

DATE: September 9, 2019

TO: Finance and Budget Commission

FROM: Nitish Sharma, Finance Director
Kiran Sanghera, CPA, Financial Analyst

SUBJECT: Draft Utility Reserve Policy Presentation

Recommendation

It is respectfully recommended that the Finance and Budget Commission receive an update on the progress of the Utility Reserve Policy as prepared by the Department of Finance and provide any comments/suggestions as deem appropriate.

Fiscal Impact

No fiscal impact; however, a solid reserve policy allows the City to mitigate against the unforeseen expenditures or a decrease in the revenues.

Council Goal(s)

N/A

Background and Analysis

The purpose of establishing this reserve policy is to ensure the financial resilience of the utilities department and to adhere to best practices within the industry. The finance department has researched and reviewed industry guidelines/practices in the development of the Utility Reserve Policy. Finance is working collaboratively with the utilities to establish a policy that takes into consideration both industry benchmarks and Utility Rate Advisory Commission (URAC) recommendations. Upon finalization, the finance department will consult with the Finance and Budget Commission and URAC prior to City Council policy recommendation.

Next Steps:

Staff will present this information to the Public Works Operations and Utilities team to provide their comments to further enhance this policy. A copy of the draft policy shall be provided by the URAC staff to the Commissioners for their guidance/directions. Staff is planning to return to the FBC in October or November with a final version prior to the City Council presentation and approval.



CITY OF DAVIS WATER AND SEWER FUND RESERVE POLICY

1. PURPOSE

The purpose of this policy is to establish targeted levels of Water and Sewer fund reserves, a crucial component in the financial resilience of public owned utilities. Strong and transparent financial policies, including maintaining adequate reserves for emergencies, rate stability, and working capital, are consistent with best practices in the utility industry as they help to:

- 1) Ensure cash for daily financial needs to counter revenue volatility and unanticipated expenses is readily available
- 2) Fund equipment and infrastructure purchases to mitigate damages related to a catastrophic event such as a natural disaster
- 3) Protect constituents from rate increases due to unexpected variances from forecasted results that arise from non-recurring events or factors

2. BACKGROUND

The City of Davis Utilities department provides water, sewer, and solid waste for citizens, businesses, and organizations. Public owned utilities are expected to provide uninterrupted service 24 hours a day, 7 days a week while relying largely on service-based revenue. As highlighted by the American Water Works Association, cash reserve balances are a critical component to the utility's financial resiliency and sustainability.

Reserve balances are set aside to address specific cash liquidity requirements, emergencies, financial need, and to reduce revenue volatility. Aging infrastructure is a critical issue materializing for the water-resources and sewer industries. The repairs for both industries tend to be costlier due to underground and complex infrastructure.

3. DEFINITIONS

Operating Reserve: liquid, unrestricted assets that an organization can utilize to support its operations in the event of an unanticipated loss of revenue, working capital deficiencies, or an increase in expenses. The City Manager shall have authority to approve appropriation of Operating Reserve funds.

Emergency Capital Reserve: Funds reserved in this category shall be used to mitigate costs associated with capital purchases due to unforeseen emergencies, including natural disasters. Should unforeseen and unavoidable events occur that require expenditure of City resources beyond those provided in the annual budget, the City Manager shall have authority to approve appropriation of Emergency Reserve funds. The City Manager shall then present to the City Council -no later than its first regularly scheduled meeting – a resolution confirming the nature of the emergency and formally authorizing the appropriation of Emergency Reserve funds.

Rate Stabilization Reserve: Rate stabilization reserves are established to cover wide fluctuations in projected revenue from season to season or year to year. A rate stabilization reserve allows a utility to draw on the fund balance during revenue shortfalls that result from lower than expected customer consumption. Use of the Rate Stabilization Reserve funds will only take place in the context of a Council-adopted long-term plan.

4. POLICY



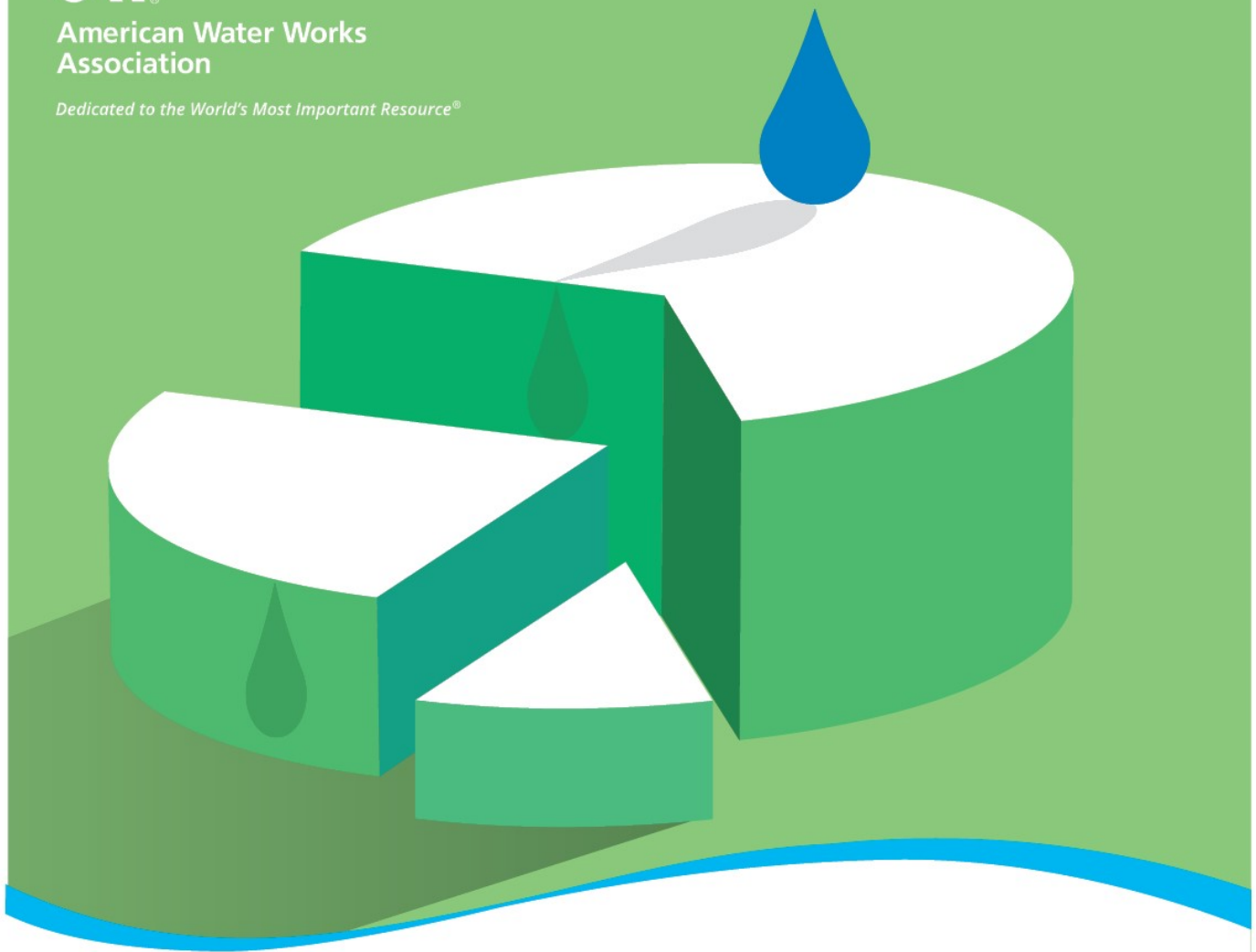
Reserve Type	Key Considerations	Policy	Methods to Achieve Funding Levels
Operating	<ul style="list-style-type: none"> Revenue fluctuations Working capital Potential risks Risk management Daily financial needs Operating expenditures 	Per Government Finance Officers Association (GFOA) the recommended reserve level is 45 days of operating expenditures. Based on FY18 audited financial statements, the reserve amount should be \$2.86 million.	At the end of each fiscal year, the Finance Department will report on the audited year-end budgetary results. Should the Water and Sewer fund revenues exceed expenditures and encumbrances, an operating surplus shall be reported. Any operating surplus shall be transferred to the reserve fund to meet targets.
Emergency Capital	<ul style="list-style-type: none"> Cost of critical assets Critical facilities Catastrophic events such as natural disasters Availability of other funds Address unanticipated, nonrecurring needs. 	Seeks to maintain a minimum balance of \$2 million dollars.	At the end of each fiscal year, the Finance Department will report on the audited year-end budgetary results. Should the Water and Sewer fund revenues exceed expenditures and encumbrances, an operating surplus shall be reported. Any operating surplus shall be transferred to the reserve fund to meet targets.
Rate Stabilization	<ul style="list-style-type: none"> Impacts of revenue shortfalls Drought restrictions Revenue volatility Weather Regional economic conditions Rate variability Sharp demand reduction 	Minimum target balance of 5% of operating water and sewer revenue. Based on FY18 audited financial statements, the reserve amount should be \$1.66 million.	At the end of each fiscal year, the Finance Department will report on the audited year-end budgetary results. Should the Water and Sewer fund revenues exceed expenditures and encumbrances, an operating surplus shall be reported. Any operating surplus shall be transferred to the reserve fund to meet targets.



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REPORT



Cash Reserve Policy Guidelines

AWWA RATES & CHARGES COMMITTEE WHITEPAPER

Cash Reserve Policy Guidelines

INTRODUCTION

Public and investor-owned water-resources related utilities (including water, wastewater, stormwater, and reclaimed water systems) must meet the operational, maintenance, and capital needs of a complex system while being financially independent, relying largely on revenue from service charges. Providing utility service requires the investment in, maintenance of, and operation of expensive, complex, and regulated infrastructure. Utility systems have no margin for failure; they are expected to provide uninterrupted service 24 hours a day, 7 days a week. Furthermore, many of the assets of a utility are located in hard to reach places (belowground) and are intermingled with other assets (within easements that include other infrastructure).

Aging infrastructure is one of the most critical issues facing the water-resources industry. With aging infrastructure of any kind comes increased probability of unplanned failure. Not only are emergency repairs unexpected, but given the nature of an unexpected event, repair costs can be higher than normal maintenance. In addition to the challenge of aging infrastructure, utility revenue is often dependent on weather conditions and thus can be volatile. During periods of high rain fall, water usage and corresponding revenue can decline as irrigation use decreases. In contrast, during drought periods, utilities are often faced with mandatory water restrictions that can have the same negative impact on water use and revenue. As such, cash reserve balances are a critical component to a utility's financial resiliency and sustainability.

Reserve balances for utility systems are funds set aside for a specific cash flow requirement, financial need, project, task, or legal covenant. Certain types of reserves, such as debt-related reserves, are often considered restricted reserves as they are required by a legal covenant and/or are restricted for a specific purpose. Unrestricted reserves, such as working capital or operating reserves, are generally maintained at levels established by formal or informal policies of the utility system and can be either designated for specific purposes (such as funds earmarked for system renewal and replacement) or available for a variety of purposes. Formal reserve policies are those that are adopted and regularly confirmed by governing boards. Informal reserve policies are not formally adopted but are used by utility management as planning targets. All types of reserves can play a significant role in addressing current and future challenges facing utility systems, such as demand volatility, water supply costs, large capital requirements, and potential liabilities from system failures associated with aged infrastructure.

The level of reserves maintained by a utility is an important component of short and long-term financial management, and is a key consideration in the rate-setting process. Therefore, many utilities and rating agencies place a significant emphasis on having sufficient reserves available for potentially adverse

conditions and future needs. However, while many utilities view higher levels of reserves as prudent and conservative planning that result in many benefits, some utilities philosophically view reserves as tying up current customer dollars that could be used for expenditures or other benefits.

Regardless of the philosophical perspective on reserves, all utilities should establish formal or informal financial policies relative to reserves. Such policies should articulate how these balances are established, their use, and how the adequacy of each respective reserve fund balance is determined. Once reserve targets are established, they should be reviewed annually during the budgeting process to monitor current levels and evaluate conformance with formal or informal policies. Decisions can then be made to maintain, increase, or spend down reserve balances, as appropriate, with an understanding of the impact of such decisions to the upcoming budget period and long-term financial plan of the utility. Moreover, a utility should review the philosophy or approach used to establish its reserve policies every three to five years. This time frame is appropriate given that customer demands, operating cost profiles, debt levels, and capital infrastructure activity can vary during this time, which would affect the appropriate level of reserve balances. This type of review allows for the philosophy of establishing reserve targets to be modified to better reflect existing conditions and current issues.

As one might expect, the types and levels of reserves maintained by utility systems vary significantly. Some systems will establish separate accounts and policies for each identified type of reserve, while others will aggregate all their reserves into a single account and policy. Moreover, reserve levels and policies vary substantially because of unique considerations, such as legal covenants, location and size of the utility, age and type of infrastructure, customer profiles, etc.

This whitepaper does not provide specific “one size fits all” reserve recommendations, but instead identifies and provides guidance on the key considerations for utilities to assist in the development of appropriate reserve policies for their unique systems. The types and levels of reserves contemplated in this whitepaper are specifically intended to meet the needs of the utility system and are not intended for nonutility purposes. While there may be situations where the temporary use of a utility’s reserves by another component of government or affiliated company may be appropriate (such as a short-term loan), the reserves of a utility should not be considered available to other component units of government or affiliated companies.

The remainder of this whitepaper identifies various types of reserves, including policy guidelines and examples, and is intended to assist water-resources related utilities in establishing appropriate formal or informal reserve policies based on the unique considerations and circumstances of each respective system.

OPERATING RESERVES

Maintaining adequate operating reserves enhance a system’s ability to manage potential risks, provides the ability to manage fluctuations in revenue, and the ability to meet working capital needs. Operating reserves are also important when facing fiscal emergencies that can result from emergency repairs, droughts, natural disasters, and unforeseen economic influences.

Along with infrastructure and revenue challenges facing utilities, systems that use revenue-backed debt (a primary financing source for publicly owned water systems) must maintain pledged bond covenants. These covenants often include a minimum operating reserve. Given these challenges and requirements, maintaining adequate operating reserves is a critical component of sustainable financial management.

The most common metric used when evaluating operating reserve levels is a specified number of days or months of operating expenses (although there are sometimes other metrics that are used, such as a specific dollar value). When considering operating reserves as a number of days or months of operating expenses, it is important to consider the specific expenses to be included. Any one-time, periodic, or abnormal operating expense (such as those associated with certain permits, studies, and/or unusual operational and maintenance activities), which could result in “spiking” reserve levels, should be excluded. Utilities that purchase water for resale may exclude the cost of purchased water, as this risk can be mitigated using volumetric rates that specifically capture this cost. In this case, fluctuations in water use and corresponding revenue are offset by opposite fluctuations in the cost of purchased water.

The following list explains several considerations for setting appropriate levels of operating reserves. It is important to note that some of the considerations listed in this whitepaper may not be applicable to the setting of an operating reserve if utilities have developed other reserves for any of these specific considerations (as addressed in other sections of this whitepaper):

- Bond requirements – bond covenants may define required minimum operating reserve levels in addition to restricted debt service reserves.
- Insurance reserve requirements – reserves held because of insurance requirements may reduce the level of operating reserves needed during emergencies.
- Credit rating objectives – unrestricted reserves (largely comprised of operating reserves) are a key consideration in establishing a utility’s bond rating. Each of the major rating agencies has unrestricted reserve criteria¹ that are used in their respective credit rating evaluations.
- Rate structure – the proportion of revenue generated in fixed versus variable rate components, the use of conservation rates (higher rates for higher levels of usage), and pass through rates (rates that recover the cost of purchased water) will all impact the potential volatility of utility system revenue.
- Usage variability – changes in usage resulting from weather, conservation, economic factors, or larger customers vary by system and will impact the amount of operating reserves that should be maintained.
- Availability of other reserves – some systems maintain multiple reserves which could be used to mitigate fiscal challenges. For example, if a utility has a separate capital, debt service, and/or rate stabilization reserve, certain expenses and considerations should be excluded from the sizing of an operating reserve.

¹ Each of the major rating agencies evaluate reserves along with several other criteria as part of the credit-rating review process for utility systems, and routinely publish their most current criteria used as part of their respective credit-rating evaluation process. The rating agencies’ criteria for evaluating reserve levels typically refer to unrestricted reserves, which would include operating, rate stabilization, capital, and other discretionary reserves. This section of the document focuses specifically on the operating reserve portion of a utility’s unrestricted reserves.

- Nonutility resources – resources outside the utility that are available in emergency conditions (such as the temporary use of general fund cash for public systems or use of cash of affiliated entities for investor-owned utilities) could impact the level of reserves.
- Use of contingencies – if utilities maintain budget contingencies, either in the form of line-item contingencies or conservative budgets above expected spending requirements, it may impact the level of operating reserve needed.
- Seasonality of cash flow – if systems experience a high degree of seasonality in cash flow during the year, additional operating reserves may be appropriate to sustain the utility during low cash flow periods during the year.

Other industry groups have published specific recommendations for minimum utility operating reserve levels, including those identified in the following table:

Organization	Recommended Reserve Level	Publication
Water Environment Federation (WEF)	One to Three Months of Operating Costs ¹	Financing and Charges for Wastewater Systems; Manual of Practice No. 27
International City/County Management Association (ICMA)	1-2 Months of Expenses ²	Capital Budgeting and Finance: A Guide for Local Governments
Government Finance Officers Association (GFOA)	No less than 45 days of expenses ³	Determining the Appropriate Levels of Working Capital in Enterprise Funds
<p>1 – Depending on the instability or unpredictability of revenues and expenses.</p> <p>2 – Depending on the utility's size, the challenges it faces, and the availability of special reserves for rate stabilization or emergency purposes.</p> <p>3 - The recommendation is to use annual operating expenses, which include depreciation expenses. If, however, annual depreciation expenses are significantly more or less than the anticipated capital outlays of the next period to be paid from working capital, consideration should be given to adjusting the benchmark. An appropriate adjusted benchmark may be annual operating expenses, annual depreciation expense + capital outlays of the next period paid from working capital.</p>		

Each of these sources indicate that higher levels of reserves may be needed in certain circumstances, and that several of the key considerations presented in this whitepaper should be considered in establishing each utility system's respective operating reserve level.

Included in this whitepaper are several case studies that identify a range of operating reserve policies and targets. Based on these case studies and AWWA's report *Benchmarking Performance Indicators for Water and Wastewater: 2016 Edition*, the range of operating reserves for utilities is generally within the range of 2 to 12 months of operating expenses. One of the principal causes of differences observed in operating reserves between utilities is whether a utility has a single reserve policy that is intended to account for liquidity, revenue volatility, rate stabilization, debt, capital, etc. as opposed to having multiple reserve policies for separate and specific purposes.

CAPITAL RESERVES

Utilities are capital intensive enterprises that must provide a critical service to their communities on an uninterrupted basis. With good record keeping, regular inspections, and long-term planning, utilities can develop reasonable estimates of the amounts and timing of future capital costs to replace and rehabilitate their infrastructure systems. However, capital expenditures generally are not incurred in even annual amounts. The impact of large capital expenses on annual budgets and user charges can be mitigated by debt financing; however, there are many advantages to cash funding a portion of capital expenditures. Cash funding is typically a combination of generating annual revenues over the amount needed to cover annual operating expenses (and debt service on prior years' debt issuances, if applicable), and cash balances or capital reserves accumulated in prior years. Cash funding eliminates interest costs and the need for bond coverage on new capital projects and may be necessary for some utilities with limited or no access to debt financing. However, it requires careful planning to avoid fluctuations in user charges.

Even with the most diligent capital planning efforts, utilities must be prepared for unplanned or accelerated capital projects. The fact that much of a utility system's infrastructure is underground and difficult to inspect complicates the task of determining when it needs to be rehabilitated or replaced. Material failures, specific local conditions, or catastrophic events may cause infrastructure to wear out or fail sooner than expected.

Capital reserves may be established to serve one or more of several general purposes: to provide funds for unplanned or accelerated infrastructure replacements; to smooth out the budgetary and rate impacts of fluctuating capital expenses and asset management considerations under a cash funding program; to provide funds for replacement of equipment with a short service life; to provide a source of funds for emergency capital expenses as a result of catastrophic events; or to set aside revenues from fees or assessments specifically designated for system expansion or replacement. Each of these types of reserves, as well as considerations for establishing the amount of annual contributions or reserve fund balances are described in this whitepaper.

Regardless of the type of capital reserves, the size of the utility is an important factor in determining the recommended amount of capital reserves. For a small utility, the cost of a capital project could exceed its annual operating budget. Therefore, the total dollar amount available to a utility must be assessed in addition to relative measures of unrestricted reserves, such as days or months of operating expenses on hand or percentage of annual revenues. A smaller utility may need a larger capital reserve fund relative to its annual operating budget or capital replacement program to have sufficient funds for unplanned or emergency capital replacements.

Rehabilitation and Replacement Reserves

Rehabilitation and replacement reserves serve to fund unplanned or accelerated infrastructure rehabilitation or replacement needs when assets wear out before their expected useful life ends or when a utility desires to accrue for its future rehabilitation and replacement needs. These reserves may also be used as a source of funds for cash funding for the utility's Capital Improvement Program (CIP), or to set aside funds for intermediate to long-term future replacement of major assets not included in the CIP.

There are several potential methods of estimating an appropriate amount of rehabilitation and replacement reserves to maintain. Each method requires planning for future asset rehabilitation and replacement over a given period, forecasting the annual amount needed for rehabilitation and replacement over the life of the utility's assets, as well as estimating the amount that will be needed each year over a specific planning horizon. The annual amount needed for rehabilitation and replacement over the long-term can be estimated based on an asset management plan, the value of assets from the fixed asset register that will reach the end of their useful lives over the planning period, or the utility's annual depreciation expenses². The following table shows an example calculating the annual amount needed for replacement and rehabilitation over the life of the utility's assets based on current value of assets and anticipated service life. This method is simpler than preparing a complete asset management plan but may more closely represent the true replacement and renewal costs than using depreciation expense.

² The use of depreciation may understate the true renewal and replacement cost needs, unless it is adjusted to current and/or future cost values. Conversely, the use of depreciation may overstate the renewal and replacement need if accelerated depreciation methods are being employed.

Example Calculation of Rehabilitation and Replacement Needs (in \$1,000)

Line No.	Asset Category	Original Cost	Current Cost*	Service Life (years)	Annual R&R (rounded)**
Source of Supply Plant					
1	Wells and Springs	710	2,560	30	90
2	Supply Mains	1,340	3,760	60	60
Pumping Plant					
3	Structures and Improvements	1,430	6,490	30	220
4	Pumping and Power Production Equipment	2,080	3,050	25	120
Water Treatment Plant					
5	Structures and Improvements	550	2,100	30	70
6	Sand or Other Media Filtration Equipment	250	260	30	10
Transmission and Distribution Plant					
7	Distribution Reservoirs and Standpipes	950	1,770	50	40
8	Transmission and Distribution Mains	12,070	40,940	80	510
9	Services	6,990	12,290	30	410
10	Meters	2,850	5,400	20	270
11	Hydrants	1,990	3,530	45	80
General Plant ***					
12	Computer Equipment	50	30	4	10
13	Transportation Equipment	590	710	10	70
14	Tools, Shop and Garage Equipment	240	300	20	20
15	Power Operated Equipment	470	710	15	50
16	Communication Equipment	120	170	10	20
17	SCADA Equipment	1,470	450	10	50
18	Total	\$34,150	\$84,520		\$2,100

* Current cost may be calculated based on multiplying an inflation factor to the original cost, based on the year of installation for each asset, or by engineering estimates of the current replacement cost.

** Annual rehabilitation and replacement amount is equal to the current cost divided by service life.

*** Any of these assets included in separate equipment replacement reserves should be excluded from the rehabilitation and replacement reserves.

In determining the level of reserves for future system rehabilitation and replacement, many factors should be considered, including but not limited to:

- Inter-generational equity issues if certain assets were originally funded with debt that is currently being repaid, it may not be appropriate for current ratepayers to also make contributions to reserves for the future replacement of those same assets.
- If a utility is planning to cash fund a certain amount of its renewal and replacement needs from annual revenues, this amount of capital funding need not be considered as part of setting the rehabilitation and replacement reserve.

- If there are any anticipated rehabilitation or replacement project requirements not yet scheduled in the CIP or there is a gap between identified annual requirements and cash funding provided by current revenues, the utility may wish to consider these amounts in setting its rehabilitation and replacement reserve levels and subsequent annual contributions.

Over the long-run, setting rates to recover the average rehabilitation and replacement amount should be sufficient. However, during shorter time periods this average amount may generate more or less than is needed to cover current infrastructure rehabilitation and replacement needs. During times when annual revenues are more than needed to fund the current year's capital expenditures, funds can be set aside in a rehabilitation and replacement reserve to build up funds that can be used for larger and/or unexpected projects in future years.

The following table shows an example of a five-year capital improvement funding program that uses a rehabilitation and replacement reserve to mitigate the rate impacts of uneven annual capital expenditures as well as build a fund for unplanned accelerated replacement needs. In this example, the utility begins with a zero balance in its reserve fund. Therefore, the targeted annual contribution as shown in line 7 includes: 1) an amount equal to the gap between the long-term rehabilitation and replacement costs and the five-year CIP; and 2) an amount needed to build a reserve fund balance over the five-year period that is equal to annual rehabilitation and replacement costs.

Example Use of Rehabilitation and Replacement Reserves (in \$1,000)

Line No.	Projected Year					Average
	1	2	3	4	5	
Calculation of Reserve Contribution						
1 Capital Improvement Program	\$1,800	\$2,000	\$3,800	\$2,500	\$3,000	\$2,620
2 Annual R&R	2,100	2,100	2,100	2,100	2,100	2,100
3 Net Difference	300	100	(1,700)	(400)	(900)	(520)
4 Cumulative Shortfall	\$300	\$400	(\$1,300)	(\$1,700)	(\$2,600)	
5 Average annual shortfall between annual R&R and CIP						520
6 Annual contribution to build reserve balance equal to annual R&R ($2,100 \div 5$)						420
7 Total annual reserve contribution						\$940
Rehabilitation and Replacement Reserves						
8 Beginning of Year Balance	\$0	\$1,240	\$2,280	\$1,520	\$2,060	\$1,420
9 Annual R&R	2,100	2,100	2,100	2,100	2,100	2,100
10 Additional Reserve Contribution	940	940	940	940	940	940
11 Capital Improvements	(1,800)	(2,000)	(3,800)	(2,500)	(3,000)	(2,620)
12 End of Year Balance	\$1,240	\$2,280	\$1,520	\$2,060	\$2,100	\$1,840

Reserves may be set based on maintaining a minimum target balance, contributing a minimum amount per year, or saving a targeted amount over a period of time to fund a certain project or group of improvements. Depending on the goals of the utility, the following approaches can be considered:

- If the goal is to have funds in reserve to cover unplanned rehabilitation and replacement because of assets that wear out before the expected useful life, the utility may consider establishing a targeted minimum balance. This amount could be established based on a percentage of total asset value, one year's depreciation expense, or the average annual rehabilitation and replacement budget.
- If the goal is to smooth out annual fluctuations in cash funding, the target fund balance or annual contribution can be determined based on the cumulative difference between the long-term average annual amount needed and the actual forecasted cash funded capital expenses for the given planning period.
- If the goal is to save funds to cash fund major improvements or asset management requirements in the future, an annual contribution can be determined based on the amount to be cash funded, the number of years until construction, and the ability of the utility to save funds or raise rates to generate additional revenues.

Some bond covenants stipulate minimum annual contributions to a renewal and replacement fund and/or fund balance requirements. Often the minimum annual contributions are expressed as a percentage of annual revenues (commonly 5%), and the minimum fund balance requirement is often a defined dollar amount as determined by a consulting engineer. In many cases, utilities will contribute and maintain more than these minimum amounts to address their actual needs.

Equipment Replacement Reserves

An equipment replacement fund may be established to fund the periodic replacement of assets with relatively short useful lives. Assets defined as equipment include vehicles, pumps, computer equipment, office equipment, mechanical equipment, laboratory equipment, and other similar equipment with an expected life typically in the range of as few as three to as many as twenty years.

There are two general methods of determining equipment replacement funds – annual deposits based on depreciation of existing equipment and maintenance of a minimum balance based on a percentage of the value of equipment.

Annual deposits are determined based on an itemized schedule of equipment, listing the type of equipment, the original cost, the expected service life, and the annual deposit to the equipment replacement fund. The total annual deposit is the sum of the annual deposits for each asset. When an asset on the equipment replacement fund list is replaced, the amount is drawn from the fund, and the schedule of annual deposits is adjusted accordingly to reflect the value and service life of the new asset(s).

A minimum balance in the equipment reserve fund is often determined based on a percentage of the value of equipment assets. The more equipment maintained by a utility, the lower the recommended percentage of value of the equipment assets that are maintained in reserve. In determining the recommended percentage, the utility should consider the value of the costliest piece of equipment on the replacement schedule as it represents the maximum cost to replace an unplanned equipment item.

Emergency Capital Reserves

Emergency capital reserves are used to fund replacement of critical assets damaged by catastrophic events such as a natural disaster. In determining the amount of emergency capital reserves that may be necessary, the following factors should be considered:

- Risk factors – The types of natural disasters, extreme weather conditions, or other force majeure events that the system may be at risk for and the extent of the damage that could result.
- Critical facilities – Identification of the specific facilities (including condition and replacement costs) that are critical to the operation of the system and may be vulnerable to identified threats.
- Availability of other funds – The ability to quickly access other funds in the event of an emergency, such as a line of credit, transfer from the municipal general fund, or funds from related agencies for investor-owned utilities (as may be appropriate).

Special Purpose Capital Reserves

Many utilities impose special assessments, system development charges (impact fees), or other capital charges to fund system expansion or replacement of specific facilities. These assessments or charges usually have specific purposes defined by state statutes and local ordinances/resolutions. In many cases, a segregated account must be established for the revenues from such fees. Even if not legally required, the utility should establish a segregated account to ensure that these types of funds are held and used for the intended purpose and are not intermingled with other utility funds. Important considerations for establishing, maintaining, and using such special purpose reserves include the following:

- Intended purpose of the assessments or charges – Specific projects or types of projects the funds may be used for, as set forth in the ordinance, resolution, or state statute under which the assessments or charges are imposed and any supporting documentation, such as reports or studies. Depending on the type of charge and the implementing documents, such assessments and fees may be limited to paying for a specific project, specific types of facilities, or may be used for any capital projects undertaken by the utility. That being said, any special purpose capital reserves should not be considered as part of reserve funds dedicated as emergency capital reserves, rehabilitation and replacement reserves, equipment reserves, etc.
- State or local regulations – State or local regulations should be reviewed carefully to determine the type of fund accounting required, whether interest earned on the funds must be retained in the fund, time limits on expenditures, and any other limitations or requirements.
- Timing of expenditures – The timing of revenues from special assessments, capital charges, and system development charges may not coincide with the capital expenses for which the fees were imposed. The documents establishing the fees should be reviewed as well as the use of such funds to determine whether funds should be used to reimburse other utility funds for past projects, applied to current debt service, or held in reserve for future projects.

DEBT SERVICE RESERVES

Debt service reserves are reserves used to pay debt service if revenues are insufficient to satisfy annual debt service requirements. Most often, a debt service reserve fund (DSRF) is established as a legal covenant of a debt issuance and is used in whole or in part to pay debt service in the event of a revenue shortfall. If funds from the DSRF are used, the utility is usually required to replenish the DSRF from the first available revenues, or in periodic repayments over a specified period. A DSRF is most common for revenue bond issues, but may be required or voluntarily established by the utility for other types of subordinate indebtedness. Some utilities may set up a discretionary DSRF, even if not legally required, that is outside of their operating reserve policy to have a dedicated funding source available in the event of unplanned emergencies to ensure their ability to make timely debt payments.

The DSRF may be entirely funded with bond proceeds at the time of bond issuance; may be funded over time through the accumulation of revenues; may be funded with a surety or other type of guaranty policy; or may be funded only upon the occurrence of a special event (e.g., upon failure to comply with a covenant in the bond contract).³ Utilities may sometimes use a surety bond⁴, bond insurance, or a letter of credit to satisfy the DSRF requirement in lieu of cash. Credit rating agencies may view conditionally funded DSRFs negatively. For example, Moody's generally considers cash to be superior to surety, although using a surety is unlikely to materially affect the rating if the surety provider is rated investment grade.⁵ S&P in its current rating criteria states that it would not recognize the utility having a DSRF at all if it is only conditionally funded. In such cases, the conditions requiring the use of the debt service reserve are likely to come at a time when the utility is least able to afford additional demand on its cash flow. S&P currently would recognize a DSRF if satisfied with an unconditional surety policy or similar arrangement with another financial counterparty. However, if S&P believes that the insurer providing the surety policy would be unable to provide funding for the DSRF in a stress scenario, and the insurer could not easily be replaced on a timely basis, S&P currently would not recognize the utility has having a DSRF, which may ultimately result in the utility having to satisfy the DSRF requirement.⁶

The amount to be maintained in a DSRF is typically specified in the bond indenture or contract. Such indentures are legal contracts between the utility and the trustee that specify the responsibilities of the issuer and the lender. A typical DSRF requirement may be specified as a fixed percentage of the outstanding par value of the bonds, or as a percentage of the average or maximum annual debt service on the bonds. In recent years, historically low interest earnings rates have resulted in more utilities issuing debt with smaller or no debt service reserves. However, credit rating agencies may react negatively to a utility that does not have a DSRF in an amount equal to at least half of the average annual debt service requirements.⁷ Although some rating agencies may state in their ratings criteria that a large cash balance can partially compensate for a lack of a debt service reserve, the combination of narrow liquidity and no

³ Municipal Securities Rulemaking Board. Accessed on 11/23/2016 at <http://www.msrb.org/Glossary/Definition/FLOW-OF-FUNDS.aspx>.

⁴ A surety bond is a third-party instrument that provides security against a default in payment.

⁵ Ratings Methodology: US Municipal Utility Revenue Debt, Moody's Investors Service, December 15, 2014.

⁶ Standard & Poor's ratings Service. U.S. Public Finance Waterworks, Sanitary Sewer, And Drainage Utility Systems: Rating Methodology and Assumptions, January 19, 2016.

⁷ Ibid.

DSRF exposes bondholders to greater risk of interrupted debt service payments, and therefore is more likely to be reflected in the ratings. For example, S&P notes that utilities that maintain at least reasonably sufficient levels of total available reserves are not likely to be penalized if they choose not to establish a DSRF. However, it would generally be viewed as a credit weakness if there is no DSRF and the utility already has low or poor liquidity levels.⁸

The size and investment of the DSRF is generally subject to federal arbitrage regulations.⁹ According to these regulations, a reserve fund may be invested without yield restrictions up to the lesser of (a) 10% of the principal amount of the bonds, (b) the maximum annual debt service on the bonds, and (c) 125% of the average debt service on the bonds. The existence of these restrictions is why a bond contract often specifies these amounts as a reserve fund requirement. The bond contract or indenture typically contains provisions describing how the DSRF monies can be invested. These provisions are designed to allow the utility to earn a reasonable interest rate but also avoid extreme volatility in the market value of the DSRF. Reserve fund investments may be limited to eligible investments that permit withdrawals without penalty or have maturities that do not exceed a specified term. Many issuer investment policies will require that investment maturities associated with the DSRF not exceed five years, while others may permit investments with longer maturities or some combination of maturities such as five, ten, or twenty years. Investment requirements typically do not allow the investment maturity to exceed the final maturity date of the bond issue itself.¹⁰ For most utilities with good credit ratings and strong revenue resources, the DSRF will never be accessed. This allows the issuer the opportunity to invest in higher yielding securities of longer duration with a rate of return that may be equal to or above the borrowing costs of the bonds. Generally, any excess DSRF investment earnings are transferred to the bond sinking fund or debt service fund to make scheduled principal and interest payments on the outstanding bonds. Such provisions are typically set forth in the bond indenture.

RATE STABILIZATION RESERVES

Rate stabilization reserves are cash reserves that can mitigate the impacts of occasional revenue shortfalls. Revenue shortfalls can occur because of several factors, including weather factors (unusually wet weather, mandatory drought restrictions), poor regional economic conditions, increased water conservation, or other unforeseen circumstances. Rate stabilization reserves can help smooth out revenue variability resulting from these factors and help ensure adequate fiscal resources during such times that could otherwise require large rate spikes.

Some utilities are required by their bond indentures to maintain a rate stabilization reserve. When specifically included in a utility's bond indenture, rate stabilization reserves can be used to help meet debt service coverage requirements during times of revenue shortfalls. Some bond indentures allow the utility to transfer money to a rate stabilization fund when revenues are higher than otherwise needed to satisfy debt service coverage requirements. In this case, the revenues transferred to the rate stabilization fund would not be counted as net revenues for calculating debt service coverage in the year they are generated.

⁸ Ibid.

⁹ 26 CFR1.103a (1986).

¹⁰ Debt Issuance Manual, League of Oregon Cities, September 2007. Accessed on November 24, 2016 at http://www.orcities.org/Portals/17/Premium/Debt_Issuance_Manual_2011.pdf.

Instead, in years when revenue shortfalls occur, the money can be transferred out of the rate stabilization fund and used to help meet debt service coverage requirements as needed.

Rating agencies have a mixed view of the use of rate stabilization funds used exclusively to meet minimum debt covenants. Some rating agencies view planned, but infrequent use of rate stabilization funds as credit neutral, indicating that the planned use of rate stabilization funds or equivalent designated reserves from time to time could mitigate declines in financial performance. However, others view the use of rate stabilization funds in lieu of other measures, such as rate adjustments to address imbalances among revenues, expenses, and debt service, as potential evidence of credit weakness. This is especially true when actual financial performance indicates insufficient pledged revenues without the use of cash.¹¹

Some utilities maintain rate stabilization funds without having them included as part of their bond indentures. In this case, the rate stabilization reserves, once they are established, simply help utilities meet their cash flow needs when net revenues fluctuate from year to year, as the rate stabilization funds are used to meet a portion of the utility's revenue requirements. As such, they help to mitigate rate adjustments and smooth out rate increases over time by providing a resource during unexpected low revenue periods.

The decision as to whether a utility should maintain a rate stabilization reserve may depend on the exposure to significant revenue and expenditure volatility. Utilities located in some areas of the country where drought restrictions are common and where variable weather impacting water sales is pronounced may decide to maintain significant rate stabilization reserves. Where these conditions are less prevalent, maintaining no rate stabilization reserve or a lesser amount than other areas where these factors are more prevalent may be appropriate. Similarly, smaller utilities may be more susceptible to revenue or expense volatility relative to the size of the overall budget as compared to larger utilities. The decision to maintain a rate stabilization reserve may also depend on whether other established reserves (such as other operating or capital reserves) have adequately addressed the utility's exposure to revenue volatility.

There are several common practices used by utilities to establish the appropriate level of this type of reserve. Some utilities will simply identify a percentage of annual operation and maintenance expense, revenues, or debt service as a rate stabilization reserve target. Other utilities will calculate the amount of the rate stabilization reserve by examining historical annual revenue or expense volatility and keep a reserve equivalent to this historical variability (an example of this approach is provided below). Another approach is to identify a historical year with the lowest water usage and set the reserve equal to the difference in revenue that would result from using the lowest water usage year versus the most recent year or a typical year based on current rates.

¹¹ Standard & Poor's ratings Service. U.S. Public Finance Waterworks, Sanitary Sewer, And Drainage Utility Systems: Rating Methodology and Assumptions, January 19, 2016.

Example Calculation of Rate Stabilization Reserve Target Amount

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Historical Revenues (in \$ thousands)	\$45,500	\$47,793	\$46,688	\$52,732	\$55,390
Revenues from Growth (Cumulative)		455	915	1,379	1,847
Revenues from Rate Increases		<u>1,820</u>	<u>3,713</u>	<u>5,681</u>	<u>7,729</u>
Adjusted Historical Revenues*	\$45,500	\$45,518	\$42,060	\$45,672	\$45,814
Revenue Variability	=\$45,814 - \$42,060 = \$3,754				
Rate Stabilization Reserve**	\$3,754				

*In this example, historical revenues are adjusted to normalize for the effects of rate increases and customer growth.

** Depending on duration of exposure to abnormal weather conditions, a utility may consider sizing such a reserve for multiple years of revenue variability

Rate stabilization reserves are typically funded or replenished in years when revenues are higher than expected or in years when events, such as mandatory drought restrictions or unusually wet summer months, do not occur. Rate stabilization reserves may be funded or replenished in a single year or over multiple years depending on the utility's annual cash flows and any minimum requirements that may exist in its bond covenants and/or stated financial policies and timeframes to achieve them, as applicable.

PUTTING IT ALL TOGETHER

Cash reserves are essential to ensure a utility's long-term financial sustainability and resiliency. Each utility system has its own unique circumstances and considerations that should be factored into the selection of the types of reserves and corresponding policies that best meet its requirements and objectives. For some utilities, a single reserve and associated policy may make the most sense because of the nature of their system, lack of revenue volatility issues, and administrative preferences. In that case, an analysis and then aggregation of the impacts of the appropriate key considerations identified herein should be performed to support a singular reserve policy. Regardless of whether a utility has a single reserve or multiple reserves, it should consider how its total reserve levels compare against the published criteria of the rating agencies to understand the potential impacts of its policies to its credit rating. Moreover, a utility should also consider having formal adopted reserve policies that will guide and govern the actions of decision makers into the future and be well received by the investment community, versus the benefits of having informal policies that provide more flexibility from year to year.

It is also important to understand that reserves are intertwined with rate structure decisions as well as certain key financial performance indicators, such as debt service coverage ratios (the ratio of net income to annual debt service expenses). Utilities with high levels of reserves may be able to have lower debt service coverage ratios and achieve similar ratings evaluations. Utilities that have conservation rate structures and/or low levels of fixed service charges may need higher levels of reserves because of the higher degree of reliance on volume-based charges and the attendant risks.

For many utilities, there may be a substantial gap between current reserve levels and desired amounts. In those instances, careful consideration should be given to multi-year plans to gradually increase or establish reserves at desired levels without causing undesired levels of rate adjustments. Moreover, utilities will need to continue to monitor the performance of their multi-year reserve plans and be prepared to adjust the timeframe to establish reserves or other parameters of their financial plans (such as rate adjustments or capital spending) if future events do not occur as projected.

Reserves for utility systems should be protected, used carefully, and monitored closely. Formal reserve policies that are adopted and regularly confirmed by governing boards can serve as mechanisms to not only protect reserves, but also specify the conditions under which they can and should be used. The use of informal policies that are not formally adopted, but rather just serve as a management and planning targets, provide great flexibility; however, they do not provide as much protection and are not externally viewed as strongly as formal reserve policies. Regardless of the structure of a utility's reserve policies, routine monitoring of reserves is essential to ensuring adequate resources to the utility and avoiding excess accumulation of current ratepayer funds.

CASE STUDIES

The following presents examples of various reserve policies of utilities throughout the country that are intended to present a range of establishing reserves for different purposes. For each utility system, the case studies present some descriptive characteristics of the utility based on public information available as of the date this document was prepared, as well as key factors that were considered in establishing their identified reserve policies. As can be seen, there is no single standard reserve policy that is right for all utilities, and each utility should consider its own unique risks and objectives in establishing reserve policies that are appropriate for its circumstances.

It is important to note that some utilities may have set their respective reserve policies with the intention of improving their bond rating. However, as evidenced by the case studies included in this whitepaper, there are no guarantees that higher reserve levels by themselves will translate into a better credit rating, because reserves are just one of many important factors considered by ratings agencies as part of their credit review and rating process.

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Orange Water and Sewer Authority		Reserve Type	Key Considerations	Policy
Location:	North Carolina	Operating	To provide cash flow for daily financial needs in addition to adequate reserves to counter revenue instability and unanticipated expenses	The greater of 4 months of operating budget <i>or</i> 20% of the succeeding 3 years capital budget
Governance:	Independent special purpose authority			
Services:	Water, Sewer & Reuse	Renewal & Replacement	Referred to as a Capital Improvements Reserve that is intended to: ensure more sustainable funding for asset and equipment rehabilitation and replacement; cover major unplanned capital costs; and provide funding flexibility to accommodate for capital cost carry-over adjustments/over-runs	Minimum balance target of 2% of annual depreciated capital costs
Number of Water Customers:	20,700 accounts			
Water Sold (ADF in MGD):	6.0	Equipment Replacement	Accounted for in single capital reserve fund (see renewal and replacement above)	N/A
Source of Supply:	Surface water via authority-owned treatment facilities			
Original Cost of Assets:	\$425,000,000	Emergency Capital	Accounted for in single capital reserve fund (see renewal and replacement above)	N/A
Net Asset Value:	\$305,000,000			
Operating Budget:	\$30,000,000	Special Purpose Capital	Accounted for in single capital reserve fund (see renewal and replacement above)	N/A
5-Year Capital Plan:	\$87,000,000			
% of Rev. in Fixed Charges:	25%	Debt Service	As a result of high credit rating, is not required to have separate debt service reserves for its outstanding revenue bond debt	N/A
Residential Rate Structure:	Inclining Block			
Credit Rating:	AA+ (Fitch), Aa2 (Moody's), AA+ (S&P)	Rate Stabilization	The purpose of this reserve fund is to provide sufficient funding for the cost of maintaining, repairing, and operating the system during extended periods when expenditures are higher and/or revenues are lower than budgeted while offsetting the need for rate increases and spending changes during the fiscal year	Minimum balance target of 5% of projected water and sewer revenue
Frequency of Policy Review:	Review of all formal reserve policies annually as part of budget process			

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City of Denton		Reserve Type	Key Considerations	Policy
Location:	Texas	Operating	Has separate Working Capital and Operating Reserves. <i>Working Capital Reserve</i> provides liquidity for management of payables and payable cycles. <i>Operating Reserve</i> provide revenue stability against demand volatility, funding in emergencies such as equipment or infrastructure failure and services to improve resiliency	Working capital: approximately 30 days or 8% of budgeted operating expenses, <u>and</u> Operating Revenues; approximately 90 to 150 days or 25-42% of budgeted operating expenses Total Reserve: 33-50% or 120-180 days of annual budgeted operating expenses
Governance:	Enterprise fund of the City			
Services:	Water			
Number of Water Customers:	34,200 Customers	Renewal & Replacement	Accounted for in operating reserve policy. Utility has comprehensive capital planning process that identifies renewal and replacement needs.	N/A
Water Sold (ADF in MGD):	17.4	Equipment Replacement	Also accounted for in operating reserve policy. Utility makes annual contributions to fund most vehicle and equipment costs	N/A
Source of Supply:	Surface water from Lake Lewis and Lake Ray Roberts			
Original Cost of Assets:	\$347,000,000	Emergency Capital	See operating reserve above.	N/A
Net Asset Value:	\$249,000,000	Special Purpose Capital	Significant growth opportunities and desire by City Council to be able to extend services to large/key economic development projects when they occur	Minimum of \$1 million fund balance in water impact fees
Operating Budget:	\$52,000,000			
5-Year Capital Plan:	\$123,000,000	Debt Service	Due to high credit rating and level of reserves, the does not have separate debt service reserves for its outstanding revenue bond debt	N/A
% of Rev. in Fixed Charges:	22%			
Residential Rate Structure:	Inclining block in summer months only (May thru October) and flat volumetric fee per in all other months			
Credit Rating:	Aa2 (Moody's) and AA+ (S&P's)	Rate Stabilization	High level of seasonality, aggressive residential conservation rate structure, and moderate exposure to extreme weather conditions (i.e. periods of abnormal rainfall and temperatures). Exposure captured as part of operating reserve policy.	N/A
Frequency of Policy Review:	Review of all formal policies annually as part of budget process			

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City of Deltona		Reserve Type	Key Considerations	Policy
Location:	Florida	Operating	Effectively serves as the comprehensive reserve of the utility for working capital, unplanned operating or capital expenses (including equipment), and to mitigate revenue volatility	7 months of annual operating budget
Governance:	Combined enterprise fund of the city			
Services:	Water, Sewer & Reuse	Renewal & Replacement	Minimum requirement per bond covenants	5% of prior year operating revenues
Number of Water Customers:	33,000 accounts	Equipment Replacement	Utility makes annual expenditures for equipment and machinery as part of the operating budget and relies on operating reserve for unplanned expenditure requirements	N/A
Water Sold (ADF in MGD):	10.0			
Source of Supply:	Groundwater via City-owned treatment facilities	Emergency Capital	Accounted for in operating reserve fund	N/A
Original Cost of Assets:	\$162,000,000	Special Purpose Capital	System growth and expansion are predominantly paid from assessment fees/impact fees and developer contributions	N/A
Net Asset Value:	\$126,000,000			
Operating Budget:	\$20,000,000	Debt Service	Elected not to have debt service reserves for its outstanding revenue bond debt	N/A
5-Year Capital Plan:	\$89,000,000			
% of Rev. in Fixed Charges:	35%	Rate Stabilization	Accounted for within single operating reserve policy	N/A
Residential Rate Structure:	Inclining Block			
Credit Rating:	A+ (Fitch)	Rate Stabilization	Accounted for within single operating reserve policy	N/A
Frequency of Policy Review:	Annual review of informal operating reserve policy as part of budget process			

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City of Tempe		Reserve Type	Key Considerations	Policy
Location:	Arizona	Operating	Uses a single reserve to account for all working capital, unplanned expenditure, and revenue volatility issues. Uses monthly billing and has access to external funds of the city in the event of an emergency/natural disaster	3 months of annual operating budget <i>and</i> 2% gross asset value
Governance:	Combined enterprise fund of the city			
Services:	Water & Sewer	Renewal & Replacement	Reserves for renewal and replacement needs are included as part of operating reserve policy (see above)	N/A
Number of Water Customers:	43,000 accounts	Equipment Replacement	Not separately accounted for, but is effectively reflected within operating reserve policy. Utility makes annual contributions to separate fleet fund for equipment replacement	N/A
Water Sold (ADF in MGD):	16.0			
Source of Supply:	Groundwater via city-owned treatment facilities and Central Arizona Project (CAP) deliveries	Emergency Capital	Utility has access to financing in lieu of reserves for this purpose.	N/A
Original Cost of Assets:	\$600,000,000			
Net Asset Value:	\$340,000,000	Special Purpose Capital	System growth and expansion are predominantly paid from assessment fees/impact fees and developer contributions	N/A
Operating Budget:	\$54,000,000			
5-Year Capital Plan:	\$260,000,000	Debt Service	City utilizes General Obligation and Excise Tax supported debt with transfers from the utility for the annual repayment requirements to take advantage of credit strength of the city as a whole. As such, there are no debt service reserves.	N/A
% of Rev. in Fixed Charges:	23%			
Residential Rate Structure:	Inclining block	Rate Stabilization	Moderate exposure to extreme weather conditions (i.e. periods of abnormal rainfall and temperatures) that could be mitigated (if prolonged) for other funds of the city or available credit lines	N/A
Credit Rating:	AA (Moody's)			
Frequency of Policy Review:	Periodic review of formal operating reserve policy			

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Virginia Beach		Reserve Type	Key Considerations	Policy
Location:	Virginia	Operating	Reserve covers working capital needs, unplanned operating, capital, and equipment expenditure needs, as well as exposure to revenue volatility	Reserve target is to maintain reserves of between 80-100% of annual operating expenses
Governance:	Combined water and sewer enterprise fund of the city			
Services:	Water & Sewer	Renewal & Replacement	Capital funding policy is to cash fund at least 25% of annual capital needs on a rolling average basis. Since rates are set to support significant cash funding of the capital R&R needs, the amount of reserves set aside for R&R is lower than it otherwise would need to be	Trust indenture requires a \$2 million minimum balance
Number of Water Customers:	133,000 accounts			
Water Sold (ADF in MGD):	31.8	Equipment Replacement	Not separately accounted for, but is effectively reflected within operating reserve policy.	N/A
Source of Supply:	Lake Gaston - Surface Water Reservoir, water conveyed to City of Norfolk for Treatment, then back to VA Beach			
Original Cost of Assets:	\$1,100,000,000	Emergency Capital	Included in renewal and replacement reserve above	N/A
Net Asset Value:	\$645,000,000	Special Purpose Capital	System growth and expansion are predominantly paid from assessment fees/impact fees and developer contributions	N/A
Operating Budget:	\$89,000,000			
5-Year Capital Plan:	\$175,000,000	Debt Service	Required per the trust indenture (i.e. bond covenants)	Maximum annual debt service on all outstanding parity bonds
% of Rev. in Fixed Charges:	60%			
Residential Rate Structure:	Fixed monthly charge with a uniform volumetric rate	Rate Stabilization	Accounted for within operating reserve policy above	N/A
Credit Rating:	AAA			
Frequency of Policy Review:	Approved bi-annually as part of budget process, which includes specific reserve policies that are highlighted to elected officials and rating agencies			

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Capital Region Water		Reserve Type	Key Considerations	Policy
Location:	Pennsylvania	Operating	Trust indenture specifies 60-day minimum reserve requirement. Management policy to maintain 200 days to cover working capital needs, unplanned operating, capital, and equipment expenditure needs, as well as exposure to revenue volatility.	Reserve policy is to maintain a total of 200 days of operating expenses as cash.
Governance:	Separate water and wastewater funds			
Services:	Water and sewer	Renewal & Replacement	Trust indenture requires a minimum level of reserves be kept on hand. As such, the utility utilizes the operating reserve fund to account for unplanned renewal and replacement needs over and above the minimum trust indenture requirement	Trust indenture requires an amount equal to the greater of \$500,000 or an amount set forth by the consulting engineer
Number of Water Customers:	20,700 accounts			
Water Sold (ADF in MGD):	5.4	Equipment Replacement	Not separately accounted for, but is effectively reflected within operating reserve policy.	N/A
Source of Supply:	Surface Water – Susquehanna River			
Original Cost of Assets:	N/A	Emergency Capital	Not separately accounted for, but is effectively reflected within operating reserve policy.	N/A
Net Asset Value:	\$140,000,000			
Operating Budget:	\$9,900,000	Special Purpose Capital	N/A	N/A
5-Year Capital Plan:	\$33,400,000			
% of Rev. in Fixed Charges:	20%	Debt Service	Required per the trust indenture (i.e. bond covenants)	maximum annual debt service on all outstanding parity bonds
Residential Rate Structure:	Fixed charge varies by meter size, uniform volumetric rate			
Credit Rating:	A+ (S&P)	Rate Stabilization	Current reserve level in the rate stabilization fund is 0. Trust indenture allows for the funding of a rate stabilization fund that can be used to help satisfy debt service coverage in the year that the funds are used.	N/A
Frequency of Policy Review:	Annually			

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City of Brentwood		Reserve Type	Key Considerations	Policy
Location:	Tennessee	Operating	Operating reserve is the only utility reserve fund and is intended to achieve the objectives of other listed reserves Purchased water costs are billed as a direct pass through rate to customers.	180 days of annual operating expenditure budget, including debt service and purchased water costs
Governance:	Combined water and sewer enterprise fund of the city			
Services:	Water and Sewer	Renewal & Replacement	Effectively included and captured within operating reserve policy (see above)	N/A
Number of Water Customers:	9,300 accounts	Equipment Replacement	Also accounted for in operating reserve policy. Utility makes annual contributions to fund most vehicle and equipment costs	N/A
Water Sold (ADF in MGD):	4.0			
Source of Supply:	Purchased water – multiple providers	Emergency Capital	Effectively included and captured within operating reserve policy (see above)	N/A
Original Cost of Assets:	\$108,000,000	Special Purpose Capital	Effectively included and captured within operating reserve policy (see above)	N/A
Net Asset Value:	\$70,000,000			
Operating Budget:	\$13,700,000	Debt Service	None – utility issues general obligation bonds	N/A
5-Year Capital Plan:	\$26,000,000			
% of Rev. in Fixed Charges:	19%	Rate Stabilization	Effectively included and captured within operating reserve policy (see above)	N/A
Residential Rate Structure:	Inclining Block			
Credit Rating:	Of the City; Aaa (Moody's) AAA (S&P)	Rate Stabilization	Effectively included and captured within operating reserve policy (see above)	N/A
Frequency of Policy Review:	Official policy adopted as ordinance in 2016.			

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Cucamonga Valley Water District		Reserve Type	Key Considerations	Policy
Location:	California	Operating	Intended to cover temporary cash flow deficiencies caused by timing differences between revenues and expenses, revenue decreases or unexpected increases in expenses. Also has a Water Banking reserve that is used for the purchase of available water supplies. Can be used with Board authorization to purchase excess supplies of water.	Operating: Maintained at a minimum amount equal to 20% of budgeted operating expenses with a maximum not to exceed 50% of operating expenses
Governance:	Independent Special District			Water Banking: Maintained at a minimum of \$2.5 million, and the maximum shall not exceed the cost of purchasing 5,000 acre feet of MWD Tier II imported water.
Services:	Water, Sewer & Recycled	Renewal & Replacement	Referred to as a Capital Project Reserve: used for funding new capital assets or the replacement of capital assets when reaching the end of their useful lives.	Maintained at a minimum target level of \$13 million (\$4 million for the water system). The maximum balance shall be determined by the master plan and long-range financial plan
Number of Water Customers:	50,200 accounts			
Water Sold (ADF in MGD):	16.1	Equipment Replacement	Referred to as Administrative Capital Improvement Fund: used to fund certain general, administrative, and overhead items. Intended for office equipment, fixtures, furnishings, vehicles, and other equipment on a pay-as-you-go basis.	Seeks to maintain a minimum balance of \$1.5 million (\$75,000 for the water and sewer funds, respectively). The maximum targeted balance is equal to the minimum balance adjusted for inflation.
Source of Supply:	Groundwater & Surface Water			
Original Cost of Assets:	\$492,000,000	Emergency Capital	Used in the event of economic events that negatively impact either revenues, or expenses, or causes a material decline in other reserve accounts; to purchase equipment and infrastructure at any time or to begin repairs after a catastrophic event. Funds may be used for capital or operating purposes.	Seeks to maintain a minimum balance of 1% of water and sewer capital assets with a maximum level of 2%.
Net Asset Value:	\$310,000,000			
Operating Budget:	\$59,500,000	Special Purpose Capital	Referred to as Local Water Resource Development Fund: used for the development, improvement, or acquisition of local water resource projects to reduce the reliance on costly imported water.	Minimum target level of \$2 million (approximate cost of a new groundwater well) and a maximum target of \$5 million
5-Year Capital Plan:	\$64,800,000			
% of Rev. in Fixed Charges:	22%	Debt Service	Elected not to have debt service reserves for its outstanding revenue bond debt.	N/A
Residential Rate Structure:	Inclining Block			
Credit Rating:	AA+ – Cert. of Participation AA - Revenue Bonds (S&P)	Rate Stabilization	Must be maintained as long as payments are due on outstanding debt under the Master Installment Purchase Agreement	Maintained at a minimum level equal to \$2.2 million and a maximum of 25% of Water Fund operating income determined from the last audited fiscal year.
Frequency of Policy Review:	Annually as part of budget process			