

REQUEST FOR COMMENT

US Municipal Utility Revenue Debt

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This Request for Comment (RFC) describes our proposed rating methodology for revenue bonds issued by various types of municipal utilities in the US.

The proposed methodology includes:

- 1) A scorecard that assigns weights and values to the factors we consider most important in utility revenue bond analysis
- 2) A framework for approaching the relationship between a municipality's revenue bonds and its General Obligation bonds, in cases when these securities exhibit disparate credit quality

If the proposed methodology is adopted, we expect a single-digit percentage of our ratings to change, with changes roughly split between upgrades and downgrades.

We invite market participants to comment on the RFC by September 30, by submitting their comments on the [Request for Comment Page](#) on www.moodys.com.

The revised Credit Rating Methodology is presented in draft form during the RFC period. Upon appropriate consideration of received comments, unless such comments lead to further changes, the revised Credit Rating Methodology will be adopted and published. Once published, the Credit Rating Methodology will update and replace two methodologies governing our municipal utility revenue ratings: the Analytical Framework for Water and Sewer System Ratings, August 1999, and US Public Power Electric Utilities, April 2008.

Rating Methodology: US Municipal Utility Revenue Debt

This methodology explains how Moody's evaluates the credit quality of essential service US municipal utility revenue bonds. The approach described in the methodology applies to six basic categories of municipal utilities: water distribution, gas distribution, electric distribution, sanitary sewerage, stormwater disposal, and solid waste disposal. The methodologies used to assign ratings to municipal utility districts, global regulated water utilities, regulated electric and gas utilities, electric generation and transmission cooperatives, waste-to-energy projects can be found in the methodology index on moodys.com.

The primary factors that drive our credit analysis for these types of utilities are the size and health of the system and its service area, the financial strength of its operations, the legal provisions governing its management, and the strength of its rate management and regulatory compliance.

We intend for this document to help investors, municipalities, utilities, and other interested market participants understand how key quantitative and qualitative risk factors are likely to affect ratings in the municipal utility sector. This document does not offer an exhaustive treatment of all factors that are reflected in our ratings, but should enable the reader to understand the considerations that are usually most important for ratings in this sector.

This methodology updates and replaces two methodologies governing our municipal utility revenue ratings: the [Analytical Framework for Water and Sewer System Ratings](#), August 1999, and [US Public Power Electric Utilities](#), April 2008. While reflecting many of the same core principles that we have used in assigning ratings to this sector for years, this updated methodology introduces a scorecard that quantifies several factors that we previously evaluated in qualitative ways. A modest number of ratings are expected to change as a result of the implementation of this methodology.

The purpose of the scorecard is to provide a reference tool that market participants can use to approximate most credit profiles within the US municipal utility sector. The scorecard provides summarized guidance for the factors that we generally consider most important in assigning ratings to these issuers. However, the scorecard is a summary that does not include every rating consideration. The weights the scorecard shows for each factor represent an approximation of their importance for rating decisions. In addition, the scorecard was built based on historical results, while our ratings are based on forward-looking expectations. As a result, we would not expect the scorecard-indicated rating to match the actual rating in every case.

Introduction

This methodology covers debt secured by the revenues generated by US municipal utilities providing monopolistic services essential to public health and functional economies.

The security for a municipal utility revenue bond is typically defined in a bond resolution or a trust indenture, which acts as a contract between the utility and bondholders. The resolution or indenture most often identifies the bond's security as a lien on the net revenues of the system after the payment of regular operating and maintenance expenses.

The sector is varied and fragmented. US municipal utilities provide many different services whose rates or fees can secure debt. The utilities rated under this methodology mostly fall into one or more of six basic categories:

- 1) **Water utilities** take water from the ground, a river, a lake, or in special cases the ocean, treat it to a potable standard, and distribute it to customers for drinking, cleaning, and commercial, industrial,

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

or agricultural uses. These utilities can be involved in any or all of the functions of water supply: water treatment, long-distance transmission, and retail water distribution. Some water utilities have no treatment capacity and purchase potable water wholesale.

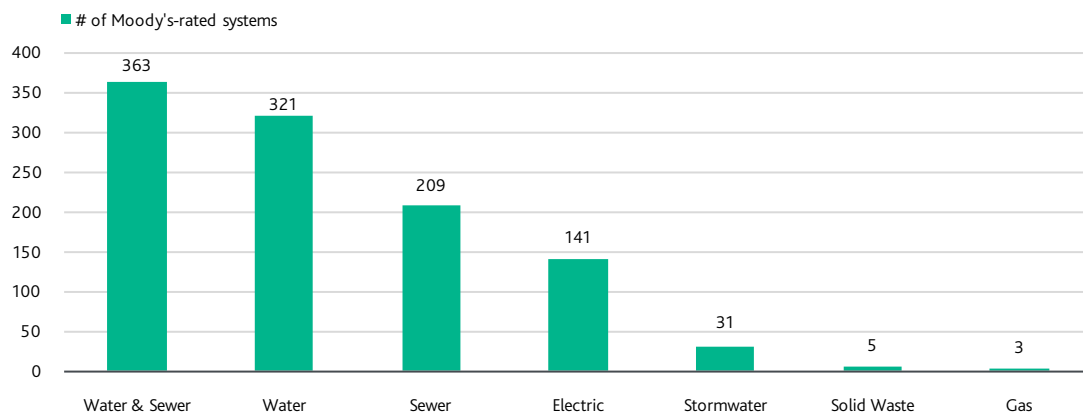
- 2) **Gas utilities** take natural gas from a wholesale¹ pipeline, odorize it for safety detection, and pressurize it and deliver it to customers through a pipe network for uses such as heating, cooking, or commercial and industrial applications. Some municipal gas systems may encompass their own natural gas supplies.
- 3) **Electric utilities** purchase electricity² from the grid and deliver it to residential, commercial, and industrial customers for a wide range of power uses.
- 4) **Sanitary sewer** utilities collect and treat wastewater, discharging it into a waterway or injecting it underground, and landfilling or incinerating the residual sludge. Some sewer utilities with no treatment capacity gather wastewater and transmit it to another utility that treats it.
- 5) **Stormwater** utilities collect and treat rainwater before discharging it into a body of water such as an ocean or a river. While every city or county addresses stormwater drainage as an integral element of its streets and highways, the stormwater systems that require capital markets financing are typically large in scale and are necessary to avert flooding from heavy seasonal rainfall in hilly areas.
- 6) **Solid waste** utilities collect residential or commercial refuse and dispose of it through landfills, waste-to-energy plants, or other waste-disposal processes. A solid waste system can be complete or collection-only, relying on another municipal or private entity for long-haul removal and disposal through landfill or incineration.

Defining the municipal utility universe

This methodology covers essential-service utilities that operate as departments, boards, or independent authorities of states or local governments. We rate approximately 1,100 utilities in this category (see Exhibit 1). More than 80% of these utilities are water and/or sewer systems. Many of these are distribution or collection systems with no treatment capacity of their own.

EXHIBIT 1

Municipal Utility System Overview



Source: Moody's

¹ This methodology covers gas distribution utilities. These utilities purchase their supply from providers covered under the [Regulated Electric and Gas Utilities](#) methodology, or other providers.

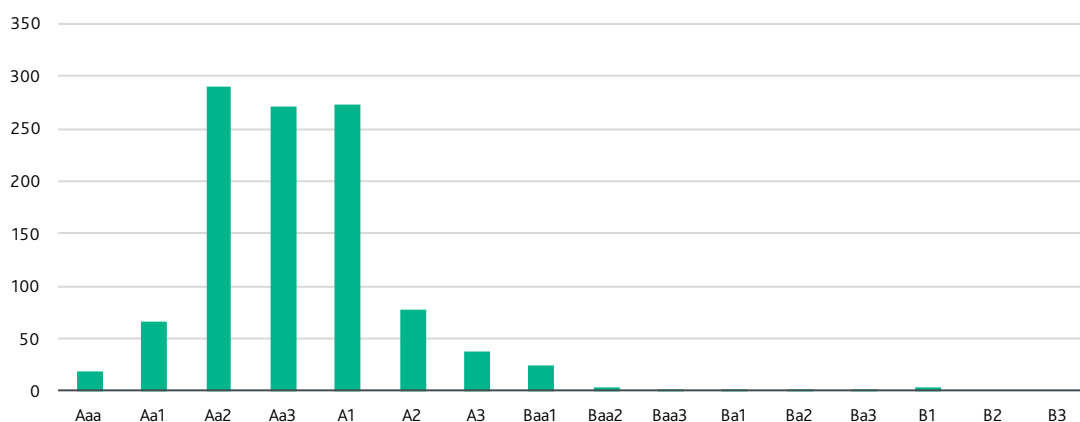
² Only those municipal electric utilities that generate less than 20% of their own power are covered by this methodology. For more information on how we rate electric generation utilities, see [US Public Power Electric Utilities with Generation Ownership Exposure](#) and [US Municipal Joint Action Agencies](#)

States and subdivisions of states, such as counties and cities, often issue bonds secured by the net revenues generated by a system operated directly under their auspices, such as a county water department. Other times, states or state subdivisions create an independent authority or special purpose district that operates the system and issues the bonds. This distinction is usually unimportant for rating purposes, although in some cases a separate authority has beneficial management expertise.

This methodology focuses on revenue bonds for essential-service functions. Other types of public utilities issue bonds backed by revenues charged for services such as telephone, cable television, or even city parking services. These services are typically highly competitive and subject to great elasticity in pricing and utilization. Bonds secured by revenues generated by these services are not rated under this methodology. Also not rated under this methodology are utility revenue bonds whose rating is ultimately [based on a General Obligation guaranty](#). Lastly, the electric utilities covered under this methodology are retail distributors of electricity mostly generated elsewhere.

The credit quality of essential-service utility revenue bonds is generally quite strong. The median rating for this sector is Aa3 (see Exhibit 2), and with very few exceptions these bonds have strong investment grade ratings. More than 85% of essential-service revenue bonds are rated A1 or higher. Half of the eight municipal utilities with speculative-grade ratings as of publication are affiliated with a local government in Chapter 9 bankruptcy³ (see “The Relationship Between General Obligation and Revenue Bond Ratings” below).

EXHIBIT 2

Municipal Utility Rating Distribution

Source: Moody's

The generally high ratings of the sector are a testament to numerous fundamental strengths, including:

- 1) The provision of essential services, usually in a government-protected monopoly
- 2) Typically unregulated and independent rate-setting
- 3) The ability to discontinue service to delinquent accounts and in many cases to put a lien on the property for nonpayment
- 4) Utility cost burdens that are typically low relative to household income and to tax burdens

³ E.g., the Detroit Water Enterprise, the Stockton Water Enterprise, the Detroit Sewer Enterprise, and the Stockton Sewer Enterprise

- 5) A generally strong federal and state regulatory framework that is designed to keep utilities functioning in order to achieve environmental goals
- 6) A “special revenue” designation that may insulate a utility from a parent’s bankruptcy

A sparse history of default, bankruptcy, and serious financial distress helps to underpin the high ratings in this sector. Since 1970, only four Moody’s-rated essential-service utility systems have [defaulted](#)⁴.

EXHIBIT 3

Rated Municipal Utility Defaults Since 1970⁵

Default	Type of System	Year of default	Recovery
Washington Public Power Supply System	Electric Generation	1983	40%
Vanceburg, KY	Electric Generation	1987	100%
Jefferson County, AL	Sewer	2008	54%
Oakdale, CA	Water and sewer	2012	94%

Source: Moody's

We see each of these default situations as unusual and idiosyncratic, with limited relevance to the sector as a whole. We expect the very low rate of default in the sector to continue. For more information, see [US Municipal Bond Defaults and Recoveries, 1970-2013](#).

The Relationship Between General Obligation (GO) and Utility Revenue Bond Ratings

A local government’s GO credit quality may directly affect the strength of its associated utility systems. This section outlines the broad principles that apply when assessing the credit linkages between a local government’s GO and utility debt. These broad principles are meant to enhance transparency around our view of the relationship between related ratings and explain why, in most cases, the ratings of GO and associated utility revenue debt are and will remain relatively close.

Municipal utility debt is generally exposed to similar credit strengths and pressures as the GO and can thus expect to experience simultaneous credit improvement or deterioration. Examples of credit linkages between the GO and utility debt include:

- » Economy: Utility systems usually rely on a coterminous or overlapping economic base and service area.
- » Finances and Debt: Cash can often flow between the two entities, sometimes with a formal funding mechanism. Debt and other long-term liabilities are often paid by the same group of constituents. GO and utility issuers may also be exposed to the same pension plan.
- » Management and Governance: Management of the city and the utility may be the same or have close ties. For instance, city management may appoint the board of the utility or have the power to affect enterprise rates.
- » Capital Markets: The GO and the utility issuer may need to access the same capital markets for funding.

⁴ The Harrisburg Authority, PA’s Resource Recovery Facility bonds [defaulted](#) in 2009. We did not rate these as revenue bonds, but as General Obligation bonds backed by the City of Harrisburg’s GO pledge. Similarly, a [City of Menasha](#), WI default on a steam plant project was rated as a GO credit and not as a municipal utility. Detroit’s water and sewer bonds are under negotiation in the city’s Chapter 9 bankruptcy, though as of this writing those bonds have not defaulted.

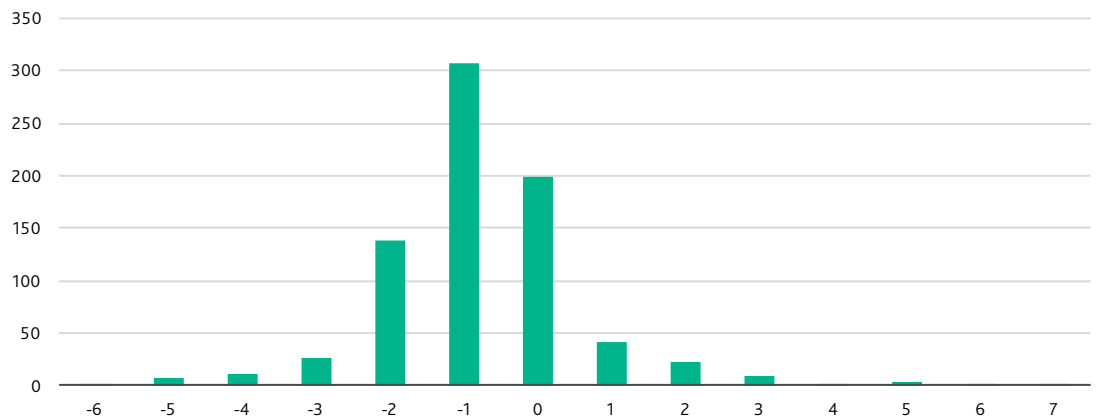
⁵ As electric generation utilities, the Washington Public Power Supply System and Vanceburg electric revenue bonds would not have been rated under the current methodology.

Because of these linkages, in most cases, ratings of a local government's utility debt will be within two notches of its GO rating. Our current rating distribution highlights this relationship, with few utility ratings varying from their respective GO ratings by more than two notches.

EXHIBIT 4

Relationship Between Municipal and Parent GO Ratings

(Negative means utility rating is lower than the GO, positive means it is higher; not all rated utilities have rated parent governments)



Source: Moody's

- » There are, however, cases where a utility may be sufficiently independent from its associated GO rating to justify a larger notching difference. We expect these cases to be rare, and they would likely include several of the following characteristics: An unusually weak GO rating which is driven by idiosyncratic factors less relevant to the utility's credit strength. A non-coterminous service area, so that utility revenues are coming from a larger and more diversified base.
- » A closed loop flow of funds, wherein the GO issuer is unable to access utility revenues.
- » A strict separation of accounts and assets.
- » The absence of rating triggers tied to the GO credit quality in utility financings.
- » Separation of management and governance.

An example of a utility rated more than two notches above its parent government is Detroit Water and Sewerage Department, which benefits from a much larger and diverse service area than the city of Detroit, has separate accounts, and bond indenture that precludes distributions of excess cash flow to the city's general fund. However, Detroit's GO and water and sewerage bonds have become more closely tied due to potential contagion risk that the city's bankruptcy filing would lead to a water and sewerage bonded debt restructuring as part of a plan to restore the city's financial solvency.

Conversely, a utility rating more than two notches below its associated GO generally has one or more of the following characteristics:

- » An unusually weak utility rating which is driven by factors less relevant to the general government's credit strength.
- » A utility service are that is narrower and less diverse than the municipality as a whole
- » A lack of expectation that the general government would transfer funds to assist a utility experiencing financial distress.
- » A strict separation of accounts and assets.
- » The absence of rating triggers tied to the utility credit quality in GO financings.
- » Separation of management and governance.

An example of a utility revenue bond rated more than two notches below the parent's GO is the [St. George Electric Enterprise](#), UT. While the [City of St. George](#) (Aa3) holds healthy reserves and has demonstrated steady operating performance, the electric distribution system has exhibited an unwillingness to raise electric rates fast enough to keep up with rising power supply costs. The electric system maintains narrow liquidity and has failed to generate enough net revenues to cover debt service in multiple years, justifying a significantly lower revenue rating than the related GO. We did, however, [downgrade the city](#) from Aa2 in 2013 partially because of the relationship to the utility funds, illustrating that these relationships are important even in cases when a wider disparity between GO and utility ratings is warranted.

Essential service revenue bonds in bankruptcy

An important property of public utility revenue bonds is that they enjoy a potential moat from a parent's bankruptcy. Under Chapter 9 of the bankruptcy code, a lien on "special revenue" bonds remains valid and enforceable even if the issuer is granted bankruptcy protection.

The potential survival through bankruptcy of a lien on the net revenues of a utility system is a key strength. When a debtor is granted bankruptcy protection, its unsecured assets are subject to an automatic stay, which freezes outflows unless approved by the bankruptcy judge. An asset secured by a lien that is not subject to the automatic stay enjoys a credit advantage over a related General Obligation credit that is subject to the stay.

Further, a special revenue bond is less susceptible to adjustment in bankruptcy if its lien leads to an interpretation of the bonds as enjoying secured status.

Although the bankruptcy code establishes these strengths of a special revenue bond, Chapter 9 remains largely untested. Case law offers few precedents, and only a handful of examples to support the assertion that a special revenue designation protects revenue bonds in bankruptcy.

The political reality is that utility systems are often major cash-generating assets that other stakeholders frequently would like to bring into bankruptcy negotiations. Moreover, bankruptcy judges in some cases have allowed the cash flows generated by special revenue systems to pay the legal costs of related parents in bankruptcy.

It is premature to conclude that utility revenue bonds are completely insulated from Chapter 9 bankruptcies, and the risks and costs of a parent bankruptcy remain considerable.

For more information, please refer to our Special Comment, [Key Credit Considerations for Municipal Governments in Bankruptcy](#).

The Scorecard

The municipal utility scorecard (see Exhibit 5) is a tool providing a composite score of a utility's credit profile based on the weighted factors we consider most important, universal and measurable, as well as possible notching factors dependent on individual credit strengths and weaknesses. The scorecard is designed to enhance the transparency of our approach by identifying critical factors as a starting point for analysis, along with additional considerations that may affect the final rating assignment.

The scorecard is not a calculator. Its purpose is not to determine the final rating, but rather to provide a standard platform from which to begin viewing and comparing municipal utility credits. It therefore acts as a starting point for a more thorough and individualistic analysis.

The scorecard-indicated rating will not match the actual rating in every case, for a number of reasons including the following:

- » Our methodology considers forward-looking expectations that may not be captured in historical data
- » The scorecard is a summary that does not include every rating consideration

- » In some circumstances, the importance of one factor may escalate and transcend its prescribed weight in this methodology

EXHIBIT 5

Municipal Utility Scorecard Factors

Broad Rating Factors	Factor Weighting	Rating Sub-Factor	Sub-factor Weighting
System Characteristics	35%	Asset Condition (Remaining Useful Life)	15%
		Service Area Wealth (Median Family Income)	12.5%
		System Size (O&M)	7.5%
Financial Strength	35%	Annual Debt Service Coverage	15%
		Days Cash on Hand	12.5%
		Debt to Operating Revenues	7.5%
Management	20%	Rate Management	10%
		Regulatory Compliance and Capital Planning	10%
Legal Provisions	10%	Rate Covenant	5%
		Debt Service Reserve Requirement	5%
Total	100%	Total	100%

We intentionally limited our scorecard metrics to major rating drivers that are common to most issuers. Outside of these drivers, we may adjust the grid score for a variety of “below-the-line” adjustments, which are more idiosyncratic factors that are likely not to apply to all issuers, but that can impact credit strength. The scorecard score is the result of the “above-the-line” score based quantitatively on the above-the-line ratings factors, combined with any “below-the-line” notching adjustments. The scorecard score is a guideline for discussion, but does not determine the final rating. The rating is determined by a committee, which considers, but is not bound by, the scorecard score.

Discussion of Key Scorecard Factors

To arrive at a scorecard-indicated rating, we begin by assigning a score for each subfactor. We’ve chosen measures that act as proxies for a variety of different service area characteristics, financial conditions, and governance behaviors that can otherwise be difficult to measure objectively and consistently. Based on the scores and weights for each subfactor, a preliminary score is produced that translates to a given rating level.

We may then move the score up or down a certain number of rating notches based on additional “below-the-line” factors that we believe impact a particular utility’s credit quality in ways not captured by the statistical portion of the scorecard. This is where analytical judgment comes into play. We may also choose to make adjustments to the historical inputs to reflect our forward-looking views of how these statistics may change.

The scorecard score, combined with below-the-line notching, then provides an adjusted score. This adjusted score is not necessarily the final rating. Because some utilities’ credit profiles are idiosyncratic, one factor, regardless of its scorecard weight, can overwhelm other factors, and other considerations may prompt us to consider final ratings that differ from the scorecard-indicated rating.

Below, we discuss each factor and subfactor, as well as the below-the-line adjustments and other considerations we analyze within each category of the methodology.

Factor 1: System Characteristics (35%)

EXHIBIT 6

System Characteristics (35%)

	Aaa	Aa	A	Baa	Ba	B and Below
Asset Condition (15%)	Net Fixed Assets/Annual Depreciation: > 75 years	Net Fixed Assets/Annual Depreciation: 75 years \geq n > 25 years	Net Fixed Assets/Annual Depreciation: 25 years \geq n > 12 years	Net Fixed Assets/Annual Depreciation: 12 years \geq n > 9 years	Net Fixed Assets/Annual Depreciation: 9 Years \geq n > 6 Years	Net Fixed Assets/Annual Depreciation: \leq 6 Years
Service Area Wealth (12.5%)	> 150% of US median	150% \geq US median > 90%	90% \geq US median > 75%	75% \geq US median > 50%	50% \geq US median > 40%	\leq 40% of US median
System Size (7.5%)	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: O&M > \$70M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$70M \geq O&M > \$40M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$40M \geq O&M > \$17M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$17M \geq O&M > \$10M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$10M \geq O&M > \$5M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: O&M \leq \$5M
	Stormwater: O&M > \$15M	Stormwater: \$15M \geq O&M > \$7.5M	Stormwater: \$7.5M \geq O&M > \$4M	Stormwater: \$4M \geq O&M > \$2M	Stormwater: \$2M \geq O&M > \$1M	Stormwater: O&M \leq \$1M
	Gas or Electric: O&M > \$115M	Gas or Electric: \$115M \geq O&M > \$65M	Gas or Electric: \$65M \geq O&M > \$30M	Gas or Electric: \$30M \geq O&M > \$15M	Gas or Electric: \$15M \geq O&M > \$8M	Gas or Electric: O&M \leq \$8M

Why it matters

This factor on the scorecard measures a utility's capacity to fund its operations and capital needs based on the health of its capital assets, the size and diversity of its operations, and the strength and resources of its service base.

The scope of this factor is broad. Each of the subfactors contributes to an analysis of what magnitude of expenditures is necessary to keep the system functioning, and how large, diverse, and flexible are the resources available to meet those expenditures.

Subfactor 1a: Asset condition (15%)

Input: Net fixed assets divided by most recent year's depreciation, expressed in years

The condition of a utility's capital assets determines its ability to comply with environmental regulations and continue delivering adequate service with existing resources.

Depreciation is an accounting concept that acts as a proxy for the rate at which a utility's plant and equipment are aging. Central to our analysis of capital adequacy is an assessment of how utilities "fund depreciation," meaning make capital replacements and repairs to address aging plant and equipment.

The consequences of failing to fund depreciation can be costly. Implicit in this measure is the concept of deferred capital investment. Utilities that delay investing in their systems, replacing aging plant and equipment, and modernizing their facilities often find it more expensive to do so later. Capital investments are ordinarily more expensive when deferred.

Further, systems whose facilities deteriorate often run afoul of environmental regulations. The failure to fund depreciation, which will manifest as a declining useful remaining life, can lead to sewage overflows, inflow and infiltration problems, or non-compliant wastewater discharges, resulting in civil fines, litigation, or regulatory consent decrees. These are usually more expensive than funding depreciation through a prudent multi-year capital plan that replaces assets as they deteriorate or break down.

The inherent differences between types of utilities are manifest in their component parts, which can have very different useful lives. Because a solid waste utility is largely automotive-based, with collection vehicles and earthmoving equipment at the landfill, the useful life of its assets will be well under 20 years, compared to a water utility whose distribution mains and reservoir have useful lives of 40 to 100 years. We generally acknowledge and address these differences below the line.

Subfactor 1b: Service area wealth (12.5%)

Input: Median family income of the service area, expressed as a percentage of the US median

Most of the costs of operating a utility and maintaining its capital assets are borne by ratepayers. The income of the residents of the service base conveys the capacity of its ratepayers to bear higher rates to fund operations and capital upgrades. The median family income breakpoints in this scorecard are aligned with the ones in our [US Local Government General Obligation Debt](#) methodology.

Utilities that serve lower-income ratepayers may have more difficulty implementing higher rates, if utility costs consume a considerable share of residents' budgets. The US Environmental Protection Agency (EPA) considers wastewater costs exceeding 2% of median household income to be excessive heavy burden, for example, a threshold that would be reached more quickly for a utility serving lower-income ratepayers.

We believe MFI is the best proxy for the wealth of a service base, but other indicators such as the poverty rate, unemployment, home foreclosures, per capita income, and median home value supplement our analysis of ratepayer capacity.

Subfactor 1c: System size (7.5%)

Input: Most recent year operations and maintenance expenditures, expressed in dollars

Larger systems tend to be more diverse and enjoy economies of scale. The size of a system implies the flexibility and resilience not only of its operations, but of its service base.

Small systems present a number of risks. They are less likely to have redundancies, which allow a system to shut down some of its operations in an emergency or to make repairs without interrupting service. A small stand-alone water or sewer system will typically depend upon a single supply of water or a single sewage treatment plant. They are more likely to be exposed to a concentrated customer base. They are more susceptible to the departure of a single large customer. An unexpected capital need is likely to be more costly relative to its annual budget. The engineering and scientific staff is likely to be less sophisticated than a larger system's.

We use different breakpoints for different types of systems in this subfactor, recognizing that not all types of utilities have the same cost structure. For instance, an electric distribution system is more expensive to run than a stormwater system. A distribution-only water system is likely to have a lower, more predictable cost base, but also depend on an external system for water supply and pay prices largely out of their control.

Below-the-line adjustments

Additional service area economic strength or diversity: We would use this adjustment, up or down, if the MFI statistic incompletely or inaccurately depicts that capacity of the service base to bear higher rates.

Significant customer concentration: A large exposure to a single user or industry, or a small number of users, poses substantial risks that might not be captured in MFI. We may adjust the scorecard rating down if a large share of a utility's revenues comes from one or a small number of customers, or from a single industry. We would be more likely to use this adjustment for volatile, unpredictable, and mobile industries than for longer-standing, more stable ones.

Revenue per customer greatly over/under regional average: Revenue per customer conveys additional information about users' capacity for higher rates that might not be captured in MFI. We might adjust the above-the-line rating, up or down, if revenue per customer implies higher or lower ability to increase rates than MFI suggests.

Exposure to weather volatility, extreme conditions or market fluctuations: Large amounts of rain that infiltrate pipes or storms that destroy equipment are examples of credit risks that could result in below-the-line adjustments. Weather can also affect the prices that distribution systems pay third-party providers for electricity or natural gas.

Resource vulnerability: Water, gas, and electric distribution utilities sell a product whose availability can be limited or expensive in some cases. For instance, a water provider in a [drought-stricken region](#) may have to purchase expensive third-party water, and see declines in billable flow due to conservation efforts. We may adjust the scorecard rating down if the availability of water, an adequate gas supply, or a dependable source of electricity is vulnerable or in doubt.

Sizeable or insufficient capacity margin: Our useful remaining life calculation is designed to assess the quality of existing capital assets, but it does not measure the adequacy of a system's capacity relative to demand. Areas that are growing need more water, gas, and electricity, and place greater demands on wastewater and trash disposal utilities. Systems that are close to capacity may face greater capital costs to expand in the future, suggesting larger debt burdens and posing additional risks that we may adjust the scorecard downward for. Alternately, systems with ample capacity may be notched up, given the lack of capital spending requirements implied by the excess capacity. Further, excess capacity can sometimes imply a revenue-generating opportunity, since utilities can often sell their product or service to other parties.

Weak depreciation practices relative to industry norms: Utilities typically have some flexibility to determine the depreciation schedules of their assets. Utilizing unreasonably long useful lives or employing other practices that distort depreciation schedules would also distort our remaining useful life calculation. We may notch a score down if an unreasonable depreciation schedule is inflating a utility's remaining useful life. Less likely, we may notch a score up if an unusually rapid depreciation schedule understates remaining useful life.

Other

Factor 2: Financial Strength (35%)

EXHIBIT 7

Financial Strength (35%)	Aaa	Aa	A	Baa	Ba	B and Below
Annual Debt Service Coverage (15%)	> 2.00x	2.00x ≥ n > 1.70x	1.70x ≥ n > 1.25x	1.25x ≥ n > 1.00x	1.00x ≥ n > 0.70x	≤ 0.70x
Days Cash on Hand (12.5%)	> 250 Days	250 Days ≥ n > > 150 Days	150 Days ≥ n > > 35 Days	35 Days ≥ n > 15 Days	15 Days ≥ n > 7 Days	≤ 7 Days
Debt to Operating Revenues (7.5%)	< 2.00x	2.00x < n ≤ 4.00x	4.00x < n ≤ 7.00x	7.00x < n ≤ 8.00x	8.00x < n ≤ 9.00x	≥ 9.00x

Why it matters

The financial health of a utility determines its flexibility to respond to contingencies, its resilience against a short-term shock, and its cushion against a long-term unfavorable trend.

We measure utilities' financial health by looking at cash and other liquid reserves, the burden that debt places on operations, and the magnitude by which revenues are sufficient to meet expenditures.

Subfactor 2a: Annual debt service coverage (15%)

Input: Most recent year's net revenues divided by most recent year's debt service, expressed as a multiple

Debt service coverage is a core statistic assessing the financial health of a utility revenue system. The magnitude by which net revenues are sufficient to cover debt service shows a utility's margin to tolerate business risks or declines in demand while still assuring repayment of debt. Higher coverage levels indicate greater flexibility to withstand volatile revenues, unexpected outflows, or customer resistance to higher rates.

Utilities usually enter into a debt service coverage covenant under which they pledge to achieve a given level of coverage each year. The covenant ensures that the utility utilizes its assets to generate sufficient income to pay bondholders.

The analysis of a utility system's debt service coverage demands ample context. If debt service escalates in future years, then the utility's current net revenues may be sufficient to cover debt service this year, but not in the future. Systems with greater revenue stability can operate comfortably at lower coverage levels. Systems with greater capital needs are likely to incur more debt, which will lead to increased debt service and decreased coverage. The debt service coverage calculation is the basis for a comprehensive analysis of a utility's financial flexibility and trend over the long term.

Debt service coverage covenants define a calculation method. These calculation methods vary, for example in the inclusion or exclusion of connection fees. Our coverage calculation will frequently differ from the coverage utilities report for purposes of complying with their rate covenants. Frequently, our analysis will consider several types of coverage, including maximum annual debt service (MADS) coverage, annual debt service coverage, coverage with and without connection fees, and coverage as calculated for the coverage covenant. For entry on the scorecard, we include connection fees in revenues, recognizing that these are pledged revenues that are usually generated annually and are an important source of funding for expansion. If connection fees are particularly volatile, or if they represent an inordinate share of revenues, we may adjust below the line.

Subfactor 2b: Days cash on hand (12.5%)

Input: Unrestricted cash and liquid investments times 365 divided by operating expenses, expressed in days

Cash is the paramount resource utilities have to meet expenses, cope with emergencies, and navigate business interruptions. Utilities with a lot of cash and cash equivalents are able to survive temporary disruptions and cash flow shortfalls without missing important payments. A low cash balance indicates poor flexibility to manage contingencies.

We include in this measure any cash or cash-equivalent that is both unrestricted and liquid. The measure does not include cash held in a debt service reserve fund, unspent bond proceeds, or cash that is restricted for capital.

Subfactor 2c: Debt to operating revenues (7.5%)

Input: Net debt divided by most recent year's operating revenues, expressed as a multiple

A utility's debt profile determines its leverage and fixed costs. Systems that carry a lot of debt have less ability to reduce costs if demand shrinks, and are generally more challenged to achieve higher debt service coverage.

A greater debt burden may also prohibit a utility from funding necessary capital upgrades, if a covenant prevents the issuer from incurring the debt necessary to fund those upgrades.

Below-the-line adjustments

Debt service coverage (annual or MADS) below key thresholds: A debt service coverage ratio below 1 times is an important threshold, because coverage below 1 times indicates the utility is not fully covering debt service with income generated from operations. If a utility fails to achieve 1 times coverage, we may adjust the score down to reflect the financial imbalance of the utility's operations. Another key threshold that would likely prompt us to adjust the score down is if coverage were to fall below the utility's coverage covenant, even if that covenant is higher than 1 times. Management's willingness and ability to operate the system for bondholders' benefit is a crucial credit consideration, and a breach of covenant calls that willingness and ability into question. A coverage level that impedes the issuance of additional bonds under the utility's additional bonds covenant could also prompt us to adjust the score down, if we think it would prevent the utility from funding necessary capital upgrades.

Constrained liquidity position due to oversized transfers: It is [common for utilities to transfer cash](#) to their parent governments regularly, either to share overhead costs, make payments in lieu of taxes for occupied property, or to help fund shared infrastructure. It is also common for parent governments to tap utilities' cash to fund General Fund operations. We may notch a utility's score down if these types of transfers are large and begin to strain its own liquidity. We are more likely to make this adjustment if the parent government is operationally reliant on utility transfers and has the authority to increase them, particularly if the parent is struggling financially. Even if a utility has never transferred cash to its parent, such transfers remain a possibility⁶, one of the reasons for the relationship between a revenue rating and the GO rating of its parent.

Outsized capital needs: A utility with significant capital needs will likely need to incur additional debt not communicated in the existing debt burden. We may adjust the score downward for utilities under regulatory consent decree, or otherwise with great capital needs, that are likely to increase their debt burdens.

⁶ Unless the utility's flow of funds is closed-loop. A closed-loop flow of funds is stronger than an open one for this very reason.

Oversized adjusted net pension liability relative to debt, or significant actuarial required contribution underpayment: Employees of public utilities are usually members of a municipal pension plan. Most utilities either sponsor their own plan or participate in another entity's plan, and are responsible for funding their share of the plan's pension liabilities. We may adjust the score down if this liability is especially large, or if the utility has underfunded its contributions.

Significant exposure to puttable debt and/or swaps, or other unusual debt structure: The risks of a debt portfolio can be magnified if it is significantly composed of puttable debt. Utilities generally set rates with the intention of covering operating expenses and debt service in the current year. A debt put, accelerated amortization under a term-out, or other unexpected call on a utility's resources can impose immediate and substantial, unbudgeted cash outflows and upend that intention. We may notch a score down, potentially by several notches, if the composition of a debt portfolio, or cash-flow demands or unfavorable valuation of a swap, communicates a greater degree of risk than the existing debt burden. The lesson of Jefferson County, Alabama, which defaulted on puttable sewer warrants in 2008 when they were tendered to their liquidity banks, applies here.

Factor 3: Management (20%)

EXHIBIT 8

Management (20%)	Aaa	Aa	A	Baa	Ba	B and Below
Rate Management (10%)	Excellent rate-setting record; Rates and cost adjustments in 20 days or less;	Strong rate-setting record; Rates and cost adjustments in 21 - 50 days; Small and well-defined General Fund transfers governed by policy	Average rate-setting record; Rates and cost adjustments 51 - 80 days; Moderate General Fund transfers governed by policy	Adequate rate-setting record; Rates and cost adjustments 81 - 120 days; Large General Fund transfer not governed by policy	Below average rate-setting record; Sizeable General Fund transfer not governed by policy	Record of insufficiently adjusting rates; Large General Fund transfer not governed by policy
Regulatory Compliance and Capital Planning (10%)	Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Not addressing compliance issues; No capital planning

Why it matters

If the legal provisions establish the minimum level of financial margin at which a utility must be run, the utility's management determines the actual level at which it is run.

Utility management refers to the dynamics of setting rates, planning for capital spending, budgeting for annual expenditures, and complying with environmental regulations. All of these factors interplay with one another to determine the credit strength of a utility system.

The scorecard captures two crucial aspects of management: rate-setting and capital planning. These two aspects encompass most of what is important in running a utility: keeping the system in good working order, and paying for it.

Subfactor 3a: Rate management (10%)

User rates are the primary, and sometimes only, mechanism utilities employ to pay for their operations.

Ideally, rates increase marginally and steadily, rather than choppily. It is common for utilities to split their rates into a “base” charge (flat rate charged to all users) plus a “volumetric” charge (per unit costs based on flow/usage). Utilities funded to a greater extent by the volumetric charge face greater risks, since volume can be economically sensitive or decline because of a shift in consumption patterns.

Management’s track record at setting rates appropriately and increasing them when necessary drives this score. We tend to give higher scores to utilities that set rate structures under which increases are automatic, and do not require annual approval for implementation.

Embedded into this factor is the length of time required to implement a rate increase. Many public utilities enjoy the [authority to set their own rates](#), and can enact a rate increase in short order by majority vote of the governing board. Some utilities must give the public a few weeks or months notice before increasing rates, or choose to do so by policy or practice. Some utilities require state approval to increase rates. Utilities that need state approval often have to file a rate case subject to public objection, and in some cases the state takes a long time to approve them or [denies the full rate increase](#).

The longer it takes a utility to implement a rate increase, the less flexibility it has to quickly generate new revenues when faced with cash flow shortfalls.

Subfactor 3b: Regulatory compliance and capital planning (10%)

The public utility sector is heavily regulated. Most public utilities are regulated by federal as well as state agencies.

The EPA enforces the Safe Drinking Water Act for water distribution utilities, the Clean Water Act for sanitary sewer and stormwater utilities, the Resource Conservation and Recovery Act for solid waste disposal systems, and the Clean Air Act for electric utilities. These statutes, and the methods employed to enforce them, are continually evolving, often intensifying over time. Additionally, many states have passed their own environmental regulations and are active enforcers.

This scorecard factor assesses utilities’ compliance with relevant regulations and their plans for the capital expenditures required to comply in the future.

In addition to achieving environmental compliance, proper capital planning ensures the continued delivery of the product or service and the ongoing generation of revenues.

During our reviews, we look for indications of potential compliance gaps, such as environmental litigation, a delay in renewing a permit, or a [consent decree](#) with a state or federal enforcement body.

Below-the-line adjustments

Unusually strong or weak capital planning: Continued violations of environmental laws and the associated litigation can impose extraordinary costs on utilities. We may notch the score down if these

costs threaten to overwhelm a system's resources, in the form of a large consent decree, lawsuit, or other costs. Alternately, we may notch the score up if a utility's capital planning is particularly sophisticated or forward-looking.

Factor 4: Legal provisions (10%)

EXHIBIT 9

US Municipal Utility Revenue Debt

Legal Provisions (10%)	Aaa	Aa	A	Baa	Ba	B and Below
Rate Covenant (5%)	> 1.30x	1.30x ≥ n > 1.20x	1.20x ≥ n > 1.10x	1.10x ≥ n > 1.00x		≤ 1.00x
Debt Service Reserve Requirement (5%)	DSRF funded > MADS	DSRF funded at MADS	DSRF funded at lesser of standard 3-prong test	DSRF funded at less than 3-prong test OR springing DSRF		NO explicit DSRF; OR funded with speculative grade surety

Why it matters

The legal provisions of a public utility revenue bond form the backbone of its security.

When a municipality assigns its General Obligation pledge to a bond, it has promised to do whatever it has to do to cover debt service, in most cases from any revenues or resources at its disposal.

A utility revenue bond enjoys no such open-ended pledge, making the legal edifice of the bond critical to bondholder security. Most commonly, the legal security for municipal utility revenue bonds is a lien on the net revenues of the system. Occasionally, bondholders enjoy a lien on the gross revenues of a system. We ordinarily do not see a gross revenue pledge as materially stronger than a net revenue pledge, because systems need to pay operating and maintenance costs in order to remain functional.

The linchpin of a bond's legal structure is its covenants: the legal compulsions the public utility agrees to when issuing the bonds.

Utilities abide by many different types of covenants. We consider three to be the most important: the debt service coverage covenant, the additional bonds test, and the debt service reserve fund. Also crucial in the analysis of a revenue bond's legal structure is whether the flow of funds is open-loop (accessible by another government entity) or closed.

Strong covenants bind the utility to utilize its assets to benefit bondholders by operating with a comfortable financial margin, not taking on too much debt, and maintaining adequate cash available to pay debt service. Weak or nonexistent covenants allow the utility to operate on a thin margin or even at a net loss, incur a lot of leverage, transfer its money to other government entities, or maintain inadequate cash, in ways that are detrimental to bondholders.

Covenants specify the minimum factors management must legally abide by. Utilities frequently exceed the minimum. Many of our ratings represent the expectation of performance at levels that exceed the covenants.

Subfactor 4a: Rate covenant (5%)

Input: Covenant governing net revenues (operating revenues minus operating expenditures net of depreciation) divided by annual debt service, expressed as a multiple

The rate covenant is a legal pledge to set rates such that net revenues will be sufficient to cover debt service at a prescribed level. For example, a covenant may bind a utility to ensure that net revenues cover debt service by 1.2 times. If net revenues fall short of this covenant in one year, the utility must raise rates to achieve a compliant coverage level the following year.

The coverage covenant takes many forms. Some utilities pledge for net revenues to cover current year annual debt service by a given level, others pledge to cover average annual debt service throughout the life of the bonds at that level. A strong coverage requirement would be for net revenues to cover maximum annual debt service (MADS) by a certain level.

Some coverage covenant formats are materially weaker than this. Some utilities allow a “rolling” calculation, which includes outstanding cash from prior years’ surpluses as part of the resources available to cover debt service. Many rate covenants allow connection fees to be included in available operating revenues.

The above-the-line coverage factor assumes the covenant is an annual debt service coverage calculation. We can adjust for any departures from this format below the line, up or down.

Subfactor 4b: Debt service reserve requirement (5%)

Input: Debt service reserve requirement

Many issuers agree to hold a specified amount of cash or other resources in a debt service reserve fund (DSRF), which the trustee can tap to pay debt service in the event that net revenues are inadequate. The DSRF covenant ordinarily requires the utility to replenish any draws from the DSRF.

The DSRF protects bondholders by assuring the payment of debt service even if net revenues fall short in one year.

DSRF funds can be funded with cash, or with surety policies from an insurer. We generally consider cash to be superior to a surety, although this is unlikely to materially affect the rating as long as the surety provider is rated investment grade.

One commonly used DSRF requirement is known as the “three-pronged test.” Under tax law, the Internal Revenue Service limits the earning of interest on proceeds of a tax-exempt bond unless the invested proceeds comply with the three-pronged test. Under that test, the DSRF must be the lesser of 10% of principal, MADS, or 1.25 times average annual debt service. A DSRF set at the three-pronged test is usually weaker than one funded at MADS.

Recent years have seen a trend of revenue bonds issued without a DSRF. This has resulted in a number of utilities with some bonds secured by a DSRF and other parity bonds secured by the same lien but no DSRF. We have rarely distinguished ratings between these parity bonds. The DSRF is a last-resort security measure, and most utilities comply with their coverage covenants and never have to tap their DSRF. We are most likely to distinguish between DSRF-secured bonds and bonds with no DSRF if the system holds narrow liquidity. A system operating with abundant liquidity can use its operating cash to meet debt service shortfalls, effectively executing a similar function to the DSRF. The

combination of narrow liquidity and no DSRF exposes bondholders to greater risks of interrupted debt service payments, and is therefore more likely to be reflected in ratings.

For a utility whose debt is mostly, but not all, secured by a DSRF, we will still enter the DSRF requirement into the scorecard. For a utility whose debt is mostly not secured by a DSRF, we will adjust the DSRF entry downward⁷.

Below-the-line adjustments

Coverage covenant other than annual debt service: Our input for the coverage covenant assumes the coverage refers to net revenue coverage of annual debt service. A “rolling” coverage covenant that includes outstanding cash, or some other modification that weakens the meaning of the covenant, may prompt us to notch the score down. Conversely, a MADS coverage covenant may prompt us to notch the score up.

Structural enhancements/complexities: The scorecard is designed to capture covenants as they are most commonly constituted, but cannot account for the myriad structures and complexities that arise in bond transactions throughout the sector. Enhancements such as a lock-box structure for debt service may lead us to notch the score up. Other shortcomings, such as a weak additional bonds test or the inclusion of cash in a coverage covenant, may lead us to notch the score down. Any characteristic of the legal provisions of a bond transaction may lead us to conclude that the scorecard does not adequately capture its risk profile.

⁷ For example, if 1/3 of a utility's debt is secured by a DSRF funded at MADs and 2/3 is not secured by a DSRF at all, we may enter the DSRF requirement as a Baa.

Appendix A: Municipal Utility Revenue Bond Scorecard

EXHIBIT 10

	Aaa	Aa	A	Baa	Ba	B and Below
System Characteristics (35%)						
Asset Condition (15%)	Net Fixed Assets/Annual Depreciation: > 75 years	Net Fixed Assets/Annual Depreciation: 75 years \geq n > 25 years	Net Fixed Assets/Annual Depreciation: 25 years \geq n > 12 years	Net Fixed Assets/Annual Depreciation: 12 years \geq n > 9 years	Net Fixed Assets/Annual Depreciation: 9 Years \geq n > 6 Years	Net Fixed Assets/Annual Depreciation: \leq 6 Years
Service Area Wealth (12.5%)	> 150% of US median	150% \geq US median > 90%	90% \geq US median > 75%	75% \geq US median > 50%	50% \geq US median > 40%	\leq 40% of US median
System Size (7.5%)	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: O&M > \$70M Stormwater: O&M > \$15M Gas or Electric: O&M > \$115M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$70M \geq O&M > \$40M Stormwater: \$15M \geq O&M > \$7.5M Gas or Electric: \$115M \geq O&M > \$65M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$40M \geq O&M > \$17M Stormwater: \$7.5M \geq O&M > \$4M Gas or Electric: \$65M \geq O&M > \$30M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$17M \geq O&M > \$10M Stormwater: \$4M \geq O&M > \$2M Gas or Electric: \$30M \geq O&M > \$15M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: \$10M \geq O&M > \$5M Stormwater: \$2M \geq O&M > \$1M Gas or Electric: \$15M \geq O&M > \$8M	Water Only / Sewer Only / Water & Sewer / Combined Utility / Solid Waste: O&M \leq \$5M Stormwater: O&M \leq \$1M Gas or Electric: O&M \leq \$8M
Financial Strength (35%)						
Annual Debt Service Coverage (15%)	> 2.00x	2.00x \geq n > 1.70x	1.70x \geq n > 1.25x	1.25x \geq n > 1.00x	1.00x \geq n > 0.70x	\leq 0.70x
Days Cash on Hand (12.5%)	> 250 Days	250 Days \geq n > 150 Days	150 Days \geq n > 35 Days	35 Days \geq n > 15 Days	15 Days \geq n > 7 Days	\leq 7 Days
Debt to Operating Revenues (7.5%)	< 2.00x	2.00x < n \leq 4.00x	4.00x < n \leq 7.00x	7.00x < n \leq 8.00x	8.00x < n \leq 9.00x	\geq 9.00x
Management (20%)						
Rate Management (10%)	Excellent rate-setting record; Rates and cost adjustments in 20 days or less;	Strong rate-setting record; Rates and cost adjustments in 21 - 50 days; Small and well-defined General Fund transfers governed by policy	Average rate-setting record; Rates and cost adjustments 51 - 80 days; Moderate General Fund transfers governed by policy	Adequate rate-setting record; Rates and cost adjustments 81 - 120 days; Large General Fund transfer not governed by policy	Below average rate-setting record; Sizeable General Fund transfer not governed by policy	Record of insufficiently adjusting rates; Large General Fund transfer not governed by policy
Regulatory Compliance and Capital Planning (10%)	Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Not addressing compliance issues; No capital planning
Legal Provisions (10%)						
Rate Covenant (5%)	> 1.30x	1.30x \geq n > 1.20x	1.20x \geq n > 1.10x	1.10x \geq n > 1.00x		\leq 1.00x
Debt Service Reserve Requirement (5%)	DSRF funded > MADS	DSRF funded at MADS	DSRF funded at lesser of standard 3-prong test	DSRF funded at less than 3-prong test OR springing DSRF	NO explicit DSRF; OR funded with speculative grade surety	

Adjustments/Notching Factors

Factor 1: System Characteristics

Additional service area economic strength or diversity

Significant customer concentration

Revenue-per-customer greatly over/under regional average

Exposure to weather volatility or extreme conditions

Resource vulnerability (1/3 or greater)

Sizable or insufficient capacity margin

Weak depreciation/reinvestment practices relative to industry norms

Other analyst adjustment to System Characteristics (Specify)

Factor 2: Financial Strength

Debt Service Coverage (Annual or MADS) below key thresholds: Additional Bonds Test and 1.00x coverage

Constrained liquidity position due to oversized transfers

Oversized capital needs

Oversized ANPL relative to debt or significant ARC under-payment

Significant exposure to puttable debt and/or swaps or other unusual debt structure

Other analyst adjustment to Financial Strength factor (Specify)

Factor 3: Legal Provisions

Structural Enhancements/Complexities

Other analyst adjustment to Legal Provisions factor (Specify)

Factor 4: Management

Unusually strong or weak operational or capital planning

Other analyst adjustment to Management factor (Specify)

Other

Credit Event/Trend not yet reflected in existing data set

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