360 DEGREE REVIEW OF TRENTON WATER WORKS

A Comparative Analysis of Governance and Asset/Liability Optimization

Project: Pool #1: Consulting Engineering Services for the New Jersey Water Bank:
360 Degree Review of Trenton Water Works

PREPARED FOR

THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

AND

THE NEW JERSEY INFRASTRUCTURE BANK

PREPARED BY

BLACK & VEATCH CORPORATION

AND

AMERICAN PUBLIC INFRASTRUCTURE

22 JANUARY 2025

Table of Contents

Legal Notice ..... **v**

Securities Disclaimer ..... **vi**

1.0 Executive Summary **1**

1.1 Report Organization 1

1.2 Technical, Managerial and Financial Capacity (TMF) – Summary Findings 2

1.3 Governance Models 2

1.3.1 Governance and Ownership Control 3

1.4 Qualitative Assessment of Alternative Governance 3

1.5 Quantitative Analysis of Alternative Governance 5

1.5.1 Asset Optimization 5

1.5.2 Liability Optimization 6

1.6 Asset/Liability Optimization and Total Public Benefits 6

1.6.1 Total Public Benefits 7

1.7 Alternatives Offer Trenton Significant Financial & Credit Rating Relief 7

1.8 360 Review Findings 7

Finding 1: TWW is an Extreme High Risk as TWW's system, management, and financial challenges are serious and systemic. 7

Finding 2: MUA & SPE Models score high in Qualitative Assessment followed by TWW P3 – Models preserved Nonprofit & Super Tax-Exempt Structures. 8

Finding 3: Quantitative Analysis 8

Finding 4: *MUA, SPE & IOU Models* alleviate the City of Trenton's downgrade risk 8

2.0 Introduction **10**

2.1 Principles of Water Governance 10

2.2 US Water Industry Overview 10

2.3 New Water Challenges 11

2.4 NJ State Water Utilities Affordability Challenges 12

3.0 Background **14**

3.1 City of Trenton and Trenton Water Works 14

3.2 TWW's Technical, Managerial and Financial Assessments Limitations 15

3.3 NJDEP Oversight 17

4.0 The 360 Review **19**

4.1 360 Review – General Approach 19

4.2 Alternative Governance Models 20

4.3 Asset Optimization 20

4.4 Liability Optimization 20

4.5 Credit and Financial Analysis 21
5.0 360 Review Qualitative Assessment 22
5.1 Water Essentiality and Trusted Stewardship 22
5.2 What Do Empirical Studies Reveal: Public or Private? 22
5.3 Federal Policy & Tax Law Help Drive Infrastructure Financial Innovation 23
5.4 Factors Affecting Governance Alternatives 23
5.5 Governance Model Considerations 25
6.0 Overview: TWW Status Quo and Alternative Governance Models 27
6.1 TWW Status Quo Model – Municipal or Muni Model 28
6.2 Municipal Utilities Authority (MUA) Model – MUA Model 29
6.3 Special Purpose Entity (SPE) Model – Sponsored by State or Nonprofit 30
6.4 P3 Model – Public-Private Partnership with the City of Trenton 32
6.5 IOU Model – TWW Privatization or Private Model 33
7.0 Qualitative Assessment of Alternative Governance Models 35
7.1 Qualitative Assessment of Governance 35
7.2 Qualitative Assessment of Management 37
7.2.1 Management – Mission and Focus 37
7.2.2 Public Owned Utility Models 38
7.2.3 Private Owned Utility Models 38
7.2.4 Qualitative Assessment of Management 39
7.3 Qualitative Assessment of Optimization 40
8.0 Technical/Managerial/Financial (TMF) Review 42
8.1 Capacity Development Strategy 42
8.2 NJ TMF Scaled Benchmarks Scoring 44
8.3 Technical Capacity Definition 44
8.3.1 Infrastructure 45
8.3.2 Source 45
8.3.3 Surface Water 46
8.3.4 Treatment 47
8.3.5 Storage 48
8.3.6 Distribution 48
8.3.7 Qualified Personnel 50
8.3.8 Licensed Operator 50
8.4 Managerial Capacity Definition 51
8.5 Financial Capacity Definition 53
8.5.1 The Trifecta of Governance Capacity 54
8.6 NJDEP's Oversite Analysis Using a Modified TMF Assessment Form 55
8.6.1 Level of Accountability Analysis 57
9.0 Financial Models and Analysis 58

9.1 Financial Assumptions 58
9.2 TWW Baseline Financial Model Description (Do Nothing) 61
9.2.1 Baseline Financial Metrics (Do Nothing) 61
9.2.2 Baseline Cash Flow Analysis with No Rate Increases (Do Nothing) 61
9.2.3 Baseline Capital Plan and Forecast with No Rate Increases (Do Nothing) 61
9.2.4 TWW Baseline Summary Statistics (Do Nothing – No Rate Increase) 63
9.3 Status Quo (Municipal Model) 64
9.3.1 Scenario 1 Status Quo with Non-Optimized CIP (No NJ Water Bank) and Muni Bond Market Financing 64
9.3.2 Scenario 2 Status Quo with Non-Optimized CIP and Water Bank Financing 67
9.3.3 Scenario 3 Status Quo with Optimized CIP and Water Bank Financing 70
9.4 Municipal Utilities Authority MUA (Regional Model) 72
9.4.1 Model Assumptions 72
9.4.2 Financial Plan Dashboard 72
9.4.3 Operating Fund Analysis 72
9.4.4 Capital Fund Analysis 73
9.4.5 Summary Statistics 73
9.5 SPE Model 74
9.5.1 Model Assumptions 74
9.5.2 Financial Plan Dashboard 74
9.5.3 Operating Fund Analysis 74
9.5.4 Capital Fund Analysis 75
9.5.5 Summary Statistics 75
9.6 Public Private Partnership (P3 Model) 76
9.6.1 Model Assumptions 76
9.6.2 Financial Plan Dashboard 76
9.6.3 Operating Fund Analysis 76
9.6.4 Capital Fund Analysis 76
9.6.5 Summary Statistics 77
9.7 IOU Privatization Model 78
9.7.1 Model Assumptions 78
9.7.2 Financial Plan Dashboard 78
9.7.3 Operating Fund Analysis 78
9.7.4 Capital Fund Analysis 79
9.7.5 Summary Statistics 79
10.0 Governance Financial Models Comparable Analysis 80
11.0 Quantitative Analysis – Financial Findings Under Alternative Governance 81
11.1 Methodology of Quantitative Analysis 81

11.2 Quantitative Analysis – Summary of Asset Optimization Results 82
11.3 Liability Optimization 84
11.4 Total Public Benefit 86
Appendix A. GLOSSARY OF TERMS & ABBREVIATIONS A-1

Legal Notice

This report was prepared for the New Jersey Water Bank, a partnership between the New Jersey Department of Environmental Protection (NJDEP) and the New Jersey Infrastructure Bank (I-BANK) (together, the Water Bank or the Client) on behalf of the Trenton Water Works (TWW) by Black & Veatch Corporation (Black & Veatch) and is based on information provided by TWW not within the control of Black & Veatch or the Water Bank. While it is believed that the information, data, and opinions contained herein will be reliable under the conditions and subject to the limitations set forth in this report, Black & Veatch does not guarantee the accuracy thereof. Black & Veatch has assumed that the information provided by others, including, but not limited to NJDEP's third party consultants, both verbal and written, is complete and correct. The projections set forth in this report are intended as "forward-looking statements." In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. While Black & Veatch believes the assumptions are reasonable actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that occur. As such, Black & Veatch does not take responsibility for the accuracy of data or projections provided by or prepared on behalf of the Client, nor does Black & Veatch have any responsibility for updating this report for events occurring after the date of this report.

This report should not be construed as an invitation or inducement to any Recipient or other party to engage or otherwise participate in the proposed or any other transaction, to provide any financing, or to make any investment. Recipient acknowledges and agrees that it is not reasonably feasible for Black & Veatch) to conduct a comprehensive investigation and make definitive determinations for the compensation provided and without thorough verification of the information upon which the Services were performed, and therefore Black & Veatch can offer no guarantee or assurances that any facts, observations, analysis, projections, opinions, or other matters contained in the report will be more accurate, either at the time the report is issued or at any other time.

Use of this report or any information contained therein by any party other than the Water Bank, shall constitute a waiver and release by such third party of Black & Veatch from and against all claims and liability, including but not limited to liability for special, incidental, indirect, or consequential damages in connection with such use. Such use of this report by a third party shall constitute agreement by the third-party user that its rights, if any, arising from this report shall be subject to the terms of this Report Limitations, and in no event shall the third party's rights, if any, exceed those of the Water Bank under its contract with Black & Veatch. The benefit of such releases, waivers, or limitations of liability shall extend to the related companies and subcontractors of any tier of Black & Veatch, and the shareholders, directors, officers, partners, employees, and agents of all released or indemnified parties.

Securities Disclaimer

This presentation is intended for discussion purposes. The contents herein are not to be construed as legal, business, or tax advice, and reader should consult its own attorney, business advisor, and tax advisor as to legal, business, and tax advice. The Presentation is not assumed to be a complete discussion of all relevant issues. In considering any projections contained herein, readers should bear in mind that past or projected performance is not necessarily indicative of future results, and there can be no assurance that the projections will be achieved. Recipients of this Presentation, other than the Water Bank, agree that American Public Infrastructure (API), its affiliates and their respective partners, members, employees, officers, directors, agents, and representatives shall have no liability for any misstatement or omission of fact, or any opinion expressed herein. Each Recipient further agrees that it will (i) not copy, reproduce, or distribute this Presentation, in whole or in part, to any person or party (including any employee of the Recipient other than an employee directly involved in evaluating the contents of the Presentation) without the prior written consent of API; and (ii) keep permanently confidential all information contained herein that is not already public. Any terms set forth herein are intended for discussion purposes only and are subject to the final terms as set forth in separate definitive written agreements. This presentation is not a commitment to lend, syndicate a financing, underwrite or purchase securities, or commit capital nor does it obligate us to enter into such a commitment, nor are we acting as a fiduciary to you.

Prior to entering into any Transaction, you should determine, without reliance upon us or our affiliates, the economic risks and merits (and independently determine) that you are able to assume. In this regard, by accepting this Presentation, you acknowledge that (a) we are not in the business of providing (and you are not relying on us for) legal, tax or accounting advice, (b) there may be legal, tax or accounting risks associated with any transaction, (c) you should receive (and rely on) separate and qualified legal, tax and accounting advice and (d) you should apprise senior management in your organization as to such legal, tax and accounting advice (and any risks associated with any transaction) and our disclaimer as to these matters. API does not provide tax or legal advice. Any discussion of tax matters in these materials (i) is not intended or written to be used and cannot be used or relied upon. Accordingly, you should seek advice based on your particular circumstances from an independent tax advisor.

Any prices or levels contained herein are preliminary and indicative only and do not represent bids or offers. These indications are provided solely for your information and consideration, are subject to change at any time without notice and are not intended as a solicitation with respect to the purchase or sale of any instrument. The information contained in this presentation may include results of analyses from a quantitative model which represent potential future events that may or may not be realized and is not a complete analysis of every material fact representing any product. Any estimates included herein constitute our judgment as of the date hereof and are subject to change without any notice.

1.0 Executive Summary

The New Jersey Infrastructure Bank (I-BANK), with and on behalf of the New Jersey Department of Environmental Protection (NJDEP), selected Black & Veatch (BV) and American Public Infrastructure (API), from an existing pool of qualified engineering firms procured through a competitive process, to perform technical, governance, and financial performance reviews of Trenton Water Works (TWW), which is a division of the City of Trenton's Water and Sewer Department.

The data, research and analysis are used for evaluating the governance of the water system, including its ability to meet regulatory requirements and protect the public health while delivering high quality water to its approximately 225,000 customers. TWW customers include all those residing in the City of Trenton (City) and parts of Ewing, Lawrence, Hopewell, and Hamilton, as 55% of TWW's revenue is generated from outside the city boundaries. The analysis and reviews also assess the City's water department and its capacity to administer and manage the staffing and resources necessary to properly operate, maintain, and improve the infrastructure to ensure all standard procedures are followed to deliver safe, reliable, and cost-effective water services to all of its customers while mitigating against all future risks.

New Jersey's Department of Environmental Protection issued the "Unilateral Administrative Order" (UAO) on October 12, 2022, highlighting the chronic neglect of TWW. Two initial studies were commissioned:

- **Technical, Managerial & Financial Capacity Evaluation (TMF)** – to study TWW's technical, managerial, and financial conditions and assess its capacity to achieve and maintain compliance with state and federal safe drinking water regulations, and the long-term sustainability of the water system.

- **360 Review** – Review and analyze the TMF, making independent observations of TWW's capacities, and conducting an in-depth review of TWW's performance as compared to Alternative Governance Models on a Qualitative and Quantitative basis, including implications for TWW's assets and liabilities, creditworthiness, and credit rating prospects.

BV, in partnership with API, performed a 360 Review of TWW for the purpose of evaluating the condition of the utility system. This evaluation relied, in part, on the accuracy of the DEP's third-party firm's comprehensive TMF. The 360 Review presents alternative solutions on how TWW might be more optimally structured to address the water system's more emergent and costly issues that address public health concerns and meet safe drinking water requirements, as well as community sustainability and affordability concerns. To evaluate options for addressing the many water quality, public health, infrastructure re-investment, and governance failures at TWW, this 360 Review considers pathways and customer cost implications under alternative governance models over a 20-year period.

1.1 Report Organization

The 360 Review is divided into two main parts 1) Analysis of the TWW's TMF findings from all sources, and 2) Review of Alternative Governance Models.

1.2 Technical, Managerial and Financial Capacity (TMF) – Summary Findings

Based on the information reviewed and work conducted, BV offers the following findings:

- TWW is an Extreme High Risk, with serious and systemic infrastructure, management, and financial challenges.
- The City of Trenton is incapable of mitigating the operational and infrastructure risks of the water system, which poses a threat to the public health and ratepayer affordability.
- TWW has severe technical, managerial, and financial challenges which in total represents systemic deficiencies that are beyond TWW's capacity to correct independently.
- TWW does not have the financial capacity to meet a ten-year, $570 million, inflation-adjusted capital improvement plan (CIP), which requires immediate attention.
- There is no evidence the City could transform TWW into a utility that consistently meets regulatory requirements to provide customers with safe, reliable drinking water without the NJDEP's direct oversight and considerable assistance.

1.3 Governance Models

Across the spectrum of water infrastructure ownership and governance modalities, five models were selected for this review. These include:

1. a baseline analysis of TWW as the Municipal Model,
2. a Municipal Utilities Authority (MUA) as a regional model,
3. a Special Purpose Entity (SPE) also a regional model as a hybrid approach that combines the strengths of both public and private water utility ownership,
4. a Public Private Partnership (P3) under municipal ownership and leadership, and
5. an Investor-Owned Utility (IOU) as a privatization or private owner model.

GOVERNANCE MODELS
TWW STATUS QUO – *Municipal or Muni Model*
MUA – *Municipal Utilities Authority*
SPE – *Special Purpose Entity, a Hybrid Model*
TWW P3 – *Public Private Partnership*
IOU – *Investor Owned Utility or Privatization*

Where necessary technical, managerial, and financial capacities are present, each governance model could satisfy public health standards and maintain applicable legal and regulatory compliance. However, key questions remain on how expeditiously, efficiently, and reliably each model would perform over time. These questions are examined from three vantage points:

a) Qualitative Assessment that focuses on Governance, Management and Optimization strengths and scores each using 5 underlying factors, which explore *"How"* alternative models can most expeditiously transform TWW into a high performance-driven utility, thereby, demonstrating to the public on a continuous basis that their water is safe, clean, reliable, and provided at the lowest cost.

b) Quantitative Analysis that takes advantage of the inherent strengths of each alternative model and optimizing Assets and Liabilities to bolster its ability to sustain high public health standards, generate greater public benefits as well as build stakeholder support for change, and

c) TWW Creditworthiness and Credit Rating Prospects under the various alternative models to provide the perspective of rating agencies, lenders, and investors.

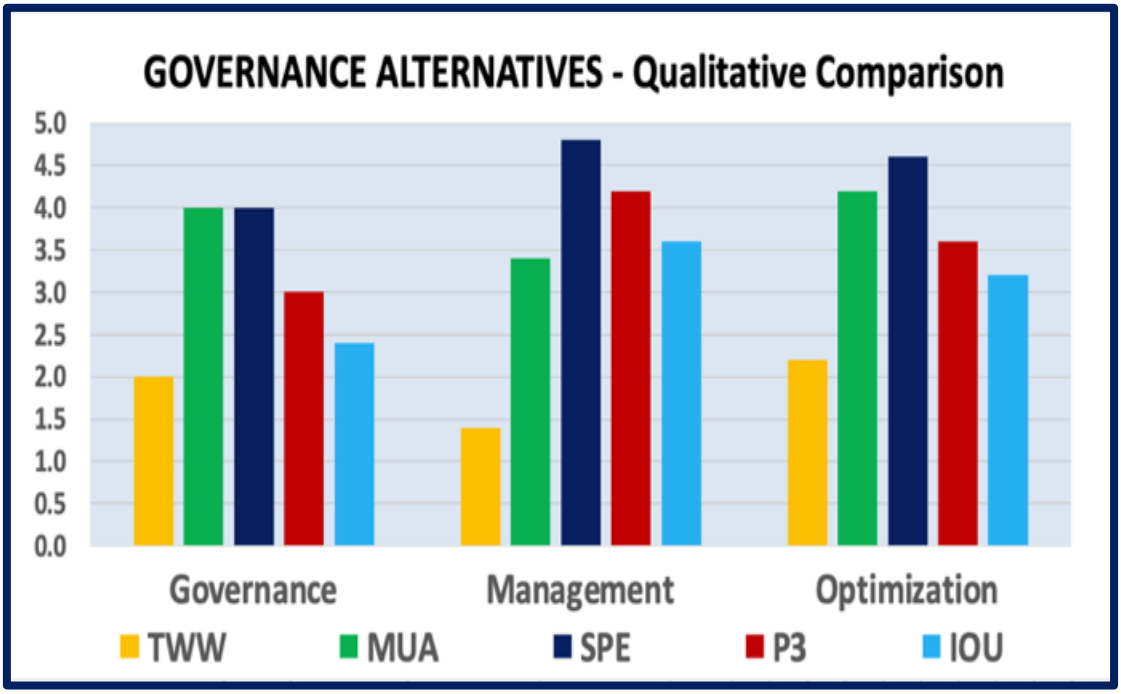
The 360 Review confirmed that TWW suffers from many system and management deficiencies threatening serious water incidents that present unacceptable and avoidable risks to public health and safety. The critical risks and systemic failures highlighted herein are evidence that, in its existing governance and management structure, TWW lacks the sustained technical, managerial, and financial capacities necessary to meet public health compliance requirements and infrastructure sustainability in a cost-effective manner.

1.3.1 Governance and Ownership Control

The US Water industry is fragmented with over 52,000 public water systems (PWS), of which 85% are owned or controlled by local governments many of which face extreme challenges. The 360 Review provides a process to evaluate compliance as well as sustainability and financial concepts beyond the typical management level. To address systemic failures and future risks, a qualitative assessment under various forms of utility governance and ownership is critical. The form of ownership and control for utilities matters, and alternative governance models can improve the quality of governance, operations, levels of service, while meeting required safe drinking water standards.

1.4 Qualitative Assessment of Alternative Governance

The 360 Review takes a holistic approach to analyzing alternative governance options building on the TMF and its own critical study of TWW assets and operations. The qualitative assessment focuses on three key drivers of performance and improvements in water quality and operations: Governance, Management, and Optimization capacity. Each of these drivers are analyzed across five factors impacting their effectiveness in rehabilitating the TWW water system in the most expeditious fashion to best protect public health.



Notably, the models' qualitative scores are not directly tied to quantitative assumptions and the results should be viewed jointly to best appreciate the sometimes subtle, but consequential differences.

As all governance models could be employed in a manner that ensures a utility satisfies public health standards and maintain regulatory compliance, each alternative model here is assumed to meet NJDEP requirements and deliver TWW's CIP. Therefore, the qualitative assessment provides insights on how well and efficiently a model may be able to execute the CIP as well as transform TWW into a high performance-driven utility that best meets the public health mandates. Below is a summary of key considerations and value drivers for each of the models.:

- ***TWW Status Quo Model*** – the *Municipal or Muni Model* scores low in this review due to TWW's documented history of weak governance, ineffective management, and inability to perform basic utility operations. These weaknesses overshadow the significant advantages of super tax-exemption and nonprofit structure that a Muni Model typically enjoys and the risks that the assumptions in the Financial Model are not met.
- ***MUA Model*** – *the Municipal Utilities Authority Model*, a regionalization that includes all TWW customers, could out-perform the P3 and IOU Models due to its tax-free, nonprofit framework, improved governance, regional synergies, and its ability to optimize liabilities.
- ***SPE Model*** – *the Special Purpose Entity, enabled by the State,* is a regionalization that includes all TWW customers. A hybrid model, the SPE achieves high scores by capitalizing on the private sector's strict, pension fiduciary standards and strong management that is bound by strict key performance indicators (KPIs) and coupling it with the advantages of the public model that include super-tax-exempt and nonprofit structure, independent rate setting authority, and the ability to provide Local Tax & Budget Relief.
- ***TWW P3 Model*** – a *Public-Private Partnership (P3), led by the City of Trenton* offers TWW better governance, stronger management, and potentially, a more rapid transformation into a better performing utility. However, a P3 is a daunting endeavor and TWW, absent the state's direct involvement in P3 contract negotiations and ongoing monitoring, is ill equipped for such a complicated and difficult undertaking.
- ***IOU Model*** – the *Privatization or Private Model* promises to transform TWW expeditiously through better governance, strong management, and significant independence, albeit at an expected greater cost. The IOU Model scores lower when considering a framework that includes Federal, state, and local taxes and owner profits as well as the drawbacks of stakeholder and community resistance to privatization.

The MUA and SPE Models, and the TWW P3 with direct state involvement, stand out when considering alternative governance options. Both models offer a regional approach that embraces economies of scale, synergizes, and takes advantage of cost-effective technologies. Thus, these models can better afford safeguarding public health and giving the public the assurance that the water is safe, clean, reliable, and provided at the lowest cost.

However, it is important to note that an MUA with the ability of combining the City's water with other regional services and/or shared services is effectively a start-up, as the new entity may have limited experience and expertise in water management but for TWW. Thus, it would likely need to engage a private contract manager(s) or enter a P3 for an initial period.

1.5 Quantitative Analysis of Alternative Governance

The 360 Review provides an overview of TWW's operational capacity as well as information pertinent to financial optimization strategies. Quantitative Analysis identifies *"What"* is the capacity of a model to improve TWW, operationally and financially, and what assurances can be made to the public about their water being safe, clean, reliable, and provided at lowest possible cost.

The quantitative analysis compares the **TWW Status Quo Model** to the four alternative governance models to gauge their relative cost effectiveness in managing TWW's operations, CIP, and risk while complying with NJDEP regulations and providing safe, clean, and reliable water services. And although this analysis assumes that the alternative models can equally generate savings in operations and capital asset management, their approach and cost structures vary, which necessarily impacts compliance and financial goals.

As discussed in the TMF Report and this review, TWW suffers from a degree of systemic failure that will greatly increase water rates to fund proficient operations, necessary maintenance, experienced staffing, and neglected capital investments. The CIP is substantial with an estimated cost of $501.2 million over 10 years, ($569.6 million escalated for inflation) and a limited CIP through 2044 of $621.3 million ($730.2 million escalated for inflation). The analysis assumes that the CIP is wholly financed by low-cost SRF loans. Using the I-BANK's pricing model, an optimized NJ Water Bank CIP funding scenario is developed for each model to minimize borrowing costs and maximize principal forgiveness, thereby driving affordability.

Each model is studied for its Asset Optimization potential in terms of increased economies of scale, operating and capital synergies, use of cost saving technologies and the other benefits. Additionally, these models look to generate these benefits through the scaled operations embedded in their private utility platforms. The SPE model being a hybrid takes advantage of both the benefits of regionalization and private utility platforms. These enhancements in the management of operations, capital assets, and risk act to protect public health and the quality, reliability, and affordability of water as well as regulatory compliance.

1.5.1 Asset Optimization

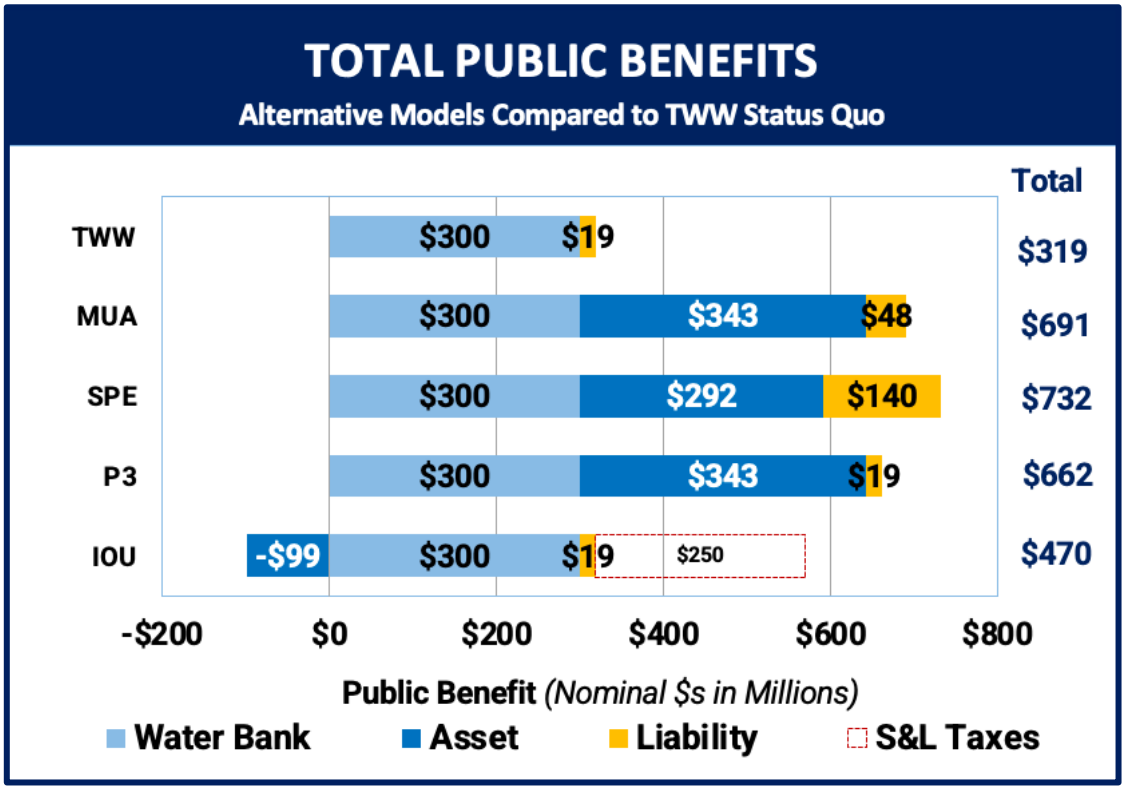
The MUA and the TWW P3 Models raise water charges the least – 50% (10 years 2024 through 2033). This equates to a 3.3% compounded annual growth rate (CAGR) and saves ratepayers $102 million when compared to the Optimized TWW Status Quo Model's rate increase of 80% for a CAGR of 5.2%. The SPE Model increased water rates 59%, which was slightly more because it uses a portion of its asset optimization savings to enhance liability optimization benefits. Lastly, the IOU Model, together with taxes and owner profits, raises rates 104% over the 10-year period for a CAGR of 6.4% which was $40 million more than TWW Status Quo Model.

WATER RATE PROJECTIONS					
Year	**TWW SQ**	**MUA**	**SPE**	**TWW P3**	**IOU**
2029	$678	$561	$552	$561	$719
2034	$844	$702	$743	$701	$951
2044	$941	$790	$804	$782	$1,024
Average Costumer of 4,000 Gallons for Month					

The MUA and TWW P3 Models offer water customers the greatest rate relief over the 2024 through 2044 period increasing annual cost from $453 per year to $790 and $782, respectfully. The SPE trails slightly with a 2044 cost of $804 while the TWW and IOU have forecasted costs of $941and $1,024, respectively.

1.5.2 Liability Optimization

The 360 Review widens the lens of public finance by not only managing the cost of debt, but it also incorporates the net pension liability (NPL) into the optimization analysis. Thus, added value can be created to enhance the fiscal health of the TWW service area through liability optimization, i.e., restructuring debt and pension obligations to minimize costs.



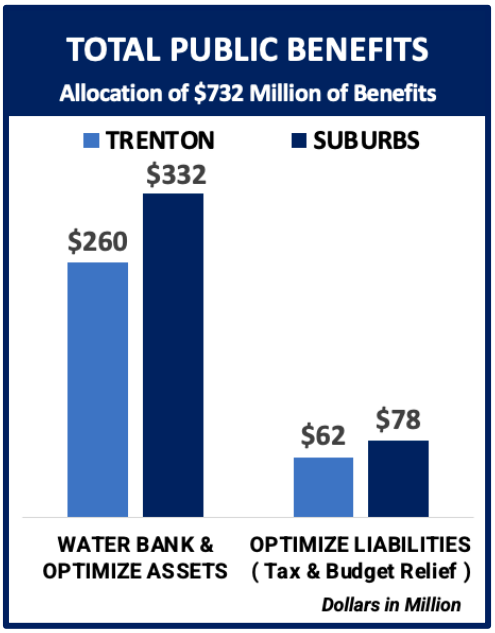
The MUA and SPE Models offer material liability optimization benefits providing Local Tax & Budget Relief that could be shared by the participating service area communities which may include Trenton, Hamilton, Ewing, Lawrence, and Hopewell, as well as Mercer County. Liability Optimization generates between $19 million and $140 million of additional public benefits, while reducing NPLs from an estimated $450 million to $310 million.

1.6 Asset/Liability Optimization and Total Public Benefits

The 360 Review is a holistic approach to addressing the public health and operational needs of TWW as well as enhancing the financial condition of TWW and all the communities it serves. In addition to growing water infrastructure needs, municipalities also face financial challenges due to underfunded pension systems. To that end, the 360 Review analyzes models for their ability to optimize both assets and liabilities and their impact on credit rating prospects of TWW and Trenton specifically, and ideally for all the service area communities. Accordingly, each model includes liability optimization as permitted under the Federal Tax Code.

1.6.1 Total Public Benefits

Reforming TWW governance to a MUA, SPE, or TWW P3 can generate $662 million to $732 million in Total Public Benefits. This combines $300 million of savings from the New Jersey Water Bank in the form of SRF loans and principal forgiveness (PF) with the benefits of Asset and Liability Optimization.



MUA, SPE & TWW P3 Models offer $362 million to $432 million more in Public Benefits, as compared to the TWW Status Quo Model. The benefits of the TWW P3 Model may be less, if TWW does not directly involve the state in P3 negotiations and contract monitoring. Lastly, the optimization analysis assumes that the public benefits are allocated based on the source of TWW water revenues *(Trenton 44%/Suburbs 56%*of sales). This analysis excludes the value of suburban utility assets that may be contributed which can increase suburban Public Benefits.

1.7 Alternatives Offer Trenton Significant Financial & Credit Rating Relief

The $500 million estimated CIP over the next 10 years *(not escalated for inflation)* will place serious stress on the city's general obligation bond rating as an "oversized debt issuance" is required and increased operating and capital expenditures may put downward pressure on the city's available fund balances which may have been kept high by deferring required maintenance. Furthermore, transferring TWW to an alternative governance model, other than the TWW P3, would reduce the city's outstanding general obligation debt by $128 million and would avoid pledging an additional $15-20 million in Qualified Bond Authorization (QBA) on water State Revolving Fund (SRF) loans. Under the MUA, SPE and IOU Models, TWW's newly restructured debt, plus the new loans to fund the CIP, would be secured solely by water enterprise revenues with no recourse to the City. This would greatly improve Trenton's debt capacity and increase its financial flexibility by removing the encumbrance on revenues pledged under Qualified Bond Authorization (QBA) program.

All told, the improvements in governance, management, and cost reductions from Water Bank loans, including principal forgiveness (PF), and the savings from asset and liability optimization support stronger credit rating prospects under the alternative governance models. Although, as detailed herein, great caution is advised with the TWW P3 absent direct state involvement.

1.8 360 Review Findings

Finding 1: TWW is an Extreme High Risk as TWW's system, management, and financial challenges are serious and systemic.

- The City of Trenton is incapable of mitigating the operational and infrastructure risks of the water system which poses a threat to the public health and ratepayer affordability.
- TWW has severe technical, managerial, and financial challenges which in total represents systemic deficiencies which are beyond their capacity to independently correct.

- TWW does not have the financial capacity to meet a ten-year, $570 million, inflation-adjusted capital improvement plan (CIP), which requires immediate attention.
- There is no evidence that, absent NJDEP's direct oversight and considerable assistance, the City could transform TWW into a utility that consistently meets regulatory requirements to provide customers with safe, reliable drinking water.

Finding 2: MUA & SPE Models score high in Qualitative Assessment followed by TWW P3 – Models preserved Nonprofit & Super Tax-Exempt Structures.

- **MUA & SPE Models** regionalize to improve governance, water safety, and benefits.
- **SPE & TWW P3** take advantage of private expertise and depth of utility platform to enhance governance, management, and optimization strengths.

Finding 3: Quantitative Analysis

- Asset Optimization - MUA, SPE & TWW P3 Models perform best in minimizing water rate increases through 2044.
- Liability Optimization generates up to $140 million in Local Tax & Budget Relief for $732 million in Total Public Benefits.
- MUA & TWW P3 Public Benefits may be significantly less if:
  - MUA as a start-up initially needs a private operator and its associated costs.
  - TWW does not directly involve the state in P3 negotiations & contract monitoring.
  - **$140 million Local Tax & Budget Relief** for Trenton and potential participants like Hamilton, Ewing, Lawrence, and Hopewell as well as Mercer County. (Benefits can rise with the addition of suburban assets).

Finding 4: *MUA, SPE & IOU Models* alleviate the City of Trenton's downgrade risk.

This could be accomplished by:

- Assuming the city's $128 million of existing General Obligation Bonds water debt,
- Providing $300 million of TWW financing with no recourse to the city, and
- Reducing the city's net pension liabilities by $62 million Local Tax & Budget Relief.

360 REVIEW OF GOVERNANCE ALTERNATIVES

Critical Qualitative Assessment

	TWW	MUA	SPE	TWW P3	IOU
GOVERNANCE	WEAK	EXCELLENT	GOOD	FAIR	FAIR
Governance – *High Standards & Strong Oversight*	✗	★	★★★	★★	★★
Framework – *Super Tax-Exempt, Nonprofit, Ecomomies of Scaled via Regionalization and/or Contract / P3 Manager*	★	★★★	★★★	★★	☆☆☆
Execution Risk – *Complexity, Ease of Completion & Timeline*	✗	★★	★	★	☆☆☆
Stakeholders – *Represented, Engaged & Transparent*	☆☆☆	★★★	★★	☆☆☆	☆☆☆
Social Impact – *Hard Work of Changing TWW's Governance*	★	★★	★	☆☆☆	☆☆☆
MANAGEMENT	CHALLENGED	GOOD	EXCELLENT	GOOD	GOOD
Independence – *Strong Shield Against Outside Interferences Fosters More Decisive & Timely Decisions*	✗	★	★★★	★	★★
Leadership – *Talented, Strong Team Builders, Aligned with Mission, and Welcome Accountabiliy & Benchmarks*	✗	★★	★★	★★	★★
Operations – *High Industry Standards & KPIs for Water Qualtiy, Operations, etc. - Best Transformation within 3 yrs.*	✗	★	★★★	★★	★
Capital – *Complete 5 Yr. CIP (On Time/Under Budget)*	✗	★	★★★	★★	★★
Risk – *Most Capable at Managing Risk Efficiently*	✗	★	★★★	★★★	★★★
OPTIMIZATION	FAIR	EXCELLENT	EXCELLENT	GOOD	GOOD
Optimize Asset – *Best Framework to Improve OpEx & CapEx*	☆☆☆	★	★★	★	★
Optimize Liabilities – *Debt & Pension Restructuring Options*	☆☆☆	★★	★★★	★	★
Rate Setting – Able & Willing to Raise Rates to Meet KPIs	☆☆☆	★★	★★	★★	★
Ratings – *Able to Improve Utility's L-T Credit Prospects*	✗	★★★	★★★	★	★★
Financial Aid – *Able & Motivated to Maximize Assistance*	★★	★★★	★★★	★★★	★

2.0 Introduction

2.1 Principles of Water Governance

The principles of water governance are rooted in the basic principles of good governance, which include legitimacy, transparency, accountability, human right, rule of law, and inclusiveness.[1] While there is no one-size-fits-all solution, water governance incorporates the institutional and administrative rules, practices and processes through which decisions are made and implemented where stakeholders can articulate their interests and have their concerns considered, and decision makers are held accountable for sustainable water management.

While there are many critical areas of water governance and management that must always have a concentrated focus both short-term and long-term, simply put, if governance is good, infrastructure is built and maintained, and water is delivered in a sustainable, integrated, and inclusive way and at an acceptable cost and in a reasonable timeframe. If is bad, it generates undue transactional costs and does not keep pace with needs and challenges.

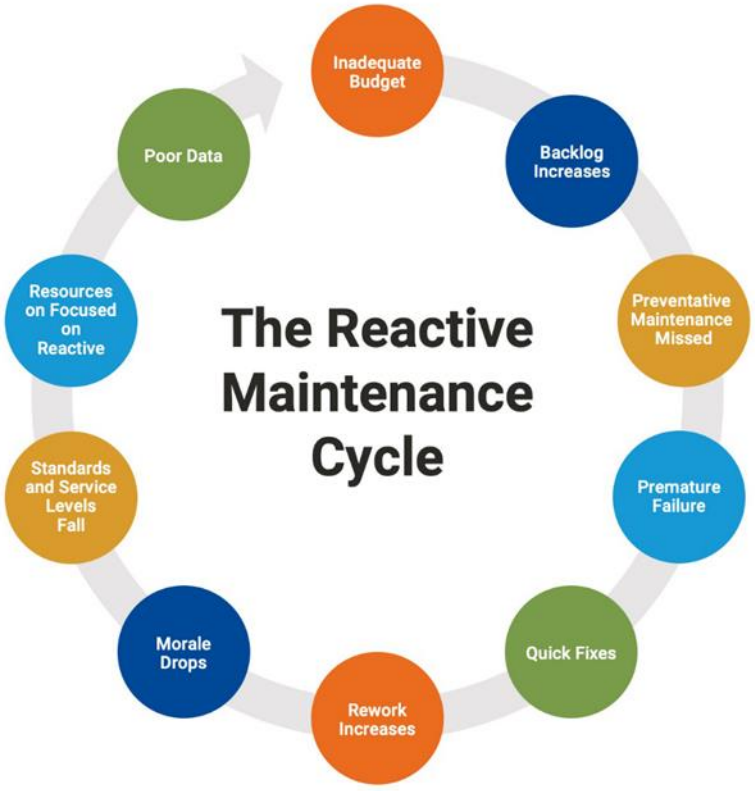
2.2 US Water Industry Overview

The US Water Industry is fragmented with over 52,000 public water systems (PWS). 85% of all water utilities fall under the governance of municipal government reporting under a public works department or, if the utility size is large enough, it may be a standalone utility department. Utilities can have significant compliance, operations, maintenance, management or financial issues for a variety of reasons. Poor governance or a lack of professional decision making over time can significantly impair a utility's ability to meet current and future challenges. A long list of compliance violations, a lack of infrastructure investment, poor data and record keeping is evidence of systemic governance and management neglect which will take expertise, change, time, and resources to correct and establish a new level of capacity.

OECD Principles on Governance Overview

[1] OECD Principles on Water Governance Centre for Entrepreneurship, SMEs, Regions and Cities Welcomed by Ministers at the OECD Ministerial Council Meeting on 4 June 2015 Adopted by the OECD Regional Development Policy Committee on 11 May 2015

The diagram below represents a "Reactive Maintenance Cycle" [2] where a utility gets in a crisis mode and costs and risks increase. Utilities carry a great deal of accountability, much of which is not quantified in terms of risk, liability, and costs. Many times, deferred maintenance and asset repair and replacement is not planned for or reported in terms of operational and financial risk. Risk, defined as any form of loss to a system, can be introduced at each step and can in aggregate lead to the degradation of the cost effectiveness of the resources provided to the utility and the quality of service provided to rate payers.



Municipalities only focused on current year budgets typically fail to understand the complexities of water and do not calculate the financial impacts until a water main break occurs, boil notices are issued, a qualified workforce dwindles, or the risk needs to be transferred to a third party.

2.3 New Water Challenges

The American Water Works Association's (AWWA) annual State of the Water Industry report, based on a survey of more than 2,400 water professionals conducted in late 2023, highlighted key trends and emerging concerns. The survey ranked watershed and source water protection as the water sector's most pressing challenge for the first time in the survey's 21-year history, unseating the perennial challenge of aging infrastructure for the top spot. The shift highlights a growing recognition of the importance of safeguarding water at its source to ensure a safe, affordable, and sustainable water supply and includes factors such as more frequent and severe climate-induced drought periods, lead service line compliance and other growing concerns related to emerging contaminants. [3]

[2] Getting a Grip on Asset Management: The Web GIS Centric Approach | WaterWorld
[3] 2024-SOTWI-Executive-Summary.pdf (awwa.org)

2.4 NJ State Water Utilities Affordability Challenges

TWW needs to increase water rates necessary to fund critical capital projects. TWW also needs to collect on delinquent water accounts. These two financial issues tie to the willingness and ability of the City of Trenton's residential water customers to pay when many are already facing water affordability thresholds.

Table 5b. Drinking Water Utility Residential Costs (45,000 gallons per year per household)

System Size (Estimated Population Served)	Minimum	Median	Maximum	# Utilities
Very Large (>100,000)	$111.73	$480.43	$562.94	14
Large (50,000 to <100,000)	$106.65	$274.59	$366.82	11
Medium (10,000 to <50,000)	$88.80	$262.98	$726.49	138
Medium (3,300 to <10,000)	$66.28	$351.50	$920.00	78
Small (500 to <3,300)	$215.16	$490.39	$695.55	23
Very Small (<500)	$251.04	$470.48	$539.93	21
All Systems	$66.28	$324.45	$920.00	266

Source: A New Jersey Affordability Methodology and Assessment for Drinking Water and Sewer Utility Costs, August 2021.

Household affordability stresses overall in New Jersey, due to the combined costs of drinking water and sewer utility charges, are presented below. The approach in the table focuses on the Lowest Quintile Income (20th percentile household income) and the essential household expenditures for each county to estimate Household Disposable Income (HDI). Utility costs are based on a "nominal household demand" of 45,000 gallons per year, based on New Jersey data regarding indoor per capita demands and typical household size. Affordability stresses are estimated using three thresholds: Baseline (10% DHI), High (20% DHI), and Severe, (30% DHI).

Using this approach, the model estimates statewide that 20.6% of households could experience affordability stress at the Baseline threshold, 18.1% at the High threshold, and 17.3% at the Severe threshold. [4] Trenton has double the statewide average of the number of households exceeding affordability thresholds when considering water and sewer bills. The 360 Review considers the increasing costs to the water bill over a 10-year period and 20-year period under each of the alternative governance models. The fact that Trenton has already surpassed statewide affordability thresholds makes the consideration for an alternative governance model even more relevant for TWW to fund its operations and capital projects necessary to meet drinking water standards.

[4] A New Jersey Affordability Methodology and Assessment for Drinking Water and Sewer Utility Costs A Project of New Jersey Future for Jersey Water Works Daniel J. Van Abs PhD, FAICP/PP With Tim Evans and Kimberley Irby, New Jersey Future August 2021

Estimated Percentage of Households Exceeding Affordability Thresholds for Water and Sewer			
	Baseline Threshold	High Threshold	Severe Threshold
Statewide	20.6	18.1	17.3
Trenton	41.5	39.1	38.1

As Table 11 from the cited report illustrates, Trenton has a very high percentage of households that reach all three thresholds.

Table 11. Percentage of Households Exceeding Affordability Thresholds, Large Municipalities					
County	Municipality Name	HHs with known data for both water & sewer	Estimated % of HHs exceeding Baseline threshold	Estimated % of HHs exceeding High threshold	Estimated % of HHs exceeding Severe threshold
Hudson	Jersey City City	100,986	24.7%	22.2%	21.4%
Essex	Newark City	96,870	35.0%	31.6%	30.4%
Passaic	Paterson City	44,746	37.4%	33.6%	32.1%
Union	Elizabeth City	40,315	31.5%	27.4%	26.0%
Middlesex	Edison Township	34,878	12.9%	11.7%	11.3%
Ocean	Toms River Township	34,461	20.1%	16.6%	15.4%
Middlesex	Woodbridge Township	33,864	15.7%	13.9%	13.3%
Mercer	Hamilton Township	31,677	15.8%	13.6%	12.9%
Ocean	Brick Township	29,689	18.2%	15.9%	15.1%
Passaic	Clifton City	29,167	17.8%	15.5%	14.7%
Mercer	Trenton City	27,373	41.5%	39.1%	38.1%
Camden	Cherry Hill Township	26,284	17.3%	14.0%	12.8%
Hudson	Hoboken City	25,069	12.9%	11.9%	11.5%
Hudson	Bayonne City	24,964	24.4%	20.5%	19.3%
Camden	Camden City	24,725	55.8%	49.7%	47.6%
Somerset	Franklin Township	24,393	18.4%	16.8%	16.4%
Middlesex	Old Bridge Township	24,105	15.4%	12.7%	11.8%
Ocean	Lakewood Township	23,869	30.2%	24.8%	23.0%
Monmouth	Middletown Township	23,681	16.4%	14.2%	13.5%
Essex	East Orange City	23,587	27.7%	24.8%	23.8%
Camden	Gloucester Township	23,350	17.8%	14.8%	13.9%
Hudson	North Bergen Township	21,791	25.4%	21.4%	20.2%
Essex	Irvington Township	20,392	29.8%	25.6%	24.3%
Union	Union Township	20,382	17.3%	14.7%	13.9%

Source: A New Jersey Affordability Methodology and Assessment for Drinking Water and Sewer Utility Costs, August 2021.

3.0 Background

3.1 City of Trenton and Trenton Water Works

TWW, owned by the City of Trenton, has been in existence in one form or another since the early 1800s. It was formally incorporated into City government in the latter part of the 19th century and currently functions as the Department of Water and Sewer within the City of Trenton. As such, it is subject to review by the City Council, reporting to the Department of Community Affairs, oversite by the NJDEP and the Board of Public Utilities (BPU) in some limited cases. As a side note, there is pending litigation between the City of Trenton, the NJDEP, and various governmental customers of TWW on a variety of issues.

The city obtains its water directly from the Delaware River. It is treated at a central treatment facility, and except for the gravity zone which receives water directly from the plant, water is stored in an uncovered finished water reservoir and distributed to its customers. Pursuant to a US Supreme Court decree in 1936, Trenton is entitled to a set amount of withdrawal rights from the Delaware River, subject to the oversight of the Delaware River Basin Commission in times of drought or another emergency.

The System has evolved over time and now TWW is accountable for hundreds of millions of dollars of critical water assets impacting the public health for New Jersey's state government and institutions and economic wellbeing of nearly a quarter of million people living in the Mercer County area and nearly 10 million travelers annually through the Trenton transportation corridor.

The Water System includes approximately 150 employees, a conventional water treatment plant designed for 60 MGD (but not able to produce that amount), a water treatment plant waste mechanical dewatering facility, a 45 MGD booster station, a 3 MGD booster station, a 2 MGD booster station, 100 million gallon ground storage reservoir, 4 one million gallon elevated storage tanks, a 1.4 million gallon standpipe, a 600,000 gallon hydropillar, about 630 miles of water main, about 8,500 valves, about 1000 fire hydrants, about 63,000 metered customer services (population service area 225,000) in the City of Trenton and to significant portions of the four surrounding Townships of Ewing, Hamilton, Lawrence and Hopewell and four emergency interconnections with adjacent water utilities. TWW owns the assets except for pockets of private water pipe systems.

"Until fairly recently, the City of Trenton was by far the largest consumer of this water supply. Over the past two decades, growth in Ewing and Hamilton townships, as well as new developments in Hopewell and Lawrence townships have made Trenton Water Works a significant regional water supply entity, creating a situation where the City of Trenton is no longer is the majority customer of its own System. This creates funding, organization and governance issues..." [5]

TWW faces many of the same issues identified in the development of the 2015 Trenton250 master planning efforts. In the area of addressing Good Governance, TWW still struggles 10 years later with the issues concerning revenue and taxes, budget cuts, no shared data, lack of technology, lack of customer service, lack of strategic partnering with state and county, poor coordination of community partnerships and leaders, plans not used to improve outcomes, budgets not being strategic, and no responding to changing demographics. Municipal control, policies and management tend to directly impact a municipal utility.

[5] City of Trenton Department of Water and Sewer Water Utility (Trenton Water Works) Report on Staffing and Budget DRAFT Prepared by: Steven Picco, GEAN Group, LLC Scott Holmes (Co-Author), Alaimo Group (August 12, 2024)

For the City of Trenton, this includes the following issues under the governance area of Insufficient Revenue, Budget Cuts, and High Tax Rates: Specifically, this includes the following: OBJ

1. Only a quarter of the city's budget comes from tax revenue.
2. Property tax revenue relies too heavily on residential development, which places a stress on already cost-burdened homeowners and makes Trenton a less desirable place to live.
3. According to the State of New Jersey, the City of Trenton has had the highest effective tax rate in Mercer County. Transitional Aide City of Trenton is mandated to raise its taxes no less than 2% each year. The increase in taxes coupled with no additional benefits seen by residents causes dissatisfaction with the quality of life in the city.
4. Too many large parcels are tax-exempt (i.e., State / religious properties) and not at optimal use to facilitate a vibrant economy.
5. The City of Trenton is too reliant on state funds and subsidies. Relying heavily on state funds and subsidies leaves the city with limited opportunities to expand its budget and provide improved services.
6. The City's commercial economy is currently not diverse enough to offset the homeowners tax rate.

Given these factors, cities with affordability threshold issues like Trenton may tend to rely on either transfers from utility enterprise funds into the general fund or utility budgets and resources that generously include general fund positions or expenses. With poor data, lack of records and customer service gaps, billing errors occur, and revenue is not collected on a timely basis. The lack of data and accountability can also cause a great deal of deferred maintenance which can cause premature failure of water assets threatening water delivery and quality. This causes difficulties for the utility, its staff, rate payers, renters, and homeowners. In governmental organizations such as Trenton, past practices are a strong indicator of future expectations applied to TWW.

3.2 TWW's Technical, Managerial and Financial Assessments Limitations

The following three capacity measures are determinations made based on BV's onsite reviews, research, and data collection activities as well as observations detailed in the NJDEP's third-party TMF study. Overall assessments in each of the three areas constitute an extremely high risk. While orange is a "medium" risk, bright red is a "high" risk the darker red represents "extreme high" risk.

TECHNICAL CAPACITY

1. Source Water Adequacy (Water Source Reliability (not infrastructure), Quality, and Protection)

2. Infrastructure Adequacy (Infrastructure Condition, Capital Improvement Plan, and Life Expectancy)

3. Technical Knowledge & Implementation (O&M Program, Operator Certification, Asset Management, Planning, LSL Compliance, PFAS Compliance, and Water Loss/Unaccounted Water)

MANAGERIAL CAPACITY

1. Ownership Accountability (Ownership Identification. Management. Information System [MIS], GIS/Asset accountability, Computerized Maintenance Management System/Workforce performance)

2. Staffing and Organization (Policies & Procedures, Operator/Manager. Identification, Qualified staff, Appropriate staff, Training & Education, and Regulatory knowledge).

3. Effective Linkages – (Customer Communication, Regulator Communication, Intersystem Communication, External Resources, Customer Complaint Tracking)

FINANCIAL CAPACITY

1.	Revenue Sufficiency (Billing & Collections, Rate Structure, Revenue for Depreciation & Interest., Revenues v. Expenses, Cost of Service Studies)	
2.	Credit Worthiness (Financial Ratios (DS Coverage; Operating ratio; Operating Cash Reserve; Debt ratio; Expense ratio; Sales ratio, and Debt-to-Equity ratio), Bonds and Assurances, Access to Capital, and Credit Rating)	
3.	Fiscal Mgmt. & Controls (Books & Records, Accounting Policies, Budgeting & Reporting, Capital Facilities Plans, Asset Valuations, Reserves Policy, Investment Strategy, Financial Plan, Affordability / Customer Assistance Plans)	

3.3 NJDEP Oversight

On October 12, 2022, the NJDEP issued a "Unilateral Administrative Order" (UAO) pursuant to the New Jersey Safe Water Drinking Act in the matter of Trenton Water Works (TWW) which authorized the NJDEP to take oversight responsibility for TWW. The NJDEP has authority to issue such an order "when a contaminant that is present in or is likely to enter a public water system may present an imminent and substantial endangerment to the health of persons."

The UAO found – among other things – that the TWW "failed to properly maintain critical treatment processes, monitor water quality, employ adequately trained personnel, and invest in required maintenance and capital needs." That since 1976 or nearly 50 years, TWW had "insufficient training of operating personnel, an absence of emergency plans, a lack of proper maintenance at the plant, insufficient funding of maintenance and training, and a lack of understanding of the factors which are essential to the efficient and reliable operation of a water utility." The UAO further concluded that its findings "reverberate through the present-day pattern of insufficient … actions, … ongoing failure to sustain compliance" (with federal regulations) combined with a lack of "technical, managerial, and financial capacity to properly maintain and operate TWW in a manner that consistently and reliably produces safe drinking water…"

The UAO also outlines, in detail, actions taken by the former Trenton City Council to block access to necessary capital funding, failure to adopt a timely 2022 budget and decisions causing Technical Default under the existing loans from the New Jersey Water Bank critically making TWW ineligible for future federal infrastructure funding and making it unlikely TWW can "meet their long-outstanding obligations under the Safe Drinking Water Act, which presents an imminent and substantial endangerment to human health."

The UAO granted the NJDEP oversight authority over the daily operations of the treatment and distribution activities of TWW, including the placement of a third-party firm, Mott McDonald, to operate the treatment plant directly. The UAO also directed several independent concurrent studies and reports by selected engineering firms including a Technical Managerial Financial (TMF) and Comprehensive Performance Evaluation (CPE) of the treatment plant report by a third-party firm, and this 360 Review Financial and Alternative Governance Review by BV and API.

4.0 The 360 Review

In general, it is important to keep an open mind for the change and betterment of water systems, considering they will continue to face greater challenges in the next 20 years, such as impacts from inflation and material cost increases, climate change, forever chemicals, and stricter regulations. Every utility will need to consider some form of consolidation, regionalization, municipalization or privatization as alternative solutions to adequately address and meet the challenges of aging water infrastructure, rising costs, environmental and regulatory change, customer affordability, technology impacts and workforce shifts. The 360 Review is an approach that facilitates the review of these alternative solutions by taking into consideration the pros and cons of alternative governance structures.

360 Review Key Steps
• **Asset and Infrastructure Data Collection and Review**
• Operations and Maintenance Review and Policy Discussion
• Capital Improvement Program Review and Policy Discussion
• Facilities Review
• Overview of Staff Qualifications Review
• Organizational Assessment Review
• **Financial Modeling and Data Collection and Review**
• Development of Revenues
○ Customer, Usage, and Flow Projections.
○ Revenue Projections.
○ Miscellaneous Revenue.
• Development of Revenue Requirements
○ Project Operation and Maintenance (O&M) Expense.
○ Capital Improvement Program Financing Plan.
○ Debt Service Expense.
○ Reserve Funding.
• **Cash Flow Analysis.**
○ Establish Baseline Model (Do Nothing)
• **Determine Alternative Governance Organizational Structures**
○ Status Quo (Municipal Model)
○ Municipal Utilities Authority (Regional Model)
○ Privatization Model
○ Public Private Partnership (P3 Model)
○ Hybrid Model
• **Develop Cash Flows for Each Model**
○ Develop Scenarios
• **Asset Optimization Analysis**
○ Economies of Scale
○ Operating Expense Efficiencies
○ Capital Expenditure Efficiencies
○ Tax & Credit Arbitrage
○ Utility Rate Regime Reforms
○ Utility Value
• **Liability Optimization Analysis**
○ Debt
○ Pension
• **Credit and Financial Analysis**
• **Alternative Governance Comparable Analysis and Findings**
• **Report and Recommendations**

4.1 360 Review – General Approach

The 360 Review approach (Key Steps chart) studies various utility operational areas, including but not limited to, infrastructure, system processes, human resource, and financial operations and structure, and is designed to:

- Identify opportunities to improve water services and reduce utility costs.
- Study the implementation of recommended changes under different governance structures to determine optimal operational and financial results.

The draft TMF report dated October 2024 for TWW, prepared by a third party, confirms that NJDEP's concerns were well justified regarding TWW. Specifically, NJDEP felt that TWW may not be able to "meet their long-outstanding obligations under the Safe Drinking Water Act, which presents an imminent and substantial endangerment to human health." **The 360 Review process also identified serious water system deficiencies** such as the medium voltage equipment powering the raw water intake pumps and the high lift pumps providing water to the uncovered finished water reservoir that are at risk of failure and pose the risk of a serious water incident that compromises the health and safety of TWW customers and may drive the prioritization of the capital projects. These capital needs demand immediate attention as do several of the other projects such as a computerized maintenance management system (CMMS) on an updated TWW CIP with an estimated cost of $501.2 million over 10 years, ($569.6 million escalated for inflation). $621.3 million 2024-2044 ($730.2

million escalated for inflation). Equally important are the overall TWW TMF and 360 Review findings regarding governance, management and operations that must be rectified.

4.2 Alternative Governance Models

The key features of the 360 Review are divided into areas of Alternative Governance Models, Asset Optimization, Liability Optimization, and Credit and Financial Analysis. The 360 Review identifies four additional models for comparison purposes that represent possible alternatives to TWW's current framework. The study covers the two ends of the spectrum of ownership, governance, and management options, starting with the **"TWW Status Quo Model,"** a Municipal Model on one end and the **"IOU Model,"** a Privatization by an Investor-Owned Utility on the other end. The study also analyzes three other options that can bolster governance, water system integrity and sustainability, and water affordability through regionalization and/or better management. They are the **"MUA Model,"** a Municipal Utilities Authority, the **"SPE Model,"** a Special Purpose Entity (SPE) that combines the strengths of both the public and private models, and the **"P3 Model,"** a Trenton initiated and led Public-Private Partnership (P3). The special purpose entity may be a not-for-profit (NFP) corporation, a State-Sponsored infrastructure Fund, Government Sponsored Enterprise (GSE), or other similar instrumentality of government, but for the purpose of the 360 Review, the SPE is assumed to be a State-Sponsored Water Sustainability Fund, which would require legislation or reverting to a NFP structure.

4.3 Asset Optimization

The 360 Review seeks to identify new financial resources through the optimization of utility assets under alternative governance structures. This analysis is based on the i) 360 Review findings of a third-party analysis of TWW's TMF (Draft dated October 2024) conditions and the ii) 360 Review estimates of how changes to governance can impact utility performance, water quality, user costs, and total public benefits. Furthermore, Asset Optimization involves crystalizing the "Hidden Value" and the "Asset Optimized Value" of existing utility assets and deploy such newfound value to advance public health, improve water affordability, and ease the burden of government.

- "Hidden Value" or "Appreciated Value" of assets on the balance sheet is the difference between "Book Value" (original cost less depreciation) and the Fair Market Value (FMV) of the asset.
- "Asset Optimized Value" is the increase in "equity-asset value" resulting from improvements in utility operations and financial performance evidenced by greater anticipated "free cash flow," calculated on a present value (PV) basis over 20 years.

4.4 Liability Optimization

The 360 Review widens the lens of public finance by not only managing the cost of debt, but it also incorporates the net pension liability (NPL) into the optimization analysis. Unfunded public pension liabilities stand as one of the top financial challenges for the State of New Jersey and its municipalities. Although the state has made great strides in the last several years to contain the spiraling cost of pensions, these legacy costs remain a heavy burden for cities like Trenton and its neighbors which have a combined NPL of ~ $450 million, which is on a PV basis. Most importantly, where asset optimization will cost $1 for every $2-3 dollars saved, liability optimization can generate similar savings at a fraction of the cost. Thus, the added value from liability optimization can be achieved by:

- Restructuring debt and pension obligations to minimize costs, and
- Coupling the restructuring with NJ Water Bank assistance, which may include State Revolving Fund (SRF) and Federal Water Infrastructure and Finance Innovation (WIFIA) loans.

So, whether you are a large corporation or the average household, paying off high-cost debts before lower cost, long-term liabilities is generally a good idea.

4.5 Credit and Financial Analysis

The task here is to compare the existing TWW credit with the possible uplift in creditworthiness that could result from remedial actions taken in response to the NJDEP UAO and subsequent undertakings. Accordingly, performing a credit review of TWW in conjunction with an engineering and governance assessment is necessary and proper given that the shortcomings in TWW asset conditions, operations, management, and capital investment highlighted in NJDEP's UAO and detailed herein. These challenges go to the heart of TWW's creditworthiness.

The five governance models are reviewed utilizing a Qualitative Assessment and a Quantitative Analysis and both are intended to arm Trenton and TWW with the necessary tools to take full advantage of opportunities to improve the governance of TWW. This is an essential step needed to provide TWW customers and the public with the assurances that – *the water they drink is safe, clean, reliable and being provided at the most affordable cost*. This is only achievable by strengthening TWW's governance, management, operations, service, and financial resources. Critical advancements such as these will greatly enhance the credit rating prospects and financial capacity of both the city and the utility.

5.0 360 Review Qualitative Assessment

5.1 Water Essentiality and Trusted Stewardship

Water is an essential resource that demands significant capital investment in infrastructure, even more so than electric and gas on a relative basis. This heavy investment, which may serve customers for 100 years or more, together with the distribution systems, makes water utilities essentially immune from competition and effectively natural monopolies. This raises concerns about water governance and pricing and is the source of great public anxiety. The role of a PWS in sourcing, treating, and transporting potable water is a privilege that comes with an inviolable responsibility that the water is safe, clean, reliable, and affordable. This privilege and its attendant responsibilities are the same regardless of where it falls on the public vs. private spectrum of ownership and control.

Given that many states across the nation, including New Jersey, face substantial funding gaps in water, wastewater, and stormwater infrastructure, it makes sense to take full advantage of all available resources, including the strengths of both the public and private sectors, to deliver the best solutions to customers and taxpayers. The funding gap in water, wastewater, and stormwater infrastructure is substantial. The American Society of Civil Engineers estimated the funding gap to be over $434 billion nationally between 2020-2029. New Jersey, being a mature and densely populated state, accounted for $31 billion of this gap, or 2.5 times the U.S. average. A recent study of over 800 water utilities reported that 20% of the water mains are beyond their useful lives and need to be replaced but have not been due to the lack of funds.[6] TWW's move to a 1% water pipe replacement rate representing a 100 year life may not address the pipes that require replacement immediately and with a lack of pipe condition assessment data TWW's water main breaks and water loss may remain high and requiring additional funding.

The 360 Review recognizes the long-standing schism that exists between public and private ownership of water systems and fully appreciates the strengths of both models as it relates to address funding for operations and capital projects. In the U.S., the public owned models are the most prevalent, serving 85% of the population, however one cannot rule out private ownership as embraced by European countries such as France and Great Britain. This dichotomy may be attributable to the substantial tax preferences granted to US state and local government enterprises, making private competition challenging.

5.2 What Do Empirical Studies Reveal: Public or Private?

Therefore, which ownership and governance structure — public, private, or somewhere in between — is more efficient and offers better outcomes is a matter of great debate and dozens of empirical studies. The divide between the public and private models is wide yet each model may be able to contribute something to improve outcomes. The 360 Review approaches all models with an open mind.

Of the many empirical studies on the outcomes from public vs. private models, the findings have generally been mixed regarding the differences in the price of water between the two models. Also, these results are a departure from the prevalent views among industry practitioners and consumer advocates alike. Practitioners tend to believe that the private model is more efficient because the owner's profit motive demands higher financial performance and greater control of costs and risks. Consumer advocates tend to feel that private owned utilities are more costly due to high profit margins. That said, studies have found that private owned water utilities have a better history with regulatory compliance.

[6] Barfuss, Steven L., "Water Main Break Rates in the USA and Canada: A Comprehensive Study" (2023). *Reports.* Paper 682. https://digitalcommons.usu.edu/water_rep/682

With respect to cost and efficiency, these empirical studies generally focus on total water prices, and they cover a broad cross-section of water markets. The public owned water utilities are 1) "Super Tax-Exempt," i.e., they are exempt for Federal and state income taxes, state sales taxes, local property taxes, and the interest on their debt generally qualifies for exemption from Federal income taxes, and 2) they effectively operate as nonprofit enterprises, giving them a combined 30% to 45% water cost advantage over their private owned counterparts depending on the state. Yet, private owned utilities still compete reasonably well, begging the question which form of ownership, public or private, is more efficient.

5.3 Federal Policy & Tax Law Help Drive Infrastructure Financial Innovation

Furthermore, the public vs. private schism has spurred practitioners to innovate on a variety of fronts that capitalize on the relative strengths of the public and private sectors, including shared services, operating contracts, alternative delivery of capital projects, and public-private partnerships (P3s). As was the case with these innovations, much of public finance in the US is driven by:

- Federally sponsored initiatives, the largest of which are the State Revolving Loan Fund (SRF) programs and the loans under the Water Infrastructure Finance Innovation Act (WIFIA), and
- Federal tax law changes like:
  - Liberalization of private management contract rules for public asset,
  - Tax Clarification under *Code Sec. 1.148-1(e)(4)* permitting U.S. public pension funds to own and invest in infrastructure assets that benefit from tax-exempt debt, and
  - Expansion of Tax Credits for infrastructure investment.

These Federal inducements are fostering new ownership structures and new forms of municipalization, like the SPE Model.

5.4 Factors Affecting Governance Alternatives

Before getting in the details of the models to be considered and the discussion of asset and liability optimization, it is important to consider how the following aspects of water utilities and their operations and finances affect the governance alternatives.

- **Tax Considerations and Super Tax-Exemption.** As discussed, public owned utilities are super tax-exempt, which compared to a private owned utility, where taxes alone can range from 10-35% of the price of water, depending on the state. So, public owned utilities and nonprofits in New Jersey have an inherent cost of goods advantage over the private owned utilities even before accounting for their requisite profit margin. Taxation is a material cost driver for private utilities as they are subject to Federal and state income taxes, pay state and local sales taxes, local property taxes or payments in lieu of taxes (PILOT), and incur other sundry taxes, fees, and charges, depending on the jurisdiction. In New Jersey, state and local taxes can amount to approximately two thirds of an IOU's tax burden, meaning those higher water costs go to meet state and local budget needs which in itself are a public benefit.

- **Governance**. Governance is the manner of governing and the process of controlling an enterprise's ethos, and so the direction of an enterprise is through its governance. Governance is critical to the success of an organization, whether leading a public or private enterprise, as governance is the primary driver of performance and long-term results. The 360 Review's five key factors for assessing governance are:
  - *Governance* standards and the quality of governing board and management oversight.
  - *Framework* factors that provide the underpinnings for maximizing public benefits include super tax-exemption, nonprofit structure, economies of scale, and better management.
  - *Execution Risk* that includes complexity, ease of completion, and timeline as well as ready access to low-cost capital with attractive financing terms.
  - *Stakeholder Representation*, engagement, and transparency.
  - *Social Impact* of moving to an alternative governance model.
- **Management Mission and Focus**. Transforming TWW into a High Performance-Driven Utility means excelling in the following areas:
  - *Independence where outside influences are minimal, and decision making is sound, deliberate, and timely.*
  - *Leadership with clearly defined and articulated mission as well as a long-term focus and disciplined approach to management of operations, capital assets, risks, and rates*.
  - *Management that is strong and builds and retains highly capable and productive teams and is committed to local employment, and minority and women-owned business enterprise (MWBE) contracting objectives.*
  - *Performance Measures at all levels of the organization are tied to rewards and penalties.*

Management Commitment to Local Hiring. As indicated in the TMF, the compensation structure and the city's residency requirement for employment by TWW, notwithstanding the permitted exceptions, has had a detrimental impact on TWWs ability to meet its staffing needs. Accordingly, a full reassessment of TWW compensation and expanding its employment pool are a must. Fortunately, the significant savings offered by regionalization (MUA & SPE Models) and from capitalizing on the strengths of large, private, utility platforms (SPE, TWW P3 & IOU) can readily afford a robust local employment and business partnership campaign with a heavy emphasis on local contracting. Any governance model under serious consideration should:

- Identify the responsible party that will lead and be accountable for the promotion of local hiring, better job training, MWBE partnerships, and career development.
- Contribute to the funding of new jobs academies and joint ventures with Mercer County's Community College, Technical Schools, and other vocational programs in the area.
- Establish protégé mentoring programs partnering with labor and industry.

These types of initiatives have been proven to work and will equip residence in Trenton and throughout Mercer County with valuable skills that can lead to higher-paying jobs and sustainable careers as well as improve individual livelihoods and the quality of life in the area, especially in the underserved communities.

- Management Oversight – Direct Regulation or Regulatory Agreement. The public expects strict oversight of utilities that are effectively monopolies. Generally speaking, the regulatory and

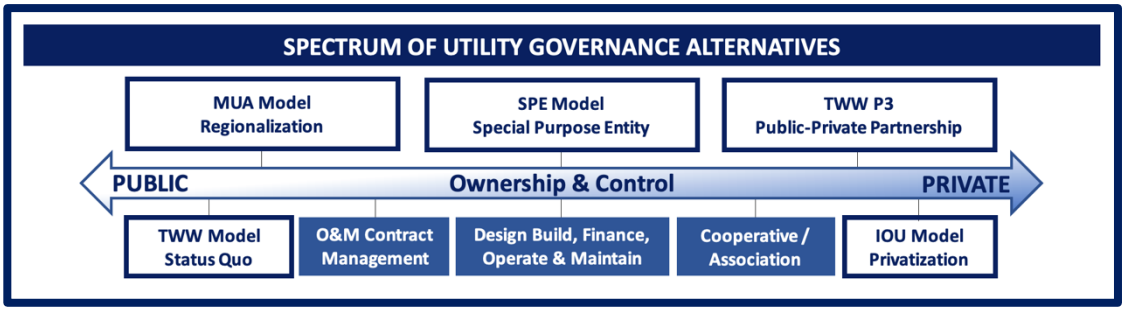
contractual approaches both work to safeguard public health and water affordability, as well as to align the interests of service providers and consumers, depending on the:

- *Power and authority delegated in law to the regulator or in the agreement to the contract administrator.*
- *Quality and strength of the regulator and contract administrator.*

- Creditworthiness – Methodologies for rating a public owned vs. private owned water utility are meaningfully different as public owners have a distinct rating advantage, where they control rate setting and can pledge a municipality's general obligation (G.O.) to the utility debt, as Trenton and many others have done. Although Trenton and each of the other alternatives will have access to Water Bank SRF loans, including principal forgiveness, that is no reason to ignore the basic tenets associated with water utility creditworthiness, especially where the future availability of SRF loans is dependent on Federal and state budget appropriations. Given that Trenton has a Moody's rating of "Baa2" which is two notches above a "non-investment grade" credit, the public model alternatives will need to overcome several weaknesses that underlie this rating. Lastly, the "outsized" CIP and the potential liquidity pressures that this may cause for the city represent red flags that Moody's has highlighted as issues that can lead to a rating downgrade.

5.5 Governance Model Considerations

There is a wide spectrum of alternative governance models for water systems and the 360 Review has selected four models to compare to the TWW Status Quo Model which is a Municipal or Muni Model. To varying degrees, each of the governance alternatives offers to i) transform TWW more quickly and effectively into a utility that meets high industry standards for operations, water quality, and public health, ii) bring about the required changes at substantially less risk, iii) provide more affordable services, and iv) generate significant public benefits.



These models can vary greatly in terms of governance, management, and optimization potential, and the differences between the public and private models deserve careful attention as both can contribute significantly to addressing the challenges that TWW faces. The 360 Review employs both "Qualitative Assessment" and "Quantitative Analysis" to gauge the relative strengths and drawbacks of each model. The models include:

- the **TWW Status Quo Model** – *Municipal or Muni Model*
- the **MUA Model** –*Municipal Utilities Authority Model,*
- the **SPE Model** *(Special Purpose Entity either State-Sponsored or Nonprofit Corporation),*
- the **TWW P3 Model** – *Public-Private Partnership led by the City of Trenton*, and
- the **IOU Model** – *Privatization or Private Model*

The overarching goal of the 360 Review is to "energize" community interest in "change" by identifying areas where alternative governance and superior management can hasten the pace of positive change by bringing urgent attention to critical needs like TWW's electrical system, a single point of failure that can disrupt water treatment and distribution for weeks. Moreover, better management of operations, capital assets and risk will greatly drive water affordability while new approaches to debt management offer Local Tax & Budget Relief. Together, ratepayers and taxpayers find themselves in a common cause where joint action can effectuate positive change.

6.0 Overview: TWW Status Quo and Alternative Governance Models

360 REVIEW OF GOVERNANCE ALTERNATIVES

Critical Qualitative Assessment

	TWW	MUA	SPE	TWW P3	IOU
GOVERNANCE	**WEAK**	**EXCELLENT**	**GOOD**	**FAIR**	**FAIR**
Governance – *High Standards & Strong Oversight*	✗	★	★★★	★★	★★
Framework – *Super Tax-Exempt, Nonprofit, Ecomomies of Scaled via Regionalization and/or Contract / P3 Manager*	★	★★★	★★★	★★	☆☆☆
Execution Risk – *Complexity, Ease of Completion & Timeline*	✗	★★	★	★	☆☆☆
Stakeholders – *Represented, Engaged & Transparent*	☆☆☆	★★★	★★	☆☆☆	☆☆☆
Social Impact – *Hard Work of Changing TWW's Governance*	★	★★	★	☆☆☆	☆☆☆
MANAGEMENT	**CHALLENGED**	**GOOD**	**EXCELLENT**	**GOOD**	**GOOD**
Independence – *Strong Shield Against Outside Interferences Fosters More Decisive & Timely Decisions*	✗	★	★★★	★	★★
Leadership – *Talented, Strong Team Builders, Aligned with Mission, and Welcome Accountabiliy & Benchmarks*	✗	★★	★★	★★	★★
Operations – *High Industry Standards & KPIs for Water Qualtiy, Operations, etc. - Best Transformation within 3 yrs.*	✗	★	★★★	★★	★
Capital – *Complete 5 Yr. CIP (On Time/Under Budget)*	✗	★	★★★	★★	★★
Risk – *Most Capable at Managing Risk Efficiently*	✗	★	★★★	★★★	★★★
OPTIMIZATION	**FAIR**	**EXCELLENT**	**EXCELLENT**	**GOOD**	**GOOD**
Optimize Asset – *Best Framework to Improve OpEx & CapEx*	☆☆☆	★	★★	★	★
Optimize Liabilities – *Debt & Pension Restructuring Options*	☆☆☆	★★	★★★	★	★
Rate Setting – Able & Willing to Raise Rates to Meet KPIs	☆☆☆	★★	★★	★★	★
Ratings – *Able to Improve Utility's L-T Credit Prospects*	✗	★★★	★★★	★	★★
Financial Aid – *Able & Motivated to Maximize Assistance*	★★	★★★	★★★	★★★	★

6.1 TWW Status Quo Model – Municipal or Muni Model

TWW is operating with significant Technical, Managerial, and Financial challenges and water system deficiencies pose the risk of serious water incidents for TWW customers.

Governance & Board	Trenton continues to be sole owner and operator of TWW as a unit of the city. The Mayor and City Council are responsible for oversight, approvals, and water rates. City policies and practices will continue to be applied to TWW's staff and operations.
Framework	Super Tax-Exempt with a limited margin to the city. There is no asset transfer, so city retains tax ownership & TWW remains eligible for tax-exempt financing. Trenton has the power to set rates.
Management	TWW general manager reports to the Mayor's Office. TWW is the utility operator and engages sub-contractors, as needed, and is also responsible for capital asset and risk management.
Risk Management	TWW bears operations & construction risks as well as risks that are difficult or costly to transfer, e.g., volume, effluent & influent, changes in law & regulation, force majeure, etc. Like other utility models, these risks are borne by ratepayers, except in cases of negligence, malfeasance, and fraud, where taxpayers may be at risk in a Municipal Model.

Overview. The Municipal Model is well tested, but TWW is a reminder of the importance of governance & management.

- Governance is key to providing for public health and safe, clean, reliable & affordable water.
- TWW faces daunting and pervasive operational, management, and financial challenges.
- TWW has water system deficiencies that pose the risk of serious water incidents that present unacceptable and avoidable risks to public health and safety.

The City of Trenton and TWW customers could benefit greatly from a regional partnership with its neighbors.

- Good suburban growth has resulted in TWW's suburban customers now accounting for 56% of revenues.
- Regionalization will afford local employment and contracting initiatives that take greater advantage of area technical programs and partnering opportunities with industry and labor.

Operations. TWW governance is directed by the City and lacks independence and strong leadership, contributing to serious short comings in operations.

- Deficiencies in the management of operations, capital assets, and risk have placed community public health and safety at risk.
- CIP will force rates significantly higher, straining water affordability.

GOVERNANCE ALTERNATIVES Critical Qualitative Assessment	TWW
GOVERNANCE	**WEAK**
Governance	✗
Framework	★
Execution	✗
Stakeholders	☆ ☆ ☆
Social Impact	★
MANAGEMENT	**CHALLENGED**
Independence	✗
Leadership	✗
Operations	✗
Capital	✗
Risk	✗
OPTIMIZATION	**FAIR**
Optimize Assets	☆ ☆ ☆
Optimize Liabilities	☆ ☆ ☆
Rate Setting	☆ ☆ ☆
Ratings	✗
Financial Aid	★ ★

There is no evidence that once NJDEP UAO is lifted that the City can transform TWW into a utility that consistently meets NJDEP requirements and has the plan, the team, the industry partners, and the funding to assure the public that the water is safe, clean, and reliable without reservation and with all deliberate speed.

Finance. The long history of neglect and mismanagement has precipitated an "outsized" CIP, which threatens a downgrade of the city's credit rating even with substantial state assistance.

- The City of Trenton's very low (Baa2) credit rating is two notches above "non-investment" grade and is propped by its spurious liquidity.
- TWW's deferred maintenance may have buttressed City liquidity.

6.2 Municipal Utilities Authority (MUA) Model – MUA Model

Regionalization fosters better governance, high quality, and affordable water.

Governance & Board	MUA acquires ownership and control of TWW, and any other assets transferred by participating communities. MUA Board will be the governing body.
Framework	MUA is Super Tax-Exempt with no or limited profit margin and is the Tax Owner of TWW. It is eligible for tax-exempt financing. MUA has the power to set water rates.
Management	MUA will be responsible for all its assets including management of operations, capital assets, and risk, and would be required to initiate remedial actions at TWW to assure that the water is safe, clean, reliable, and provided at affordable cost, as well as assure full NJDEP compliance.
Risk Management	MUA assumes all risks of ownership, including operations and construction risks as well as risks that are difficult or costly to transfer, which risks are borne by ratepayers.

Overview. The MUA, like the SPE, assumes a regional approach to water utility management that represents all its ratepayers and is committed to full engagement and transparency.

- Trenton and participating neighbors join, and collectively, transfer assets to the MUA that enhances water operations through improved governance and management.
- Analysis does not estimate the benefits of other contributed utility asset albeit significant.

Operations. TWW's pay and residency hiring requirement have created staffing challenges. MUAs offer to build on the combined strengths of their utilities and other assets to enhance governance and management

and may also be a ready source of trained managers, technicians, and staff support as well as a magnet for qualified new hires.

- Regional models can afford to improve pay and promote local jobs.
  - Bolster jobs training at community college and technical programs with a Jobs Academy and Protégé Mentoring with industry and labor.
  - Place strong emphasis on local hiring and MWBE contracting.
- Better training equips citizens with valuable skills, higher-paying jobs, sustainable careers, and a better quality of life.

Mercer County has three large municipal wastewater treatment systems, while TWW is the only large municipal water system.

- MUA will effectively be a start-up with limited water experience.
- MUA may need to engage contract manager or enter a P3.

Finances. Like the SPE & IOU Models, the MUA would greatly relieve Trenton's balance sheet and help mitigate the threat of a credit rating downgrade.

- MUA will target financial metrics that support an "A" rating, and
- Quantitative analysis assumes the same level of asset optimization (interest subsidy and principal forgiveness) benefits for all four alternative governance models.

GOVERNANCE ALTERNATIVES
Critical Qualitative Assessment

	MUA
GOVERNANCE	**EXCELLENT**
Governance	★
Framework	★★★
Execution	★★
Stakeholders	★★★
Social Impact	★★
MANAGEMENT	**GOOD**
Independence	★
Leadership	★★
Operations	★
Capital	★
Risk	★
OPTIMIZATION	**EXCELLENT**
Optimize Assets	★
Optimize Liabilities	★★
Rate Setting	★★
Ratings	★★★
Financial Aid	★★★

6.3 Special Purpose Entity (SPE) Model – Sponsored by State or Nonprofit

SPE Model is a hybrid combining the best of the public and private models.

Governance & Board	SPE as a government instrumentality, acquires TWW pursuant to an AIK to the New Jersey Pensions, and the SPE Board, appointed by the Governor, is the governing body. Board retains Administrator and SEC Registered Investment Advisor (RIA) to oversee utility and serve as pension fund fiduciaries.
Framework	Super Tax-Exempt and a nonprofit structure that includes an investment return to pension owners which provides Local Tax & Budget Relief. SPE is the new Tax Owner and is eligible for tax-exempt debt, including acquisition costs, and has the power to set water rates, subject to the AIK transfer agreement.
Management	RIA engages a contract operator (or P3) and is responsible for asset oversight and overall management, including the mandate to accelerate TWW's rehabilitation. RIA oversees operator performance, e.g., strict KPIs, incl. health and water quality metrics, sub-contractors and NJDEP regulatory compliance, and financial results.
Risk Management	SPE assumes the risks of ownership but can transfer much of the operations & construction risks to a private party and risks that are difficult or costly to transfer are borne by ratepayers, except in cases of negligence, malfeasance, and fraud.

Overview. The SPE Model, a regionalization that includes all TWW customers, is a hybrid that combines the private sectors high, pension fiduciary standards and strong management that is bound by strict KPIs with the advantages of the public model that include super-tax-exempt and nonprofit structure, independent rate setting authority, and the ability to provide Local Tax & Budget Relief under new Federal Tax Rules as consideration for ownership interest in TWW and other contributed utility assets.[7]

Operations. Like the TWW P3, the SPE engages a private partner which will be contractually obligated to meet high KPIs with compensation tied to performance, including water standards, hiring targets, and NJDEP compliance, subject to strict oversight and monitoring by the RIA.

- In addition to Trenton transferring TWW to MUA, its neighbors contribute other assets to the SPE to enhance operations.
- It is beyond the scope of this study to estimate the benefits of suburban contributed asset which could be substantial.
- Governor appointed Board, the Advisory Board, and the Pension's fiduciary duties, including environmental, social, and governance (ESG), all work to assure strong governance and management and provide substantial benefits.

Finances. The SPE, like the MUA & IOU, would relieve The City of Trenton's balance sheet and mitigate the threat of a credit downgrade.

GOVERNANCE ALTERNATIVES
Critical Qualitative Assessment

	SPE
GOVERNANCE	**GOOD**
Governance	★ ★ ★
Framework	★ ★ ★
Execution	★
Stakeholders	★ ★
Social Impact	★
MANAGEMENT	**EXCELLENT**
Independence	★ ★ ★
Leadership	★ ★
Operations	★ ★ ★
Capital	★ ★ ★
Risk	★ ★ ★
OPTIMIZATION	**EXCELLENT**
Optimize Assets	★ ★
Optimize Liabilities	★ ★ ★
Rate Setting	★ ★
Ratings	★ ★ ★
Financial Aid	★ ★ ★

- SPE's public stewards aim to maximize public benefits with increased scale, synergies, and private managers *(fee estimates included)* and their high KPIs, and bottom-line focus.
- SPE takes full advantage of new Federal Tax Rules by leveraging asset optimization savings to bolster liability optimization.
- SPE Model will target financial metrics that support an "A" rating.

[7] The SPE structured as a state-sponsored entity will likely require legislation unless structured as a nonprofit corporation.

6.4 P3 Model – Public-Private Partnership with the City of Trenton

TWW P3 Model may offer a faster transformation of TWW, including regulatory compliance – but absence an experienced P3 negotiator and monitoring team, the risks are significant.

Governance & Board	Trenton negotiates a long-term TWW P3 concession contract where the city retains responsibility for TWW oversight, specified approvals, and rate setting in accordance with the P3 contract. P3 concessionaire is responsible for management of operations, CIP, and risk as well as compliance with NJDEP regulations. TWW responsible for monitoring P3 contract.
Framework	TWW remains the tax owner and Super Tax-Exempt with a limited margin to the city and is eligible for tax-exempt financing. City has power to set rates pursuant to the TWW P3 contract which is subject to BPU review. This is not a "Regionalization."
Management	P3 contract will require expediting TWW transformation and improving water safety, quality, reliability, and affordability. Performance monitoring of a P3 requires a team with strong utility competencies, including management of "asymmetric information" and areas where delays in city "specific performance" can result in protracted litigation and significantly increased costs.
Risk Management	TWW can transfer much of its operations and construction risks to P3 partner and risks that are difficult or costly to transfer are generally borne by ratepayers, except in cases of negligence, malfeasance and fraud.

Overview. The City of Trenton enters into a P3 contract to expedite the rehabilitation of TWW and to assure the public that their water is safe, clean, and reliable. TWW gets stronger management of operations, assets, and risk, pursuant to strict industry KPIs while TWW mitigates its risk. P3s are long-term contracts that can span decades, making strong compliance monitoring essential to meeting performance goals.

Operations. A P3 aims to leverage a large utility platform to enhance TWW's economies of scale, synergies, use of technology, risk management and expedited rehabilitation. P3s are extremely complex, requiring highly skilled negotiators and a long-term contract monitoring as well as:

- Strict KPIs *(operational, public health, and performance targets)*.
- Myriad of operational & capital management functionalities, and
- Allocations of responsibilities, risks, and contractual remedies.

P3 of only TWW foregoes other opportunities to improve the quality and cost of water services in Mercer County.

GOVERNANCE ALTERNATIVES
Critical Qualitative Assessment

	TWW P3
GOVERNANCE	**FAIR**
Governance	★ ★
Framework	★ ★
Execution	★
Stakeholders	☆ ☆ ☆
Social Impact	☆ ☆ ☆
MANAGEMENT	**GOOD**
Independence	★
Leadership	★ ★
Operations	★ ★
Capital	★ ★
Risk	★ ★ ★
OPTIMIZATION	**GOOD**
Optimize Assets	★
Optimize Liabilities	★
Rate Setting	★ ★
Ratings	★
Financial Aid	★ ★ ★

Finances. The long history of neglect and mismanagement has precipitated an "outsized" CIP, which threatens a downgrade of the city's credit rating even with substantial state assistance.

- P3 does not relieve the City of Trenton's finances or the threat of a rating downgrade. Also, contract terms and compliance are concerns.
- The City's very low (Baa2) credit rating, which is nearly "non-investment" grade, is propped by its spurious strong liquidity.
- Quantitative analysis assumes the same level of asset optimization benefits for all four alternative governance models.

6.5 IOU Model – TWW Privatization or Private Model

IOU Model may offer a faster transformation and regulatory compliance – but absent strong public support for a Privatization, the risks and costs of a failed process could be substantial.

Governance & Board	Trenton sells TWW to an IOU which assumes all rights and risks of ownership. IOU board is the governing body, subject to BPU approval of the sale and water rates.
Framework	For profit structure, subject to Federal, state, and local taxes. IOU is the new Tax Owner and generally is not eligible for tax-exempt financing. The BPU must approve privatizations; BPU oversees operations and capital investments; and it set rates.
Management	IOU leverages its utility platform to increase TWW's economies of scale, technology use, and risk management. Thereby, it enhances public health & NJDEP compliance.
Risk Management	IOU assumes all risks of ownership – Operations & construction, e.g., volume, effluent & influent, change in law & regulation, force majeure, etc. These risks are generally borne by ratepayers, except in cases of negligence, malfeasance, & fraud.

Overview. The City sells TWW to an IOU to take advantage of a "turn-key" approach to rehabilitating TWW while also dramatically reducing the city's exposure to the risks of ownership that TWW presents. ***And, providing the public with safe, clean, and reliable water is an IOU's first duty as it must be for any PWS. Thereafter, IOU management can balance the financial interests of its shareholders and the BPU regulations.***

Operations. IOU can expeditiously bring TWW into NJDEP compliance, but the IOU's regulatory rate regime also needs to be effectively policed:

- Pass-Through operating expenses (OpEx) (*operating, maintenance, debt interest, and tax expenses) are borne by ratepayers and thus there is limited incentive by IOUs to fully contain such expenditures,* and
- Capital expenditures (CapEx) eligible for Rate Base require regulatory approval, but an IOU has an incentive to not fully contain such costs as its profits are directly tied to the return on the capital invested.

Left unchecked, these moral hazards can result in water rate escalations. Due to these tensions, the analysis assumes that the IOU Model generates no greater asset optimization benefit than MUA, SPE, and TWW P3, which models also benefit from being super tax-exempt, and depending on the model, can improve management of operations and capital assets through regionalization (MUA & SPE) and private management with strict KPIs (SPE & P3).

Finances. IOU's management and operational improvements will protect public health, upgrade water quality and reliability, and generate public benefits, which are partly offset by taxes & profits.

- IOU Model will relieve the City of Trenton's finances and help mitigate the threat of a rating downgrade.
- Federal, state & local taxes range from 10% to 35% of revenues *(analysis uses 20% of operating revenue)*.
- Taxes together with profits range from 30% to 45% of the water bill, and IOU efficiencies and the BPU permitted "common rate schedule" act to mitigate these high-cost hurdles.
- IOU state & local taxes ease the burden of government and is acknowledged with the soft $250 million credit in Public Benefit.

GOVERNANCE ALTERNATIVES
Critical Qualitative Assessment

	IOU
GOVERNANCE	**FAIR**
Governance	★ ★
Framework	☆ ☆ ☆
Execution	☆ ☆ ☆
Stakeholders	☆ ☆ ☆
Social Impact	☆ ☆ ☆
MANAGEMENT	**GOOD**
Independence	★ ★
Leadership	★ ★
Operations	★
Capital	★ ★
Risk	★ ★ ★
OPTIMIZATION	**GOOD**
Optimize Assets	★
Optimize Liabilities	★
Rate Setting	★
Ratings	★ ★
Financial Aid	★

7.0 Qualitative Assessment of Alternative Governance Models

The 360 Qualitative Assessment focuses on three key drivers of performance and optimization of value: Governance, Management, and Optimization capacity. Each of these drivers are analyzed across five factors impacting their effectiveness in rehabilitating TWW most expeditiously to protect the public health and deliver safe, clean, reliable, and affordable water. The scores assigned are not absolute but rather are intended to provide a relative sense of performance capacity of each model as well as offer a guide on how best to improve a governance model. Moreover, the 360 Review assesses these models both in the abstract and as each model relates to the TWW situation. The Qualitative Scorecard works to balance both perspectives. For instance, the Municipal Model, as governed by many communities of TWW's size and characteristics would score higher, but for this instance where the model is specific to TWW. Similarly, the TWW P3 if it were viewed as a contract between two experienced P3 counterparties and the municipal partner had a highly skilled team to properly monitor and assess the performance of the private party, those scores would be higher.

To be fair to all the models, qualitative scores are not directly tied to the assumptions in the quantitative analysis. For instance, the TWW Status Quo Model's qualitative score is substantially lower than the IOU Model, but because of taxes and IOU profits, the IOU Model requires higher water rate increases than the Optimized TWW Status Quo Model. Such increases may be moderated by the "common rate schedule" that NJ BPU permits IOUs to employ to harmonize water rates across an IOU's portfolio of utilities.

Holistic Qualitative Assessment of Key Model Considerations:

- ***TWW Status Quo Model*** scores low due to its weak governance, ineffective management, and inability to perform well at the basic level of operations, and this overshadows the significant framework advantages that it enjoys with super tax-exemption and nonprofit structure.
- ***MUA Model*** bests the TWW P3 and IOU Models with its tax-free, nonprofit framework, improved governance, regional synergies, and its ability to optimize liabilities. However, an MUA would essentially be a start-up with limited experience operating a water utility. So, at least initially, the MUA may need to engage a private operator or enter a P3 arrangement.
- ***SPE Model*** outpaces the other models being a hybrid that combines the advantages of the public and private models, i.e., its improved governance, great independence, and strong management, coupled with super-tax-exemption, strict KPIs, and ability to provide local Tax & Budget Relief. However, a state sponsored SPE will most likely require legislation whereas a nonprofit entity can generally benefit from existing laws and regulations.
- ***TWW P3 Model*** offers the utility better governance, stronger management, and potentially a more rapid transformation, however, P3 negotiations and ongoing monitoring is a daunting undertaking and TWW is ill equipped for such a complicated and difficult endeavor.
- ***IOU Model*** promises better governance, strong management, and significant independence and should be able to transform TWW expeditiously, albeit at an expected greater cost, but the IOU Model's serious drawback are its framework that includes taxes and profits as well as stakeholder and community resistance fomented by privatization.

7.1 Qualitative Assessment of Governance

Governance is one of the main drivers of long-term success and sustainability of any enterprise, whether public or private owner. Across the Nation, there is a wide diversity of legal and governance structures for water utilities. And in the main, these varying structures work. But in the U.S., this concentration in the

public-owner model has raised question about "How well do they work?" and "How much better could the utility's performance be under alternative governance?"

MUA Model is "regionalization" and it improves on TWW's Status Quo Model in several ways. It represents all the communities in the service area and enlists more inclusive governance boards with a strong institutional framework, including the ability to set water rates. And, where both of these public owner models trail in relative management ability, they more than compensate with their structural framework which includes super tax-exempt status and nonprofit financial structure with MUA being the stronger public model due to its expanded county-wide footprint, strong governance and greater stakeholder support.

GOVERNANCE QUALITATIVE FACTORS	
Governance	High Standards & Strong Oversight
Framework	Super Tax Exempt Nonprofit, Scale & Synergies
Execution	Complexity, Ease of Execution, Timeframe & Cost
Stakeholders	Representative, Active Engagement & Transparent
Social Impact	Hard Work of Changing TWW Governance

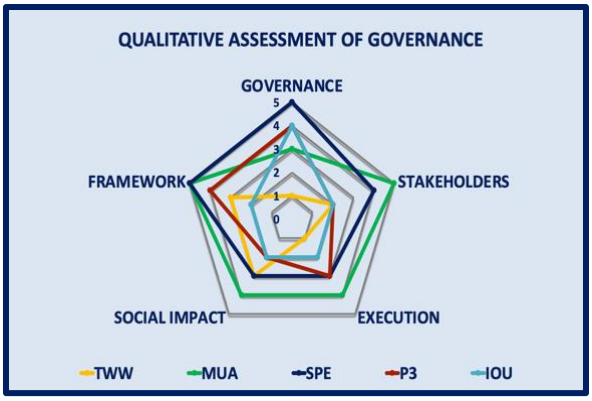
This is a substantial step in the right direction when juxtaposed against the current situation where more than half of the TWW customers reside outside of Trenton, have no representation in TWW's governance, and suffer from poor TWW customer services and fears about the safety, quality, and reliability of TWW water. In assessing TWW, one of the few benefits of maintaining the TWW Status Quo Model is to avoid the hard work and contentiousness that comes with governance change.

Although regional models, like MUAs, represent a significant improvement over the TWW Status Quo Model, they remain vulnerable to mission drift, outside influences, greater costs as well as the other drawback of the public owner models. Instead of the favorable optics of bigger boards representing a broader range of interests, regional boards, including MUAs, should be small, highly professionally oriented, diverse, and focused solely on their public mission to deliver safe, clean, and reliable water services at the most affordable cost.

SPE Model, like the MUA, has a long-term aim towards regionalization and sets the highest standards for governance, management, and conduct led by:

- Expanding stakeholder engagement and forming an Advisory Board that includes AIK contributors, and

- Establishing strict KPIs that are tied to manager compensation, and in addition to operational and financial performance measures that include public health, water quality, regulatory compliance, and local hiring and MWBE targets.



Thus, both regional models offer Trenton strong partners with the financial resources to:

- Strengthen TWW's governance, independence, and public trust with the highest standards of conduct and robust stakeholder participation,
- Transform TWW into a performance-driven utility delivering safe, clean, and affordable water,
- Build broad stakeholder support with representation for the whole service area as well as performance requirements on promoting local employment and MWBE partnerships,
- Free the City's debt capacity and encumbered Qualified Bond Authorization (QBA) as these models solely secure TWW debt with enterprise revenues with no recourse to the city, and
- Maximize total public benefits for all TWW's customers and the local taxpayers.

TWW P3 Model can generate a similar list of benefits as the MUA and SPE if the state would be directly involved in P3 negotiations and long-term contract monitoring. However, since TWW ownership is not transferred as it is in MUA, SPE and IOU Models, there is little financial relief for TWW and the threat of a rating downgrade of the City of Trenton's G.O. bonds remain.

IOU Model has several strong virtues, the threat of increased costs whether perceived or real and the fear of losing control of an essential asset raises strong concerns and rancor. Conversely, the SPE Model engages private partners like a P3 but couples it with strong public stewardship allaying the worries of skeptics and replacing it with the hope that reform sparks. Moreover, Trenton's failed referendum to privatize TWW and the emotions that it flared are clear reminders of the enormity of the task of shifting from public to private ownership. This together with the risks and costs of protracted timetables and public rejection warrant caution.

The 360 Review fully appreciates that "change" is difficult under the best of circumstances and that transformational change in the public sector is exceedingly challenging due to the number and diversity of competing interests. So, governance together with "What are the total benefits from change?" reign paramount when public assets are involved.

7.2 Qualitative Assessment of Management

7.2.1 Management – Mission and Focus

First, managing any enterprise is about producing goods or providing services to sell to customers at a price that they are willing to pay. The aim of a privately-owned enterprise is relatively straight forward – to be a "High performance-driven enterprise with superior risk management that maximizes the return on investment for its owners or shareholders." Businesses do this largely by developing new and/or better products or services and generating cost savings from greater economies of scale, increased synergies, leveraging technology, propelling revenue growth, strong asset management, and risk mitigation. And

under "perfect competition," the theory is that profits are close to zero as the business cannot charge more than a "market price" for fear of losing sales and failing.

7.2.2 Public Owned Utility Models

For the most part, governments own and control water utilities directly as departments or agencies like TWW or indirectly through authorities, commissions, and boards. Although some such entities benefit from autonomy from the political nature of government, most are subject to varying degrees of external influences, or the fear of it, which can contribute to suboptimal economies of scale, operational inefficiencies, poor asset and risk management, vacancies in key staffing positions, and lack of accountability and transparency.

On the other hand, the price of water provided by utilities owned by governments and nonprofit corporations are not driven by a profit motive and their revenue requirements and user rates are set to recover costs with no profit "margin." There are exceptions, where public owners levy a limited or in some cases a large margin to fund the cost of other community needs. This is especially the case where the Municipal Model has a service area, like TWW, that extends beyond the city limits. Those considerations aside, this essentially nonprofit structure together with super tax-exemption makes public owned and nonprofit utilities highly attractive to consumer advocates and the general public as these structures can save customers 30% to 45% of the water bill that goes to pay Federal, state, and local taxes as well as the profit margin to the private owner.

Lastly, as exemplified in the TWW Municipal Model, the public retains substantial risk from poor operations, deferred maintenance, and the lack of adequate risk management. These are all areas where strict industry benchmarks, KPIs, and strong governance can 1) protect the health of water customers and the public from undue risks, and 2) erect institutional firewalls to assure that the water is safe, clean, reliable, and provided at most affordable cost.

7.2.3 Private Owned Utility Models

Although the Private Models are a small share of water utility ownership in the US, IOUs and the scale of their utility platforms, their army of trained professionals, and the size of their balance sheets play an important role in America and the world. Moreover, there is little doubt that the leading IOUs have the experience, expertise, and the financial wherewithal to remediate TWWs many issues in the most expeditious manner. But the question is under which model and at what cost will an IOU do it.

However, unlike most industries that better fit the economic theory of "perfect competition" and "market prices", the private water world is not "perfect" when it comes to competition. In fact, water providers are far from competing in a marketplace that has many sellers of a homogeneous product giving buyers a

Private Water Utilities – Selected Financial Highlights [20]

Company	Market Cap (Mil)	Enterprise Value (Mil)	Earnings Multiple	Payout Ratio	Total Return	Credit Ratings	
						S&P	Moody's
America Water	$27,475	$40,017	26.8x	56.9%	10.2%	A	Baa1
Essential	10,864	17,752	20.0x	64.1%	9.3%	A-	Baa2
California Water	3,141	4,435	16.1x	33.2%	10.5%	A+	NR
American States	3,044	3,863	27.2x	58.7%	6.2	A+	NR
San Jose Water	1,926	3,691	21.5x	58.0%	8.7	A	NR
Middlesex Water	1,095	1,519	27.3x	N/A	8.7	A	NR

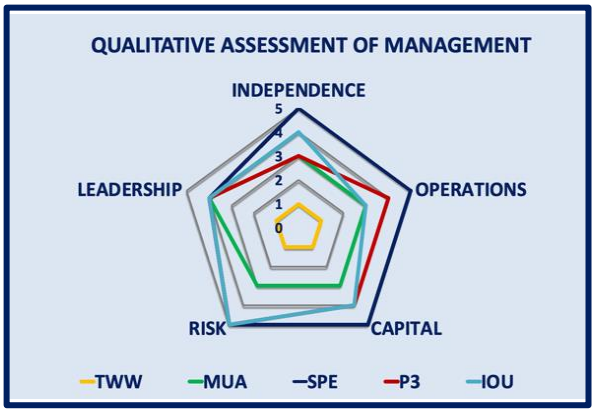
JP Morgan Weekly Power & Utilities Review – North America, August 19, 2024.

choice. In fact, the competitive framework of a water utility is just the opposite as it is effectively a monopoly business selling water that is a vital resource and/or removing and treating wastewater which is an essential service. So, for some buyers "price may be no object," but for others, affordability will be a significant issue. Thus, to protect the public from excessive profiteering by an IOU or other private owner, the user rates and charges are generally limited and subject to BPU regulatory approvals or, in the case of the TWW P3 and SPE Models, protections are provided through regulatory contracts that details the terms of a P3 concession and/or an AIK transfer agreement, respectively.

7.2.4 Qualitative Assessment of Management

Management factors in the Qualitative Assessment examines the impact of independence, leadership, and the management of operations, capital and risk have on an organization. The TWW Status Quo Model struggles greatly in all three areas in part because the factors are mutually reinforcing and failures in one can have serious cascading consequences on the others.

MANAGEMENT QUALITATIVE FACTORS	
Independence	Enterprise Focus & Shield Against Interference
Leadership	Talented, Team Builder, Aligned Mission & KPIs
Operations	Best Transformation within 3 Years
Capital	Complete 5 Yr. CIP – On Time/On Budget
Risk	Most Capable at Managing Risk Efficiently



On the other hand, the MUA Model is buoyed by greater independence and improved leadership, building strong teams and having more freedom to make key decisions on a timelier basis. However, the MUA assessment is impeded by water being a "start-up" enterprise as only TWW has any substantive water experience in the county, which raises concerns about how effectively an MUA framework can transform TWW in three years and complete the five-year CIP on time and on budget. Given the substantial challenges at TWW, the MUA Model could benefit greatly by partnering with a nationally recognized contract manager or enter a P3 arrangement. Such a partnership would make the MUA like the SPE Model on a qualitative basis as they both would be regional and both would require strict operational standards with private partner's compensation tied to performance that includes key metrics on public health, water safety, quality, reliability, and affordability, as well as achieving operational and capital savings, and financial targets.

What makes the private management models (SPE, TWW P3 & IOU) important areas for study are how large, highly experienced, utility platforms can tackle a TWW turnaround situation and how quickly and how well they can do it. Moreover, where can these models contribute to strengthening public health and regulatory compliance while meeting key operational goals, given their:

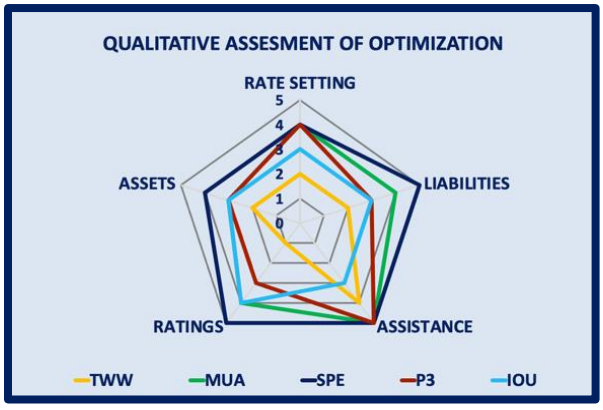
- Clear mission and defined responsibilities,
- Large, boundaryless scale, and
- Incentives that drive synergies, innovation, revenues, and profits.

7.3 Qualitative Assessment of Optimization

The key 360 Review factors for optimization are the governance powers and authority entrusted to the governing body under the model as well as that governing body's willingness to produce revenue requirements that reflect the real cost of water production and distribution, including meeting regulatory requirements for water quality, safety, reliability, and affordability. Additionally, it is about the ability and willingness to take all necessary actions to optimize assets, liabilities, ratings, and financial assistance.

OPTIMIZATION QUALITATIVE FACTORS	
Assets	Best Framework to Improve OpEx & CapEx
Liabilities	Greater Debt & Pension Restructuring Options
Rates	Able & Willing to Set Rates to Meet KPIs
Rating	Able to Improve TWW Credit Prospects
Assistance	Able & Motivated to Maximize Available Aid

Ultimately, customers demand to know why their water rates are going up and how much more rates will increase in future years. And for these models, except for Privatization, it is the ability to control what the utility's rates will be that is a significant credit positive as well as a source of great structuring flexibility for optimizing assets and liabilities. Conversely, it is also a serious credit negative where this power is misused to avoid rate increases needed to meet operations, maintenance, and capital needs that are essential to protecting public health and sustaining water safety, quality, reliability, and affordability.



- The MUA and SPE Models best optimize assets in terms of ability to meet or exceed public health standards, assure safety, quality, reliability, and affordability of water through regionalization and associated improvements in economies of scale, synergies, asset management, and use of technology. The SPE further bolsters asset optimization by incorporating public health, operational, and financial KPIs into its performance requirements. On the liability optimization side of the analysis, the fact that both models represent a true sale to another tax-exempt entity creates the most financial benefits and potentially the greatest amount of Local Tax & Budget Relief. But it is important to note that a state sponsored SPE will most likely require legislation whereas a nonprofit entity can generally benefit from existing laws.

Lastly, the MUA and SPE Models stand to generate substantial public benefits based on:

- Ability to manage utility's water rates and promote affordability is a major credit positive,

- Amount of newfound value available to meet TWW's public health and water quality needs as well as Local Tax & Budget Relief from greater liability optimization bodes well for greater stakeholder support for change, and
- Potential uplift in creditworthiness of both TWW and the city from the "out-sized" CIP and the liquidity demands that it may pose on the finances of the city and its credit rating.

Theoretically, the TWW P3 could match the MUA and the SPE, however, P3 agreements are exceedingly complex requiring highly expert negotiators, and more importantly, a team of highly qualified P3 contract monitors policing all the terms and conditions of the P3 contract, KPIs, financial performance, and P3 bonuses and penalties, etc. And more challenging, many of these terms require "specific performance" by the City and TWW, where delays in timely action can result in large penalties against the City and its taxpayers.

8.0 Technical/Managerial/Financial (TMF) Review

This 360 Review section's purpose is intended to establish a TWW baseline by providing an overall risk review framework to highlight the areas and levels of risk using New Jersey TMF Scaled Benchmarks, analyzing NJDEP's oversite using a modified NJ TMF assessment form, and categorizing the risk levels of each capacity's objectives and indicators.

8.1 Capacity Development Strategy

The 1996 Amendments to the Federal Safe Drinking Water Act (SDWA) focused on promoting the technical, managerial, and financial (TMF) capacity of public water systems (PWS) to comply with the National Primary Drinking Water Regulations. These amendments also required states to prepare an annual report documenting the ongoing implementation of the Capacity Development Program for addressing capacity determinations for new systems and the application of an approved strategy for existing public water systems. In accordance with Section 1420(a) of the SDWA, which requires each state to have the legal authority to assure that all new community and non-transient noncommunity water systems demonstrate adequate technical, managerial and financial capacity, the New Jersey Safe Drinking Water Act (N.J.S.A. 58:12A) was amended on August 2, 1999 (P.L. 1999 Chapter 176). The NJDEP subsequently adopted regulations at N.J.A.C. 7:10-13 which established the requirements to assure that all new public community and non-transient noncommunity water systems have adequate capacity. In addition, each state is required to develop and implement a strategy to assist existing systems in acquiring and maintaining capacity. The United States Environmental Protection Agency (USEPA) approved the NJDEP's first Capacity Development Strategy (CDS) on September 28, 2000, which was subsequently updated in August 2009. [8]

Capacity is the ability of a PWS to plan for, achieve and maintain compliance with all applicable drinking water standards. Capacity Development (CD) focuses on cultivating a system's TMF capabilities to improve the system's long-term viability.[9]

Water system capacity refers to a water system's ability to consistently provide safe drinking water for its customers. To do that, a system must have the technical abilities, managerial skills, and financial resources to meet state and federal drinking water regulations. Technical, managerial, and financial capacity are individual yet highly interrelated dimensions of capacity.

Capacity, therefore, requires the sustained development of all areas. One area's weaknesses can critically impact the overall capacity. Once the individual areas are studied the whole needs to be assessed. (T+M+F = Capacity) Utilities with weaknesses in several areas, may never be able to sufficiently build and maintain its capacity because of the interdependences and overall structural barriers.

[8] State of New Jersey (nj.gov)

[9] Cap Dev Benchmarks.web (nj.gov)

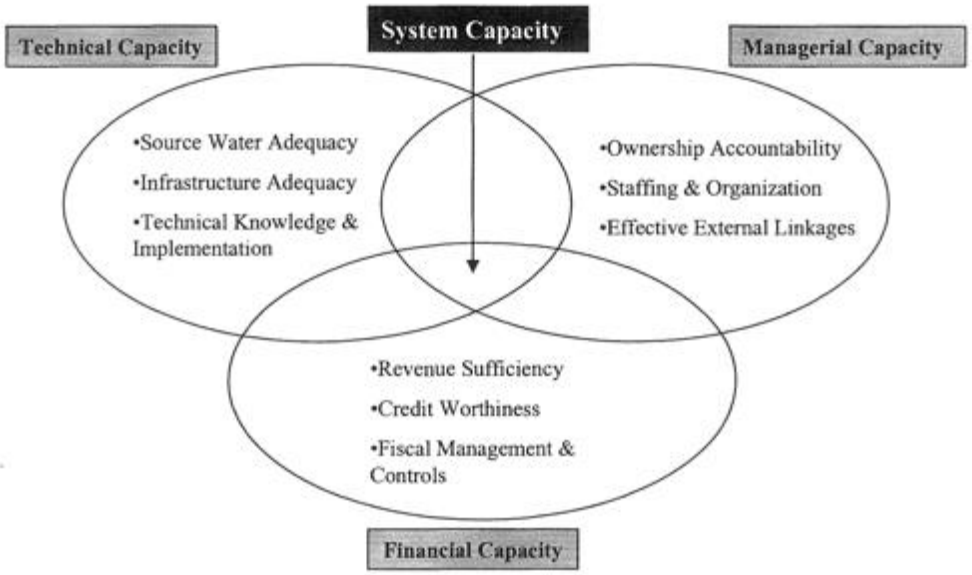


Figure 8-1 Conceptual Model: Technical, Managerial, and Financial Capacity[10]

Technical Capacity refers to the physical infrastructure of the water system, including but not limited to the source water adequacy (including wells and/or source water intakes, treatment, storage, and distribution) and the ability of system personnel to implement the requisite technical knowledge.

Managerial Capacity refers to the management structure of the water system, *including but not limited to* ownership accountability, staffing and organization, and effective linkages.

Financial Capacity refers to the financial resources of the water system, *including but not limited to* revenue sufficiency, credit worthiness, and fiscal controls.

Water System Capacity Development is an effort by the states to help drinking water systems (primarily new or proposed systems) improve their finances, management, infrastructure, and operations so they can provide safe drinking water consistently, reliably, and cost-effectively.[11]

The framework of analyzing a TMF has its basic components, however, additional capacity sustainability and viability concerns need to be addressed by answering the following questions specifically for TWW:

1. Has the TWW only checked some of the boxes because of the intervention and administrative orders from the NJDEP?
2. Without the NJDEP's oversight could the TWW maintain its current TMF improvements and reduce the identified risks?
3. Without the NJDEP's oversite could the TWW implement TMF recommendations successfully?
4. Without the NJDEP's oversite would the TWW implement TMF recommendations independently?
5. With the NJDEP's oversite and level of authority could the NJDEP implement all TMF recommendations and risks successfully?

[10] Source: EPA 816-R-98-008

[11] AAE0C4C9-155D-0A36-31B4-D5A81B35D60A (naruc.org)

6. Are the critical priorities and dependencies identified in order to correct Capacity Risks?
7. Has the TMF as a whole been reviewed versus just the individual parts?

The answers to these questions give rise to the effectiveness of the existing organizational management and governance authority to ensure the sustainability and viability of the water utility.

The proposed NJDEP/IBANK state strategy to enhance the TMF analysis included conducting this 360 Review to (i) perform a review of a water system's ability to develop capacity, (ii) implement TMF recommendations more cost-effectively, and (iii) mitigate all identified risks. One concept attached to a new strategy considers that the TMF identified weaknesses and recommendations may never be mitigated under the current governance structure, even with regulatory oversight. This 360 Review provides an analysis of the risks and barriers to success including taking a deeper dive into the financial metrics and hidden asset optimization alternatives for TWW under various scenarios including the five (5) different identified governance structures.

8.2 NJ TMF Scaled Benchmarks Scoring

A first step in evaluating a TMF for New Jersey should include the application of NJDEP's adopted and published practices such as the "Scaled Benchmarks" as explained below.

New Jersey's Capacity Development Program Criteria and Benchmarks for Technical, Managerial, and Financial (TMF) Capacity[12] Colors are used to highlight the Scaled Benchmarks.

The City of Trenton consistently remains a High Risk.

8.3 Technical Capacity Definition

Technical capacity refers to the adequacy of the source, infrastructure, operation, and maintenance of a PWS. Infrastructure refers to the physical/mechanical components of the source, treatment, storage, and distribution network of the PWS.

To demonstrate adequate technical capacity, TWW must have adequate source water and infrastructure, qualified personnel with sufficient technical knowledge available to operate and maintain the System, and an operator of the proper license and classification.

The approved CDS defines the following standards for determining if TWW has adequate technical capacity:

1. TWW is not in significant non-compliance (SNC) as defined by the USEPA,
2. TWW does not have any continuing violations of New Jersey's Safe Drinking Water Act regulations (N.J.A.C. 7:10) and Water Supply Allocation Permit regulations (N.J.A.C. 7:19), and
3. TWW is operating the System under a licensed operator of the appropriate license pursuant to N.J.A.C. 7:10A, "Licensing of Water Supply and Wastewater Treatment System Operators."

Technical capacity should address and/or include without limitation:

- The ability to consistently provide an ample quantity of safe drinking water to its customers.
- Projected water use.

[12] Cap Dev Benchmarks.web (nj.gov)

- A description of all major projects and planned expansions.
- Hydraulic analysis of distribution system and storage tank levels to address pressure problems.
- Source water adequacy.
- Source water protection.
- Water disposal issues.
- Licensed operator requirements.
- Laboratory needs.
- Compliance with state and federal regulations.
- Cross connection control program.

The following sections clarify what information is needed to address the parameters listed above:

8.3.1 Infrastructure

TWW must possess basic knowledge on the location, age, construction, general condition, and anticipated service life remaining for all existing infrastructure associated with its source, treatment, storage, and distribution network.

A scaled map showing the locations of the various infrastructure components must also be available. If TWW does not have this basic information when the TMF capacity evaluation is performed, then the improvement plan for TWW must specify the need to acquire the information.

This knowledge is required for TWW to develop an asset management plan (AMP) that includes a capital improvement plan (CIP) to operate, maintain, upgrade, refurbish, and/or replace existing infrastructure and add new infrastructure as necessary to operate the utility and maintain service in compliance with applicable laws, regulations, and standards.

The CIP provides the description of all major projects and planned expansions. Possessing basic knowledge of the system and an AMP with a CIP will serve as common benchmarks for all categories of infrastructure.

Records should be available to show the required permits/approvals were obtained and all conditions stipulated in those permits/approvals were met. If the records do not exist or are not available at the time of the TMF capacity evaluation, the improvement plan should instruct TWW to work with the appropriate regulatory agency to determine the need for such documentation.

Additional benchmarks for source, treatment, storage, and distribution system infrastructure are provided below to further define how to determine whether a PWS has adequate technical capacity for its infrastructure.

8.3.2 Source

Discussions of source infrastructure must inherently include a discussion of the source itself. In this regard, TWW must know the current and future projected use/demand as a prerequisite to demonstrating adequate source water supply. Available information from recordkeeping will show whether current demand is being met. Reference sources (e.g., master plans, planning board records, business plans, or school board plans) may be available to support projections on future development and population growth. This information should be used to estimate future use/demand.

TWW (and the NJDEP) will then be in a position to know if the existing supply source is adequate and will remain so, or if an additional source(s) of supply water is needed. The benchmark is the ability to demonstrate the existence of an adequate supply of source water capable of meeting current use/demand and, at a minimum, a plan to secure an adequate supply of source water to meet future projected use/demand. "Adequate supply" includes the existence of any required backup/duplicate well(s) and/or interconnections pursuant to N.J.A.C. 7:10, as applicable. Any PWS subject to the New Jersey Water Supply Allocation Rules, N.J.A.C. 7:19 must also have a valid Water Supply Allocation Permit or Water Use Registration, as applicable.

Observation: Under NJDEP oversite and compliance enforcement, the Scaled Benchmark Score for source water has improved but water quality has remained at risk over the last 18 months. TWW ranges between a Red and Yellow Scaled Benchmark for Source.

- Unauthorized diversion or PWS has 4 or more violations over the term of a required permit/registration; current and future projected use/demand are unknown; current demand not met; no plans to address problems
- Authorized diversion but PWS has 2-3 violations over the term of a required permit/ registration; current use/demand is known but not always met; future projected use/demand and associated permitting needs are unknown; no plans to address problems
- Authorized diversion but PWS has 1 violation over term of permit/registration; current use/ demand is known and met; future projected use/demand and associated permitting needs are not clear, but there are plans to address lack of information
- Authorized diversion with no violations over term of required permit/registration; current use/demand is known and met; future projected use/demand and associated permitting needs are known, plans are in place to secure adequate supply to meet future use/demand

8.3.3 Surface Water

New Jersey's Safe Drinking Water Act Regulations, N.J.A.C. 7:10-12 do not allow a public non-community water system (PNCWS) to use surface water as a source unless specifically approved by the administrative authority. When such approval is obtained, the regulations require the source infrastructure be constructed in compliance with standards for a public community water system (PCWS) as specified at N.J.A.C. 7:10-11. Any PCWS or PNCWS using surface water as a source should be able to demonstrate the source infrastructure is constructed in compliance with applicable regulations (e.g., N.J.A.C. 7:10-11). To expand on the basic knowledge needed for a surface water source, TWW must know the details for all meters, gauges, pumps, devices, and/or equipment required by the applicable regulations and the distance from septic systems and/or sanitary lines. The benchmarks for demonstrating adequate capacity for source infrastructure under this scenario will be possessing all the basic knowledge and an AMP/CIP to operate/maintain the existing intakes(s), and to eventually upgrade, refurbish, or replace the intake(s).

Observation: Under NJDEP oversight, and intake project, TWW has moved from a Black to Yellow Scaled Benchmark Level. However, winter source water conditions quickly degrade the level.

- Intake specifications and permit status are unknown, intake condition is poor, water quality problems exist, and there are no plans to refurbish or replace the intake
- Intake is permitted but old and older design does not conform to current regulations, intake condition is poor, water quality problems exist, and there are no plans to refurbish/ replace the intake
- Intake is permitted and design conforms to current regulations, intake condition is fair, sporadic water quality problems exist, and there are plans to refurbish/replace the intake
- Intake in good condition, constructed/permitted in accordance with applicable regulations, no water quality problems exist, and AMP/CIP contains long-term plans

8.3.4 Treatment

As a prerequisite, TWW must know which, if any, contaminants exceed their respective primary and/or secondary drinking water standards based on analytical results. Data from raw water samples from new well tests, SWSTA sampling, GWUDI investigations, and source water monitoring per the Ground Water Rule (40 CFR Parts 9, 141 and 142) should also be evaluated for this purpose. Data quantifying contaminants may be from compliance monitoring samples collected by the PWS and/or new well test, complete profile, and/or small water system technical assistance (SWSTA) samples collected by the NJDEP. TWW needs this knowledge to:

- Make informed decisions about the need for and type(s) of treatment requirements required.
- Comply with federal and state drinking water laws/regulations.
- Provide consumers with a ready and reliable source of water that meets the primary and secondary drinking water standards.

For existing treatment infrastructure, TWW must possess the basic knowledge described at the beginning of this Technical Capacity section. Infrastructure includes without limitation any units for chemical feed systems, pre-treatment, filtration, treatment processes, and disinfection. TWW must also have an inventory of the chemicals/materials required for the various treatment processes and have an AMP and corresponding CIP to operate/maintain the existing unit(s) and eventually upgrade, refurbish, or replace each treatment unit to conform to the applicable standards (e.g., N.J.A.C. 7:10). These criteria serve as benchmarks for demonstrating adequate treatment capacity under this scenario. For situations where the installation of new infrastructure is required to remediate contaminant(s) detected above their respective primary and/or secondary drinking water standard(s), TWW must identify the type(s) of treatment chosen to remediate any such contaminant(s) and provide a schedule to install the required treatment. The schedule must depict timelines and milestones for obtaining permits/approvals and installing the treatment unit(s) on or before any compliance date mandated by applicable regulations or set by an enforcement document (e.g., administrative consent order). Installation of the required treatment unit(s) in conformance with the approved permit(s) will be the benchmark for demonstrating adequate treatment under this scenario.

Having an AMP with a CIP that integrates the operation and maintenance of the new unit(s) along with plans to operate, maintain, upgrade, refurbish, or replace the new unit(s) will serve as an additional benchmark.

Observation: TWW ranges between a Red and Yellow Scaled Benchmark for Treatment.

- Water consistently has multiple contaminant(s) above primary standards; treatment unit(s) not installed or not maintained; no backup equipment available to meet demand when largest unit(s) out of service; no plans to address problems;
- Water consistently has at least 1 contaminant above primary standards; treatment unit(s) not installed or not maintained; no backup equipment available to meet demand when largest unit(s) out of service; no plans to address problems;
- Water occasionally has contaminant(s)above primary standards and consistently exceeds secondary standards, treatment unit(s) installed but O&M needs improvement; backup equipment in place to meet demand when largest unit(s) out of service, plan exists to address problems
- Water quality consistently meets primary and secondary standards, treatment unit(s) installed with proper O&M, backup equipment in place to meet demand when largest unit(s) out of service

8.3.5 Storage

For a PCWS like TWW, the system must know the basic information required to allow for a comparison to the requirements of N.J.A.C. 7:10-11.6 and 11.11 and whether the storage capacity is compliant with the Water Supply Management Act Rules, N.J.A.C. 7:19-6.1 et seq. For a PNCWS, the system must know the basic information necessary to facilitate a comparison with the requirements at N.J.A.C. 7:10-12.34 and 12.35. The benchmarks for demonstrating adequate storage will be possession of this basic knowledge and an AMP with a CIP to operate/maintain each existing storage facility, and eventually upgrade, refurbish, or replace the storage facility.

Observation: Under NJDEP oversight, TWW's storage capacity and independent ability to plan, develop, fund, build, inspect, maintain and sustain its storage has ranged from Black to Yellow.

- Storage capacity inadequate; facility past useful life, improperly designed, in disrepair, ill-equipped, and/or poorly maintained; finished water quality impaired; minimum pressure insufficient; no plans to address problems. Facility not inspected within last 5 years.
- Storage capacity adequate; facility has little remaining useful life, improperly designed, in disrepair, ill-equipped, and/or poorly maintained; finished water quality impaired; minimum pressure insufficient; no plans to address problems. Facility not inspected within last 5 years.
- Storage capacity adequate; facility has some remaining useful life and few if any design or equipment issues; existing O&M procedures could be improved; finished water quality satisfactory; sporadic problems with maintaining minimum pressure; plans exist to address problems. Facility inspected within last 5 years.
- Storage capacity adequate per applicable regulations; facility is new and/or in good condition with no design, repair, equipment, and/or maintenance deficiencies, finished water quality satisfactory, minimum pressure maintained. Facility routinely inspected at least every 5 years.

8.3.6 Distribution

For a PCWS like TWW, the system must know the basic information required to allow for a comparison to the requirements of N.J.A.C. 7:10-11.6, 11.9 and 11.10. For a PNCWS, the system must know the basic information required to allow for a comparison to the requirements at N.J.A.C. 7:10-12.36 through 12.38. In either situation, information from customer complaints, O&M records, and/or other sources must be used to identify conditions with the potential to affect water quality or service. Such conditions would

include, but not be limited to areas with flow restrictions from deposits (e.g. - iron or manganese), areas of low or high pressure, leaks/breaks, and improper/unauthorized connections.

This information is necessary to identify what actions are required. The benchmarks for demonstrating adequate distribution infrastructure will be possession of this basic knowledge and an AMP/CIP to operate/maintain the existing distribution system, and eventually upgrade, refurbish, or replace the various components of the distribution system.

Observation: TWW Transmission and Distribution pipes Scaled Benchmarking ranges between Black and Red. While asset data has been put into a GIS, the data is not complete, the age and condition are not known, and a CMMS has not been purchased and implemented for asset work orders, maintenance, and cost tracking.

Source: The TWW Water Distribution System Asset Management Preliminary Report dated April 13, 2023, contains the following GIS asset data.

- Hydrants: Count, location, type (no age, cost, or condition in order to plan maintenance or replacements)
- Valves**:** Count, location, size, direction, type, and function (no age, cost or condition in order to plan maintenance or replacements). Assumes a 10% turning cycle.
- Water mains**:** Location, diameter, material, length (no age, cost or condition in order to plan maintenance or replacements). Assumes a 150-year replacement cycle and 10-year cleaning and lining program for unlined cast iron pipes for 60 miles a pipe. Larger diameter transmission pipelines are shown on a map.
- Storage**:** Asset description and location.
- Meters**:** Count, location size, type (no age, cost, or condition in order to plan maintenance or replacements)
- Plant and plant assets**:** Description, location, asset type (no age, cost or condition in order to plan maintenance or replacements).
- Interconnections**:** Description and location

The TWW Capital Improvement Plan (CIP) provides a 10-year high level, prioritized list of projects and estimated costs (not escalated). The CIP is not tied to the AMP due to the lack of age, cost, and condition data. As a result, the "Green" Scaled Benchmark for "AMP/CIP" is not met. Assets with unknown material types, age and condition are considered a high risk requiring further investigation and condition assessment activities.

Observation: Distribution assets are at a Red to Yellow Scaled Benchmark Level.

- Location, age, construction, and condition of distribution system components unknown; high percentage of unaccounted for water loss; history of customer complaints due to water quality, water pressure, and/or service interruptions with poor response times; no plans to address problems
- Limited knowledge on location, age, construction, and condition of distribution system; high percentage of unaccounted for water loss; history of customer complaints due to water quality, water pressure, and/or service interruptions with poor response times; no plans to address problems
- Location, age, construction, and condition of distribution system components known; low to moderate percentage of unaccounted for water loss; moderate volume of localized customer complaints due to water quality, water pressure, and/or service interruptions; poor response times; plans exist to address problems
- Location, age, construction, and condition of distribution system components known and mapped; low percentage of unaccounted for water loss; few if any customer complaints; water quality and pressure satisfactory; service interruptions are infrequent and receive prompt response when they occur

8.3.7 Qualified Personnel

All system personnel involved with the operation and maintenance of the system must be qualified to perform the level of assigned work. To demonstrate their qualifications, TWW must be able to show the personnel have the knowledge, training, and skills necessary for the position held and the tasks/duties routinely performed. The policies and procedures these personnel are to follow in the performance of their duties must be included in the written detailed operations and maintenance procedures prepared by the licensed operator (see item III, below). In addition, the name(s), title(s), job description(s) and other relevant information such as training received/scheduled for these personnel must be included in the managerial plans (see Managerial Capacity section, below).

Observation: The Scaled Benchmark ranges from Black to Yellow depending on the infrastructure type.

- Personnel are unqualified to perform assigned work because they do not possess knowledge of system policies/procedures, have not been trained, and/or lack necessary skills
- Personnel are poorly qualified due to limited knowledge, received inadequate training, and/or do not possess all necessary skills
- Personnel are fairly qualified, but need to improve knowledge on system policies/procedures, require more training, and/or need to improve the skills they already possess
- Personnel are qualified to perform assigned work, know policies/procedures, are properly trained, and have all necessary skills

8.3.8 Licensed Operator

For utilities where a licensed operator is required, the PWS must have a licensed operator of the appropriate license pursuant to N.J.A.C. 7:10A. The licensed operator must perform the duties, maintain the records, and satisfy the reporting requirements of N.J.A.C. 7:10A-1.12. Regarding the requirement to have written detailed operations and maintenance procedures, this “O&M manual” must conform to the regulations,

include all necessary plans (e.g. - emergency management, source water protection, and water quality monitoring), and adhere to recognized industry standards for items including, but not limited to frequency of inspection and types of materials/additives used. An operations plan template is available from the NJDEP for TWW's licensed operator to use as guidance in preparing/revising an O&M manual. The O&M manual should also:

- Provide clear, concise instructions for the licensed operator and/or qualified personnel to follow when performing assigned duties including without limitation the operation, routine inspection, preventive maintenance, necessary repair, and replacement of infrastructure components and/or any testing conducted on water.
- Indicate which duties/tasks are not to be performed by the licensed operator and/or qualified personnel (e.g. – do not perform work that require the services of licensed professionals such as well drillers, electricians, or plumbers).
- Include provisions for personnel to document, record, and track work performed, and to report observations or recommended follow-up actions to the licensed operator and/or system manager to consider/implement.
- Be consistent with any contracts for services maintained by TWW (see Managerial Capacity section, below); and
- Be routinely updated as warranted for consistency with the most recent version of the AMP/CIP for the PWS.

TWW's licensed operator must demonstrate familiarity and ensure compliance with all applicable laws, rules, regulations, and license conditions. The licensed operator must submit the monthly Operating Report of Water Treatment Plants as required. These benchmarks clarify the responsibilities, and the capabilities needed for TWW to demonstrate technical capacity for a licensed operator.

Observation: TWW has consistently shifted between Black, Red and Yellow using the Scaled Benchmark.

- No licensed operator as required
- Licensed operator does not have the appropriate license; duties, recordkeeping, and reporting not performed as required; O&M manual does not exist or does not conform to regulations; licensed operator not familiar and/or does not ensure compliance with all applicable laws, rules, regulations, and license conditions; monthly reports not submitted as required.
- Licensed operator has appropriate license but needs to improve performance of duties, recordkeeping, and reporting; O&M manual exists but does not fully conform to regulations; monthly reports submitted as required.
- Licensed operator has appropriate license; performs all required duties, recordkeeping, and reporting as required; O&M manual current and conforms to regulations; licensed operator is familiar and ensures compliance with all applicable laws, rules, regulations, and license conditions; monthly reports submitted as required.

8.4 Managerial Capacity Definition

Managerial Capacity Managerial capacity refers to the expertise required of the personnel who administer the overall water system operations. To ensure adequate managerial capacity, TWW must demonstrate that relative to its water system it has clear ownership, proper and organized staffing, effective interaction

with regulators, and effective interaction with customers. The approved CDS defines the following standards for determining if TWW has adequate managerial capacity:

1. The owner(s) of TWW is not in receivership.
2. The owner(s) of TWW demonstrates clear ownership of the water system.
3. TWW has a clear and defined organizational structure.
4. TWW has established an emergency management plan.

Managerial capacity should address and/or include without limitation:

- Identification of the owner(s) or other responsible legal body.
- An organizational chart which also provides job descriptions and lists license/certification requirements for the personnel on the chart.
- A representative who can be contacted in New Jersey.
- Operator training and certification.
- Licensed operator succession planning.
- Routine inspections of operations.
- Listing of O&M contracts.
- Emergency planning.
- Legal authority to implement requirements.
- Policies and procedures for interaction/communication with regulators.
- Policies and procedures for interaction/communication with customers.

Consistent with the benchmarks for measuring all aspects of TMF capacity, a PWS must have AMP/CIP and use it to prepare/revise any other applicable plans required to demonstrate managerial capacity. Possession of a managerial plan that incorporates these plans (e.g., source water protection, water conservation, emergency response/management, security/safety, etc.) either directly or by reference to the licensed operator's O&M manual will serve as an additional benchmark.

Observation: TWW may have improved the most in this Scaled Benchmark on paper, but the supporting practices and actual details may not be actionable. Inadequate staffing, overloading key staff, having an asset management plan which does not have the age, or the condition of the asset may score a Red.

- PWS in receivership and/or cannot demonstrate clear ownership; organizational structure not clearly defined; no emergency management plan (if required), AMP/CIP, licensed operator succession plan or other required plans
- PWS not in receivership, but cannot demonstrate clear ownership; organizational structure not clearly defined; no emergency management plan (if required), AMP/CIP, licensed operator succession plan or other required plans
- PWS not in receivership and demonstrates clear ownership; organizational structure clearly defined; no emergency management plan (if required), AMP/CIP, licensed operator succession plan or other required plans
- PWS not in receivership and demonstrates clear ownership; organizational structure clearly defined; emergency management plan (if required), AMP/CIP, licensed operator succession plan and other required plans in place

8.5 Financial Capacity Definition

Financial capacity refers to the monetary resources available to a PWS to support the cost of operating, maintaining, and improving the water system. To assure adequate financial capacity, TWW must demonstrate it has sufficient revenues, credit worthiness, and fiscal management/controls to cover these costs. The approved CDS defines the following standards for determining whether TWW has adequate financial capacity:

1. The PWS has an effective financial plan which accounts for revenues, operating expenses, reserves, and capital improvements for the next three years.
2. The PWS has an Operating Ratio and a Debt Service Coverage Ratio of greater than 1.0.
3. The PWS has sufficient reserve accounts to cover an operating cash reserve (12% of the annual O&M and general/administrative expenses) and emergency reserve for critical equipment replacement.
4. The PWS has an annual operating budget to demonstrate sufficient revenue to meet all expenses associated with SDWA compliance. Other ratios (e.g. – expense, sales, current, quick, per capita, receivable ratios) are also available to monitor the financial health of a PWS.

The USEPA includes four financial indicators in its Check Up Program for Small System (CUPSS); (i) debt ratio (DR), (ii) expense ratio (ER), (iii) operating ratio (OR), and (iv) sales ratio (SR). The NJDEP is adding the DR, ER, and SR for consistency with USEPA and will retain the DSCR as an indicator, particularly for use with PNCWS.

Summaries of the DR, DSCR, ER, OR, and SR are provided in Appendix A.

Color coding helps to illustrate what these indicators are saying about the financial health of the PWS. Applying the symbolism associated with the colors red, yellow, and green is a generally accepted practice, is used in USEPA's CUPSS, and is incorporated here.

- For the DR and the ER, a value between 0 and 0.33 is green, a value between 0.34 and 0.66 is yellow, and a value between 0.66 and 1.0 is red.
- For the DSCR, a value less than 1.0 is red, a value between 1.0 and 1.5 is yellow, and a value of 1.5 or greater is green.

- For the OR, a value of 0.75 or lower is red, a value between 0.75 and 1.0 is yellow, and a value of 1.0 or greater is green.
- For the SR, a value of less than 0.1 is red, a value between 0.1 and 0.5 is yellow, and a value greater than 0.5 is green.

Each of these ratios should be used to trigger responses by the PWS.

The following provides one possible example of how the PWS should respond to a high (red) DR. In such instances, the PWS should try to find ways to reduce debt, generate other revenues, or restructure rates to lower the DR and improve its financial health. In summary, each of the ratios/indicators discussed above will serve as benchmarks for financial capacity along with the possession of an AMP/CIP that integrates the budgeting, reserve funding, and financial planning inherent in the process.

Observation: A TMF should calculate each of these ratios as a snapshot in time based on available financial data. When financial data is not forth coming or contains gaps then these impairments are signs of just "checking the box" which is not providing a practical financial plan used in short-term and long-term financial decision making for the management of the utility. TWW may be a RED using this Scaled Benchmark.

- No financial plan for future revenues, operating expenses, reserves, and capital improvements; do not have information needed to calculate financial indicator ratios; insufficient reserve accounts; no annual operating budget; water system revenues are siphoned off for non-utility use.
- Financial plan exists, but does not cover future revenues, operating expenses, reserves, and capital improvements; financial indicator ratios in the red; insufficient reserve accounts; annual operating budget has insufficient revenue to meet all expenses; no AMP/CIP, water system revenues are siphoned off for non-utility use.
- Financial plan exists and covers most but not all future revenues, operating expenses, reserves, and capital improvements; financial indicator ratios mix of red, yellow, and green; insufficient reserve accounts; annual operating budget has sufficient revenue to meet all expenses; no AMP/CIP, water system revenues dedicated for utility use.
- Financial plan covers future revenues, operating expenses, reserves, and capital improvements; financial indicator ratios in the green, sufficient reserve accounts; annual operating budget has sufficient revenue to meet all expenses; AMP/CIP exists and is being implemented; water system revenues dedicated for utility use.

8.5.1 The Trifecta of Governance Capacity

Trenton Water Works has many high-risk assessments which are interdependent. As an example, city employment policies and practices would need to be updated and at the same time, water utility training expectations and compensation would also need to be updated necessary to attract, hire and retain several competent finance and water professionals necessary to address managerial issues to reduce maintenance backlog and safely execute capital projects. While an individual indicator may seem inconsequential, technical shortcomings impact managerial indicators and vice versa which in turn prevent the resolution of financial capacity issues. Seasonal capacity issues also exist which increases risk, such as winter source water conditions impacting intake infrastructure and management and staff's lack of capacity to address electrical supply concerns and optimize plant production to meet water demands. Additionally, a city/utility brand (reputation) by itself can adversely impact its ability to recruit experienced managers and staff necessary to quickly mitigate risks. The Trifecta of Governance capacity includes

technical, managerial, and financial indicators and persistent risks can create a systemic organizational failure.

8.6 NJDEP's Oversite Analysis Using a Modified TMF Assessment Form

Using the basic New Jersey TMF questions in a TMF Assessment Form[13], additional columns were developed to review the role of NJDEP's oversight over the last 18 months. The Draft TMF (April 2024) is a snapshot in time and its observations are heavily influenced by NJDEP's oversite including the development of the last 2 TMFs conducted on TWW. NJDEP's Oversite Analysis using a Modified Assessment Form

While it is evident that TWW would not make certain TMF Capacity improvements without the NJDEP oversight, it is also very likely that many indicators will not be sustained by TWW. The following table highlights this snapshot in time observation.

Could TWW Sustain these Technical Elements?	Before NJDEP - YES	Before NJDEP - NO	With NJDEP after last 18 months - YES	With NJDEP after last 18 months - NO	IF NJDEP Stopped oversite could TWW Execute? YES	IF NJDEP stopped oversite could TWW Execute? NO
TECHNICAL CAPACITY						
1. System Description provided?						
Does it contain?						
a. A detailed description of source of supply, treatment, storage, and distribution of the water system's infrasturcture.		X	X		X	
b. Identification and evaluation of all critical facilities and equipment whose failure would result in a water outage or water quality failure.		X		X		X
c. Evidence, including a description, of any deeds, leases or easements for land, water supply sources, or physical facilities used in the operation of the system.		X	X		X	
d. Evaluation of connecting to an adjacent Public Water System	X		X		X	
e. Emergency provisions for alternative water supply such as a back-up well or interconnection with another public water system.	X		X		X	
2. Infrastructure Replacement Plan provided?		X		X		X
Does it contain?						
a. A description and an estimate of the life expectancy of all sources of water supply, treatment, and transmission/distribution facilities including pipes, pumping stations, storage facilities, and meters		X		X		X
b. An equipment replacement plan including expected replacement date, costs, and sources of funding.		X		X		X

Could TWW Sustain these Managerial Elements?	Before NJDEP - YES	Before NJDEP - NO	With NJDEP after last 18 months - YES	With NJDEP after last 18 months - NO	IF NJDEP Stopped oversite could TWW Execute? YES	IF NJDEP stopped oversite could TWW Execute? NO
MANAGERIAL CAPACITY						
1. Information available concerning the Organizational Structure of the System?	X		X		X	
Does it contain?						
a. A description of the organizational structure with a chart indicating all aspects of water system management and operation.		X	X		X	
b. A description of the primary responsibilities and identification of all key personnel involved in the management or operation of the system	X		X		X	
c. The names and phone numbers of those responsible for policy decisions ensuring compliance with Federal/State regulatory requirements, and the day-to-day operation of the system.	X		X		X	
2. Proof of compliance with the operator certification regulations including the name of the operator and licenses held.	X		X		X	
3. Is a Procedure for keeping management personnel informed concerning Regulatory Requirements for Operating a Public Water System available?		X	X			X
4. Is an Emergency Management Plan available?		X	X			X
Does it contain?						
a. Identification of known and potential natural and human-caused risks to the water system.		X	X			X
b. Identification of key personnel for emergency management.		X	X			X
c. A description of the notification procedures and means for implementation.		X	X			X
d. A description of an emergency response plan.		X	X			X

[13] State Program Capacity Development Strategy
https://www.nj.gov/dep/watersupply//pdf/capdev.pdf

Could TWW Sustain these Financial Elements?	Before NJDEP - YES	Before NJDEP - NO	With NJDEP after last 18 months - YES	With NJDEP after last 18 months - NO	IF NJDEP Stopped oversite could TWW Execute? YES	IF NJDEP stopped oversite could TWW Execute? NO
FINANCAL CAPACITY						
1. Is an annual Budget available that includes Revenues, Operating Expenses, Reserves, and Capital Improvements?		X	X			X
Does it contain?						
a. All operating and maintenance expenses such as salaries, chemicals, repairs, and utility expensitures for the year.		X	X			X
b. Identification of reserve accounts for emergency funding and equipment replacement.		X		X		X
c. A capital improvement plan including identification of the project(s), estimated costs, and amount allocated for repayment of debt financing to meet current/new drinking water standards.		X		X		X
2. A Description of the Budget and Expenditure Control Procedures and Reports that Assure Adequate Budget Control?		X		X		X
Does it contain?						
a. Quarterly reports comparing expenditures to budgeted expenses.		X		X		X
b. Purchasing procedures or policy to prevent misuse of funds.		X		X		X
3. Is a Statement of Credit Worthiness available?		X		X		X
Does it contain?						
a. Certification that the system is not in arrears on existing debt.		X		X		X
b. A current credit report.		X		X		X

8.6.1 Level of Accountability Analysis

The NJDEP oversight function is not in utility Governance or Utility Management. While TWW has shown some progress with NJDEP's oversite and engagement, neither the City of Trenton, TWW or NJDEP should be tasked with implementing all recommendations. The NJDEP does not make actual governance (ownership) and management changes necessary to mitigate all severe risks and shortcomings identified in the Draft (October 2024) TMF analysis and 360 Review. The following explains the level of responsibility and accountability by capacity objective.

The **Technical Capacity** area over **Source Water Adequacy** (reliability, quality, protection), **Infrastructure Adequacy** (condition, CIP, asset life) and **Technical Knowledge & Implementation** (O&M. operator certification, asset management planning, LSL compliance, PFAS, water loss).

- The NJDEP has some responsibility in monitoring specific indicators in the Technical Capacity area.
- The City of Trenton as the governing body is mostly accountable while the TWW management retains all of the responsibility.

The **Managerial Capacity** area over **Ownership Accountability** (owner identification, management information systems, GIS, work order maintenance, **Staffing & Organization** (policy and procedures, operator and management qualified and adequate staffing, training, regulatory education), **Effective Linkages** (communications with customers, regulators, inter-system, external stakeholders, customer complaints and resolution).

- The NJDEP has a small responsibility in monitoring specific indicators in the Managerial Capacity area.
- The City of Trenton as the governing body and the TWW management are completely accountable.

The **Financial Capacity** area over **Revenue Sufficiency** (billing and collection, rate structures, depreciation and interest, revenues and expenses, cost of service), **Credit Worthiness** (debt service coverage, operating ratio, cash reserves, credit rating, access to capital), **Fiscal Management and Controls** (books and records, accounting policies, budgeting and reporting, capital plans, asset valuations, reserve policy, investment plan, financial plan, affordability and customer assistance programs).

- The NJDEP has no responsibility for indicators in the Financial Capacity area.
- The City of Trenton as the governing body and the TWW management has all responsibility and accountability.

The recent NJDEP issuance of 47 violations at Tier 2 for TWW is an example of systemic failure.[14]

[14] NJDEP| Trenton Water Works | Direct Operational Oversight

9.0 Financial Models and Analysis

9.1 Financial Assumptions

Table 9-1 Key Modeling Assumptions

Model	O&M Factor*	CAPEX Factor*	Transfer to General Fund**
MUA	85%	90%	$1,500,000
IOU	85%	90%	$1,500,000
P3	85%	90%	$1,500,000
SPE	85%	90%	$1,500,000
Status Quo	100%	100%	$2,650,000

*Applied to baseline O&M and CAPEX assumptions.
**Assumed "transfer" in non-Status Quo scenarios represent increase in O&M costs to execute back-office functions executed by other state entities for TWW.

The AWWA Utility Benchmarking – Performance Management for Water and Wastewater (2021) [15] demonstrates that there is on average a 25% improvement for a median utility as compared to a poor performing water utility (25 percentile). In each model, on a conservative basis, it was assumed that an alternative governance structure would operate its O&M 15% better than the City of Trenton and the capital program's cost 10% better than Trenton. It is also assumed that while Trenton transfers $2.6M annually to the general fund, the alternative governance models would have some type of overhead costs for central services not found in the TWW budget in the amount of $1.5M.

Table 9-2 Bad Debt Collection Assumption by Fiscal Year

Model	2024	2025	2026	2027
MUA	$4,500,000	$1,500,000	$1,000,000	$500,000
IOU	$4,500,000	$3,000,000	$2,000,000	$1,000,000
P3	$4,500,000	$3,000,000	$2,000,000	$1,000,000
SPE	$4,500,000	$3,000,000	$2,000,000	$1,000,000

[15] AWWA Utility Benchmarking 2023: Performance Management for Water and Wastewater (PDF)

Model	2024	2025	2026	2027
Status Quo	$4,100,000	$1,000,000	$750,000	$-

Delinquent accounts are estimated at $23M, the bad debt collection assumptions are based on the qualitative profiles of each alternative governance model.

Table 9-3 O&M Escalation Factors

Category	2024	2025	2026-2034	2035-2044
Salaries	3.00%	10.00%	3.00%	3.00%
Benefits	3.00%	3.00%	3.00%	3.00%
Contract Services	5.00%	5.00%	5.00%	2.50%

The 2025 Salaries increase of 10% represents the increased staffing estimate of the Draft April 2024 TMF.

Table 9-4 Customer Growth Assumptions (Fixed Bills)

Category	2024	2025-2044
Residential	0.00%	0.25%
Commercial	0.00%	0.25%
Private Fire	0.00%	0.15%

Table 9-5 Customer Growth Assumptions (Consumption)

Category	2024	2025-2029	2030-2044
Residential	0.00%	-0.75%	0.00%
Commercial	0.00%	-0.75%	0.00%
Private Fire	0.00%	-0.75%	0.00%

Table 9-6 Other Key Assumptions

Assumption	Value
Minimum Operating Reserves (Non-SPE and IOU)	150 Day Cash on Hand
Combined Debt Service Coverage (Non-SPE and IOU)	Low: 1.0x Medium: 1.2x **Target: 1.5x**
Starting Fund Balance	$4,961,258
Cost of Debt	6%
Cost of Equity	10%

Financial models are expected to meet operating reserve and debt service coverage targets to set a baseline to generate the needed water rate increases to support the O&M and capital programs. The O&M budget and capital program is assumed to be adequate to meet drinking water standards and water quality compliance requirements while delivering water to protect the public health.

9.2 TWW Baseline Financial Model Description (Do Nothing)

The TWW Baseline Financial Model assumes do nothing – "no rate increases" with an operations and maintenance budget like the Draft (April 2024) TMF and a 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical and instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding,

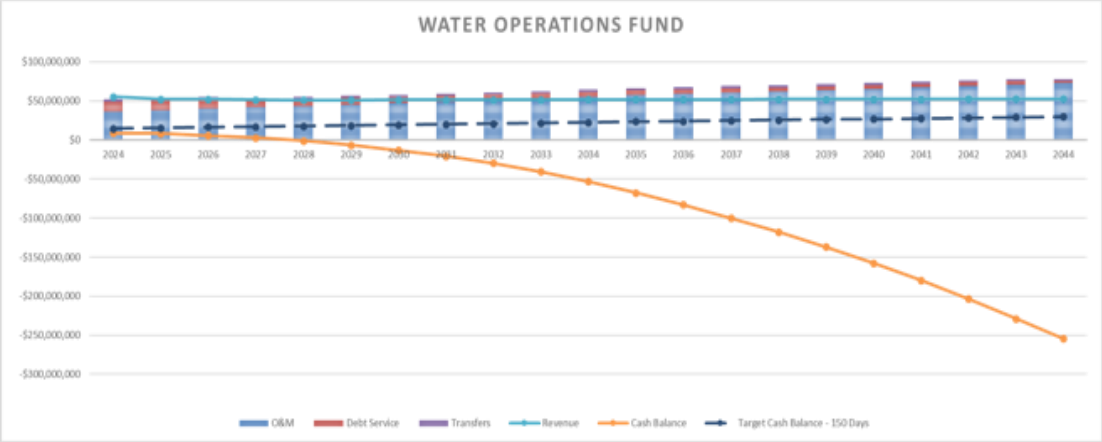
9.2.1 Baseline Financial Metrics (Do Nothing)

Without rate increases, TWW's financial metrics and indicators fail to meet minimum standards to finance new debt for needed capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SECTION 1: WATER OPERATIONS FUND							
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fund Balance ($)							
Net Annual Cash Balance	$ 3,811,000	$ (337,800)	$ (2,936,800)	$ (2,447,400)	$ (3,883,900)	$ (5,569,700)	$ (6,589,100)
Net Cumulative Fund Balance	$ 8,772,300	$ 8,434,500	$ 5,497,700	$ 3,050,300	$ (833,600)	$ (6,403,300)	$ (12,992,400)
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 14,860,900	$ 15,457,900	$ 16,501,000	$ 17,162,900	$ 17,852,900	$ 18,572,300	$ 19,322,500
Days Cash on Hand	89	82	50	27	(7)	(52)	(101)
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	1.50	1.18	0.98	1.02	0.86	0.67	0.52

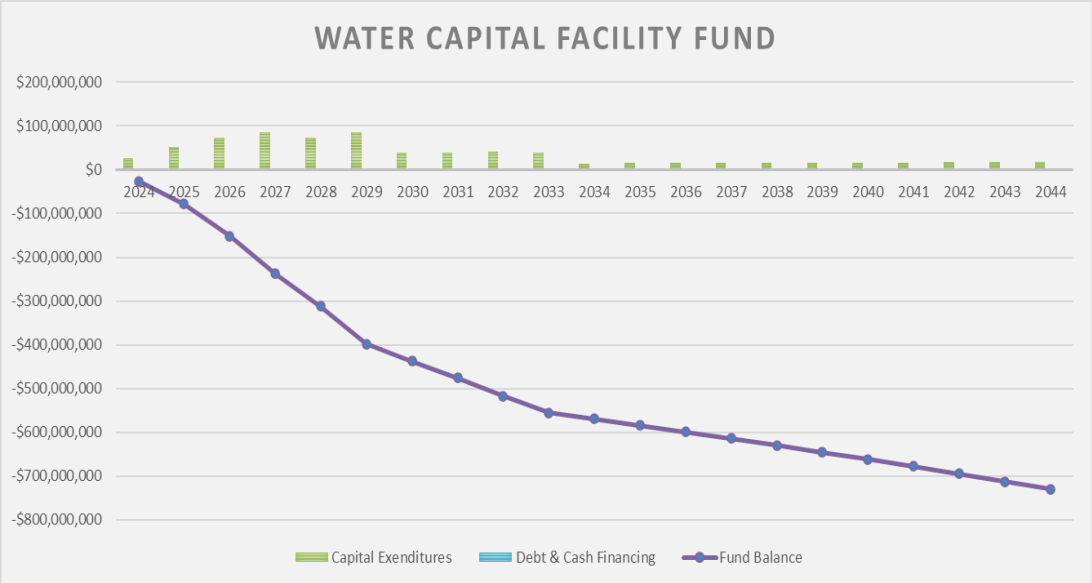
9.2.2 Baseline Cash Flow Analysis with No Rate Increases (Do Nothing)

Without rate increases, TWW is unable to sustain operations.



9.2.3 Baseline Capital Plan and Forecast with No Rate Increases (Do Nothing)

Without rate increases, TWW is unable to contribute cash towards capital projects or fund additional debt issuances.


WATER CAPITAL FACILITY FUND
$200,000,000
$100,000,000
$0
-$100,000,000
-$200,000,000
-$300,000,000
-$400,000,000
-$500,000,000
-$600,000,000
-$700,000,000
-$800,000,000
2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044
Capital Exenditures
Debt & Cash Financing
Fund Balance

9.2.4 TWW Baseline Summary Statistics (Do Nothing – No Rate Increase)

Summary Statistics				
Category	**Sub-Category**		**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue			$520,082,100	$1,094,853,000
O&M	Salary & Wages		$212,685,512	$534,966,712
	Cost of Goods		$231,466,456	$614,071,656
		Total	$444,152,000	$1,149,038,400
Debt Service			$94,820,000	$149,511,700
Total Revenue Requirement			*$565,472,000*	*$1,354,200,100*
Uninflated CIP			$501,195,000	$621,345,000
Inflated CIP	Engineering/Adr		$299,131,587	$377,693,575
	Treatment		$39,360,137	$39,360,137
	Water Distributi		$217,239,064	$313,118,418
		Total	$555,730,788	$730,172,130
Debt Raised	Principal Forgive		$0	$0
	Loan (Less: PF)		$0	$0
		Total	$0	$0
Rate Increase (Cumulative)			*0%*	*0%*
Rate Increase (CAGR %)			*0%*	*0.0%*
NPV of Revenues		*5.0%*	*$418,381,105*	*$687,936,430*

9.3 Status Quo (Municipal Model)

9.3.1 Scenario 1 Status Quo with Non-Optimized CIP (No NJ Water Bank) and Muni Bond Market Financing

The TWW Status Quo Financial Model assumes rate increases necessary to meet financial metrics to issue water revenue bonds on the municipal bond market – not using the State Revolving Funds, DEP Funding or IBANK Financings. The TWW operations and maintenance budget is like the Draft (April 2024) TMF, and a 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding but has not been optimized to receive SRF principal forgiveness.

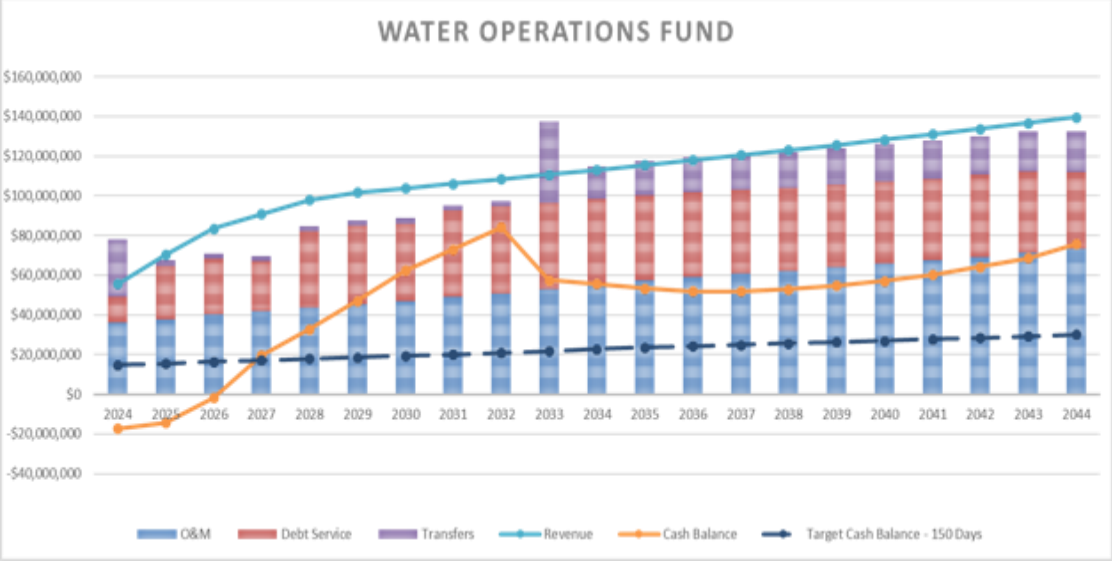
9.3.1.1 Financial Plan Dashboard

With significant rate increases in the first few years, TWW can meet bond market financial metrics necessary to issue water revenues bonds to pay for capital projects. In future years, TWW will be able to cash fund long-term capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	35.00%	20.00%	10.00%	8.00%	4.00%	2.00%
Fund Balance ($)							
Net Annual Cash Balance	$ (22,159,000)	$ 2,903,000	$ 12,627,900	$ 21,247,700	$ 13,307,700	$ 14,172,200	$ 15,231,900
Net Cumulative Fund Balance	$ (17,197,700)	$ (14,294,700)	$ (1,666,800)	$ 19,580,900	$ 32,888,600	$ 47,060,800	$ 62,292,700
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 14,860,900	$ 15,457,900	$ 16,501,000	$ 17,162,900	$ 17,852,900	$ 18,572,300	$ 19,322,500
Days Cash on Hand	(174)	(139)	(15)	171	276	380	484
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	1.50	1.21	1.54	1.95	1.41	1.42	1.46

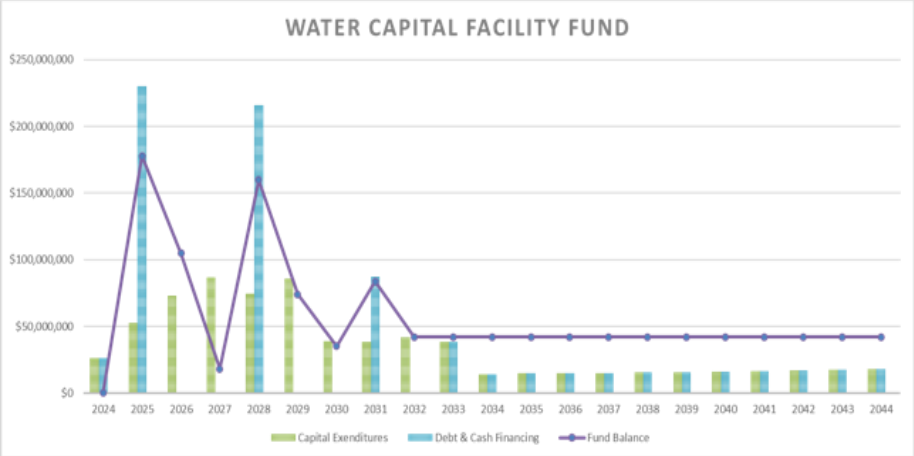
9.3.1.2 Operating Fund Analysis

With significant rate increases, TWW can sustain operations.



9.3.1.3 Capital Fund Analysis

With significant rate increases, TWW can issue water revenue bonds and fund future projects in cash.



9.3.1.4 Summary Statistics

Status Quo Non-Optimized CIP & Market Financing			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$928,962,000	$2,314,187,700
O&M	Salary & Wages	$212,685,512	$534,966,712
	Cost of Goods	$231,466,456	$614,071,656
	Total	**$444,152,000**	**$1,149,038,400**
Debt Service		$341,551,100	$800,037,400
Total Revenue Requirement		*$876,463,239*	*$2,243,427,280*
Uninflated CIP		$501,195,000	$621,345,000
Inflated CIP	Engineering/Admin	$299,131,587	$377,693,575
	Treatment	$39,360,137	$39,360,137
	Water Distribution	$217,239,064	$313,118,418
	Total	**$555,730,788**	**$730,172,130**
Debt Raised	Principal Forgiveness	$0	$0
	Loan (Less: PF)	$533,514,500	$533,514,500
	Total	**$533,514,500**	**$533,514,500**
Rate Increase (Cumulative)		*117%*	*169%*
Rate Increase (CAGR %)		*7%*	*4.5%*
Capital Fund Balance		*$42,043,850*	*$42,043,850*
NPV of Revenues (5%)		*$726,243,485*	*$1,369,517,838*

9.3.2 Scenario 2 Status Quo with Non-Optimized CIP and Water Bank Financing

The TWW Status Quo Financial Model assumes rate increases necessary to meet financial metrics to access the State Revolving Funds, DEP Funding and IBANK Financings. The TWW operations and maintenance budget is like the Draft (April 2024) TMF and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models.

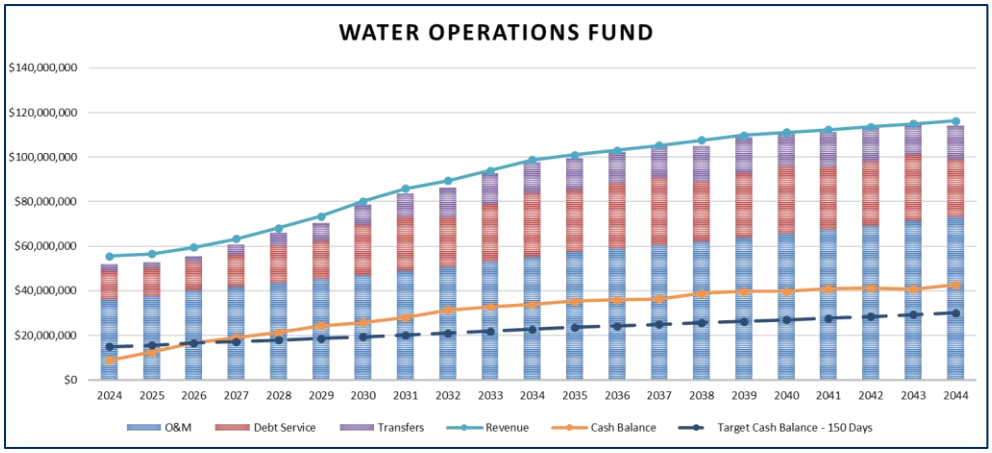
9.3.2.1 Financial Plan Dashboard

With significantly lower rates than the Revenue bond scenario, TWW can meet financial metrics to receive IBANK financings for capital projects. In future years, TWW will be able to cash fund long-term capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SECTION 1: WATER OPERATIONS FUND							
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	8.00%	6.00%	8.00%	8.00%	8.00%	9.00%
Fund Balance ($)							
Net Annual Cash Balance	$ 3,811,000	$ 3,723,300	$ 4,007,816	$ 2,583,878	$ 2,109,197	$ 3,075,187	$ 1,465,198
Net Cumulative Fund Balance	$ 8,772,300	$ 12,495,600	$ 16,503,416	$ 19,087,293	$ 21,196,490	$ 24,271,678	$ 25,736,875
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 14,860,900	$ 15,457,900	$ 16,501,000	$ 17,162,900	$ 17,852,900	$ 18,572,300	$ 19,322,500
Days Cash on Hand	89	121	150	167	178	196	200
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	1.50	1.51	1.53	1.50	1.49	1.68	1.47

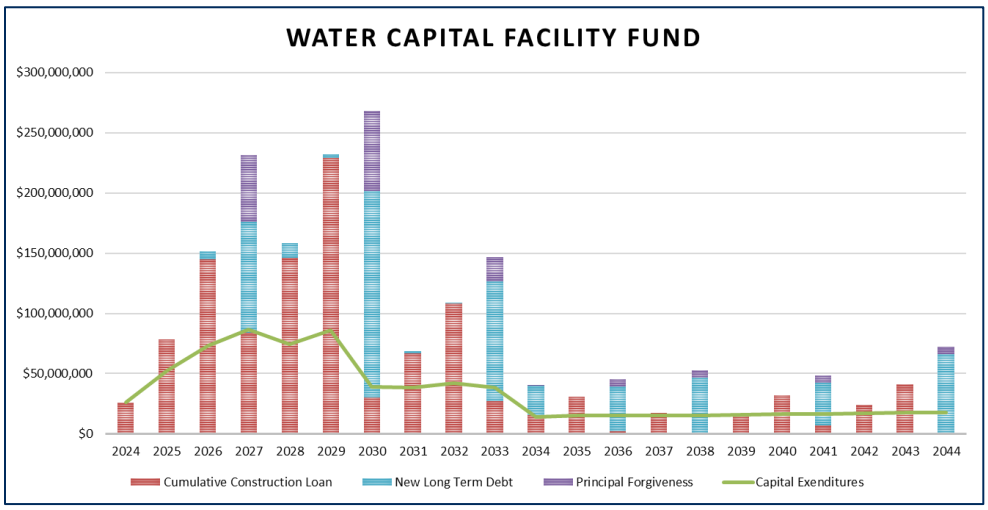
9.3.2.2 Operating Fund Analysis

With low-rate increases, TWW is able to sustain operations.



9.3.2.3 Capital Fund Analysis

With significantly lower rate increases, TWW can issue water revenue bonds and cash fund future projects.



9.3.2.4 Summary Statistics

Summary Statistics			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$726,122,100	$1,695,091,211
O&M	Salary & Wages	$212,685,512	$534,966,712
	Cost of Goods	$231,466,456	$614,071,656
	Total	$444,151,968	$1,149,038,368
Debt Service		$180,958,661	$495,364,111
Total Revenue Requirement		*$651,610,661*	*$1,700,052,511*
Uninflated CIP		$501,195,000	$621,345,000
Inflated CIP	Engineering/Admin	$299,131,587	$377,693,575
	Treatment	$39,360,137	$39,360,137
	Water Distribution	$217,239,064	$313,118,418
	Total	$555,730,788	$730,172,130
Ibank Funding	Principal Forgiveness	$141,870,648	$166,496,007
	Loan (Less: PF)	$387,041,556	$597,703,735
	Total	$528,912,204	$764,199,742
Conclusions			
Rate Increase (Cumulative)		*84%*	*124%*
Rate Increase (CAGR %)		*5.4%*	*3.6%*
NPV of Revenues	*5.0%*	*$567,187,480*	*$1,042,313,409*
Avg customer Annual	*2024*	$453	
5/8" & 4000 gal	*2029*	*$653*	
	2034	$873	
	2044	*$974*	

9.3.3 Scenario 3 Status Quo with Optimized CIP and Water Bank Financing

The TWW Status Quo Financial Model assumes rate increases necessary to meet financial metrics to access the State Revolving Funds, DEP Funding and IBANK Financings. The TWW operations and maintenance budget is similar to the Draft (April 2024) TMF and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models.

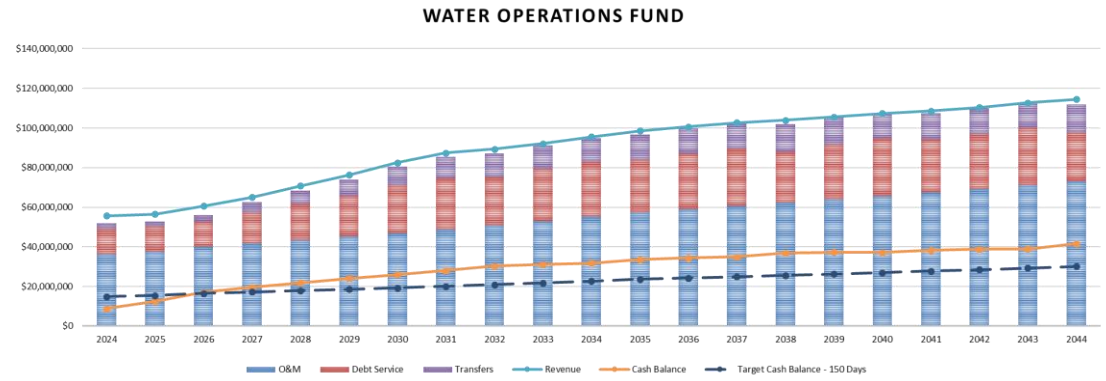
9.3.3.1 Financial Plan Dashboard

With significantly lower rates than the Revenue bond scenario, TWW can meet financial metrics to receive Water Bank financings for capital projects. In future years, TWW will be able to cash fund long-term capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SECTION 1: WATER OPERATIONS FUND							
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	8.00%	8.00%	9.00%	9.00%	8.00%	8.00%
Fund Balance ($)							
Net Annual Cash Balance	$ 3,811,000	$ 3,723,300	$ 4,555,016	$ 2,505,160	$ 2,251,023	$ 2,321,307	$ 1,892,661
Net Cumulative Fund Balance	$ 8,772,300	$ 12,495,600	$ 17,050,616	$ 19,555,776	$ 21,806,798	$ 24,128,106	$ 26,020,767
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 14,860,900	$ 15,457,900	$ 16,501,000	$ 17,162,900	$ 17,852,900	$ 18,572,300	$ 19,322,500
Days Cash on Hand	89	121	155	171	183	195	202
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	1.50	1.51	1.61	1.48	1.48	1.51	1.47

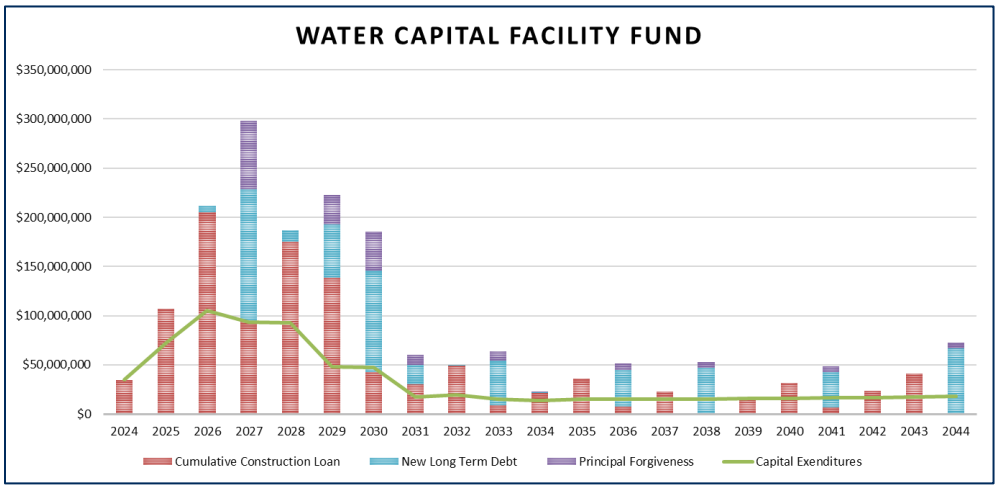
9.3.3.2 Operating Fund Analysis

With low rate increases, TWW is able to sustain operations.



9.3.3.3 Capital Fund Analysis

With significantly lower rate increases, TWW is able to issues water revenue bonds and fund future projects in cash.



9.3.3.4 Summary Statistics

Summary Statistics			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$736,181,500	$1,695,411,770
O&M	Salary & Wages	$212,685,512	$534,966,712
	Cost of Goods	$231,466,456	$614,071,656
	Total	$444,151,968	$1,149,038,368
Debt Service		$193,610,184	$495,684,670
Total Revenue Requirement		*$664,262,184*	*$1,700,373,070*
Uninflated CIP		$501,195,000	$621,345,000
Inflated CIP	Engineering/Admin	$291,574,928	$370,136,916
	Treatment	$39,360,137	$39,360,137
	Water Distribution	$213,772,243	$309,651,597
	Total	$544,707,308	$719,148,650
Ibank Funding	Principal Forgiveness	$159,899,490	$184,524,849
	Loan (Less: PF)	$376,185,013	$563,197,699
	Total	$536,084,503	$747,722,548
Conclusions			
Rate Increase (Cumulative)		*80%*	*120%*
Rate Increase (CAGR %)		*5.2%*	*3.5%*
NPV of Revenues	*5.0%*	*$575,431,946*	*$1,043,302,220*
Avg customer Annual	*2024*	$453	
5/8" & 4000 gal	*2029*	*$678*	
	2034	$844	
	2044	*$941*	

9.4 Municipal Utilities Authority MUA (Regional Model)

9.4.1 Model Assumptions

The MOU Financial Model assumes rate increases necessary to meet financial metrics to access the State Revolving Funds, DEP Funding and IBANK Financings. The MOU operations and maintenance budget is similar to the Draft (April 2024) TMF with MUA efficiencies applied and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models.

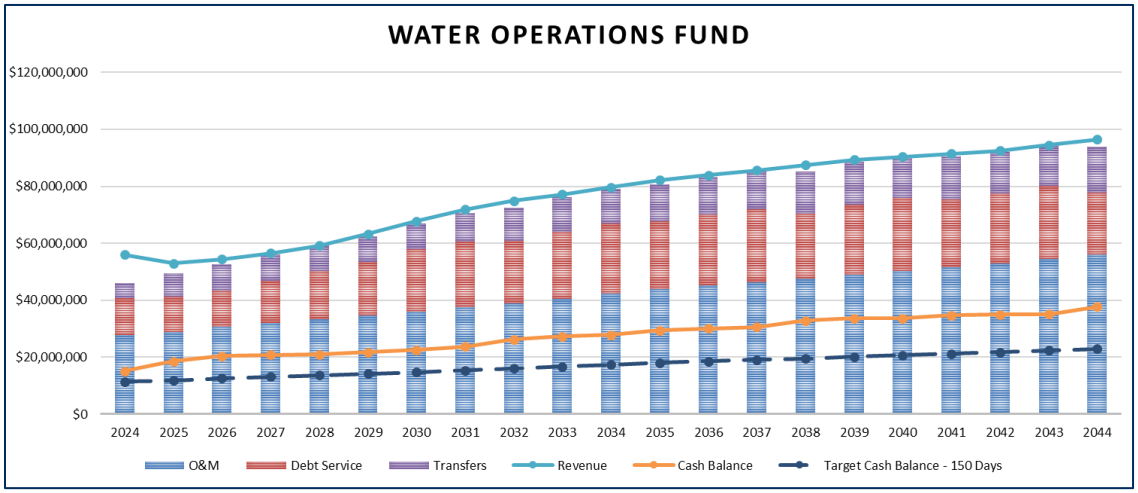
9.4.2 Financial Plan Dashboard

With lower rates than the Status Quo Optimized CIP and IBANK Financing scenario 2, the MOU can meet financial metrics to receive IBANK financings for capital projects. In future years, the MOU can cash fund long-term capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SECTION 1: WATER OPERATIONS FUND							
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	0.00%	4.00%	5.00%	6.00%	7.00%	7.00%
Cumulative Rate Adjustment	0.00%	0.00%	4.00%	9.20%	15.75%	23.85%	32.52%
Fund Balance ($)							
Net Annual Cash Balance	$ 10,133,150	$ 3,441,125	$ 1,831,431	$ 504,479	$ 97,909	$ 799,769	$ 713,654
Net Cumulative Fund Balance	$ 15,094,450	$ 18,535,575	$ 20,367,006	$ 20,871,486	$ 20,969,395	$ 21,769,164	$ 22,482,818
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 11,368,600	$ 11,825,500	$ 12,623,400	$ 13,129,600	$ 13,657,400	$ 14,207,800	$ 14,781,800
Days Cash on Hand	199	235	242	238	230	230	228
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	2.18	1.93	1.88	1.66	1.52	1.52	1.45

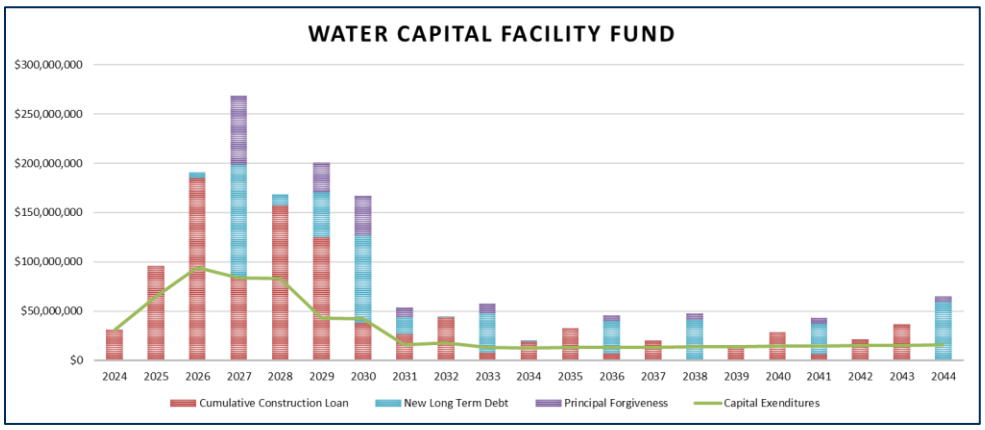
9.4.3 Operating Fund Analysis

With lower rate increases, the MUA is able to sustain operations.



9.4.4 Capital Fund Analysis

With lower rate increases, The MUA is able to access IBANK financing and fund future projects in cash.



9.4.5 Summary Statistics

Summary Statistics			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$634,067,300	$1,352,763,639
O&M	Salary & Wages	$162,707,851	$409,257,491
	Cost of Goods	$177,069,722	$469,755,832
	Total	$339,777,573	$879,013,323
Debt Service		$179,263,826	$447,211,439
Total Revenue Requirement (- Capital F		*$534,041,526*	*$1,357,724,939*
Uninflated CIP		$451,075,500	$559,210,500
Inflated CIP	Engineering/Admin	$262,417,435	$333,123,224
	Treatment	$35,424,124	$35,424,124
	Water Distribution	$192,395,019	$278,686,437
	Total	$490,236,578	$647,233,785
Ibank Funding	Principal Forgiveness	$159,899,490	$184,524,849
	Loan (Less: PF)	$322,576,562	$488,425,444
	Total	$482,476,053	$672,950,293
Conclusions			
Rate Increase (Cumulative)		*50%*	*85%*
Rate Increase (CAGR %)		*3.3%*	*2.6%*
NPV of Revenues	*5.0%*	*$499,391,619*	*$860,831,737*
Avg customer An	*2024*	$453	
5/8" & 4000 gal	*2029*	*$561*	
	2034	$702	
	2044	*$790*	

9.5 SPE Model

9.5.1 Model Assumptions

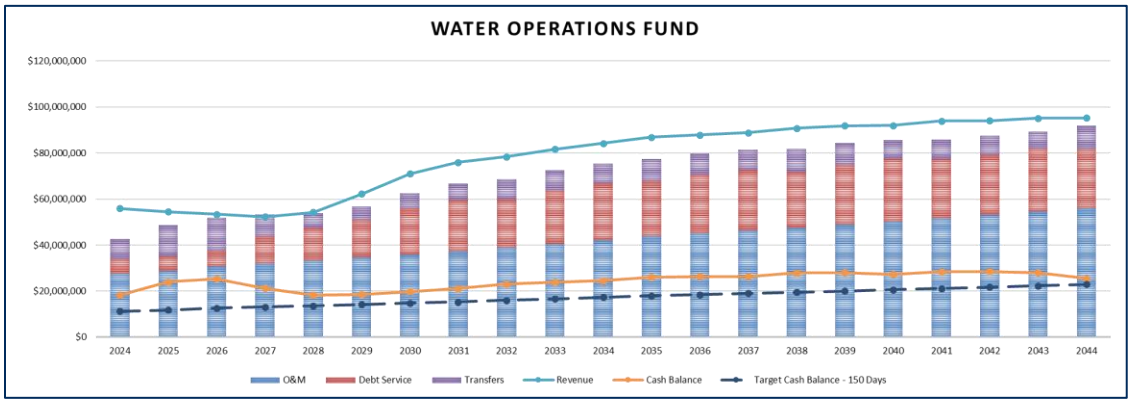
The SPE Financial Model assumes rate increase to be based on the rate base as calculated using straight line depreciation of existing assets and planned capital projects. To establish a rate base, the SPE is assumed to be transferred TWW as an Asset in Kind (AIK), as such, the SPE does not with any equity in its rate base and must build equity from capital investments. For its rate base calculation, the SPE is assumed to include principal forgiveness from government grants. The model assumes a regulatory capitalization of 50 percent debt at 6% cost of debt and 50 percent equity at 10% cost of equity which are assumed to be set by the New Jersey Board of Public Utilities. The SPE is also permitted to pay a dividend up to 50% of its authorized net income based on its rate base.

The SPE operations and maintenance budget is similar to the Draft (April 2024) TMF with SPE efficiencies applied and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and computer maintenance management system (CMMS) software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models.

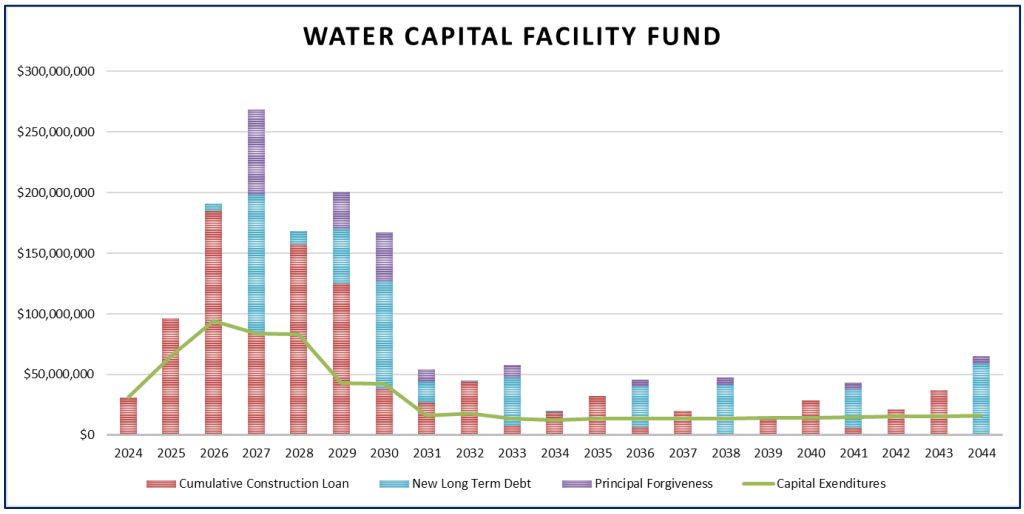
9.5.2 Financial Plan Dashboard

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	0.00%	0.00%	0.00%	6.00%	15.00%	14.00%
IOU Return Metrics							
Dividend Payout (as % of Net Income)	0%	0%	50%	50%	50%	50%	50%
Fund Balance ($)							
Net Annual Cash Balance	$ 13,429,400	$ 5,614,850	$ 1,442,415	$ (4,166,323)	$ (2,971,264)	$ 277,282	$ 1,184,070
Net Cumulative Fund Balance	$ 18,390,700	$ 24,005,550	$ 25,447,965	$ 21,281,642	$ 18,310,378	$ 18,587,660	$ 19,771,730
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 11,368,600	$ 11,825,500	$ 12,623,400	$ 13,129,600	$ 13,657,400	$ 14,207,800	$ 14,781,800
Days Cash on Hand	243	304	302	243	201	196	201
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	4.43	4.01	3.36	1.73	1.46	1.70	1.75

9.5.3 Operating Fund Analysis



9.5.4 Capital Fund Analysis



9.5.5 Summary Statistics

Summary Statistics			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$639,904,600	$1,459,184,597
O&M	Salary & Wages	$162,707,851	$409,257,491
	Cost of Goods	$177,069,722	$469,755,832
	Total	$339,777,573	$879,013,323
Debt Service		$148,443,826	$432,099,739
Total Revenue Requirement		*$503,221,526*	*$1,342,613,239*
Uninflated CIP		$451,075,500	$559,210,500
Inflated CIP	Engineering/Adr	$262,417,435	$333,123,224
	Treatment	$35,424,124	$35,424,124
	Water Distributi	$192,395,019	$278,686,437
	Total	$490,236,578	$647,233,785
Ibank Funding	Principal Forgive	$159,899,490	$184,524,849
	Loan (Less: PF)	$322,576,562	$488,425,444
	Total	$482,476,053	$672,950,293
Conclusions			
Rate Increase (Cumulative)		*59%*	*83%*
Rate Increase (CAGR %)		*3.8%*	*2.6%*
NPV of Revenues	*5%*	*$502,020,994*	*$968,900,542*
Avg customer Annual	*2024*	$453	
5/8" & 4000 gal	*2029*	*$552*	
	2034	$743	
	2044	*$804*	

9.6 Public Private Partnership (P3 Model)

9.6.1 Model Assumptions

The P3 Financial Model assumes rate increases necessary to meet financial metrics to access the State Revolving Funds, DEP Funding and IBANK Financings. The P3 operations and maintenance budget is similar to the Draft (April 2024) TMF with P3 efficiencies applied and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models.

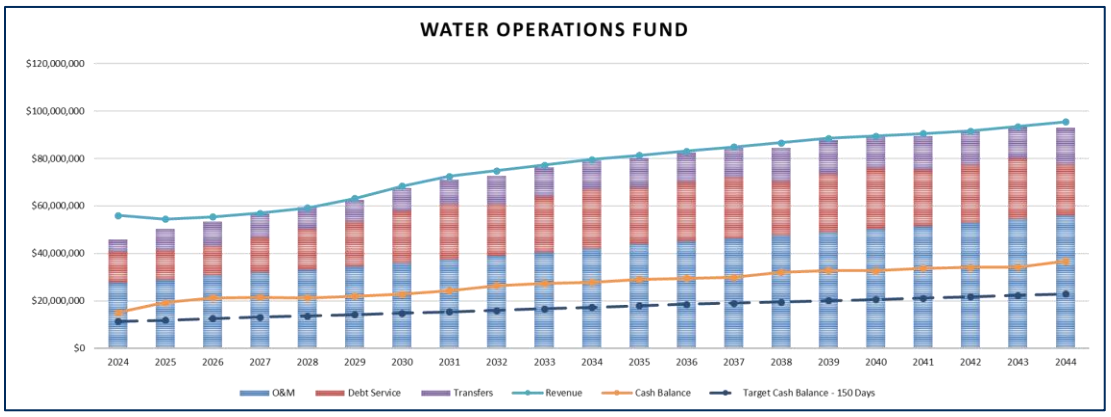
9.6.2 Financial Plan Dashboard

With rates similar to the MUA Optimized CIP and IBANK Financing scenario 1, the P3 can meet financial metrics to receive IBANK financings for capital projects. In future years, the P3 will be able to cash fund long-term capital projects.

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SECTION 1: WATER OPERATIONS FUND							
Water Operations							
Input Rate Revenue Adjustment (Choose)	0.00%	0.00%	4.00%	5.00%	6.00%	7.00%	8.00%
Fund Balance ($)							
Net Annual Cash Balance	$ 10,133,150	$ 4,191,125	$ 1,956,431	$ 316,979	$ (245,841)	$ 627,894	$ 940,016
Net Cumulative Fund Balance	$ 15,094,450	$ 19,285,575	$ 21,242,006	$ 21,558,986	$ 21,313,145	$ 21,941,039	$ 22,881,055
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 11,368,600	$ 11,825,500	$ 12,623,400	$ 13,129,600	$ 13,657,400	$ 14,207,800	$ 14,781,800
Days Cash on Hand	199	245	252	246	234	232	232
NJ Utility Health Standards							
Combined Debt Service Coverage (Target: 1.5)	2.18	2.05	1.96	1.69	1.52	1.52	1.48

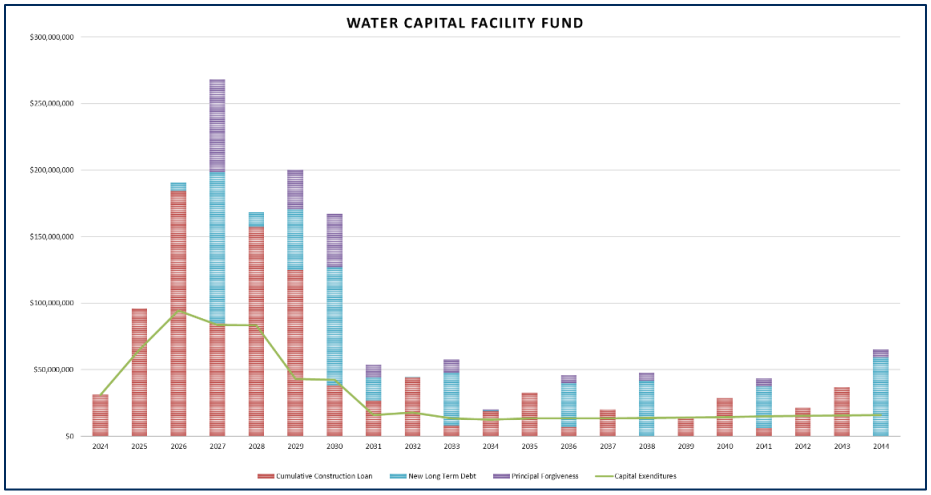
9.6.3 Operating Fund Analysis

With low rates increases, the P3 is able to sustain operations.



9.6.4 Capital Fund Analysis

With low rate increases, the P3 is able to use Water Bank Financing and fund future projects in cash.



9.6.5 Summary Statistics

Summary Statistics			
Category	**Sub-Category**	**10-year (2024-2033)**	**21-Year (2024-2044)**
Revenue		$638,300,900	$1,352,763,639
O&M	Salary & Wages	$162,707,851	$409,257,491
	Cost of Goods	$177,069,722	$469,755,832
	Total	$339,777,573	$879,013,323
Debt Service		$179,263,826	$447,211,439
Total Revenue Requirement		*$534,041,526*	*$1,357,724,939*
Uninflated CIP		$451,075,500	$559,210,500
Inflated CIP	Engineering/Admin	$262,417,435	$333,123,224
	Treatment	$35,424,124	$35,424,124
	Water Distribution	$192,395,019	$278,686,437
	Total	$490,236,578	$647,233,785
Ibank Funding	Principal Forgivenes	$159,899,490	$184,524,849
	Loan (Less: PF)	$322,576,562	$488,425,444
	Total	$482,476,053	$672,950,293
Conclusions			
Rate Increase (Cumulative)		*50%*	*83%*
Rate Increase (CAGR %)		*3.3%*	*2.6%*
NPV of Revenues	*5.0%*	*$503,035,023*	*$862,110,679*
Avg customer Annu	*2024*	$453	
5/8" & 4000 gal	*2029*	*$561*	
	2034	$701	
	2044	*$782*	

9.7 IOU Privatization Model

9.7.1 Model Assumptions

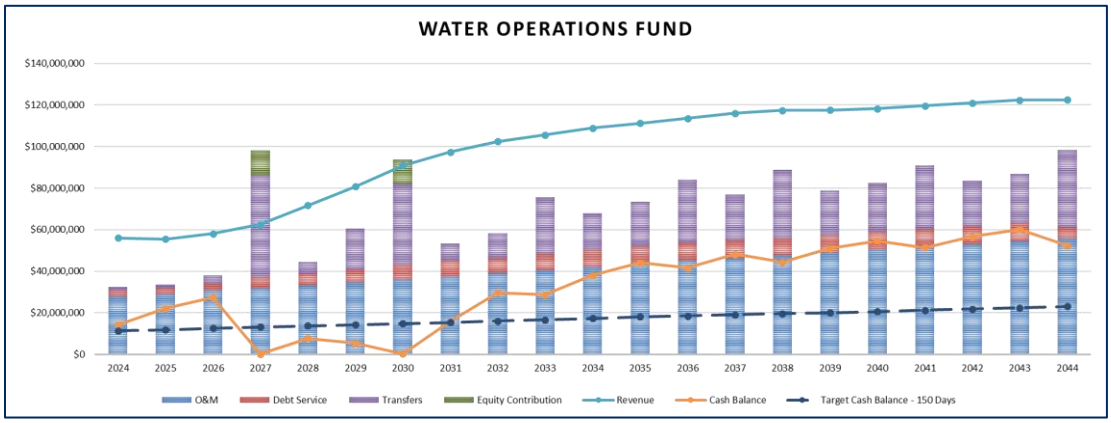
The IOU Financial Model assumes rate increases based on the rate base as calculated using straight line depreciation of existing assets and planned capital projects. To establish a rate base, an IOU is assumed to purchase TWW at the value of TWW's current principal outstanding ($128m). The model assumes a regulatory capitalization of 50 percent debt at 6% cost of debt and 50 percent equity at 10% cost of equity which are assumed to be set by the New Jersey Board of Public Utilities. Further, the IOU is assumed to incur sales taxes of 20% and is assumed to extract a dividend equal to an amount equal to 50% of its regulated net income.

The IOU operations and maintenance budget is like the Draft (April 2024) TMF with IOU efficiencies applied and an optimized (individual projects scheduled for gaining the highest thresholds of principal forgiveness, project construction funds and a new project based low-cost loan amortization when the project is completed). The CIP is based on the 360 Review modified capital plan (with annual inflation) extended to 2044 which has accelerated and added dollars for plant electrical & instrumentation, critical asset management condition assessment and CMMS software and long-term asset replacement funding. The Optimized CIP and IBANK Financing is available to all forms of water governance in New Jersey and is applied to the alternative governance models. However, the IOU does miss out on some programs which offer principal forgiveness, such as some meter replacement programs. As a result, the IOU reaps the same benefits from principal forgiveness as the other models.

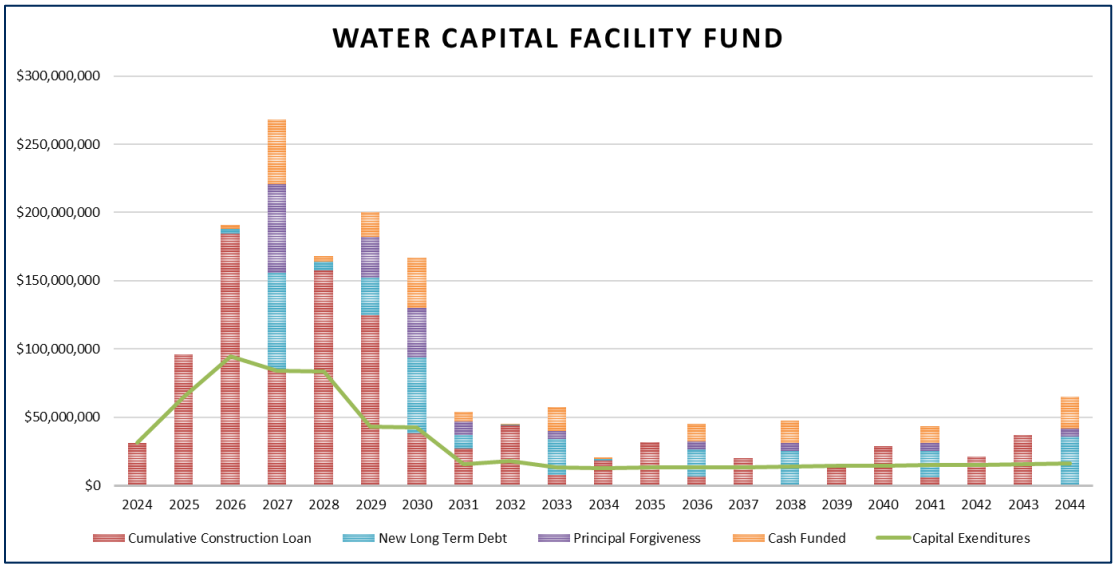
9.7.2 Financial Plan Dashboard

Description	Budget 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
Water Operations							
Input Rate Revenue Adjustment (Choose)	10.00%	0.00%	4.00%	7.00%	17.00%	12.00%	9.00%
IOU Return Metrics							
Regulated Return (Actual minus Allowed)	$ (821,895)	$ 433,263	$ (329,016)	$ (521,785)	$ (254,122)	$ (91,492)	$ (247,331)
Dividend Payout (as % of Net Income)	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%
Fund Balance ($)							
Net Annual Cash Balance	$ 4,264,445	$ 3,835,963	$ 1,836,001	$ 647,695	$ 1,870,498	$ 2,579,010	$ 1,899,530
Net Cumulative Fund Balance	$ 9,225,745	$ 13,061,709	$ 14,897,710	$ 15,545,405	$ 17,415,903	$ 19,994,913	$ 21,894,443
Fund Health Metrics							
Minimum Operating Reserves (150 Days)	$ 11,368,600	$ 11,825,500	$ 12,623,400	$ 13,129,600	$ 13,657,400	$ 14,207,800	$ 14,781,800
Days Cash on Hand	122	166	177	178	191	211	222
NJ Utility Health Standards							
Combined Debt Service Coverage (Min 1.0x), 1.2, 1.5	2.31	2.45	2.37	2.11	2.29	2.46	2.37

9.7.3 Operating Fund Analysis



9.7.4 Capital Fund Analysis



9.7.5 Summary Statistics

Summary Statistics			
Category	Sub-Category	10-year (2024-2033)	21-Year (2024-2044)
Revenue		$775,723,100	$1,794,023,110
O&M	Salary & Wages	$162,707,851	$409,257,491
	Cost of Goods	$177,069,722	$469,755,832
	Total	$339,777,573	$879,013,323
Debt Service		$56,370,211	$146,906,830
Total Revenue Requirement		$566,292,531	$1,466,948,470
Uninflated CIP		$451,075,500	$559,210,500
Inflated CIP	Engineering/Admin	$262,417,435	$333,123,224
	Treatment	$35,424,124	$35,424,124
	Water Distribution	$192,395,019	$278,686,437
	Total	$490,236,578	$647,233,785
Ibank Funding	Principal Forgiveness	$146,849,072	$171,161,707
	Loan (Less: PF)	$335,642,204	$502,369,311
	Total	$482,491,276	$673,531,019
Conclusions			
Rate Increase (Cumulative)		104%	133%
Rate Increase (CAGR %)		6%	3.7%
NPV of Revenues	5.0%	$582,354,401	$1,175,984,925

Avg customer Annual	2024	$	453
5/8" & 4000 gal	2029	$	719
	2034	$	951
	2044	$	1,024

10.0 Governance Financial Models Comparable Analysis

Table 10-1 Model Financial Comparison – 10 Year Summary

Summary Statistics (2024-2033)							
Category	Sub-Category	Status Quo		MUA	SPE	P3	IOU
		Non-Optimized	Optimized	Optimized	Optimized	Optimized	Optimized
Revenue		$726,122,100	$736,181,500	$634,067,300	$639,904,600	$638,300,900	$775,723,100
O&M	Salary & Wages	$212,685,512	$212,685,512	$162,707,851	$162,707,851	$162,707,851	$162,707,851
	Cost of Goods	$231,466,456	$231,466,456	$177,069,722	$177,069,722	$177,069,722	$177,069,722
	Total	**$444,151,968**	**$444,151,968**	**$339,777,573**	**$339,777,573**	**$339,777,573**	**$339,777,573**
Debt Service		$180,958,661	$193,610,184	$179,263,826	$148,443,826	$179,263,826	$56,370,211
Total Revenue Requirement		*$651,610,661*	*$664,262,184*	*$534,041,526*	*$503,221,526*	*$534,041,526*	*$566,292,531*
Uninflated CIP		$501,195,000	$501,195,000	$451,075,500	$451,075,500	$451,075,500	$451,075,500
Inflated CIP	Engineering/Admin	$299,131,587	$291,574,928	$262,417,435	$262,417,435	$262,417,435	$262,417,435
	Treatment	$39,360,137	$39,360,137	$35,424,124	$35,424,124	$35,424,124	$35,424,124
	Water Distribution	$217,239,064	$213,772,243	$192,395,019	$192,395,019	$192,395,019	$192,395,019
	Total	**$555,730,788**	**$544,707,308**	**$490,236,578**	**$490,236,578**	**$490,236,578**	**$490,236,578**
Water Bank Funding	Principal Forgiveness	$141,870,648	$159,899,490	$159,899,490	$159,899,490	$159,899,490	$146,849,072
	Loan (Less: PF)	$387,041,556	$376,185,013	$322,576,562	$322,576,562	$322,576,562	$335,642,204
	Total	**$528,912,204**	**$536,084,503**	**$482,476,053**	**$482,476,053**	**$482,476,053**	**$482,491,276**
Conclusions							
Rate Increase (Cumulative)		*83.7%*	*80.0%*	*50.5%*	*59.3%*	*50.4%*	*103.9%*
Rate Increase (CAGR %)		*5.4%*	*5.2%*	*3.3%*	*3.8%*	*3.3%*	*6.4%*
NPV of Revenues	*5.0%*	*$567,187,480*	*$575,431,946*	*$499,391,619*	*$502,020,994*	*$503,035,023*	*$582,354,401*
Avg customer Annual	*2024*	*$453*	*$453*	*$453*	*$453*	*$453*	*$453*
5/8" & 4000 gal	*2029*	*$653*	*$678*	*$561*	*$552*	*$561*	*$719*

Table 10-2 Model Financial Comparison – 20 Year Summary

Summary Statistics (2024-2044)							
Category	Sub-Category	Status Quo		MUA	SPE	P3	IOU
		Non-Optimized	Optimized	Optimized	Optimized	Optimized	Optimized
Revenue		$1,695,091,211	$1,695,411,770	$1,352,763,639	$1,453,168,248	$1,352,763,639	$1,794,023,110
O&M	Salary & Wages	$534,966,712	$534,966,712	$409,257,491	$409,257,491	$409,257,491	$409,257,491
	Cost of Goods	$614,071,656	$614,071,656	$469,755,832	$469,755,832	$469,755,832	$469,755,832
	Total	**$1,149,038,368**	**$1,149,038,368**	**$879,013,323**	**$879,013,323**	**$879,013,323**	**$879,013,323**
Debt Service		$495,364,111	$495,684,670	$447,211,439	$425,699,739	$447,211,439	$146,906,830
Total Revenue Requirement		*$1,700,052,511*	*$1,700,373,070*	*$1,357,724,939*	*$1,336,213,239*	*$1,357,724,939*	*$1,466,948,470*
Uninflated CIP		$621,345,000	$621,345,000	$559,210,500	$559,210,500	$559,210,500	$559,210,500
Inflated CIP	Engineering/Admin	$377,693,575	$370,136,916	$333,123,224	$333,123,224	$333,123,224	$333,123,224
	Treatment	$39,360,137	$39,360,137	$35,424,124	$35,424,124	$35,424,124	$35,424,124
	Water Distribution	$313,118,418	$309,651,597	$278,686,437	$278,686,437	$278,686,437	$278,686,437
	Total	**$730,172,130**	**$719,148,650**	**$647,233,785**	**$647,233,785**	**$647,233,785**	**$647,233,785**
Water Bank Funding	Principal Forgiveness	$166,496,007	$184,524,849	$184,524,849	$184,524,849	$184,524,849	$171,161,707
	Loan (Less: PF)	$597,703,735	$563,197,699	$488,425,444	$488,425,444	$488,425,444	$502,369,311
	Total	**$764,199,742**	**$747,722,548**	**$672,950,293**	**$672,950,293**	**$672,950,293**	**$673,531,019**
Conclusions							
Rate Increase (Cumulative)		123.8%	120.5%	85.2%	82.9%	83.4%	133.1%
Rate Increase (CAGR %)		*3.6%*	*3.5%*	*2.6%*	*2.6%*	*2.6%*	*3.7%*
NPV of Revenues	*5.0%*	*$1,042,313,409*	*$1,043,302,220*	*$860,831,737*	*$968,900,542*	*$862,110,679*	*$1,175,984,925*
Avg customer Annual	2024	$453	$453	$453	$453	$453	$453
5/8" & 4000 gal	*2029*	*$653*	*$678*	*$561*	*$552*	*$561*	*$719*
	2034	*$873*	*$844*	*$702*	*$743*	*$701*	*$951*
	2044	*$974*	*$941*	*$790*	*$804*	*$782*	*$1,024*

11.0 Quantitative Analysis – Financial Findings Under Alternative Governance

11.1 Methodology of Quantitative Analysis

The quantitative analysis of alternative governance builds on the findings in TMF Critical Review and the Qualitative Assessment of Alternative Governance herein and provides insights for the Financial Model with relevant assumptions and cost drivers for the specific model options. There are a number of key value drivers and normally "cost of debt" would be one of them, however, the availability of NJ Water Bank SRF Loans to both public and private borrowers as well as the ability to provide principal forgiveness to all of the models under consideration narrows the impact of key drivers, which are:

- Cost of Capital – The cost of capital is the sum of the weighted average cost of debt and equity represented by the return on investment (ROI), which is assumed to be 10% for the IOU and 8% for the SPE.
  - **Cost of Debt –** The Optimized TWW Status Quo Model and the four alternative models maximize PF to minimize the cost of debt and the other debt assumptions are:
  - Status Quo and TWW P3 existing debts remain outstanding at same interest rates,
    - CIP funded with Water Bank SRF Loans at an average rate of 0.75% p.a., and
    - Debt to acquire TWW is assumed to be a tax-exempt interest rate of 4.5% fully amortized over 20 years for MUA and SPE and a taxable rate of interest of 5.5% for IOU with no principal amortization through 2044.
  - **Cost of Equity –** Only the IOU and SPE Models involve equity capital. In the Private Model, 50% of the total capital (Rate Base) is the private owner's equity investment and the SPE Model starts with zero equity and grows by the realized PF in the total asset value of the utility and by the annual retained earning that the pension funds provide to finance the utility's ongoing CIP.
- Optimization Benefits – Increased economies of scale, operating and capital synergies, use of cost saving technologies and more come with regionalization in the MUA and SPE Models and are embedded in the scaled operations of the IOU and TWW P3 Models as well as the SPE Model. These enhancements in the management of operations, capital assets, and risk directly act to improve public health and the quality, reliability, and affordability of water as well as NJDEP regulatory compliance.
  - **Private Management Fees** – The TWW P3 and SPE Models engage private managers to optimize management of operations, capital assets, and risk. Note: The IOU Model by its very nature employs private management, however, in that model, the private management is compensated through the return on investment in the utility.
  - **Cash Reserves –** Each of the public owner models (Optimized TWW Status Quo, MUA, SPE, and TWW P3) target a municipal utility revenue debt rating in the "A" category and accordingly are based on higher debt service coverage requirements and greater number of days of cash on hand. This is not to say that the TWW Status Quo can achieve such a rating. Conversely, the IOU Model relies on the owner's credit rating and limits utility liquidity to minimize the cost of idle cash reserves and maximize overall financial results.

- Taxation – Only the IOU Model is subject to taxes, particularly Federal and state income taxes, state sales taxes among others, and local property taxes. In each case, the tax rates are applied against a different tax base, e.g., income, sale and use of goods, property values, franchise value, etc. A review of published financial results of IOUs shows a fair degree of variance in tax impacts on financial results ranging from 15% to 30% of operating revenues. The 360 Review assumes an average tax burden of 20% of utility revenues.

Several IOUs have indicated that they are working diligently on initiatives to mitigate federal and state income taxes as well as local property taxes by participating in tax credit programs, enterprise and opportunity zones, and other tax avoidances opportunities. Furthermore, IOUs in New Jersey and many other states are subject to sale and use taxes that account for a large portion of an IOU's tax burden that is a pass-through cost to customers. These state sales and local property taxes are used to meet state and local budget needs which effectively constitute Public Benefits, and so in fairness, are estimated at $250 million in the IOU's total Public Benefits.

11.2 Quantitative Analysis – Summary of Asset Optimization Results

TWW Optimized Status Quo Calls for Water Rate Spike. Over the first 5 years, this model calls for a 50% hike in water rates from an annual cost of $453 to $719, whereas the MUA, SPE, and TWW P3 raise rates from 21% (SPE) to 23% (MUA & TWW P3). The IOU Model raises water rates 59% over the same period for an annual cost of $719.

WATER RATE PROJECTIONS

Year	TWW SQ	MUA	SPE	TWW P3	IOU
2029	$678	$561	$552	$561	$719
2034	$844	$702	$743	$701	$951
2044	$941	$790	$804	$782	$1,024

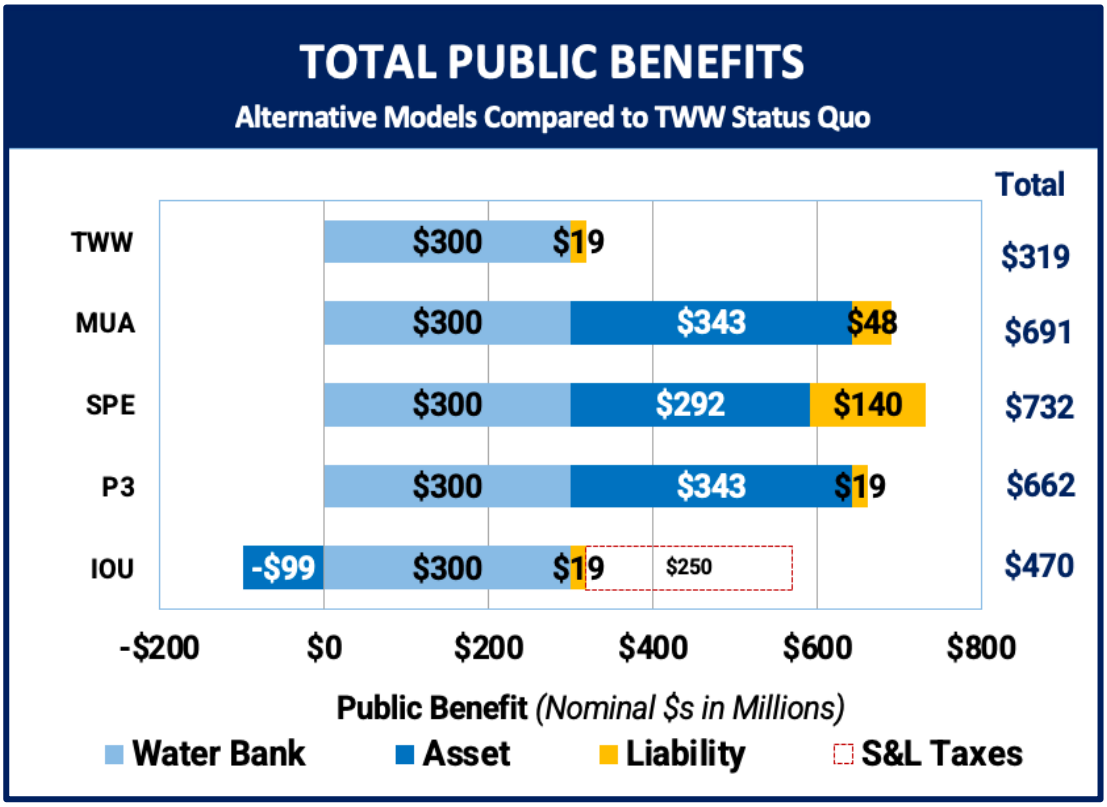
Average Costumer of 4,000 Gallons for Month

MUA & TWW P3 Models Minimize Increases in Water Cost. The quantitative analysis shows that the MUA and TWW P3 Models increase annual water costs from $453 in 2024 to $790 and $782 in 2044, respectively. These lower water costs are achievable due to asset optimization savings of $343 million through 2044 when compared to the Optimized TWW Status Quo Model. Where the TWW Status Quo Model requires rates to rise 121% through 2044 at annual compounded growth rate (CAGR) of 3.5%, these models require water rate increases of 85% for a 2.6% CAGR.

SPE Model Shares Benefits with Service Area Taxpayers. The SPE annual water costs rise 83% to $804 in 2044 with a 2.6% CAGR. The SPE trails behind the MUA and TWW P3 Models due to the costs associated with the 8% ROI on the AIK of TWW to the New Jersey pensions. These pension fund AIK costs are more than offset by the benefits of lowering Trenton's NPL and providing Local Tax & Budget Relief. However, it is important to note that SPE Model structured as state-sponsored entity may require legislation, whereas a nonprofit structure may be able to rely on existing laws and regulations.

IOU Model Results in Higher Water Rates. Although the four alternatives are based on same level of asset optimization savings, the IOU Model includes taxes and profits offsetting operational and capital savings and costing $99 million more than TWW Status Quo Model. This equates to a rate increase of 133% through 2044 for a CAGR of 3.7%.

However, under state rate regulations, IOUs can absorb TWW into their portfolio of utility assets and employ a "common rate schedule" which socializes TWW's CIP costs across the IOU's whole system in New Jersey which may enable the IOU to lower and smooth TWW rates at least in the earlier years. An IOUs competitiveness will depend in broad term on the trade-off between the IOUs capital structure, achievable asset and liability optimization savings, and its "common rate schedule" as compared to the costs associated with taxes and IOU profit requirements.



TWW Valuation Estimates. Trenton, like many New Jersey municipalities, does not maintain its financial records in accordance with the Governmental Accounting Standards Board (GASB) and its fixed assets inventory and recordkeeping of original costs and depreciation are unavailable, piecemeal, or deemed unreliable. Moreover, as detailed herein, the water system is functional albeit much of it is approaching or is beyond its useful life and in need of substantial investment in deferred maintenance and replacement of critical systems, water mains, as well as lead replacement projects.

Given the lack of information regarding the existing assets in terms of original cost, placed in service date, depreciation, remaining useful life, etc., trying to estimate replacement cost less depreciation and write-downs is highly speculative, and the value could be less than the $128 million of debt outstanding. For modeling purposes, asset value is assumed to be $128 million which is equal to the amount of outstanding debt. To the extent that further study requires a better estimate of the value of TWW and its assets under the alternative governance models, the following approaches would be employed depending on the quality of data available at that time and the intended purpose of the valuation.

Moreover, valuation estimates herein that employ the Cost Approach largely reflect the value of fixed assets financed and built as part of the forecasted CIP and which also may include forgivable loans, grants, and

other assistance as well as estimated values for legacy assets. The 360 Review approach to FMV relies primarily on the Income Approach utilizing the Financial Model as modified to estimate benefits under the alternative models, including rough approximations of a rate base for calculating ROI for the IOU and SPE Models.

Valuation of Water Assets – FMV is the generally accepted legal standard of valuation and the standard that is common under the Federal Tax Code and public pension investments. FMV represents an arm's-lengths exchange of property between a willing seller and a willing buyer, and the three accepted approaches for determining FMV are Income, Market, and Cost:

- ***Income Approach*** – Generally employing a discounted cash flow (DCF) model, the FMV is calculated as the present value of future free cash flows, net of capital expenditures (CapEx) and including termination value, that is deemed the property of the asset owner.
- ***Market Approach*** – Like residential and commercial real estate transaction, FMV is estimated by comparing the prices paid for similar properties, however, given the scarcity of water utility transactions and the limited probability that the assets might be comparable, make this approach less helpful.
- ***Cost Approach –*** Represents replacement cost less depreciation, where the net depreciation amount reflects the asset value for the remaining useful life of the asset. Again, not a practical approach in the TWW case due to the dearth of relevant information.

11.3 Liability Optimization

Liability Optimization discussions, including AIKs, are hypothetical and illustrative in nature and subject to specific administrative actions or legislation. Moreover, any estimates of benefits are also subject to the facts and circumstance of an actual undertaking and the rules and requirements that the state may place on the treatment of prepaid actuarial determined employer contributions (ADEC) and other related considerations.

FOR ILLUSTRATION PURPOSE ONLY	Initial Debt & NPL		Optimized Debt & NPL		
MODELS *(All Dollars in Mil.)*	Type of Liability	Initial Principal	Optimized Principal	Interest Rate	Interest & AIK Savings / (Costs)
MUA – Acquire TWW for $195M *(Est. $130M in Debt Defeasance Cost & $65M Premium)*	Tax Exempt Debt	$130	**$195**	4.50%	**($91.2)**
	NPL Amortization	$450	**$385**	7.00%	**$139.0**
	Total Liabilities	$580	$580		**$47.8**
SPE – Owns TWW pursuant to *$65M* AIK – (Est. $130M in Debt *Defeasance Cost)*	Tax Exempt Debt	$130	$130	4.50%	**($41.0)**
	AIK Transfer	$450	**($65)**	**AIK**	**$65.0**
	NPL Amortization		**$385**	7.00%	**$116.4**
	Total Liabilities	$580	**$515**		**$140.4**
STATUS QUO / TWW P3 / IOU – $65M taxable interest rate borrowing	Taxable Debt	$0	**$65**	**5.50%**	**($70.1)**
	NPL Amortization	$450	**$385**	7.00%	**$89.4**
	Total Liabilities	$450	$450		**$19.3**

NOTE: As is generally the case with any public employer payments into retirement plans, there is no assurance that the New Jersey pension funds will achieve the current 7% actuarial assumed rate of return so public benefits may vary or not be realized.

The 360 Review looks to widen the lens of public finance by not only managing the cost of debt but also incorporates the net pension liability (NPL) into the optimization analysis. This together with the reduction of NPLs through AIKs can generate significant benefits by:

- Restructuring debt and pension obligations to minimize costs by:
  - Deferring the payment of lower cost debt and
  - Accelerate amortization of high-cost NPL.
- Benefits can be enhanced to the extent that a restructuring can be coupled with AIKs and loans from the Water Bank's State Revolving Fund (SRF) and USEPA's Federal Water Infrastructure and Finance Innovation (WIFIA) loan programs.

Liability Optimization of Debt & NPLs Illustration – Available to all governance alternatives, subject to Federal tax restrictions and changes in rules and procedures by the state to accommodate liability optimization. *(Illustration excludes SRF Loans from the Optimization).*

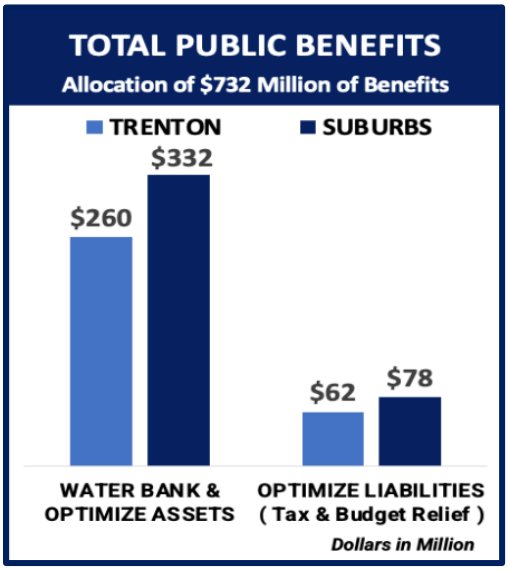
Acquisition Financing. Under Federal Tax Code, the "true sale" of TWW to either the MUA or the SPE Model should qualify for tax-exempt debt financing as there is a change in tax ownership. For comparison, the acquisition price for the MUA was increased by $65 million to match the $65 million asset transfer value of the AIK of TWW in the SPE Model. The AIK effectively reduces the NPL for the TWW Service Area Communities by $65 million from $450 million to $385 million.

The MUA purchase price includes a $65 million premium that is used to prepay NPLs which generates a $48 million increase in total public benefits over 20 years or about $2.4 million p.a. in Local Tax & Budget Relief. Note: The Liability Optimization Model self-amortizes the $65 million of additional debt from NPL interest cost reductions. The SPE Model with the $65 million AIK that reduces NPLs by like amount generates a benefit of $140 million over 20 years or about $7 million p.a. of Local Tax & Budget Relief. *NOTE: There is no assurance that the New Jersey pensions will achieve the 7% actuarial assumed rate so public benefits may not be realized.*

Taxable Debt *(This as ALL Comparison are for Illustration Purposes Only*) In the TWW Status Quo and TWW P3 Models, Trenton retains ownership of TWW, so acquisition financing is not applicable, and for comparison purposes, those models along with the IOU Model include a taxable borrowing to prepay NPLs owed by TWW Service Area Communities. In all three models, the taxable debt is optimized along with the 7% NPLs and generates potential benefits of approximately $19 million or about $1 million in annual Local Tax & Budget Relief.

11.4 Total Public Benefit

Total public benefit is the sum of Water Bank loan benefits, including principal forgiveness, asset and liability optimization, and the soft credit to the IOU Model acknowledging that state and local taxes are public benefits, albeit not directly assignable to TWW.



The selected governance alternative model will dictate the level of asset optimization benefits that will accrue to ratepayers based on water billings. Similarly, it is assumed that liability optimization will be shared by the TWW's service area communities which may include Trenton, Hamilton, Ewing, Lawrence, Robbinsville, and Hopewell as well as Mercer County.

TWW Status Quo Sets Baseline. TWW's total public benefits of $319 million represents the sum of the benefits from Water Bank loans and liability optimization.

MUA and SPE Models are the primary beneficiaries from Federal Tax provisions related to acquisition financing and accordingly generate the most public benefits amounting to $691 million and $732 million, respectively. However, it is important to note that SPE Model may require legislation if structured as state-sponsored entity.

TWW P3 Offers Substantial Benefits. Subject to direct state involvement in P3 negotiations and compliance monitoring, the TWW P3 Model is estimated to generate $662 million in total public benefits, including $343 million in asset optimization savings to ratepayers and $19 million savings to service area taxpayers.

IOU Model Is Hamstrung by Taxes & Profits. Absent the $250 million soft credit acknowledging the IOU's contribution to defraying the cost of state and local government, total public benefits would have only amounted to $220 million, an amount less than the Water Bank loan benefit.

Benefit of Water Bank Loan Program. For the purpose of quantifying how beneficial the Water Bank loan program is to TWW and water borrowers across the state, the 360 Review estimated the difference in interest cost between TWW issuing bonds based on Trenton's "Baa2" credit rating without pledging State QBA credit enhancement versus borrowing through the Water Bank. This analysis, which includes the benefits of principal forgiveness, produced a savings of approximately $312 million.

Public Benefits – New Jersey Water Bank Comparison of Borrowing Costs Including Fees & Principal Forgiveness *(2024-2044)*			
Scenario	**Municipal Status Quo**	**Optimized Water Bank**	**Water Bank Benefits**
Gross Savings	$658 Million	$346 Million	$312 Million
Net Present Value	$498 Million	$253 Million	$245 Million
Under Municipal Status Quo Model, the borrowing assumes an all-in cost interest rate of 5.5%, while the same financing but taking advantage of Water Bank loans assumes an all-in cost interest rate of 1%. NPV discount rate is 2.5%.			

Public Benefit of State & Local Taxes. Private owned utilities are subject to Federal, state, and local taxes, whereas the public owned utilities are exempt from taxes. And, although the basis of taxation varies by the specific tax, a review of New Jersey IOUs observed a range of 15% to 30%% of total utility operating revenues with much of the burden being state sales taxes. In some cases, the state sales tax and local property accounted for some two-thirds of the tax burden. The financial model assumes a tax burden of 20% of operating revenues. Moreover, taxes are operating expenses that are passed through to ratepayers resulting in higher revenue requirements and higher water rates. Thus, it is important to note that these taxes go to defray the cost of state and local government which is an IOU-associated "public benefit."

The 360 Review finds that asset and liability optimization, coupled with a change in TWW governance to a MUA, SPE, or TWW P3 Model can generate *$662 million* to $732 million in Total Public Benefits. These benefits are in the form of:

- **Water Bank Loan Rate Savings** of $300 million, including Principal Forgiveness,
- **Asset Optimization Benefits** of $292 million to $343 million, reducing rate increases, and
- **Liability Optimization** of $19 million to $140 million, which includes an assumed $65 million AIK and can provide Local Tax & Budget Relief.

Together, the improvements in governance, management, and cost reductions from Water Bank loans, including PF, and the savings from asset and liability optimization support stronger credit prospects under several of the alternative governance options. Should the City decide to pursue any of the four alternatives, there appears to be sufficient statutory authority to do so with an important caveat, the SPE Model as a State-Sponsored Fund would require legislation but may not as a nonprofit corporation. Moreover, if the city deemed that an "Emergent Conditions" under the Water Infrastructure Protection Act (WIPA)[16] exists at TWW, a Privatization and P3 may require a vote of the people if a voter initiative meets the minimum signature requirement which is viewed as low and generally achievable.

Trenton Credit Rating, Moody's Downgrade, and Long-Term Credit Prospects

Creditworthiness – *City of Trenton Compared to Alternative Governance Models*. The task of the 360 Review is to compare the existing TWW credit with the possible uplift in creditworthiness that could result from remedial actions taken in response to the NJDEP UAO and subsequent actions. Rating

[16] Water Infrastructure Protection Act (WIPA), New Jersey Department of Environmental Protection, https://dep.nj.gov/wipa/

methodologies vary across the alternative governance options, which can be beneficial to the City of Trenton, its customers, and taxpayers.

The City of Trenton is not alone with regards to its inability to fund maintenance activities, let alone capital improvements. Such underinvestment in a municipal utility can be symptomatic of the serious social and economic disparities that still plague many cities and rural areas across New Jersey and the US. It is commendable that NJDEP, the I-BANK, and other State agencies are working diligently to ensure that TWW's water is safe, clean, reliable, and affordable. The 360 Review, commissioned and led by the NJ Water Bank, is an important step in delivering new financial and management resources to cities like Trenton with the goal of jumpstarting state and Federal financial assistance and maximizing benefits to water customers and local taxpayers.

The governance, management, and financial challenges go to the heart of TWW's creditworthiness. Again, this 360 Review is intended to arm Trenton and TWW with the necessary tools to take full advantage of opportunities to improve TWW's governance, operations, management, water service, and affordability, as well as the credit rating prospects of both the city and the utility. Broader rating prospects also extend to the state and the region. That is, the rating agencies will look favorably on actions taken by the state and the surrounding communities to remedy the City and TWW's need for continuing state intervention and support. Water is a most critical service and minimizing default risk given outsized future capital needs is in everyone's best interest.

Municipal Model as employed by the City of Trenton makes TWW and the city intrinsically related as TWW's bonds are secured by the city's G.O. credit. Therefore, the TWW rating is tied to Moody's "General Obligation Scorecard"[17] for the City of Trenton, which is included below. Accordingly, performing a credit review of TWW in conjunction with an engineering and governance assessment is necessary and proper given that the shortcomings highlighted herein.

MUA and SPE Models specifically rely on the "Municipal Utility Revenue Debt Rating Methodology." For the Financial Model, both the MUA and SPE Models have been structured to achieve "A" ratings from Moody's, i.e., assumes debt service coverage of 1.5 times, rate covenant of not less than 1.25 times, debt service reserve fund, and over 90 days of cash on hand as well as other requisite covenants including bankruptcy protection of utility revenues and assets. See Moody's Municipal Utility Revenue Debt Scorecard on the following page.

[17] Moody's Investor Services, Moody's Credit Opinion for the City of Trenton, NJ, August 23, 2022

Municipal Utility Revenue - Debt Scorecard [18]

The exhibit below shows Moody's US Municipal Utility Revenue Debt Scorecard *(Moody's Rating Methodology, Dated March 7, 2024)* and 10 key metrics used to rate a water revenue bond.

MOODY'S INVESTORS SERVICE U.S. PUBLIC FINANCE

Appendix: US Municipal Utility Revenue Debt Scorecard

Exhibit 6

		Aaa	Aa	A	Baa	Ba	B and Below
Numerical score		**0.5 to 1.5**	**1.5 to 2.5**	**2.5 to 3.5**	**3.5 to 4.5**	**4.5 to 5.5**	**5.5 to 6.5**
System Characteristics (30%)							
Asset Condition (10%)	Net Fixed Assets/Annual Depreciation:	> 75 years	75 years ≥ n > 25 years	25 years ≥ n > 12 years	12 years ≥ n > 9 years	9 Years ≥ n > 6 Years	≤ 6 Years
System Size (7.5%)	Water and/or Sewer/ Solid Waste:	O&M > $65M	$65M ≥ O&M > $30M	$30M ≥ O&M > $10M	$10M ≥ O&M > $3M	$3M ≥ O&M > $1M	O&M ≤ $1M
	Stormwater:	O&M > $30M	$30M ≥ O&M > $15M	$15M ≥ O&M > $8M	$8M ≥ O&M > $2M	$2M ≥ O&M > $750K	O&M ≤ $750K
	Gas or Electric:	O&M > $100M	$100M ≥ O&M > $50M	$50M ≥ O&M > $20M	$20M ≥ O&M > $8M	$8M ≥ O&M > $3M	O&M ≤ $3M
Service Area Wealth (12.5%)		> 150% of US median	150% ≥ US median > 90%	90% ≥ US median > 75%	75% ≥ US median > 50%	50% ≥ US median > 40%	≤ 40% of US median
Financial Strength (40%)							
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 (15%)		> 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 (10%)		< 2.00x	2.00x < n ≤ 4.00x	4.00x < n ≤ 7.00x	7.00x < n ≤ 8.00x	8.00x < n ≤ 9.00x	≥ 9.00x
Management (20%)							
Rate Management (10%)		Excellent rate-setting record; no material political, practical, or regulatory limits on rate increases	Strong rate-setting record; little political, practical, or regulatory limits on rate increases	Average rate-setting record; some political, practical, or regulatory limits on rate increases	Adequate rate-setting record; political, practical, or regulatory impediments place material limits on rate increases	Below average rate setting record; political, practical, or regulatory impediments place substantial limits on rate increases	Record of insufficiently adjusting rates; political, practical, or regulatory obstacles prevent implementation of necessary rate increases
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 ≥ n > 1.20x	1.20x ≥ n > 1.10x	1.10x ≥ n > 1.00x	≤ 1.00x*	
Debt Service Reserve Requirement (5%)		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**		

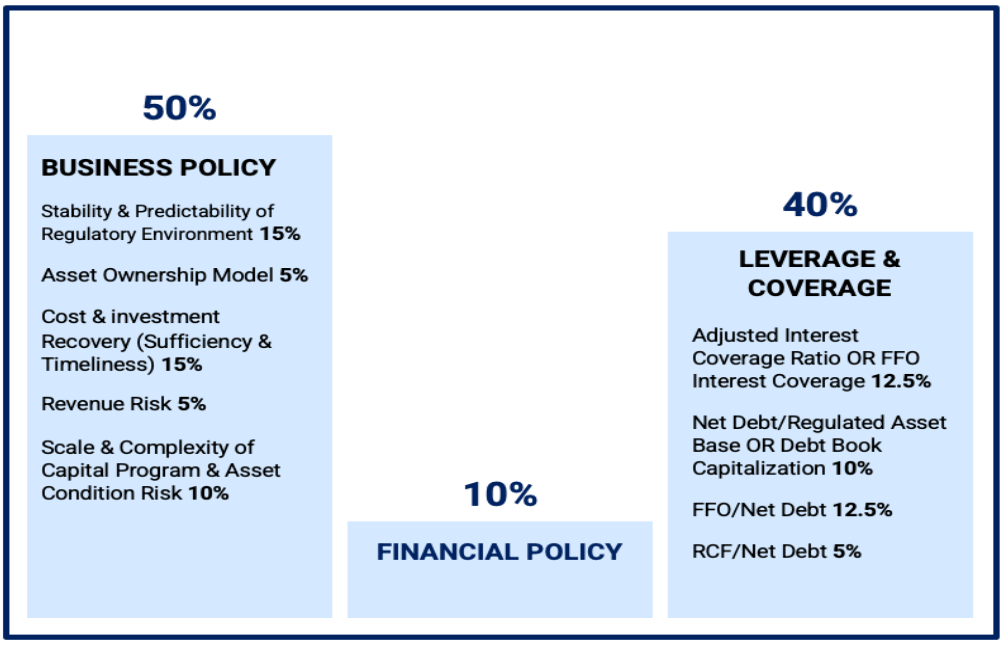
* Scores as a Ba.
** Scores as a Baa.
Source: Moody's Investors Service

[18] Moody's Investor Services, Moody's US Municipal Utility Revenue Debt Scorecard *(Moody's Rating Methodology, Dated March 7, 2024)*

TWW P3 Model relies on Moody's rating methodologies for project finance with respect to construction and operating risks assumed by the P3 concessionaire. Accordingly, there are several different criteria that may apply which are based on specific facts and circumstances. This analysis assumes that the P3 is based on i) the underlying credit factors of the MUA and SPE Models, which are modelled to achieve an "A" rating from Moody's and ii) that the financial commitments of the concessionaire are consistent with an "A" rating.

IOU Model ratings use "Regulated Water Utilities Methodology[19]" which are companies that are primarily rate-regulated monopolies. Moody's outlines that their "general approach to assessing credit risk of regulated water utilities globally, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector." See Moody's Regulated Water Scorecard below that includes these weights.

Regulated Water Utilities Scorecard– *Moody's Investor Services dated August 18, 2023*US.



Trenton Moody's Downgrade. TWW and the City are intrinsically related as TWW's bonds are secured by the City's G.O. credit, and on August 23, 2022, Moody's downgraded the rating on all $252 million of bonds secured by the city's G.O. pledge, which included TWW's water debt, from Baa1 down to Baa2 – only two notches above "non-investment grade" debt.[20] Even if TWW's bonds were separately secured as water revenue bonds, rating agencies would not want to assign ratings to a municipal utility that are more than 1 or 2 credit notches above the municipality's G.O. bonds.

The City of Trenton's financial and infrastructure challenges may reflect a long history of social injustice, but it is hard to imagine a more damning indictment from a credit rating perspective. It is clear from the long history of consent orders that TWW suffers from years, if not decades, of neglect. TWW operations and capital program have been held back by what appears to be a long-standing unwillingness to invest sufficiently in the system. The CIP of the improvements necessary to bring TWW into full regulatory

[19] Moody's Investor Services, Regulated Water Utilities Scorecard Illustration, August 18, 2023.
[20] Moody's Investor Services, Moody's Credit Opinion for the City of Trenton, NJ, May 23, 2024.

compliance are a high at $500 million over the next 10 years *(not escalated for inflation)* – an amount that even after significant state assistance may be more than the city can afford, especially given the inherent risks associated with project construction, supply chains, inflation, and having a capable and experienced procurement team to manage the program. Fortunately for Trenton, the state has a well-established, state aid intercept program, the Qualified Bond Authorization (QBA) program, TWW can qualify for Water Bank financial assistance in the form of extraordinarily low interest rate SRF Loans, including forgivable loans, and possibly WIFIA loans.

New Jersey State-Aid Intercept, *also known as the Qualified Bond Authorization (QBA) Program.*[21] The QBA program is a state intercept program designed to provide municipalities with a credit enhancement tied to the municipality's available state-aid payments and anchored to the state's G.O. rating. When debt service is allocated pursuant to QBA, the State Treasury intercepts state aid monies to make debt service payments on I-BANK loans. QBA secured debt is rated (A2 by Moody's) one-notch below the State's G.O. bond rating (A1). Trenton can allocate the QBA to any debt payments it chooses. NOTE: *Qualified Bond Authorization (QBA) - https://law.justia.com/codes/new-jersey/title-52/section-52-27d-483/*

Trenton's 2024 adopted budget includes $65 million in state-aid and the Water Bank will only underwrite up to 80% of qualified state aid (~ $52 million) in case such aid is decreased in future years. Accordingly, the city's debt capacity for SRF financing is limited by the Water Bank's QBA loan limit, less an estimated $22 million of QBA funds that have already been encumbered for other debt obligations. The Water Bank estimates that the remaining $30 million in QBA debt service capacity can support some $600-700 million in SRF loans.

It is important to note that the Water Bank's attractive interest rates, principal forgiveness and borrowing terms are available to the other four governance models in similar amounts and essentially the same conditions. Therefore, the estimated $300 million in Water Bank loans are available to all. Lastly, it is important to remember that a $500 million, 10-year CIP *(not escalated for inflation)* can consume a large portion of Trenton's remaining debt capacity, which could limit its ability to make needed investments in its sewer system and other city infrastructure.

Credit and Financial Analysis. The task of the 360 Review is to compare the existing TWW credit with the possible uplift in creditworthiness that could result from remedial actions taken in response to the NJDEP UAO and subsequent actions. Accordingly, performing a credit review of TWW in conjunction with an engineering and governance assessment is necessary and proper given that the shortcomings highlighted herein.

Moody's Credit Opinion for the City of Trenton, NJ, May 23, 2024

Creditworthiness and Credit Scorecards. Rating agencies use different methodologies depending on the pledge to debt repayment. A meaningful credit strength for municipal utilities is their control over rate-setting versus IOUs that are subject to PUC oversight and rate setting as that could add risks. Trenton, like some other cities, has historically met its utility borrowings by pledging its G.O.to its water and sewer borrowings whereby Moody's employs its 'cities and counties' rating methodology. Future ratings will depend on what the security pledge is employed on the new debt and the application of the appropriate rating methodology.

[21] New Jersey Environmental Infrastructure Financing Program (State Fiscal Year 2024 Financing Program Year Amended Financial Plan), New Jersey Infrastructure Bank and New Jersey Department of Environmental Protection, May 2023.

The below exhibit shows the City of Trenton's G.O. scorecard metrics (dated May 7, 2024) and Moody's methodology and eight metrics considered in their "Baa2" rating. Moody's adjusted their A2 scorecard indicated rating to Baa2 or three notches lower because of "historical governance challenges". However, Moody's improved their outlook from Negative to Stable signaling that there is little to no risk of a downgrade over the next 12-24 months which is their rating outlook horizon. Moody's explains their assigned rating that is three notches lower than the scorecard in their preface to the scorecard metrics in their May 7, 2024, report as follows:

"The city's Baa2 rating is 3 notches lower than the scorecard-indicated outcome of A2, as the scorecard does not capture the city's recent history of poor governance nor its heavy reliance on discretionary state support to balance its budget."

Exhibit 11
Trenton (City of) NJ

	Measure	Weight	Score
Economy			
Resident income ratio	58.7%	10.0%	Ba
Full value per capita	32,803	10.0%	Ba
Economic growth metric	3.6%	10.0%	Aaa
Financial Performance			
Available fund balance ratio	40.4%	20.0%	Aaa
Liquidity ratio	58.8%	10.0%	Aaa
Institutional Framework			
Institutional Framework	Aa	10.0%	Aa
Leverage			
Long-term liabilities ratio	354.5%	20.0%	Baa
Fixed-costs ratio	20.5%	10.0%	Baa
Notching factors			
Financial disclosures	-0.5		
Scorecard-Indicated Outcome			A2
Assigned Rating			**Baa2**

The Economic Growth metric cited above compares the five-year CAGR of real GDP for Trenton-Princeton, NJ Metropolitan Statistical Area to the five-year CAGR of real GDP for the US.
Sources: US Census Bureau, Trenton (City of) NJ's financial statements and Moody's Ratings

Moody's Rating Methodology & Scorecard Factors *(Trenton, NJ Credit Opinion - May 23, 2024)*

Moody's Rating Rationale. Moody's on May 7, 2024[22], summarized their Trenton, NJ rating citing the weak economy and challenging governance factors that are partly mitigated by balance sheet strengths and state support. The state's ongoing willingness to assist in remediating local economic and fiscal challenges is a very important factor for the city's rating. New Jersey's "A1" G.O. rating outlook was improved to Positive from Stable on August 21, 2024. Accordingly, the rating agency will be looking to understand how the state and Trenton's regional partners will work to remedy and address the needs and challenges facing TWW and by extension the region. In this report, Moody's noted the following:

"Trenton, NJ's (Baa2) primary credit challenge is providing services to a low-income population in a city where the majority of property is tax-exempt. All conventional economic indicators point to a struggling city: Its resident income ratio of 58.7% is among the lowest in the state, and poverty at 26.2% is well above the national rate. In spite of these challenges, Trenton's balance sheet is solid. Available fund balance of 36.9% as of 2023 compares favorably to peers, and leverage is similar to the state median. Ongoing support from the State of New Jersey (A1 Positive), which provides nearly 40% of the Trenton's Current Fund revenue, will be crucial to the city's credit profile going forward. Provided the state continues supporting the city, it will be

[22] Moody's Investor Services, Moody's Credit Opinion for the City of Trenton, NJ, May 7, 2024.

able to maintain its sound financial position." Lastly, Moody's highlighted below Trenton's Strengths and Challenges as well as factors that can lead to a subsequent rating upgrade or downgrade."

MOODY'S CREDIT STRENGTHS & CHALLENGES	
STRENGTHS	**CHALLENGES**
⇒ Solid Balance Sheet	⇒ History of poor performance
⇒ Some Economic Growth	⇒ Large amount of tax-exempt property in city
⇒ Moderate Leverage	⇒ Low income and high poverty
RATING OUTLOOK: Moody's does not assign outlooks to local governments with this amount of debt outstanding.	
Factors that can lead to an upgrade	**Factors that can lead to a downgrade**
↑ Continued improvement in the economy	↓ ***Outsized debt issuance to fund water and sewer capital needs driving debt to much higher levels***
↑ Continued support from the State of New Jersey	↓ ***Deterioration in available fund balance below 20% of revenues***
↑ Improvement in available fund balance above 40% of revenues	↓ Decision by state to curtail support for city

Governance Alternatives Offer Trenton Significant Financial & Credit Rating Relief. The $500 million estimated CIP over the next 10 years *(not escalated for inflation)* will place serious stress on the City's GO bond rating as an "oversized debt issuance" is required and increased operating and capital expenditures may put downward pressure on the city's available fund balances which are likely to have been kept high by deferring required maintenance. The alternative governance structures discussed herein would greatly relieve financial pressures on the City's GO credit and free managers to focus on other critical City needs. Furthermore, by transferring TWW to a MUA, SPE or IOU, the City can extinguish $128 million of GO water debt and avoid borrowing over $300 million on GO debt, including pledging some $15-20 million in QBA on water SRF loans. Under the alternative governance model, except for the TWW P3 Model, TWW's debt would be secured by enterprise revenues with no recourse to the City and this would greatly free the City's debt and QBA capacity for other City needs.

The MUA and SPE Models structures rely on the U.S. Municipal Utility Revenue Debt rating methodology, whereas the P3 rating is based on project finance criterion together with the underpinnings of the MUA and SPE credit structures. The credit ratings under the IOU Model are based on the IOU's credit rating.

Debt under the MUA and SPE models would be structured targeting at least an "A" rating and that would not involve a pledge of taxes or GO credit by the City of Trenton or any other municipality. The bond rating would be based on the utility's credit attributes and would not involve a QBA pledge as neither the MUA nor SPE will be eligible for state-aid.

Appendix A. GLOSSARY OF TERMS & ABBREVIATIONS

ADEC (Including ARC) Actuarially Determined Employer Contribution, like the Actuarially Required Contribution (ARC). is the annual amount actuarially calculated that an employer must contribute to its pension's pool of assets to ensure sufficient funds to pay pension benefits.

AIK Asset In-Kind Contribution is an asset transferred to a pension plan. It does NOT relieve an employer of prior obligations but does increase plan's total assets and reduce NPL. Value and cash generated from AIK can reduce an employer's future ADEC requirements.

Asset Optimization Baseline asset optimization focuses on existing utility and how better management and operations can enhance performance, public health, and value. Whereas regionalization can offer even greater savings from economies of scale and synergies.

Book Value It is the value of assets recognized on the balance sheet and it is essentially the original cost of assets minus any depreciation, amortization, and impairment of value.

CapEx Capital Expenditures are investments made by an enterprise to acquire, improve or maintain long-term assets such as buildings, land, machinery or equipment.

DCF Discounted Cash-Flow is an asset valuation model using the cash flows that the asset is expected to generate in the future to estimate its value today – Key DCF value drivers are cash flow (CF), discount rate (r), and number of periods (n) measured.

Equity Value It is the total value of the enterprise attributable to the owner(s), i.e., what value of the enterprise is available to the owners (shareholders, municipality, pensions, etc.) after subtracting debt, debt equivalents, and non-controlling interests.

ERISA Employer Retirement Income Security Act, which is the Federal law that regulates employee benefit plans. Although public plans are exempt from ERISA, there are provisions in the Federal Tax Code governing public plans that mirror ERISA.

ESG Environmental, Social & Governance factors for assessing an enterprise's sustainability.

EV Enterprise Value is useful in comparing entities with different capital structures, i.e., amount of debt versus equity, since that does not affect the total value of the entity. In the

FMV Fair Market Value is the price that would be received to sell an asset in an orderly transaction between market participants at that time. There are tools for determining FMV, including: Comparable Sales, Replacement Cost less Depreciation, and DCF Model.

GASB (Including GAAP) Governmental Accounting Standards Board is a private group that sets accounting and financial reporting standards for US states and local governments none as Generally Accepted Accounting Principles (GAAP). Accounting (GAAP).

GO Bonds General Obligation Bonds are issued by state and local governments and secured by the full faith and credit and unlimited taxing power of the issuer.

I-BANK NJ Infrastructure Bank is an independent state financing authority authorized to issue revenue bonds to finance eligible environmental and transportation infrastructure projects.

IOU Investor-Owned Utility is a private company acting as a public utility and a Water IOU sources, treats, and/or distributes water. With respect to debt, it means "I Owe You."

KPI Key Performance Indicator is a quantifiable measurement that helps an enterprise assess the efficacy of its operations and strategies. Each metric measures a specific component that contributes to its performance such as revenues, hours spent, expense tracking, etc.

LGS (Unit of DCA) NJ Local Government Services is a unit within the Department of Community Affairs (DCA) that serves as an advocate for local government as well as a resource providing financial assistance in budgeting, financial reporting, joint services, purchasing, and management. LGS is also the guardian of the financial integrity of local units.

Liability Optimization A function of optimizing the cost of the utility financing sources, e.g., working capital, SRF, WIFIA, tax-exempt debt, bank debt, pension liabilities, and Other Post-Employment Benefits (OPEB), by amortizing the higher cost debt faster, i.e., prepay higher cost NPLs and backloading the scheduled amortization of cheaper debt.

OpEx Operating Expenses are the ongoing costs an enterprise incurs to run daily operations.

MWBE Minority and Women-Owned Business Enterprise are programs that expand opportunities for minority and women businesses to access government contracts. When eligible businesses are certified, they become more visible to prospective buyers, including public agencies and private contractors seeking to purchase goods and services.

NFP Not-for -Profit or Nonprofit Corporation is an entity that incorporates for a purpose other than making shareholder profits and can act as a charity, SPE, government instrumentality, etc.

NJDEP New Jersey Department of Environmental Protection

NOI Net Operating Income (NOI) is a measure of an enterprise's profitability, calculating total operating revenues minus total operating expenses.

NPL (Including UAAL) Net Pension Liability, like the Unfunded Actuarial Accrued Liability (UAAL), is the present value of the future pension benefit payments and the valuation of current plan assets.

P2P (See SPE) Public-Public Partnership is a collaboration between two or more public entities or NFPs to provide or improve public services through greater economies of scale, efficacy.

PERSNJ Public Employees Retirement System of New Jersey

PF (Including SRF) Principal Forgiveness refers to State Revolving Fund (SRF) loans either under the Clean Water or Drinking Water loan programs that are forgivable by the DEP.

PFRSNJ Police & Firemen's Retirement System of New Jersey

PPP/P3 Public-Private Partnership is a contract between public and private sector entities that outlines the provision of assets and delivery of services by private partners.

PV Present Value is the current value of the sum of a future stream of cash flows given a specific rate of return – higher the rate the less future cash flows are worth today.

PWS (Including PCWS) Public Water System provides portable water to at least 15 service connections or an average of 25 people for at least 60 days a year. In New Jersey, Public Community Water System (PCWS) are defined as systems with 500 service connections.

QBA Qualified Bond Authorization program provides for I-BANK bonds to be also secured by the intercept of state-aid payable to all municipal participants and the municipalities underlying those Authority participants that have executed deficiency agreements with such underlying municipalities. If a participant fails to make full and timely debt service payments to the I-BANK, the state-aid intercept

mechanism may be triggered and state-aid may be diverted from the participant, or an underlying municipality of the participant, to the bond trustee to pay debt service to the bondholders.

Rate Base (Including ROI) Value of property for which a utility is permitted to earn a specified return on investment (ROI) per regulations. It can include cash, working capital, materials, depreciation, aid of construction, customer advances for construction, deferred taxes & tax credits.

RIA (Including SEC) Registered Investment Advisor is a financial firm that advises clients on investments as required by the Securities and Exchange Commission (SEC). An RIA has a fiduciary duty to act in the best interest of their clients.

ROFR Right of First Refusal is a contractual right that gives the holder the right to match an offer to sell before the asset is sold.

True Sale Asset ownership that is transferred pursuant to a sales contract, whereby the change in ownership to the buyer is deemed permanent, including acceptance of other contractual terms and restrictions, e.g., easements, ROFR, etc. This is a key consideration for the treatment of asset transfers by rating agencies and GASB rules.

SPE Special Purpose Entity is a legal entity formed for a specific purpose, e.g., develop, own and operate a special project while isolating financial risks to the beneficial SPE owners.

UAO Unilateral Administrative Order issued by NJDEP, dated 10/12/22, and amended as appropriate, highlights the chronic neglect of TWW and places it under NJDEP supervision.

TMF Financial Metrics

Debt Ratio (DR) - measures the amount of debt used by the PWS; in other terms, to what degree the utility is mortgaged.

Debt Service Coverage Ratio (DSCR) measures the ability of a PWS to cover debt, over and above operating expenses.

Expense Ratio (ER) (operating expense/total expense) measures the amount of operating expenses compared to total expenses.

OR Operating Ratio (operating revenue/operating expense) demonstrates the relationship between operating revenues and operating expenses.

SR Sales Ratio (sales/total revenue) measures the percentage of total revenue generated by sales of operations (i.e., from rates).