-program income or net investment income and, similar to the purchase of bond insurance, would qualify as an SRF eligible expense. For example, an LOC that was triggered at half of the S&P assumed cumulative default rate would increase GI funding capacity from the factor ranges cited in the preceding paragraph to 9.2 to 13 times for the leveraged portfolio and 10 to 15.5 times for the direct financing portfolio. An expansion of funding capacity with LOCs would require annual LOC fee expense of 55-65 basis points or 0.55% to 0.65%.

[14] Securing such lines with a pledge of recoveries would not violate existing pledges to bondholders as bond payments would have been provided for by excess pledged cash flows and any draws against the letters of credit. Once drawn, the bondholders rights of subrogation would pass to the LOC provider(s). For the avoidance of doubt, LOC security could be subject to the prior pledge of cash flows, including recoveries to bondholders, without affecting LOC terms.

Results Provide a Baseline for Estimating the SRF's GI Funding Capacity

These estimates provide a baseline for a deeper discussion of potential GI funding capacity. As mentioned above, recycled CWSRF equity cashflow represents one measurable component of SRF resources that can be used to build GI funding capacity for a triple-A rated financing mechanism. In addition to CWSRF equity, on which the above capacity range estimates are based, additional capacity can be sourced from DWSRF free cashflows and the combined investment balances of both the SRFs. By law, DWSRF cashflows are already permitted to be pledged to CWSRF bond financings and vice-versa under existing statutory authority as clarified through various U.S. EPA Policy Guidance. Consequently, DWSRF cashflows can be added to the assets that can be pledged to GI financing indentures or backstop CWSRF guarantees consistent with the Act. [15] It is not unrealistic to assume that the integration of CSWRF and DWSRF cashflows for this purpose would expand GI funding capacity by a percentage comparable to the ratio of a state's DWSRF and CWSRF cashflows, with minor risk adjustments for credit quality differences between the portfolios of the two programs. Other resources available for capacity building are the investment balances of the two programs. How much capacity can be added due to such balances depends on how stable a state's SRF investment balances are, the investment quality thereof and competing commitments or claims. We can expect that investment quality is extremely high for the SRFs. [16] Also, Moody's SRF rating criteria report specifically mentions that it has become more comfortable with unpledged funds as a source of credit support. [17] Currently, there is limited information on SRF investment balances and trends.

VIII. Conclusions and Recommendations

Since program inception in 1989, the CWSRF has received federal appropriations of $29.1 billion and matching state contributions of $5.9 billion, while amassing retained earnings of $5.7 billion. According to U.S.EPA's website, the CWSRF has utilized these resources to fund $89 billion in financial assistance. Despite these achievements, the nation continues to face enormous capital funding gaps in the wastewater infrastructure space. The purpose of this

[15] See Safe Drinking Water Act, Section 1452(f)(4) and (5) and "New York's Short Term Cross-Investment Structure," January 2000, U.S. EPA, www.epa.gov/safewater/dwsrf/pdfs/newyork.pdf.

[16] See U.S. EPA Financial Advisory Board, "SRF Investment Function: Current Status and Prospects for Enhancing SRF Sustainability", January 2011.

[17] Moody's Investors Service, "U.S. State Revolving Fund Debt," March 20, 2013.

report has been to demonstrate the potential of the CWSRF to expand delivery of financial assistance by looking to unused federal authority, balance sheet strength and annual free cashflows. While the guarantee funding mechanisms included herein may be most easily attained by large SRF programs (and/or those programs that have already leveraged) and SRF programs that can afford additional staffing and administration costs necessary to start and maintain this structure, guarantee funding may be accessible to all SRF programs.

Converting this potential into an operating reality will require a number of actions on the part of local governments, state SRF Administrators, state legislatures and U.S. EPA. Based on the model provided by the City of Philadelphia and other municipalities, an important step in catalyzing distributed GI development will be the need for local governments to implement a pricing structure for stormwater services that will incentivize property owners to undertake stormwater mitigation projects. In order to foster a more conducive environment, U.S. EPA will need to actively partake in the transfer of knowledge related to GI solutions that are currently being developed and identify strategies that actively engage SRF Administrators in developing SRF financial assistance mechanisms that can further lower the costs and expend the pace of GI funding on a national scale. At the state level, current barriers to implementation are twofold: certain states have chosen to limit SRF financial assistance to direct financing through their enabling legislation and states with bonding authority may not have included guarantee authority in state law or authorizing resolutions. Some states will need to amend their governing statutes and indentures if they are to position their SRFs to assist GI funding efforts in this manner.

Findings presented in this report suggest that SRFs, after giving full effect to traditional financial assistance commitments, may have resources available for credit enhancement mechanisms at the state or sub-state level to support additional eligible projects. The stress models developed to estimate the funding capacity that indicates a minimum funding capacity at ratios of 3:1 to as much as 14:1 for every dollar of SRF Program Free Cashflow after adjustment for rating agency requirements. When applying the estimated $2 billion in aggregate nationwide free cashflow reported in 2010, these ratios translate to a range of $6 to $28 billion in potential GI funding capacity. Additionally, other tools also exist that could be used to expand funding capacity beyond these levels, such as securing LOCs or NGO commitments that would be collateralized by assumed default recoveries or using the cross-investment authority provided by Section 1452(f)

of the Save Drinking Water Act to pledge DWSRF free cashflow and investment balances. Applying these tools could more than double the potential funding estimate. Developing SRF capacity for credit enhancement products could serve U.S. EPA's efforts to promote both more effective utilization of SRF resources and the implementation of low cost GI project solutions in meeting the nation's clean water goals.

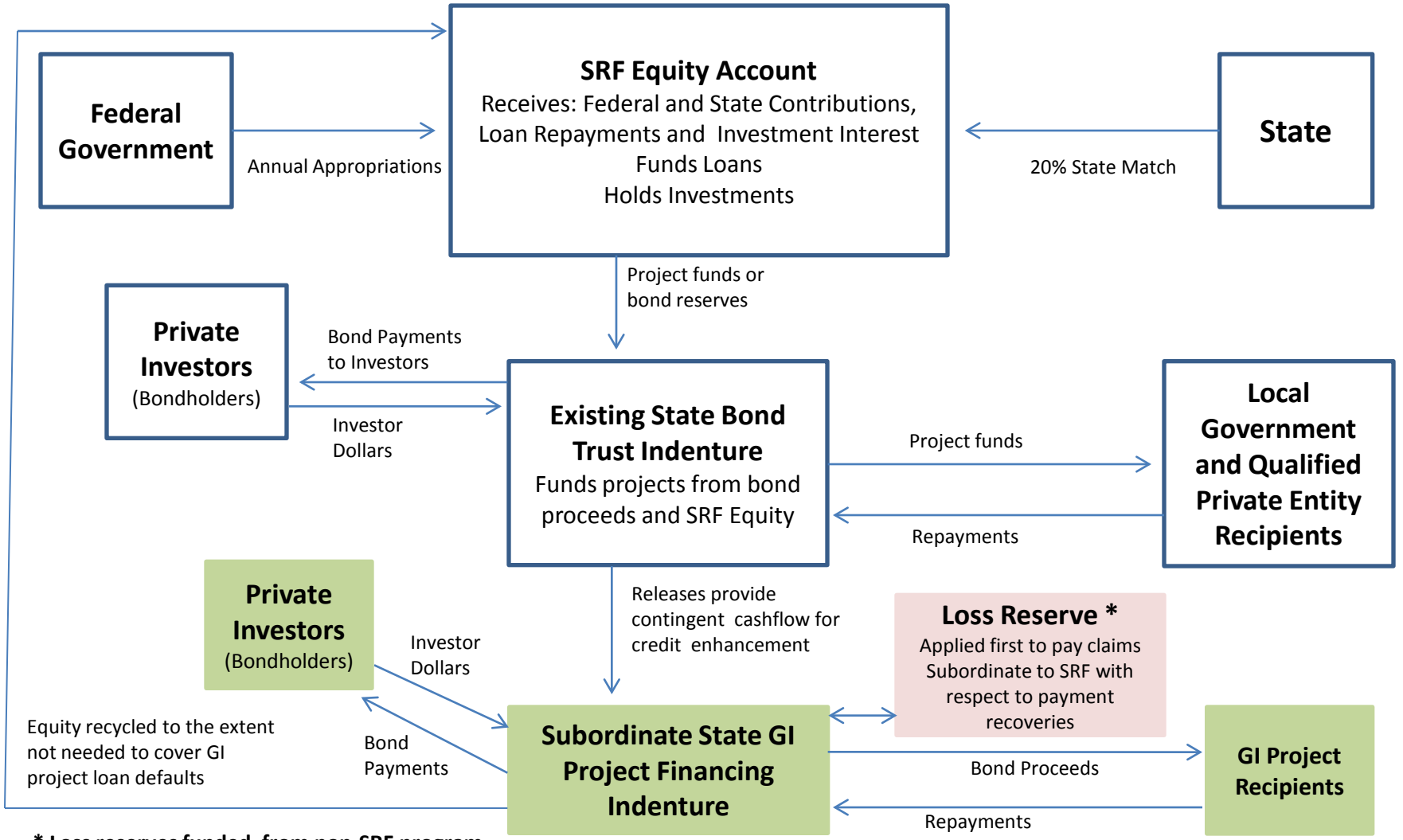
In order to maximize SRF value in service of these outstanding goals, the Board recommends that U.S. EPA take the following actions:

1. Evaluate and revise, as appropriate, existing SRF guidance and policy to empower SRF Administrators, municipalities and sub-SRF Administrators with respect to:
    a. Project eligibility reviews and approvals; and
    b. The construction of SRF funding interfaces consistent with Section 603(d) authority, including the credit design templates outlined in this report (see Figures 1-4), short-term funding strategies, use of non-program income and safe harbor provisions;
2. Actively promote SRF credit enhancement, including sub-state approaches, in partnership with the promotion of market-based GI project undertakings, including outreach to cities that are not currently supported by their SRFs;
3. Promote the development of model SRF financing indentures that can accommodate existing SRF direct and leverage financings and subordinated state sponsored or sub-SRF guarantee mechanisms;
4. Direct U.S. EPA's Regional Administrators to inventory state law governing SRF programs to:
    a. Determine the extent of any state legal authority to implement a guarantee program;
    b. Formally report on any variances between federal and state law; and
    c. As appropriate, provide legal guidance to those states interested in, and capable of tapping the federal guarantee authority to expand SRF eligible project funding capacity;
5. Consider revisions to U.S. EPA's Clean Water Benefits Reporting System to incorporate metrics that measure SRF guarantee capacity against guarantee support provided, or its equivalent, under Section 603(d)(3), (4) and (5); and

6. Encourage U.S. EPA's Regional Administrators to promote GI financing tools, including SRF applications, especially for those state water programs managing to total maximum daily load water quality requirements.

FIGURE 1

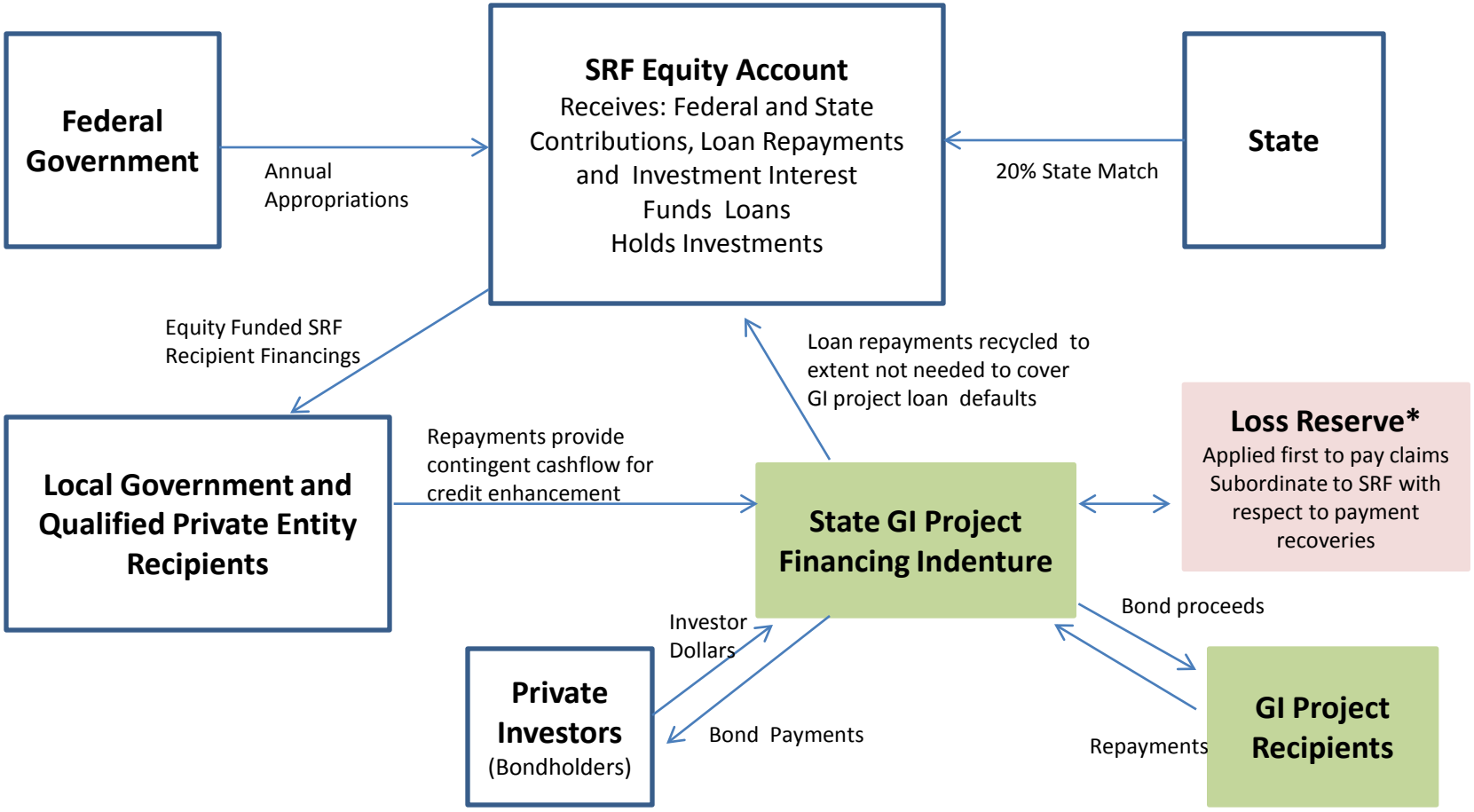
State Level Framework for a SRF Credit Mechanism to Support Green Infrastructure Projects Using an Existing Bond Funded "Leveraged" Financing Model



*** Loss reserves funded from non-SRF program sources and/or NGO contributions**

FIGURE 2

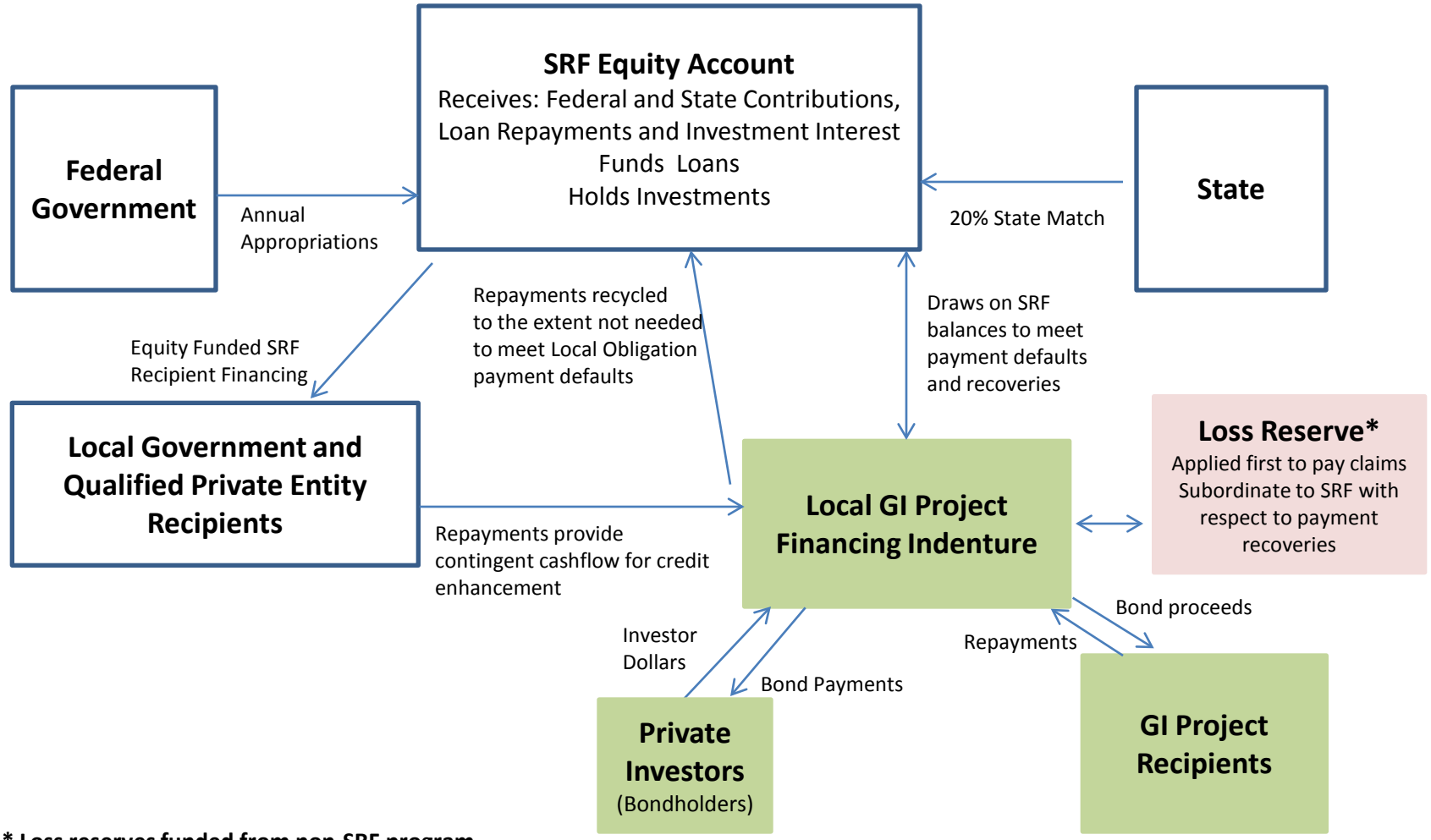
State Level Framework for a SRF Credit Mechanism to Support Green Infrastructure Water Projects Using the "Direct Financing" Model



*** Loss reserves funded from non-SRF program sources and/or NGO contributions**

FIGURE 3

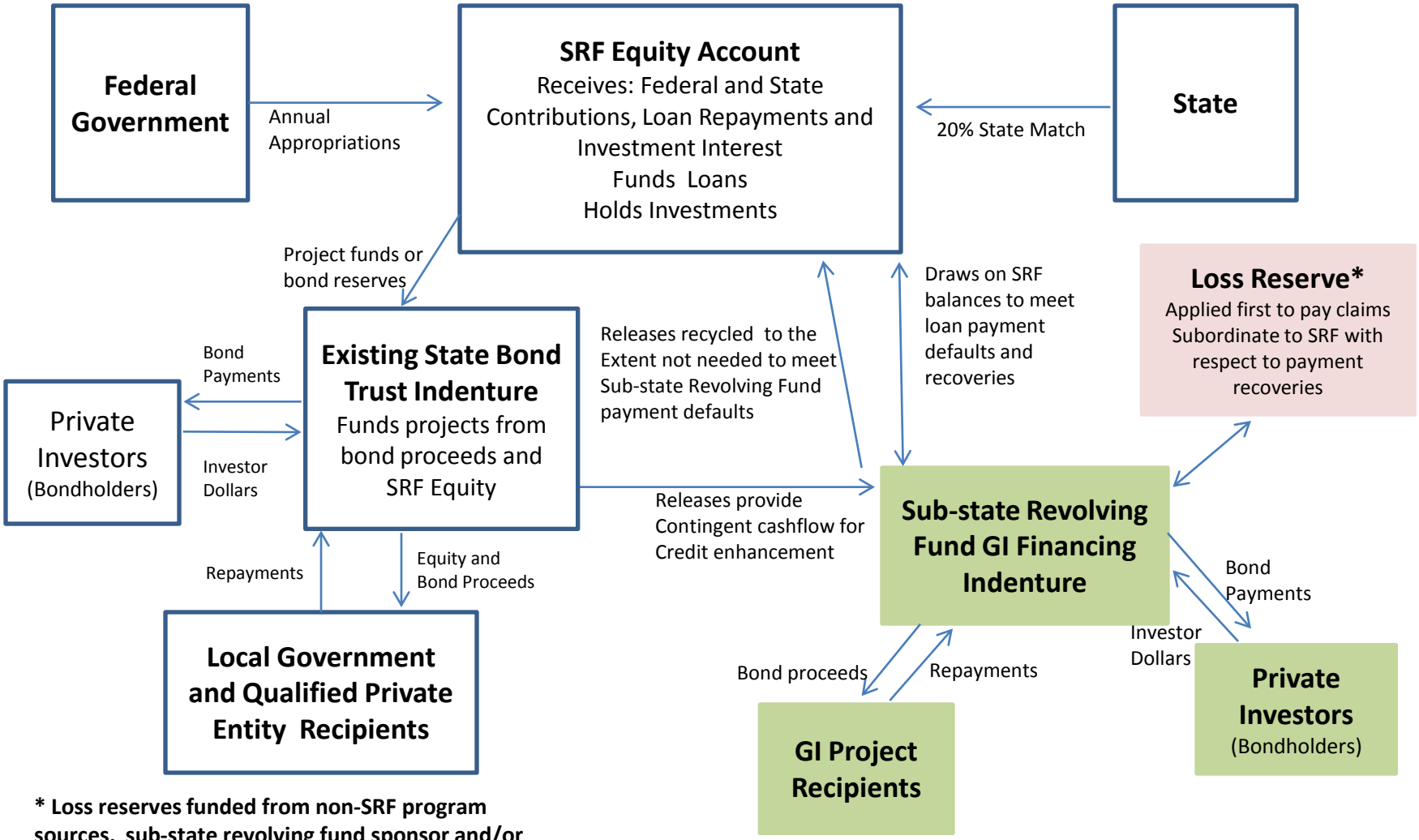
Sub-state Level Framework for a SRF Guarantee of Local Obligations that Fund GI Water Projects Using the "Direct Financing" Model



*** Loss reserves funded from non-SRF program sources, local obligor and/or NGO contributions**

FIGURE 4

Sub-state Level Framework for a SRF Guarantee of Loan Obligations that Fund GI Water Projects Using an Existing Bond Funded "Leveraged" Financing Model



*** Loss reserves funded from non-SRF program sources, sub-state revolving fund sponsor and/or NGO contributions**

FIGURE 5

Clean Water SRF Funds: Estimated Free Cashflows Available for Credit Enhancement

July 1, 2008 through June 30, 2009

(Millions of Dollars)

State	Gross Loan Principal Repayments	Gross Loan Interest Repayments	Gross Investment Earnings	Gross Receipts		Leveraged Bonds Repaid	State Match Bonds Repaid	Interest Paid on Bonds	Total Payments	Free Cashflow Available for Credit Enhancement
	(1)	(2)	(3)	(4)=(1)+(2)+(3)		(5)	(6)	(7)	(8)=(5)+(6)+(7)	=(4)-(7)
U.S. Total	**$ 2,486**	**$ 1,011**	**$ 534**	**$ 4,031**		**$ 1,057**	**$ 159**	**$ 738**	**$ 1,953**	**$ 2,078**
Alabama	35.9	17.4	8.8	**62.1**		35.3	1.2	20.7	**57.2**	**4.9**
Alaska	12.5	2.0	3.6	**18.1**		0.0	1.3	0.0	**1.3**	**16.8**
Arizona	47.6	11.3	5.4	**64.3**		17.2	3.2	25.7	**46.1**	**18.2**
Arkansas	17.6	6.0	1.2	**24.8**		7.2	0.0	3.4	**10.6**	**14.2**
California	176.6	33.7	8.6	**218.9**		22.9	0.0	8.8	**31.7**	**187.2**
Colorado	33.5	11.9	11.2	**56.6**		27.2	0.0	22.5	**49.7**	**6.9**
Connecticut	52.8	13.4	17.6	**83.8**		46.9	0.0	30.2	**77.1**	**6.7**
Delaware	8.0	1.4	0.8	**10.2**		0.0	0.0	0.0	**0.0**	**10.2**
Florida	89.3	22.0	4.5	**115.8**		8.9	0.0	5.0	**13.9**	**101.9**
Georgia	30.3	15.9	5.8	**52.0**		0.0	0.0	0.0	**0.0**	**52.0**
Hawaii	17.9	3.2	3.0	**24.1**		0.0	0.0	0.0	**0.0**	**24.1**
Idaho	5.4	3.7	2.3	**11.4**		0.0	0.0	0.0	**0.0**	**11.4**
Illinois	103.3	17.8	13.0	**134.1**		11.7	0.0	6.6	**18.3**	**115.8**
Indiana	69.4	47.4	23.1	**139.9**		52.6	6.4	72.4	**131.4**	**8.5**
Iowa	33.8	12.7	4.8	**51.3**		11.6	5.5	6.7	**23.8**	**27.5**
Kansas	36.0	14.9	3.7	**54.6**		30.2	3.3	19.9	**53.4**	**1.2**
Kentucky	21.7	5.7	7.0	**34.4**		0.0	0.0	0.0	**0.0**	**34.4**
Lousiana	12.1	7.4	2.6	**22.1**		0.0	0.0	0.0	**0.0**	**22.1**
Maine	29.2	5.4	1.9	**36.5**		6.1	0.0	2.5	**8.6**	**27.9**
Maryland	61.8	10.9	6.3	**79.0**		12.0	0.0	4.1	**16.1**	**62.9**
Massachusetts	114.2	82.0	61.9	**258.1**		118.8	0.0	126.5	**245.3**	**12.8**
Michigan	111.3	38.1	52.3	**201.7**		72.3	11.7	82.7	**166.7**	**35.0**
Minnesota	68.1	28.4	14.7	**111.2**		47.2	0.0	41.7	**88.9**	**22.3**
Mississippi	21.0	4.7	1.8	**27.5**		0.0	0.2	0.3	**0.5**	**27.0**
Missouri	59.3	53.2	6.7	**119.2**		55.0	3.4	53.5	**111.9**	**7.3**
Montana	13.4	3.2	0.1	**16.7**		0.0	2.9	0.5	**3.4**	**13.3**
Nebraska	11.2	5.0	1.6	**17.8**		0.0	0.6	0.0	**0.6**	**17.2**
Nevada	15.4	7.4	0.8	**23.6**		4.5	1.5	4.2	**10.2**	**13.4**
New Hampshire	15.3	4.6	1.9	**21.8**		0.0	0.0	0.0	**0.0**	**21.8**
New Jersey	125.2	25.3	10.6	**161.1**		57.3	0.0	4.2	**61.5**	**99.6**
New Mexico	7.2	2.3	0.5	**10.0**		0.0	0.0	0.0	**0.0**	**10.0**
New York	276.4	163.7	145.4	**585.5**		255.4	0.0	0.0	**255.4**	**330.1**
North Carolina	36.7	12.2	9.4	**58.3**		0.0	0.0	0.0	**0.0**	**58.3**
North Dakota	9.0	3.4	5.5	**17.9**		3.8	1.7	2.8	**8.3**	**9.6**
Ohio	150.9	81.7	18.2	**250.8**		63.3	13.2	65.6	**142.1**	**108.7**
Oklahoma	12.8	3.5	6.6	**22.9**		4.9	0.3	5.2	**10.4**	**12.5**
Oregon	25.0	9.9	0.5	**35.4**		0.0	0.9	0.7	**1.6**	**33.8**
Pennsylvania	70.4	15.5	4.4	**90.3**		0.0	0.0	0.0	**0.0**	**90.3**
Puerto Rico	9.5	1.3	0.2	**11.0**		0.0	0.0	0.0	**0.0**	**11.0**
Rhode Island	29.6	13.5	7.7	**50.8**		25.6	0.0	20.0	**45.6**	**5.2**
South Carolina	26.3	14.5	5.8	**46.6**		0.0	0.0	0.0	**0.0**	**46.6**
South Dakota	12.4	3.8	2.5	**18.7**		1.6	2.7	2.7	**7.0**	**11.7**
Tennessee	29.4	14.2	3.7	**47.3**		0.0	0.0	0.0	**0.0**	**47.3**
Texas	131.8	91.1	9.1	**232.0**		42.4	59.9	59.9	**162.2**	**69.8**
Utah	14.2	0.8	0.5	**15.5**		0.0	0.0	0.0	**0.0**	**15.5**
Vermont	5.5	0.0	0.4	**5.9**		0.0	0.0	0.0	**0.0**	**5.9**
Virginia	64.2	26.7	20.3	**111.2**		14.7	32.6	32.6	**79.9**	**31.3**
Washington	33.3	7.8	1.4	**42.5**		0.0	0.0	0.0	**0.0**	**42.5**
West Virginia	22.6	2.3	1.2	**26.1**		0.0	0.0	0.0	**0.0**	**26.1**
Wisconsin	64.0	23.2	1.3	**88.5**		0.0	6.0	6.0	**12.0**	**76.5**
Wyoming	5.9	3.7	1.5	**11.1**		0.0	0.0	0.0	**0.0**	**11.1**

Source: USEPA, Clean Water SRF Funds Available for Projects, Detail, By State, July 1, 2008 through June 30, 2009

FIGURE 6

Clean Water SRF Funds: Estimated Free Cashflows Available for Credit Enhancement

July 1, 2009 through June 30, 2010

(Millions of Dollars)

State	Gross Loan Principal Repayments	Gross Loan Interest Repayments	Gross Investment Earnings	Gross Receipts	Leveraged Bonds Repaid	State Match Bonds Repaid	Interest Paid on Bonds	Total Payments	Free Cashflow Available for Credit Enhancement
	(1)	(2)	(3)	(4)=(1)+(2)+(3)	(5)	(6)	(7)	(8)=(5)+(6)+(7)	=(4)-(7)
U.S. Total	**$ 3,082**	**$ 1,074**	**$ 411**	**$ 4,567**	**$ 1,315**	**$ 103**	**$ 762**	**$ 2,180**	**$ 2,387**
Alabama	37.4	16.7	5.6	**59.7**	28.9	1.3	18.7	**48.9**	**10.8**
Alaska	14.1	1.6	3.0	**18.7**	0.0	1.0	0.0	**1.0**	**17.7**
Arizona	50.1	22.4	9.1	**81.6**	19.8	1.0	37.7	**58.5**	**23.1**
Arkansas	21.5	5.8	0.3	**27.6**	7.2	0.0	2.9	**10.1**	**17.5**
California	185.6	28.9	2.6	**217.1**	23.7	0.0	7.9	**31.6**	**185.5**
Colorado	33.4	12.7	8.7	**54.8**	29.4	0.0	21.2	**50.6**	**4.2**
Connecticut	60.4	14.5	16.9	**91.8**	53.7	0.0	-71.6	**-17.9**	**109.7**
Delaware	8.7	1.3	0.5	**10.5**	0.0	0.0	0.0	**0.0**	**10.5**
Florida	113.5	23.8	6.7	**144.0**	17.7	0.0	14.9	**32.6**	**111.4**
Georgia	50.7	20.5	0.4	**71.6**	0.0	0.0	0.0	**0.0**	**71.6**
Hawaii	19.1	2.9	1.7	**23.7**	0.0	0.0	0.0	**0.0**	**23.7**
Idaho	7.2	3.6	1.7	**12.5**	0.0	0.0	0.0	**0.0**	**12.5**
Illinois	115.9	16.5	5.3	**137.7**	12.2	0.0	6.0	**18.2**	**119.5**
Indiana	93.6	47.9	12.5	**154.0**	61.1	5.9	70.9	**137.9**	**16.1**
Iowa	38.6	15.5	1.8	**55.9**	13.2	5.3	11.6	**30.1**	**25.8**
Kansas	42.4	14.9	2.4	**59.7**	27.1	2.1	20.1	**49.3**	**10.4**
Kentucky	23.1	5.9	6.8	**35.8**	0.0	0.0	0.0	**0.0**	**35.8**
Lousiana	17.3	7.1	0.9	**25.3**	0.0	0.6	0.0	**0.6**	**24.7**
Maine	25.5	4.3	1.1	**30.9**	6.1	0.0	2.1	**8.2**	**22.7**
Maryland	64.8	10.2	4.8	**79.8**	11.3	0.0	4.0	**15.3**	**64.5**
Massachusetts	133.0	79.7	58.9	**271.6**	134.6	0.0	129.2	**263.8**	**7.8**
Michigan	120.0	40.9	40.3	**201.2**	75.6	0.0	88.8	**164.4**	**36.8**
Minnesota	81.1	31.5	4.8	**117.4**	37.8	0.0	39.3	**77.1**	**40.3**
Mississippi	22.6	5.1	1.3	**29.0**	0.0	0.2	0.3	**0.5**	**28.5**
Missouri	68.2	53.6	3.1	**124.9**	62.1	5.0	53.7	**120.8**	**4.1**
Montana	12.5	3.4	0.0	**15.9**	0.0	2.9	0.5	**3.4**	**12.5**
Nebraska	19.5	4.9	1.3	**25.7**	0.0	0.7	0.0	**0.7**	**25.0**
Nevada	17.4	5.0	0.4	**22.8**	4.7	1.8	3.9	**10.4**	**12.4**
New Hampshire	15.6	4.4	0.6	**20.6**	0.0	0.0	0.0	**0.0**	**20.6**
New Jersey	131.2	31.7	3.3	**166.2**	63.6	0.0	2.5	**66.1**	**100.1**
New Mexico	7.7	2.3	0.1	**10.1**	0.0	0.0	0.0	**0.0**	**10.1**
New York	313.8	175.4	144.6	**633.8**	289.3	0.0	23.1	**312.4**	**321.4**
North Carolina	40.8	13.0	3.7	**57.5**	0.0	0.0	0.0	**0.0**	**57.5**
North Dakota	9.6	3.9	4.5	**18.0**	4.0	1.9	5.6	**11.5**	**6.5**
Ohio	163.5	81.2	8.1	**252.8**	103.4	57.7	64.0	**225.1**	**27.7**
Oklahoma	14.6	4.3	4.5	**23.4**	5.5	0.3	5.0	**10.8**	**12.6**
Oregon	51.6	14.3	0.2	**66.1**	0.0	0.9	0.8	**1.7**	**64.4**
Pennsylvania	70.4	16.0	2.5	**88.9**	0.0	0.0	0.0	**0.0**	**88.9**
Puerto Rico	16.6	4.6	0.1	**21.3**	0.0	0.0	0.0	**0.0**	**21.3**
Rhode Island	31.2	13.4	5.7	**50.3**	23.9	0.0	20.6	**44.5**	**5.8**
South Carolina	53.9	14.2	5.9	**74.0**	0.0	0.0	0.0	**0.0**	**74.0**
South Dakota	12.8	3.9	2.6	**19.3**	1.7	1.1	2.7	**5.5**	**13.8**
Tennessee	26.8	16.4	0.7	**43.9**	0.0	0.0	0.0	**0.0**	**43.9**
Texas	379.0	104.4	2.4	**485.8**	181.9	13.7	69.9	**265.5**	**220.3**
Utah	17.6	0.8	0.1	**18.5**	0.0	0.0	0.0	**0.0**	**18.5**
Vermont	6.5	0.0	0.0	**6.5**	0.0	0.0	0.0	**0.0**	**6.5**
Virginia	69.0	32.1	14.8	**115.9**	15.2	0.0	90.6	**105.8**	**10.1**
Washington	35.2	7.9	0.7	**43.8**	0.0	0.0	0.0	**0.0**	**43.8**
West Virginia	23.0	2.5	0.1	**25.6**	0.0	0.0	0.0	**0.0**	**25.6**
Wisconsin	74.7	23.2	0.3	**98.2**	0.0	0.0	15.0	**15.0**	**83.2**
Wyoming	19.8	3.0	2.3	**25.1**	0.0	0.0	0.0	**0.0**	**25.1**

Source: USEPA, Clean Water SRF Funds Available for Projects, Detail, By State, July 1, 2009 through June 30, 2010

APPENDIX A
Rating Agency SRF Rating Criteria

Moody's Investors Service[1]

Moody's bases SRF ratings on the following four rating factors and weightings:

- Portfolio Credit Quality and Default Tolerance Score (50%);
- Portfolio Size and Diversity (15%);
- Debt Structure, Investments and Cashflows (20%); and
- Management and Governance (15%).

Portfolio Credit Quality and Default Tolerance – Default tolerance measures the level of borrower defaults that an SRF bond program could tolerate over its life and still make full and timely bond debt service payments. Moody's considers reserves, repayment revenue and/or draws on program equity when measuring program tolerances and assigning a rating score. Repayments on SRF recipient obligations are discounted based on the weighted average portfolio rating. The minimum tolerance thresholds, portfolio ratings and scores are provided in the following table.

Table A-1
Moody's Rating Factors
Portfolio Credit Quality and Default Tolerance Scorecard

Default Tolerance Threshold		***25% and Higher***	***20%***	***15%***
Weighted Average SRF Portfolio Rating	Aaa	1	1	1
	Aa	1	1	2
	A	1	2	3
	Baa	2	3	4
	Less than Baa	3 or below	4 or below	5

For example, if a portfolio with a weighted average rating of "A" can withstand a scenario where 25% or more of its loans default and remain able to pay the outstanding debt service, this portfolio would receive a "1" rating. A score of "1" is indicative of "Aaa" rating characteristics, and a "2" is indicative of "Aa" rating characteristics.

Moody's criteria stipulate that even a portfolio with underlying financings that average a Baa3 rating can receive the top portfolio rating if default tolerances significantly exceed the minimum required for the top score. This is important for considering the rating potential for an SRF-guaranteed portfolio backed by liens on commercial property, which are likely to be of lower credit quality than a traditional SRF portfolio. Moody's currently rates 43 out of 44 state-level program indentures "Aaa", including many subordinated indentures that benefit from assets pledged to the senior indenture only after they become free of the senior lien pledge. It is likely that the average credit quality of some of these portfolios fall into the "Baa3" category.

[1] From "U.S. State Revolving Fund Debt," Moody's Investors Service, March 20, 2013.

Portfolio Size and Diversity – In Moody's evaluation, larger portfolios add credit strength as increasing borrower numbers mitigate event risk or credit deterioration within the portfolio. Diversity is measured on the basis of the percentage of borrowers that represent less than 1% of the portfolio and the percentage of loans corresponding to the top five borrowers. If the concentrated borrowers have high individual ratings assigned, this can mitigate any negative rating score impacts due to concentration. Table A-2 identifies size, diversity thresholds and associated ratings.

Table A-2
Moody's Rating Factors
Portfolio Size and Diversity

SRF Characteristic	***Very Strong (Aaa)***	***Strong (Aa)***	***Medium (A)***	***Low (Baa)***	***Weak (Below Baa)***
Size of Portfolio	100 or more	50-99	30-49	20-29	Less than 20
% of Borrowers with less than 1% of the Portfolio	More than 35%	20-34%	10-19%	5-9%	Less than 5%
% of Loans to the Top Five Borrowers	Less than 20%	20-29%	30-39%	40-49%	More than 50%

SRF financing programs have reached a mature stage in their development. It is unlikely that many SRF does not currently meet the "Aaa" standard for size, diversity and concentration limits. Moody's portfolio size requirement underscores the value of aggregating SRF financial assistance obligations and the importance of building in mechanisms through the "lending" of program equity or tapping capital markets for short-term funds that can support project funding as lending activity and project outlays ramp up in advance of long-term financing. (See Section IV, *Loan Warehousing*.) The value of portfolio size and diversity in the rating assessment favors state-level programs that can draw exposure from across the state.

Debt Structure, Investments and Cashflow – This factor focuses on the structure and legal framework of the program. This includes the governing terms of the SRF trust agreement and the SRF financing indenture, as each addresses the availability of funds pledged to SRF bondholders and the flow of fund mechanics, such as priority of payments, the relative timing of repayment obligations and SRF bond debt service, flow of funds coverage relative to periodic debt service, the quality, availability and accessibility of reserves and program equity when needed for SRF debt service. Most, if not all, reserve model programs fund reserves with investment agreements collateralized by U.S. government or U.S. government-guaranteed securities that are given the highest marks in accordance with Moody's criteria. Additional bonds tests are also considered in assigning a rating score. Moody's rating scores for debt service, investment and cashflow characteristics are provided in Table A-3.

Table A-3
Moody's Rating Factors
Debt Structure (DS), Investments (I) and Cashflows (CFs)

DS/I/CFs	*Very Strong (Aaa)*	*Strong (Aa)*	*Medium (A)*	*Low (Baa)*
Counterparties and Investments	Counterparties and investments rated A1/P1 or better(short-term) or Aa3 long-term	Counterparties and investments rated A2/P1 or better(short-term) or Aa3 long-term	Counterparties and investments are rated at and above A3	Counterparties and investments are rated at and above Baa3
	SRF Financial resources can mitigate funds in lower rated securities; funds not invested in Guaranteed Investment Contracts (GICs) are in permitted investments			financial resources may be able to mitigate funds invested in lower rated securities; funds not in GICs are in permitted investments
	Counterparty exposure is well distributed or not material to the credit	Counterparty exposure is moderately distributed and may be material to the credit	Counterparty exposure is significantly material to the credit	Substantial counterparty concentration
Cashflows	Meets default stress scenarios and variable rate stress tests; asset revenues demonstrate ability to pay scheduled debt service			Meets default scenarios and variable rate stress tests in the near to medium term

Management and Governance - Based on its criteria, Moody's assignment of top SRF ratings has required SRF Administrators to demonstrate superior management, including an excellent understanding of a program's financial strength, challenges and regulatory environment; the ability to act swiftly and appropriately to address challenges; and an excellent ability to underwrite, manage and monitor the portfolio. By logical extension, Moody's would necessarily incorporate its current SRF management and governance assessment in rating SRF financings or SRF-guaranteed financings geared toward GI market rate financial assistance.

Standard & Poor's[2]

Standard & Poor's rating criteria rely on a framework for scoring enterprise risk and financial risk from which an indicative rating is determined. The final rating is then determined after the application rating score modifiers are applied. The scoring system assigns values of 1-6 with the highest/lowest values being assigned the lowest/highest numerical score. The factors that drive each of these risk scores are as follows:

Enterprise Risk

- Industry risk
- Market position
- Adjustment factor – geographic concentration

Financial Risk

- Preliminary loss coverage score – with adjustment for "least favorable" largest obligor test (discussed below)
- Adjusted loss coverage – further adjustment for the average of financial policies and operating performance scores

Indicative and Final Rating

An indicative rating is derived from the enterprise risk and financial risk score matrix. An indicative rating of "AAA" requires a combined score of 1. The indicative rating is then subject to modification by a leverage test and an adjustment for favorable or unfavorable credit features to produce the final rating.

Enterprise Risk Score – The enterprise risk score presents the lowest ratings hurdle for SRF Administrators. S&P currently assigns a low industry risk assessment based on the stable credit quality of municipal pools and governmental, legal and regulatory conditions. Market position assessments characterized by programs, such as the SRFs, that receive regular capital infusions from multiple layers of government and which are established through legislative action receive a very low risk assessment and the highest score. There is a potential adjustment for geographic concentration. S&P cites programs that target only one metropolitan area as candidates for a one-notch negative score adjustment.

Financial Risk Score – The financial risk score is derived from the assessment of "loss coverage", which is the margin by which available resources cover expected defaults based on S&P's municipal collateralized debt obligation ("CDO") criteria, inclusive of adjustments for borrower concentration as measured by a test of the largest obligor (the "Largest Obligor Test").

S&P stresses municipal debt portfolios by assuming that over a four-year period defaulted obligations stop payment for a rolling period of four years. Below, Table A-4 shows the CDO

[2] From "U.S. Public Finance Long-Term Municipal Pools: Methodology And Assumptions," Standard & Poor's, March 19, 2012; "CDOs and Pooled TOBs Backed by U.S. Municipal Debt: Methodology And Assumptions," Standard & Poor's, March 13, 2012; and "Bond Insurance Rating Methodology And Assumptions," Standard & Poor's, August 25, 2011.

criteria default rates for hypothetical municipal pools. S&P assumes that 25% of the defaults occur each year. For a 20-year "A"-rated portfolio the 31.7% default rate shown in Table A-4 (in bold) would be divided by four to derive the percentage of the portfolio going into default in each year.

Table A-4
AAA Scenario CDO Default Rates (%)

	Asset credit rating			
Portfolio Maturity	AA	A	BBB	BB
7	6.7	13.3	23.3	46.7
10	10.0	17.5	30.0	55.0
15	15.8	24.2	39.2	64.2
20	22.5	31.7	47.5	70.0
30	35.0	44.2	58.3	77.5

Source: "CDO and Pooled TOBs Backed by U.S. Municipal Debt, Methodology And Assumptions," Standard & Poor's, April 3, 2012.

In year five, the recovered portion of missed payments would start to be paid over the following four years. From the date that payment resumes, regularly scheduled payments would be made at the recovery rate. S&P assigns default recovery rates based on four groupings of municipal credit types from strongest to weakest. Tax-backed general obligation pledges, revenue-backed water-sewer/solid waste bonds and dedicated tax-backed bonds are included in the strongest group. For a "AAA" target rating, a municipal credit portfolio for a state-sponsored program must be able to demonstrate post default loss coverage based on a 95% recovery rate. S&P criteria's recognizes full value for reserve investments that satisfy its counterparty and investment guidelines, as applicable. These factors drive the calculation of a loss coverage score. A score of 1 is a pre-requisite for a "AAA" rating. This score is then subject to adjustment by two modifiers. The first measures concentration exposure by applying a test of the largest obligor's impact on the portfolio's ability to pay its obligations owed based on 60% recovery rates. This test requires that collateralization levels be sufficient to cover defaults from the worst-case outcome of seven prescribed concentrated default scenarios. Failure drops the financial risk score out of the "AAA" category. The last S&P modifier measures operating performance and financial policies based on recipient repayment performance, origination, monitoring, default and delinquencies policies, long-term planning and investment policies. A top score here can offset a negative Largest Obligor Test result.

The new criterion is in stark contrast to pre-2012 criteria that applied much lower stress factors to municipal credit pools. (For example, the four year stress for 20-year "A"-rated weighted average portfolios increased to 31.7% from 4.2%.) The increase in stresses was made to realign how municipal pools were evaluated relative to S&P's corporate debt obligation criteria. The principal driver for this change was S&P's recent assessment that their rating system and methods by which ratings are assigned should be equitable across fixed income sectors (i.e., ratings assigned at the same level to corporate and municipal debt obligations reflect the same level of risk to investors). The revision to municipal pool criteria, to rely more closely on corporate default histories, was made to address corporate and municipal pooled criteria inconsistencies.

Fitch Ratings[3]

Fitch identifies five rating factors:

- Portfolio credit risk;
- Financial structure;
- Legal risk;
- Program management risk; and
- Counterparty risk.

Fitch does not reveal the weightings of these indicators, if any, in the rating determination.

The core of the rating assessment is the two quantitative factors; portfolio credit risk and financial structure. Portfolio credit risk is assessed against the weighted average credit quality of SRF recipients. Fitch applies a three step process to measuring SRF default stress and SRF default tolerance. In the first step, Fitch uses empirical default data of corporate issuers to measure weighted average default probability of an SRF portfolio by loan term. Using this data, Fitch derives a weighted average default rate (the "WADR"). Fitch provides an example in its SRF Criteria, which is incorporated in the following table.

Table A-5
Sample Cumulative Default Rates by
Credit Rating and Loan Term

Loan	***Asset Mean Probability of Default by Rating (%)***				
Terms	*AAA*	*AA*	*A*	*BBB*	*BB*
One Year	----------	0.01	0.07	0.19	1.16
Five Year	0.08	0.17	0.59	1.91	10.03
10 Year	0.19	0.64	1.58	4.54	17.43
20 Year	0.60	1.58	3.82	**10.97**	29.43

In step two, Fitch applies multiples to the WADR to create cumulative default stresses by rating category. The multiples are shown below in Table A-6.

Table A-6
Sample Default Stress Coverage Multiples (x)

Default Stress Multiple	*Portfolio Weighted Average Default Rate ("WADR")*		
by Target Rating	***A***	***BBB***	***BB***
AAA	4.6	**3.4**	2.2
AA	3.6	2.8	2.0
A	2.7	2.2	1.7
BBB	2.3	1.9	1.6
BB	1.4	1.4	1.3

The multiples produce the cumulative default stress by target rating for portfolios with 5, 10 and 20 year weighted average loan terms provided in Table A-7.

[3] From "State Revolving Fund and Leveraged Municipal Loan Pool Criteria," FitchRatings, May 21, 2012.

Table A-7
Sample Cumulative Default Stresses (%)
5 /10 / 20 Year Financing Terms

Cumulative Default Stress by Target Rating	*Portfolio Weighted Average Default Rate ("WADR")*								
	A			***BBB***			***BB***		
	5	***10***	***20***	***5***	***10***	***20***	***5***	***10***	***20***
AAA	2.71	7.27	17.57	6.49	15.44	37.30	22.07	38.85	64.75
AA	2.12	5.69	13.75	5.35	12.71	30.72	20.06	34.86	58.86
A	1.59	4.27	10.31	4.20	9.99	24.13	17.05	29.63	50.03

The last step of the analysis is to determine the four-year default tolerance of the portfolio, incorporating financial structure considerations including pledged loan repayments, forms of credit enhancement, reserves, reserve de-allocation provisions, cross-collateralization features and additional bond tests. Default tolerances are determined by running cashflow models to solve for breakeven default levels within the portfolio where breakeven is measured over four-year default periods based on the first, middle and last four years of a program's life. The default tolerance rate is spread evenly over the four-year period (i.e., the test takes into account annual cashflows plus available reserves over the period and solves for breakeven against these amounts).

Fitch then compares the default tolerance rate generated by the model under each four-year scenario to the cumulative default tolerance rate associated with the outstanding or target rating. For example, SRFs that pledge a blend of leveraged and direct financings (the "Blend Rate Model") to issue bonds with a 20-year maturity and leverage program equity 2:1 would show a default tolerance equal to the free cashflow, net of bond payments, which in this example is 50% of total cashflow over any four-year period. So, if the underlying 20-year portfolio is of "BBB" average credit quality, as shown in Table 5, the mean probability of default would be 10.97%. For a "AAA" target rating, the product of the 10.97% mean probability of default and the corresponding stress coverage multiple of 3.4 (shown in Table 6) produces a 37.30% capital charge against cashflow leaving a net cashflow margin of 12.70%. Based on a 20-year "A"-rated portfolio, the respective numbers of 3.82% and 4.6 produces a 17.52% charge against cashflow, leaving a net cashflow margin of 32.48%. These margins represent solely the net cashflow released from an existing bond indenture that could be pledged to a subordinated GI financing indenture. Fitch would discount the releases from direct financing cashflows based on application of the same risk adjusted default rates. However, because direct financing cashflows simply represent either return on or return of equity, the default tolerance is 100%. Applying the Fitch "BBB" and "A" portfolio default rates from the prior example to a direct financing portfolio produces net cashflow margins of 72.70% and 82.48%, respectively. Fitch's stress tests also evaluate portfolio concentrations. Concentration is tested by increasing mean probability of default by 50% for the top five borrowers and weighting it based on each borrower's rating and percentage of the portfolio. For better or worse, the credit quality of concentrated borrowers is an important factor in the Fitch analysis.

The remaining factors that drive Fitch's SRF ratings are legal risk, program management risk and counterparty exposure. Legal risk refers to the integrity of the legal contracts that stand behind the pledge to bondholders. These generally include the financing indenture, which sets the

terms of the bond pledge (i.e., the pledge of financing recipient cashflows, reserves, investment limits, coverage and additional bond test requirements), loan agreements, local obligor bonds and their terms as well as investment agreement provisions. Fitch's assessment of program management considers underwriting criteria and portfolio monitoring capabilities and performance. Counterparty exposure is weighted based on the credit quality of third-party investment providers, the target rating for an SRF financing indenture and the terms of the pledged investments. This is most critical for reserve fund models that rely on reserve fund investment instruments to clear default tolerance hurdles necessary to support the highest ratings. The strongest investments consist of investment agreements collateralized by U.S. government or U.S. government-guaranteed securities that eliminate any direct counterparty exposure and that can be liquidated at par on bond payment dates to the extent needed to cover SRF borrower payment defaults. These terms are characteristic of SRF reserve fund models throughout the country. Under Fitch's criteria, such investment agreements support higher default tolerance at any given leverage ratio. This is due to the immediate access to all available reserve dollars provided by such investment agreements. So, over any four-year test period, the absolute level of tolerance is a function of the drawdown of investment earnings and reserve balances against payments due from SRF financing recipients. For SRFs using the Blend Rate Model, default tolerance is strictly a function of the cashflow match of payments due from SRF recipients, funded from bond proceeds and equity, and bond cashflows. Compared to a reserve fund model, this produces lower tolerance thresholds for any given leverage ratio. However, the Blend Rate Model can demonstrate higher minimum stressed cashflows from which subordinated financing indentures and SRF guarantees can derive credit benefits.

APPENDIX B

Excel Model Instructions

The purpose of the model is to allow users to test the credit limits for applying the Act's Title VI, Section 603(d) financial assistance options given Moody's, S&P and Fitch rating criteria and a state's SRF rating targets. The premise of the model rests on the characteristics of the existing state CWSRF programs. The model accommodates this with data fields that allow users to input the variables that reflect existing conditions in a given state. These conditions include the allocation between equity financed loans that are not part of a bond indenture pledge and loans pledged to SRF bond financings. Input percentages are provided to capture the respective portfolios' credit quality. The model also provides a field to input assumptions regarding a prospective portfolio of guaranteed financings. Each of these inputs can be found on the first worksheet (Assumption WS - Worksheet No. 1 - General Model Assumptions), which controls all the independent variable inputs that are needed to run the model.

The inputs included in the General Model Assumptions page are as follows:

- Outstanding SRF bond portfolio weighted average interest rate and term;
- Outstanding direct financing portfolio weighted average interest rate and term;
- Prospective weighted average interest rates and terms of a GI portfolio;
- Actual weighted average bond and direct financing portfolios by credit ratings; and
- Assumed weighted average credit rating for prospective SRF GI portfolio.

These data points are used to solve for GI funding capacity for a given state SRF programs average annual equity cashflow. The Model contains a field, "Average Annual SRF Equity Cashflow", that captures this vital data point. The example provided in the report assumes $100. Once this assumption is entered the model requires entries for:

- the percentage of the cashflows derived from direct financing repayments; the difference is the percentage of equity being released from the pledge of leveraged financings;
- the leverage factor where 1 represents bonding equal to the sum of the direct financing debt service payable over the weighted average term; and
- Letters of credit secured by a percentage of assumed recoveries on assumed SRF loan defaults.

The last section on Worksheet No. 1 provides the GI funding capacity estimates that result from the above entries after solving for the net SRF cashflow that would be available to support a triple-A rated SRF GI funding program. The available net cashflows are provided on Worksheet No. 1 but are derived from the embedded worksheets used to undertake the analysis.

The Model operates with a total of nine worksheets. These are as follows:

1. General Model Assumptions;

2. Moody's-Solve for GI Cashflow;
3. Moody's-GI Funding Capacity WS;
4. S&P- Solve for Net CF for GI;
5. S&P-Bond Cashflow WS;
6. S&P-GI Funding Capacity WS;
7. Fitch-Solve for Net CF Available for GI;
8. Fitch-Bond Cashflow WS; and
9. Fitch-GI Funding Capacity WS.

It should be noted that for state-specific analysis, the bond cashflow worksheets, which include direct financing cashflows, can be overridden with actual state data inputs.

Note, the attached model worksheets reflect the SRF leveraged assumptions discussed in the body of the report.

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Worksheet No. 1

General Model Assumptions

State of:

Bond Portfolio Weighted Avg. Interest Rate: 4.00%
Bond Portfolio Weighted Average Term: 15

Direct Financing Portfolio Weighted Avg Interest Rate: 0.00%
Direct Financing Portfolio Weighted Average Term: 15

SRF-Prospective GI Financing Terms Taxable Triple -A Scale	
Financing Term	Interest Rate
5	2.50%
7	2.50%
10	3.00%
15	3.50%
20	4.00%

Weighted Average SRF Loan Portfolio Bond-Financed Loans	
Credit Rating	Percentage of Portfolio
Triple-A	0%
Double-A	10%
Single-A	45%
Triple- B	40%
Non-Rated ("NR")	5%

Weighted Average SRF Loan Portfolio Direct Loans	
Credit Rating	Percentage of Portfolio
Triple-A	0%
Double-A	0%
Single-A	30%
Triple- B	50%
Non-Rated ("NR")	20%

Weighted Average SRF Loan Portfolio Guaranteed GI Loans	
Credit Rating	Percentage of Portfolio
Triple-A	0%
Double-A	0%
Single-A	0%
Triple- B	0%
Non-Rated ("NR")	100%

Average Annual SRF Equity Cashflow: $ 100.00

Direct Financing % 25% (Equity loaned directly to projects)
Leveraged % 75% (Equity pledged to bonds)

Leverage Factor where 1 represents bonding equal to pledged Direct Financing DS 1

S&P Solve for 50%

Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

Moody's: $ 20.72 S&P: $ 34.82 Fitch: $ 43.25

Available Net Cashflow After Applying Letter of Credit Support

Moody's: $ 41.43 S&P: $ 67.41 Fitch: $ 71.62

Results

Weighted Average Financing Terms	Interest Rate	GI Funding Capacity (No LOCs)			GI Funding Capacity (LOCs Collateralized by Recoveries)		
		Moody's	S&P	Fitch	Moody's	S&P	Fitch
5	2.50%			$910.55			$1,507.99
7	2.50%	$292.32	$473.47		$584.63	$916.54	
10	3.00%	$392.72	$540.10	$962.06	$785.44	$1,045.52	$1,593.30
15	3.50%	$530.24	$624.73		$1,060.49	$1,209.36	
20	4.00%	$625.68	$676.10	$907.78	$1,251.36	$1,308.79	$1,503.40

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Worksheet No. 2

Average Annual Cash Flow Available for GI Credit Support and Capacity Limits After Applying Ratings Service Criteria for Triple-A Target Ratings Moody's Investors Service

Moodys Analysis - Leveraged/Direct

Bond Debt Service		$ 101.18	a
Pledged Equity (0% Direct Financing CF)		$ 75.00	b
Cash Flow ("CF") Pledged to Bonds:		$ 176.18	=a+b
Direct Financing Bal. Outstanding:	$ 375.00		
Direct Financing CF ("DF CF"):	$ 25.00		
DF Investment Credit:	100.00%		Input Field
Adjusted DF CF:		$ 25.00	
Total Adjusted CF to Cover Defaults		$ 201.18	
Less: Bond CF		$ (101.18)	
SRF Free Cash Flow		$ 100.00	
SRF Breakeven Default % Before GI CF (including Adjusted DF CF)		42.57%	
Target Breakeven Default % After Covering GI CF	45%		Input Field
Total Adjusted CF to Cover Defaults		$ 201.18	
CF at Target Breakeven Default		$ 180.47	
Net CF for GI before Loss Reserve		$ 20.72	
GI CF After LOC Support	$ 41.43		Model assumes 2 times the Net CF balance
GI CF at Breakeven Default Rate:	$ 92.08	$ 46.04	GI CF divided by the target breakeven default rate

Weighted Average Financing Terms	Interest Rate	GI Financing Capacity	After LOC Support
7	2.50%	$292.32	$584.63
10	3.00%	$392.72	$785.44
15	3.50%	$530.24	$1,060.49
20	4.00%	$625.68	$1,251.36

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Worksheet No. 3

GI Debt Service Worksheet
Available Aaa/AAA/AAA Cash Flows
After Applying Ratings Service Criteria
Moody's Ratings Service

Based on Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

GI Cash Flow WS, Cell G36:	$ 46.04

Interest Rate	2.50%	3.00%	3.50%	4.00%
Financing Term	7	10	15	20

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c
1	$ 46.04	$ 7.31	$ 38.73	$292.32	$ 46.04	$ 11.78	$ 34.26	$392.72	$ 46.04	$ 18.56	$ 27.48	$530.24	$ 46.04	$ 25.03	$ 21.01	$625.68
2	$ 46.04	$ 6.34	$ 39.70	$253.59	$ 46.04	$ 10.75	$ 35.28	$358.46	$ 46.04	$ 17.60	$ 28.44	$502.76	$ 46.04	$ 24.19	$ 21.85	$604.67
3	$ 46.04	$ 5.35	$ 40.69	$213.89	$ 46.04	$ 9.70	$ 36.34	$323.18	$ 46.04	$ 16.60	$ 29.44	$474.32	$ 46.04	$ 23.31	$ 22.73	$582.81
4	$ 46.04	$ 4.33	$ 41.71	$173.20	$ 46.04	$ 8.60	$ 37.43	$286.83	$ 46.04	$ 15.57	$ 30.47	$444.89	$ 46.04	$ 22.40	$ 23.63	$560.09
5	$ 46.04	$ 3.29	$ 42.75	$131.49	$ 46.04	$ 7.48	$ 38.56	$249.40	$ 46.04	$ 14.50	$ 31.53	$414.42	$ 46.04	$ 21.46	$ 24.58	$536.45
6	$ 46.04	$ 2.22	$ 43.82	$88.74	$ 46.04	$ 6.33	$ 39.71	$210.84	$ 46.04	$ 13.40	$ 32.64	$382.88	$ 46.04	$ 20.47	$ 25.56	$511.87
7	$ 46.04	$ 1.12	$ 44.92	$44.92	$ 46.04	$ 5.13	$ 40.90	$171.13	$ 46.04	$ 12.26	$ 33.78	$350.25	$ 46.04	$ 19.45	$ 26.59	$486.31
8					$ 46.04	$ 3.91	$ 42.13	$130.22	$ 46.04	$ 11.08	$ 34.96	$316.47	$ 46.04	$ 18.39	$ 27.65	$459.72
9					$ 46.04	$ 2.64	$ 43.40	$88.09	$ 46.04	$ 9.85	$ 36.19	$281.50	$ 46.04	$ 17.28	$ 28.76	$432.07
#					$ 46.04	$ 1.34	$ 44.70	$44.70	$ 46.04	$ 8.59	$ 37.45	$245.32	$ 46.04	$ 16.13	$ 29.91	$403.32
#									$ 46.04	$ 7.28	$ 38.76	$207.87	$ 46.04	$ 14.94	$ 31.10	$373.41
#									$ 46.04	$ 5.92	$ 40.12	$169.10	$ 46.04	$ 13.69	$ 32.35	$342.31
#									$ 46.04	$ 4.51	$ 41.52	$128.98	$ 46.04	$ 12.40	$ 33.64	$309.97
#									$ 46.04	$ 3.06	$ 42.98	$87.46	$ 46.04	$ 11.05	$ 34.99	$276.33
#									$ 46.04	$ 1.56	$ 44.48	$44.48	$ 46.04	$ 9.65	$ 36.38	$241.34
#													$ 46.04	$ 8.20	$ 37.84	$204.96
#													$ 46.04	$ 6.68	$ 39.35	$167.11
#													$ 46.04	$ 5.11	$ 40.93	$127.76
#													$ 46.04	$ 3.47	$ 42.57	$86.83
#													$ 46.04	$ 1.77	$ 44.27	$44.27
	$ 322.27	$ 29.95	$ 292.32		$ 460.38	$ 67.67	$ 392.72		$ 690.58	$ 160.33	$ 530.24		$ 920.77	$ 295.09	$ 625.68	

Available Cashflow Net of Capital Charges and LOC Support

GI Cash Flow WS, Cell F36:	$ 92.08

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c	a	b	c =a+b	d =d*prior*-c
1	$ 92.08	$ 14.62	$ 77.46	$584.63	$ 92.08	$ 23.56	$ 68.51	$785.44	$ 92.08	$ 37.12	$ 54.96	$1,060.49	$ 92.08	$ 50.05	$ 42.02	$1,251.36
2	$ 92.08	$ 12.68	$ 79.40	$507.17	$ 92.08	$ 21.51	$ 70.57	$716.92	$ 92.08	$ 35.19	$ 56.88	$1,005.53	$ 92.08	$ 48.37	$ 43.70	$1,209.33
3	$ 92.08	$ 10.69	$ 81.38	$427.77	$ 92.08	$ 19.39	$ 72.69	$646.35	$ 92.08	$ 33.20	$ 58.87	$948.64	$ 92.08	$ 46.63	$ 45.45	$1,165.63
4	$ 92.08	$ 8.66	$ 83.42	$346.39	$ 92.08	$ 17.21	$ 74.87	$573.67	$ 92.08	$ 31.14	$ 60.93	$889.77	$ 92.08	$ 44.81	$ 47.27	$1,120.18
5	$ 92.08	$ 6.57	$ 85.50	$262.97	$ 92.08	$ 14.96	$ 77.11	$498.80	$ 92.08	$ 29.01	$ 63.07	$828.84	$ 92.08	$ 42.92	$ 49.16	$1,072.91
6	$ 92.08	$ 4.44	$ 87.64	$177.47	$ 92.08	$ 12.65	$ 79.43	$421.69	$ 92.08	$ 26.80	$ 65.28	$765.77	$ 92.08	$ 40.95	$ 51.13	$1,023.75
7	$ 92.08	$ 2.25	$ 89.83	$89.83	$ 92.08	$ 10.27	$ 81.81	$342.26	$ 92.08	$ 24.52	$ 67.56	$700.49	$ 92.08	$ 38.90	$ 53.17	$972.62
8					$ 92.08	$ 7.81	$ 84.26	$260.45	$ 92.08	$ 22.15	$ 69.92	$632.93	$ 92.08	$ 36.78	$ 55.30	$919.45
9					$ 92.08	$ 5.29	$ 86.79	$176.19	$ 92.08	$ 19.71	$ 72.37	$563.01	$ 92.08	$ 34.57	$ 57.51	$864.15
#					$ 92.08	$ 2.68	$ 89.40	$89.40	$ 92.08	$ 17.17	$ 74.90	$490.64	$ 92.08	$ 32.27	$ 59.81	$806.64
#									$ 92.08	$ 14.55	$ 77.53	$415.73	$ 92.08	$ 29.87	$ 62.20	$746.83
#									$ 92.08	$ 11.84	$ 80.24	$338.21	$ 92.08	$ 27.38	$ 64.69	$684.62
#									$ 92.08	$ 9.03	$ 83.05	$257.97	$ 92.08	$ 24.80	$ 67.28	$619.93
#									$ 92.08	$ 6.12	$ 85.95	$174.92	$ 92.08	$ 22.11	$ 69.97	$552.65
#									$ 92.08	$ 3.11	$ 88.96	$88.96	$ 92.08	$ 19.31	$ 72.77	$482.68
#													$ 92.08	$ 16.40	$ 75.68	$409.91
#													$ 92.08	$ 13.37	$ 78.71	$334.23
#													$ 92.08	$ 10.22	$ 81.86	$255.52
#													$ 92.08	$ 6.95	$ 85.13	$173.67
#													$ 92.08	$ 3.54	$ 88.54	$88.54
	$ 644.54	$ 59.91	$ 584.63		$ 920.77	$ 135.33	$ 785.44		$ 1,381.15	$ 320.67	$ 1,060.49		$ 1,841.54	$ 590.18	$ 1,251.36	

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Worksheet No. 4

Average Annual Cash Flow Available for GI Credit Support After Applying Ratings Service Criteria for Triple-A Target Ratings Standard &Poor's Ratings Service

S&P Analysis - Leveraged/Direct

Pledged Bond Cash Flow ("CF"):		$ 176.18	a
Maximum Defaulted DS		$ 55.25	b
Payments Net of Default		$ 120.93	c= a-b
Bond Debt Service		$101.18	d
Min.Stressed Pledged Bd CF:		$ 19.75	e= c-d
After LOC Draw	$ 47.37		
Direct Financing ("DF CF"):		$ 25.00	f
Maximum Defaulted DS		$ 9.93	g
Minimum Stressed DF CF:		$ 15.08	h= f-g
After LOC Draw	$ 20.04		
Total Adj. CF Available to GI	$ 67.41	$ 34.82	I = e+h

Weighted Average Financing Terms	Interest Rate	GI Financing Capacity	GI Capacity With LOCs
7	2.50%	$473.47	$916.54
10	3.00%	$540.10	$1,045.52
15	3.50%	$624.73	$1,209.36
20	4.00%	$676.10	$1,308.79

SRF Bond Portfolio: Weighted Average Default Rate by Credit Rating ("WADR")

Rating	% Wght	Assigned Default Rate by Financing Term /Term 7	10	15	20
AA	10%	6.7%	10.0%	15.8%	22.5%
A	45%	13.3%	17.5%	24.2%	31.7%
BBB	40%	23.3%	30.0%	39.2%	47.5%
NR	5%	46.7%	55.0%	64.2%	70.0%
WADR	100%	18.3%	23.6%	31.4%	39.0%

Direct Loan Portfolio by Weighted Average Credit Rating

Rating	% Wght	Assigned Default Rate by Financing Term /Term 7	10	15	20
AA	0%	6.7%	10.0%	15.8%	22.5%
A	30%	13.3%	17.5%	24.2%	31.7%
BBB	50%	23.3%	30.0%	39.2%	47.5%
NR	20%	46.7%	55.0%	64.2%	70.0%
WADR	100%	25.0%	31.3%	39.7%	47.3%

GI Portfolio by Weighted Average Credit Rating

Rating	% Wght	Assigned Default Rate by Financing Term /Term 7	10	15	20
AA	0%	6.7%	10.0%	15.8%	22.5%
A	0%	13.3%	17.5%	24.2%	31.7%
BBB	0%	23.3%	30.0%	39.2%	47.5%
NR	100%	46.7%	55.0%	64.2%	70.0%
WADR	100%	46.7%	55.0%	64.2%	70.0%

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Worksheet No. 5

Available Aaa/AAA/AAA Cash Flows
After Applying Ratings Service Criteria
To Existing Bond Indentures and Direct Financings

Standard &Poor's Ratings Service

Assumptions: Bond Pledged Cash Flows("CF")

Direct Financing CF	*$ 75.00*
Bond Debt Service	*$101.18*
Pledged Cash Flow	*$ 176.18*
Bond Interest Rate("BIR")	*4.00%*
Financing Term	*15*

Rating Weighted

Average Cum Default Rate:	*31.4%*	
Annual Default Rate ("ADR"):	*7.8%*	
Recovery Rate ("RR"):	*95%*	*Input Field*

Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

Available Cashflow Net of Capital Charges and LOC Support

	SRF Financings		Market Rate Financing														
	Aggregate Debt Service Due	Equity Funded Direct Loan DS	Bond Funded Loan Debt Service	Loan Interest	Loan Principal Payment	Amount of Default	Payments Net of Default	Bond Debt Service	Bond Interest	Principal Payment	Recoveries	Net Cash Flow to SRF Equity	Bond Principal Balance ("BOY")	LOC Draw	Adjusted Net Cash Flow to SRF Equity
	a	b	c =a-b	d = BIR*m	e =c-d	f = Cum ADR*a	g =a-f	h =a-b	i =g	j =h-i	k =RR*f	l =g-h+k	m =m-*jprior*		
1	$ 176.18	$ 75.00	$ 101.18	$ 45.00	$ 56.18	$ 13.81	$ 162.37	$ 101.18	$ 45.00	$ 56.18		$ 61.19	$ 1,125.00	$6.91	$ 68.09
2	$ 176.18	$ 75.00	$ 101.18	$ 42.75	$ 58.43	$ 27.63	$ 148.56	$ 101.18	$ 42.75	$ 58.43		$ 47.37	$ 1,068.82	$13.81	$ 61.19
3	$ 176.18	$ 75.00	$ 101.18	$ 40.42	$ 60.77	$ 41.44	$ 134.75	$ 101.18	$ 40.42	$ 60.77		$ 33.56	$ 1,010.39	$20.72	$ 54.28
4	$ 176.18	$ 75.00	$ 101.18	$ 37.98	$ 63.20	$ 55.25	$ 120.93	$ 101.18	$ 37.98	$ 63.20		$ 19.75	$ 949.62	$27.63	$ 47.37
5	$ 176.18	$ 75.00	$ 101.18	$ 35.46	$ 65.73	$ 42.13	$ 134.05	$ 101.18	$ 35.46	$ 65.73	$ 13.12	$ 45.99	$ 886.42		
6	$ 176.18	$ 75.00	$ 101.18	$ 32.83	$ 68.36	$ 28.32	$ 147.87	$ 101.18	$ 32.83	$ 68.36	$ 26.24	$ 72.93	$ 820.69		
7	$ 176.18	$ 75.00	$ 101.18	$ 30.09	$ 71.09	$ 14.50	$ 161.68	$ 101.18	$ 30.09	$ 71.09	$ 39.37	$ 99.86	$ 752.33		
8	$ 176.18	$ 75.00	$ 101.18	$ 27.25	$ 73.93	$ 0.69	$ 175.49	$ 101.18	$ 27.25	$ 73.93	$ 52.49	$ 126.80	$ 681.24		
9	$ 176.18	$ 75.00	$ 101.18	$ 24.29	$ 76.89	$ 0.69	$ 175.49	$ 101.18	$ 24.29	$ 76.89	$ 40.02	$ 114.33	$ 607.31		
10	$ 176.18	$ 75.00	$ 101.18	$ 21.22	$ 79.97	$ 0.69	$ 175.49	$ 101.18	$ 21.22	$ 79.97	$ 26.90	$ 101.21	$ 530.42		
11	$ 176.18	$ 75.00	$ 101.18	$ 18.02	$ 83.17	$ 0.69	$ 175.49	$ 101.18	$ 18.02	$ 83.17	$ 13.78	$ 88.09	$ 450.45		
12	$ 176.18	$ 75.00	$ 101.18	$ 14.69	$ 86.49	$ 0.69	$ 175.49	$ 101.18	$ 14.69	$ 86.49		$ 74.31	$ 367.29		
13	$ 176.18	$ 75.00	$ 101.18	$ 11.23	$ 89.95	$ 0.69	$ 175.49	$ 101.18	$ 11.23	$ 89.95		$ 74.31	$ 280.79		
14	$ 176.18	$ 75.00	$ 101.18	$ 7.63	$ 93.55	$ 0.69	$ 175.49	$ 101.18	$ 7.63	$ 93.55		$ 74.31	$ 190.84		
15	$ 176.18	$ 75.00	$ 101.18	$ 3.89	$ 97.29	$ 0.69	$ 175.49	$ 101.18	$ 3.89	$ 97.29		$ 74.31	$ 97.29		
16				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00		
17				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00		
18				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00		
19				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00		
20				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00		
	$ 2,642.76	$ 1,125.00		$ 392.76	$ 1,125.00				$ 392.76	$ 1,125.00	$ 211.92	$ 1,108.32			

Leverage Adj. $ 1,125.00

Assumptions: Direct Financing Cash Flows

DF Cash Flow	*$ 25.00*	
Interest Rate	*0.00%*	*Input*
Financing Term	*15*	*Input*

Rating Weighted

Average Cum Default Rate	*39.70%*	
Annual Default Rate ("ADR"):	*9.9%*	
Recovery Rate ("RR"):	*95.00%*	*Input*

	Direct Financing Payment	Interest	Principal Payment	Amount of Default	Payments Net of Default	Bond Debt Service	Bond Interest	Principal Payment	Recoveries	Net Cash Flow to SRF Equity	SRF Financings Principal Balance ("BOY")	LOC Draw	Adjusted Net Cash Flow to SRF Equity
	a	b	c =a-b	d =Cum ADR*a	e =a-d				f =RR*e	g =e+f	h =BOY-c		
1	$ 25.00	$ -	$ 25.00	$ 2.48	$ 22.52					$ 22.52	$375.00	$1.24	$ 23.76
2	$ 25.00	$ -	$ 25.00	$ 4.96	$ 20.04					$ 20.04	$350.00	$2.48	$ 22.52
3	$ 25.00	$ -	$ 25.00	$ 7.44	$ 17.56					$ 17.56	$325.00	$3.72	$ 21.28
4	$ 25.00	$ -	$ 25.00	$ 9.93	$ 15.08					$ 15.08	$300.00	$4.96	$ 20.04
5	$ 25.00	$ -	$ 25.00	$ 7.57	$ 17.43				$ 2.36	$ 19.79	$275.00		
6	$ 25.00	$ -	$ 25.00	$ 5.09	$ 19.91				$ 4.71	$ 24.63	$250.00		
7	$ 25.00	$ -	$ 25.00	$ 2.61	$ 22.39				$ 7.07	$ 29.47	$225.00		
8	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88				$ 9.43	$ 34.30	$200.00		
9	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88				$ 7.19	$ 32.07	$175.00		
10	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88				$ 4.83	$ 29.71	$150.00		
11	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88				$ 2.48	$ 27.35	$125.00		
12	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88					$ 24.88	$100.00		
13	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88					$ 24.88	$75.00		
14	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88					$ 24.88	$50.00		
15	$ 25.00	$ -	$ 25.00	$ 0.12	$ 24.88					$ 24.88	$25.00		
16		$ -	$ -	$ -	$ -					$ -	$0.00		
17		$ -	$ -	$ -	$ -					$ -	$0.00		
18		$ -	$ -	$ -	$ -					$ -	$0.00		
19		$ -	$ -	$ -	$ -					$ -	$0.00		
20		$ -	$ -	$ -	$ -					$ -	$0.00		
	$ 375.00	$ -	$ 375.00										

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Worksheet No. 6

After Applying Ratings Service Criteria
Solve for GI Funding Capacity
Available Aaa/AAA/AAA Cash Flows

Standard &Poor's Ratings Service

Based on Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

GI Cash Flow WS, Cell F25:	$ 34.82

Interest Rate *Input*	2.50%	3.00%	3.50%	4.00%
Financing Term *Input*	7	10	15	20

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	d
			=a+b	=d*prior*-c			=a+b	=d*prior*-c			=a+b	=d*prior*-c			=a+b	=d*prior*-c
1	$ 74.57	$ 11.84	$ 62.73	$473.47	$ 63.32	$ 16.20	$ 47.11	$540.10	$ 54.24	$ 21.87	$ 32.38	$624.73	$ 49.75	$ 27.04	$ 22.70	$676.10
2	$ 74.57	$ 10.27	$ 64.30	$410.74	$ 63.32	$ 14.79	$ 48.53	$492.98	$ 54.24	$ 20.73	$ 33.51	$592.36	$ 49.75	$ 26.14	$ 23.61	$653.39
3	$ 74.57	$ 8.66	$ 65.91	$346.44	$ 63.32	$ 13.33	$ 49.98	$444.46	$ 54.24	$ 19.56	$ 34.68	$558.85	$ 49.75	$ 25.19	$ 24.56	$629.78
4	$ 74.57	$ 7.01	$ 67.56	$280.53	$ 63.32	$ 11.83	$ 51.48	$394.48	$ 54.24	$ 18.35	$ 35.90	$524.16	$ 49.75	$ 24.21	$ 25.54	$605.22
5	$ 74.57	$ 5.32	$ 69.24	$212.97	$ 63.32	$ 10.29	$ 53.03	$342.99	$ 54.24	$ 17.09	$ 37.15	$488.27	$ 49.75	$ 23.19	$ 26.56	$579.68
6	$ 74.57	$ 3.59	$ 70.98	$143.73	$ 63.32	$ 8.70	$ 54.62	$289.97	$ 54.24	$ 15.79	$ 38.45	$451.11	$ 49.75	$ 22.12	$ 27.62	$553.12
7	$ 74.57	$ 1.82	$ 72.75	$72.75	$ 63.32	$ 7.06	$ 56.26	$235.35	$ 54.24	$ 14.44	$ 39.80	$412.66	$ 49.75	$ 21.02	$ 28.73	$525.50
8					$ 63.32	$ 5.37	$ 57.94	$179.10	$ 54.24	$ 13.05	$ 41.19	$372.86	$ 49.75	$ 19.87	$ 29.88	$496.77
9					$ 63.32	$ 3.63	$ 59.68	$121.15	$ 54.24	$ 11.61	$ 42.63	$331.67	$ 49.75	$ 18.68	$ 31.07	$466.89
10					$ 63.32	$ 1.84	$ 61.47	$61.47	$ 54.24	$ 10.12	$ 44.13	$289.03	$ 49.75	$ 17.43	$ 32.32	$435.82
11									$ 54.24	$ 8.57	$ 45.67	$244.91	$ 49.75	$ 16.14	$ 33.61	$403.50
12									$ 54.24	$ 6.97	$ 47.27	$199.24	$ 49.75	$ 14.80	$ 34.95	$369.89
13									$ 54.24	$ 5.32	$ 48.92	$151.97	$ 49.75	$ 13.40	$ 36.35	$334.94
14									$ 54.24	$ 3.61	$ 50.64	$103.04	$ 49.75	$ 11.94	$ 37.80	$298.59
15									$ 54.24	$ 1.83	$ 52.41	$52.41	$ 49.75	$ 10.43	$ 39.32	$260.79
16													$ 49.75	$ 8.86	$ 40.89	$221.47
17													$ 49.75	$ 7.22	$ 42.53	$180.58
18													$ 49.75	$ 5.52	$ 44.23	$138.06
19													$ 49.75	$ 3.75	$ 46.00	$93.83
20													$ 49.75	$ 1.91	$ 47.83	$47.83
	$ 521.98	$ 48.52	$ 473.47		$ 633.16	$ 93.06	$ 540.10		$ 813.64	$ 188.90	$ 624.73		$ 994.97	$ 318.87	$ 676.10	

Available Cashflow Net of Capital Charges and LOC Support

GI Cash Flow WS, Cell e25:	$ 67.41

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	d
			=a+b	=d*prior*-c			=a+b	=d*prior*-c			=a+b	=d*prior*-c			=a+b	=d*prior*-c
1	$ 144.35	$ 22.91	$ 121.44	$916.54	$ 122.57	$ 31.37	$ 91.20	$1,045.52	$ 105.00	$ 42.33	$ 62.68	$1,209.36	$ 96.30	$ 52.35	$ 43.95	$1,308.79
2	$ 144.35	$ 19.88	$ 124.47	$795.10	$ 122.57	$ 28.63	$ 93.94	$954.32	$ 105.00	$ 40.13	$ 64.87	$1,146.69	$ 96.30	$ 50.59	$ 45.71	$1,264.83
3	$ 144.35	$ 16.77	$ 127.59	$670.63	$ 122.57	$ 25.81	$ 96.76	$860.38	$ 105.00	$ 37.86	$ 67.14	$1,081.82	$ 96.30	$ 48.76	$ 47.54	$1,219.12
4	$ 144.35	$ 13.58	$ 130.77	$543.04	$ 122.57	$ 22.91	$ 99.66	$763.63	$ 105.00	$ 35.51	$ 69.49	$1,014.68	$ 96.30	$ 46.86	$ 49.44	$1,171.59
5	$ 144.35	$ 10.31	$ 134.04	$412.27	$ 122.57	$ 19.92	$ 102.65	$663.97	$ 105.00	$ 33.08	$ 71.92	$945.19	$ 96.30	$ 44.89	$ 51.42	$1,122.15
6	$ 144.35	$ 6.96	$ 137.40	$278.23	$ 122.57	$ 16.84	$ 105.73	$561.32	$ 105.00	$ 30.56	$ 74.44	$873.27	$ 96.30	$ 42.83	$ 53.47	$1,070.73
7	$ 144.35	$ 3.52	$ 140.83	$140.83	$ 122.57	$ 13.67	$ 108.90	$455.59	$ 105.00	$ 27.96	$ 77.04	$798.83	$ 96.30	$ 40.69	$ 55.61	$1,017.26
8					$ 122.57	$ 10.40	$ 112.17	$346.69	$ 105.00	$ 25.26	$ 79.74	$721.79	$ 96.30	$ 38.47	$ 57.84	$961.64
9					$ 122.57	$ 7.04	$ 115.53	$234.53	$ 105.00	$ 22.47	$ 82.53	$642.05	$ 96.30	$ 36.15	$ 60.15	$903.81
10					$ 122.57	$ 3.57	$ 119.00	$119.00	$ 105.00	$ 19.58	$ 85.42	$559.51	$ 96.30	$ 33.75	$ 62.56	$843.66
11									$ 105.00	$ 16.59	$ 88.41	$474.09	$ 96.30	$ 31.24	$ 65.06	$781.10
12									$ 105.00	$ 13.50	$ 91.50	$385.68	$ 96.30	$ 28.64	$ 67.66	$716.04
13									$ 105.00	$ 10.30	$ 94.71	$294.18	$ 96.30	$ 25.94	$ 70.37	$648.38
14									$ 105.00	$ 6.98	$ 98.02	$199.47	$ 96.30	$ 23.12	$ 73.18	$578.01
15									$ 105.00	$ 3.55	$ 101.45	$101.45	$ 96.30	$ 20.19	$ 76.11	$504.83
16													$ 96.30	$ 17.15	$ 79.15	$428.72
17													$ 96.30	$ 13.98	$ 82.32	$349.57
18													$ 96.30	$ 10.69	$ 85.61	$267.25
19													$ 96.30	$ 7.27	$ 89.04	$181.64
20													$ 96.30	$ 3.70	$ 92.60	$92.60
	$ 1,010.46	$ 93.92	$ 916.54		$ 1,225.67	$ 180.15	$ 1,045.52		$ 1,575.04	$ 365.68	$ 1,209.36		$ 1,926.05	$ 617.27	$ 1,308.79	

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Worksheet No. 7

Average Annual Cash Flow Available for GI Credit Support and Capacity Limits After Applying Ratings Service Criteria for Triple-A Target Rating

Fitch Ratings

Fitch Analysis - Leveraged/Direct

Pledged Bond Cash Flow ("CF"):		$ 176.18	a
Bond Debt Service		$101.18	b
Free CF from Bond Indenture		$ 75.00	c= a-b
Direct Financing ("DF CF"):		$ 25.00	d
SRF Free Cash Flow		$ 100.00	e= c+d
	LOC		
Minimum Stressed Bond CF:	$ 51.23	$ 27.47	f
Minimum Stressed DF CF:	$ 20.39	$ 15.78	g
Min. Stressed SRF Free CF:	$ 71.62	$ 43.25	h=f+g
Total Adj. CF Available to GI	$ 71.62	$ 43.25	

Weighted Average Financing Terms	Interest Rate	GI Financing Capacity	GI Capacity w/LOCs
5	2.50%	$910.55	$1,507.99
10	3.00%	$962.06	$1,593.30
15	N/A	N/A	N/A
20	4.00%	$907.78	$1,503.40

Fitch Cumulative Default Rates by Credit Rating and Financing Term					
Financing Term	Asset Mean of Default by Portfolio Rating (%)				
	AAA	AA	A	BBB	BB
One Year		0.01%	0.07%	0.19%	1.16%
Five Year	0.08%	0.17%	0.59%	1.91%	10.03%
10 Year	0.19%	0.64%	1.58%	4.54%	17.43%
20 Year	0.60%	1.58%	3.82%	10.97%	29.43%

Fitch Default Stress Coverage Multiples (x)					
Default Stress Multiple by Target Rating	Portfolio Weighted Average Default Rate				
	AAA	AA	A	BBB	BB
AAA		5.8	4.6	3.4	2.2
AA		4.4	3.6	2.8	2.0
A		3.2	2.7	2.2	1.7

Weighted Average Portfolio Rating and Financing Term					
Cumulative Stresses for AAA Target Rating (%)					
Financing Term	Portfolio Weighted Average Default Rate				
	AAA	AA	A	BBB	BB
Five Year		0.99%	2.71%	6.49%	22.07%
Ten Year		3.71%	7.27%	15.44%	38.35%
Twenty Year		9.16%	17.57%	37.30%	64.75%

SRF Bond Portfolio: Weighted Average Default Rate ("WADR")					
Rating	%	Assigned Default Rate by Financing Term			
		5	10	15	20
AA	10%	0.1%	0.4%		0.9%
A	45%	1.2%	3.3%		7.9%
BBB	40%	2.6%	6.2%		14.9%
BB	5%	1.1%	1.9%		3.2%
WADR	100%	5.0%	11.7%	0.0%	27.0%

Direct Loan Portfolio: Weighted Average Default Rate ("WADR")					
Rating	%	Assigned Default Rate by Financing Term			
		5	10	15	20
AA	0%	0.0%	0.0%		0.0%
A	30%	0.8%	2.2%		5.3%
BBB	50%	3.2%	7.7%		18.6%
NR	20%	4.4%	7.7%		12.9%
WADR	100%	8.5%	17.6%	0.0%	36.9%

GI Portfolio by Weighted Average Credit Rating					
Rating	%	Assigned Default Rate by Financing Term			
		5	10	15	20
AA	0%	0.0%	0.0%		0.0%
A	0%	0.0%	0.0%		0.0%
BBB	0%	0.0%	0.0%		0.0%
NR	100%	22.1%	38.3%		64.7%
WADR	100%	22.1%	38.3%	0.0%	64.7%

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Worksheet No. 8

Available Aaa/AAA/AAA Cash Flows
After Applying Ratings Service Criteria
To Existing Bond Indentures and Direct Financings

Fitch Ratings

Assumptions: ***Bond Cash Flows("CF")***

Direct Financing CF	*$ 75.00*
Bond Debt Service	*$101.18*
Pledged Cash Flow	*$ 176.18*
Bond Interest Rate("BIR")	*4.00%*
SRF Financing IR	*2.00%*
Financing Term	*15*

Rating Weighted

Cum Average Default Rate:	*26.98%*
Annual Default Rate ("ADR"):	*6.75%*
Recovery Rate ("RR"):	*90%*

Solve for Breakeven if 0; ADR if 1: 1 ***Breakeven Default Rate:*** ***50.0%***

Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

	SRF Financings		Market Rate Financing											Bond	**Available Cashflow Net of Capital Charges and LOC Support**	
	Aggregate Debt Service Due	Equity Funded Direct Loan DS	Loan Debt Service	Loan Interest	Loan Principal Payment	Amount of Default	Payments Net of Default	Bond Debt Service	Bond Interest	Principal Payment	Recoveries	Net Cash Flow to SRF Equity	Bond Principal Balance ("BOY")	LOC Draw	Adjusted Net Cash Flow to SRF Equity	
	a	b	c =a-b	d = BIR*m	e =c-d	f = Cum ADR*a	g =a-f	h =a-b	i =g	j =h-i	k =RR*f	l =g-h+k	m =m-*jprior*			
1	$ 176.18	$ 75.00	$ 101.18	$ 45.00	$ 56.18	$ 11.88	$ 164.30	$ 101.18	$ 45.00	$ 56.18		$ 63.12	$ 1,125.00	$5.94	$	69.06
2	$ 176.18	$ 75.00	$ 101.18	$ 42.75	$ 58.43	$ 23.77	$ 152.42	$ 101.18	$ 42.75	$ 58.43		$ 51.23	$ 1,068.82	$11.88	$	63.12
3	$ 176.18	$ 75.00	$ 101.18	$ 40.42	$ 60.77	$ 35.65	$ 140.53	$ 101.18	$ 40.42	$ 60.77		$ 39.35	$ 1,010.39	$17.83	$	57.17
4	$ 176.18	$ 75.00	$ 101.18	$ 37.98	$ 63.20	$ 47.53	$ 128.65	$ 101.18	$ 37.98	$ 63.20		$ 27.47	$ 949.62	$23.77	$	51.23
5	$ 176.18	$ 75.00	$ 101.18	$ 35.46	$ 65.73	$ 36.84	$ 139.34	$ 101.18	$ 35.46	$ 65.73	$ 10.70	$ 48.86	$ 886.42			
6	$ 176.18	$ 75.00	$ 101.18	$ 32.83	$ 68.36	$ 24.96	$ 151.23	$ 101.18	$ 32.83	$ 68.36	$ 21.39	$ 71.43	$ 820.69			
7	$ 176.18	$ 75.00	$ 101.18	$ 30.09	$ 71.09	$ 13.07	$ 163.11	$ 101.18	$ 30.09	$ 71.09	$ 32.09	$ 94.01	$ 752.33			
8	$ 176.18	$ 75.00	$ 101.18	$ 27.25	$ 73.93	$ 1.19	$ 175.00	$ 101.18	$ 27.25	$ 73.93	$ 42.78	$ 116.59	$ 681.24			
9	$ 176.18	$ 75.00	$ 101.18	$ 24.29	$ 76.89	$ 1.19	$ 175.00	$ 101.18	$ 24.29	$ 76.89	$ 33.16	$ 106.97	$ 607.31			
10	$ 176.18	$ 75.00	$ 101.18	$ 21.22	$ 79.97	$ 1.19	$ 175.00	$ 101.18	$ 21.22	$ 79.97	$ 22.46	$ 96.27	$ 530.42			
11	$ 176.18	$ 75.00	$ 101.18	$ 18.02	$ 83.17	$ 1.19	$ 175.00	$ 101.18	$ 18.02	$ 83.17	$ 11.76	$ 85.58	$ 450.45			
12	$ 176.18	$ 75.00	$ 101.18	$ 14.69	$ 86.49	$ 1.19	$ 175.00	$ 101.18	$ 14.69	$ 86.49		$ 73.81	$ 367.29			
13	$ 176.18	$ 75.00	$ 101.18	$ 11.23	$ 89.95	$ 1.19	$ 175.00	$ 101.18	$ 11.23	$ 89.95		$ 73.81	$ 280.79			
14	$ 176.18	$ 75.00	$ 101.18	$ 7.63	$ 93.55	$ 1.19	$ 175.00	$ 101.18	$ 7.63	$ 93.55		$ 73.81	$ 190.84			
15	$ 176.18	$ 75.00	$ 101.18	$ 3.89	$ 97.29	$ 1.19	$ 175.00	$ 101.18	$ 3.89	$ 97.29		$ 73.81	$ 97.29			
16				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00			
17				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00			
18				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00			
19				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00			
20				$ 0.00	$ (0.00)	$ -	$ -			$ -		$ -	$ 0.00			
	$ 2,642.76	$ 1,125.00		$ 392.76	$ 1,125.00				$ 392.76	$ 1,125.00	$ 174.33					

Leverage Adj: $ 1,125.00

Assumptions: ***Direct Financing Cash Flows***

DF Cash Flow	*$ 25.00*
Interest Rate	*0.00%*
Financing Term	*15*

WADR Cum Default Rate:	*36.87%*
Annual Default Rate:	*9.2%*
Recovery Rate:	*90.00%*

											SRF Financings			
	Direct Financing Payment	Interest	Principal Payment	Amount of Default	Payments Net of Default	Bond Debt Service	Bond Interest	Principal Payment	Recoveries	Net Cash Flow to SRF Equity	Principal Balance	LOC Draw	Adjusted Net Cash Flow to SRF Equity	
	a	b	c =a-b	d =Cum ADR*a	e =a-d				f =RR*e	g =e+f	h =h-*cprior*			
1	$ 25.00	$ -	$ 25.00	$ 2.30	$ 22.70					$ 22.70	$375.00	$1.15	$	23.85
2	$ 25.00	$ -	$ 25.00	$ 4.61	$ 20.39					$ 20.39	$350.00	$2.30	$	22.70
3	$ 25.00	$ -	$ 25.00	$ 6.91	$ 18.09					$ 18.09	$325.00	$3.46	$	21.54
4	$ 25.00	$ -	$ 25.00	$ 9.22	$ 15.78					$ 15.78	$300.00	$4.61	$	20.39
5	$ 25.00	$ -	$ 25.00	$ 7.14	$ 17.86				$ 2.07	$ 19.93	$275.00			
6	$ 25.00	$ -	$ 25.00	$ 4.84	$ 20.16				$ 4.15	$ 24.31	$250.00			
7	$ 25.00	$ -	$ 25.00	$ 2.53	$ 22.47				$ 6.22	$ 28.69	$225.00			
8	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77				$ 8.30	$ 33.07	$200.00			
9	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77				$ 6.43	$ 31.20	$175.00			
10	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77				$ 4.36	$ 29.12	$150.00			
11	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77				$ 2.28	$ 27.05	$125.00			
12	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77					$ 24.77	$100.00			
13	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77					$ 24.77	$75.00			
14	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77					$ 24.77	$50.00			
15	$ 25.00	$ -	$ 25.00	$ 0.23	$ 24.77					$ 24.77	$25.00			
16		$ -	$ -	$ -	$ -					$ -	$0.00			
17		$ -	$ -	$ -	$ -					$ -	$0.00			
18		$ -	$ -	$ -	$ -					$ -	$0.00			
19		$ -	$ -	$ -	$ -					$ -	$0.00			
20		$ -	$ -	$ -	$ -					$ -	$0.00			
	$ 375.00	$ -	$ 375.00											

U.S. EPA Environmental Financial Advisory Board Report:
Utilizing SRF Funding for Green Infrastructure Projects

Worksheet No. 9

Solve for GI Funding Capacity
Available Aaa/AAA/AAA Cash Flows
After Applying Ratings Service Criteria

Fitch Ratings

Based on Available Cashflow Net of Capital Charges for Direct and Bond Financed Obligations

GI Cash Flow WS, cell F24: $ 43.25

Interest Rate	2.50%	3.00%	3.50%	4.00%
Financing Term	5	10	15	20

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c	d	a	b	c	d					a	b	c	d
			=a+b	=d*prior*-c			=a+b	=d*prior*-c							=a+b	=d*prior*-c
1	$ 195.99	$ 22.76	$ 173.23	$910.55	$ 112.78	$ 28.86	$ 83.92	$962.06		$ -	$ -		$ 66.80	$ 36.31	$ 30.48	$907.78
2	$ 195.99	$ 18.43	$ 177.56	$737.32	$ 112.78	$ 26.34	$ 86.44	$878.14		$ -	$ -	$0.00	$ 66.80	$ 35.09	$ 31.70	$877.29
3	$ 195.99	$ 13.99	$ 182.00	$559.76	$ 112.78	$ 23.75	$ 89.03	$791.70		$ -	$ -	$0.00	$ 66.80	$ 33.82	$ 32.97	$845.59
4	$ 195.99	$ 9.44	$ 186.55	$377.76	$ 112.78	$ 21.08	$ 91.70	$702.67		$ -	$ -	$0.00	$ 66.80	$ 32.50	$ 34.29	$812.62
5	$ 195.99	$ 4.78	$ 191.21	$191.21	$ 112.78	$ 18.33	$ 94.45	$610.97		$ -	$ -	$0.00	$ 66.80	$ 31.13	$ 35.66	$778.33
6					$ 112.78	$ 15.50	$ 97.29	$516.51		$ -	$ -	$0.00	$ 66.80	$ 29.71	$ 37.09	$742.66
7					$ 112.78	$ 12.58	$ 100.21	$419.22		$ -	$ -	$0.00	$ 66.80	$ 28.22	$ 38.57	$705.57
8					$ 112.78	$ 9.57	$ 103.21	$319.02		$ -	$ -	$0.00	$ 66.80	$ 26.68	$ 40.12	$667.00
9					$ 112.78	$ 6.47	$ 106.31	$215.81		$ -	$ -	$0.00	$ 66.80	$ 25.08	$ 41.72	$626.88
10					$ 112.78	$ 3.28	$ 109.50	$109.50		$ -	$ -	$0.00	$ 66.80	$ 23.41	$ 43.39	$585.16
11										$ -	$ -	$0.00	$ 66.80	$ 21.67	$ 45.12	$541.77
12										$ -	$ -	$0.00	$ 66.80	$ 19.87	$ 46.93	$496.65
13										$ -	$ -	$0.00	$ 66.80	$ 17.99	$ 48.81	$449.72
14										$ -	$ -	$0.00	$ 66.80	$ 16.04	$ 50.76	$400.91
15										$ -	$ -	$0.00	$ 66.80	$ 14.01	$ 52.79	$350.15
16													$ 66.80	$ 11.89	$ 54.90	$297.36
17													$ 66.80	$ 9.70	$ 57.10	$242.46
18													$ 66.80	$ 7.41	$ 59.38	$185.36
19													$ 66.80	$ 5.04	$ 61.76	$125.98
20													$ 66.80	$ 2.57	$ 64.23	$64.23
	$ 979.96	$ 69.41	$ 910.55		$ 1,127.83	$ 165.77	$ 962.06		$ -	$ -	$ -		$ 1,335.92	$ 428.14	$ 907.78	

Based on Available Cashflow Net of Capital Charges and LOC Support

GI Cash Flow WS, cell E24: $ 71.62

	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance	Payment	Interest	Principal Payment	Principal Balance
	a	b	c	d	a	b	c	d					a	b	c	d
			=a+b	=d*prior*-c			=a+b	=d*prior*-c							=a+b	=d*prior*-c
	$ 324.59	$ 37.70	$ 286.89	$1,507.99	$ 186.78	$ 47.80	$ 138.98	$1,593.30		$ -	$ -		$ 110.62	$ 60.14	$ 50.49	$1,503.40
	$ 324.59	$ 30.53	$ 294.06	$1,221.10	$ 186.78	$ 43.63	$ 143.15	$1,454.31		$ -	$ -	$0.00	$ 110.62	$ 58.12	$ 52.51	$1,452.91
	$ 324.59	$ 23.18	$ 301.41	$927.03	$ 186.78	$ 39.33	$ 147.45	$1,311.16		$ -	$ -	$0.00	$ 110.62	$ 56.02	$ 54.61	$1,400.41
	$ 324.59	$ 15.64	$ 308.95	$625.62	$ 186.78	$ 34.91	$ 151.87	$1,163.71		$ -	$ -	$0.00	$ 110.62	$ 53.83	$ 56.79	$1,345.80
	$ 324.59	$ 7.92	$ 316.67	$316.67	$ 186.78	$ 30.36	$ 156.43	$1,011.84		$ -	$ -	$0.00	$ 110.62	$ 51.56	$ 59.06	$1,289.01
					$ 186.78	$ 25.66	$ 161.12	$855.41		$ -	$ -	$0.00	$ 110.62	$ 49.20	$ 61.42	$1,229.95
					$ 186.78	$ 20.83	$ 165.95	$694.29		$ -	$ -	$0.00	$ 110.62	$ 46.74	$ 63.88	$1,168.52
					$ 186.78	$ 15.85	$ 170.93	$528.34		$ -	$ -	$0.00	$ 110.62	$ 44.19	$ 66.44	$1,104.64
					$ 186.78	$ 10.72	$ 176.06	$357.40		$ -	$ -	$0.00	$ 110.62	$ 41.53	$ 69.09	$1,038.20
					$ 186.78	$ 5.44	$ 181.34	$181.34		$ -	$ -	$0.00	$ 110.62	$ 38.76	$ 71.86	$969.11
										$ -	$ -	$0.00	$ 110.62	$ 35.89	$ 74.73	$897.25
										$ -	$ -	$0.00	$ 110.62	$ 32.90	$ 77.72	$822.52
										$ -	$ -	$0.00	$ 110.62	$ 29.79	$ 80.83	$744.79
										$ -	$ -	$0.00	$ 110.62	$ 26.56	$ 84.06	$663.96
										$ -	$ -	$0.00	$ 110.62	$ 23.20	$ 87.43	$579.90
													$ 110.62	$ 19.70	$ 90.92	$492.47
													$ 110.62	$ 16.06	$ 94.56	$401.55
													$ 110.62	$ 12.28	$ 98.34	$306.99
													$ 110.62	$ 8.35	$ 102.28	$208.65
													$ 110.62	$ 4.25	$ 106.37	$106.37
	$ 1,622.95	$ 114.96	$ 1,507.99		$ 1,867.83	$ 274.53	$ 1,593.30		$ -	$ -	$ -		$ 2,212.46	$ 709.06	$ 1,503.40	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB- 7 2014

OFFICE OF
WATER

Ms. Karen Massey, Chair
Environmental Financial Advisory Board
1200 Pennsylvania Avenue, NW
Washington, D.C 20460

Dear Ms. Massey:

Thank you for your letter of January 2, 2014, to Administrator McCarthy and accompanying report of the Environmental Financial Advisory Board (EFAB) entitled: "Utilizing SRF Funding for Green Infrastructure Projects." I am responding on behalf of the Administrator.

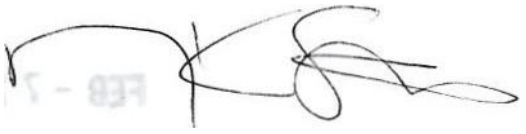
First, I want to express our appreciation to EFAB and to the authors for their hard work in producing the report. It is an impressive analytical document with much useful information on expanding leveraging in the Clean Water State Revolving Fund (CWSRF) programs.

The EPA's view of leveraging these important programs, whether by the sale of bonds, use of credit enhancements, or some other means, is that both the capacity of the programs to expand their lending through leveraging and the demand for additional funds should be established in advance of making the critical decision to leverage. Each state needs to make this assessment in the context of its own legal, policy, institutional and financial circumstances in evaluating the merits of leveraging. In recent years, we have seen increasing interest in using the guaranty authority of the CWSRFs in Title VI of the Clean Water Act (CWA) for both traditional projects and nontraditional green infrastructure and nonpoint source projects. To this end, the EFAB report is especially timely and helpful.

I have asked Andrew Sawyers, Director of the Office of Wastewater Management, to share the report with the State/EPA SRF workgroup and to provide me their feedback on the report's analysis and its recommendations as well as their ideas on how to increase the demand for CWSRF assistance through more creative use of the financial authorities in Title VI of the CWA.

Thanks again for a job well done. I look forward to further conversation on ways to expand and magnify the assistance provided by the CWSRF programs.

Sincerely,



Nancy K. Stoner
Acting Assistant Administrator