CAPITAL STRATEGIC SOLUTIONS

TECHNICAL MEMORANDUM

To: Cherry Valley Rochdale Water District

From: Michael J. Schrader, PE

Date: February 3, 2025

Project: Cherry Valley & Rochdale Water District Financial Planning and Forecast Study

Re: Summary of process and results

This memorandum is intended to accompany the Findings and Recommendations report dated January 29th, 2025, and is intended to serve as an executive summary. Page numbers from the report are referenced where applicable.

Introduction:

Water utilities are, by their nature, capital intensive operations and small systems suffer from a lack of economy of scale which results in higher per capita costs. The Cherry Valley Rochdale Water District (CVRWD or The District) is a perfect example of this, where significant cost-cutting measures, including deferring capital investments, have been implemented, yet user costs remain high.

The District has also experienced some significant challenges in terms of water treatment regulatory compliances. As a result, it transitioned in a relatively short period from treating and supplying its own water to purchasing 100% of its water from the City of Worcester.

Despite the many challenges experienced, one thing that is clear is the District's unwavering commitment to addressing its challenges and exploring / implementing alternative options. This is supported by the District's decision to resume treatment at one of its sources, the decision to engage with RCAP to develop an asset management plan and ultimately the decision to fund this evaluation.

This evaluation was based upon a ten-year horizon using available data; some of which is not complete, thus it should be considered a starting point that should be revised as necessary.

Capital Plan Review:

The first task in the District's scope for this project was to review the Capital Improvement Plan developed by RCAP (P. 2). This evaluation was loosely based upon the asset management methodology which is ideally suited to developing a defendable, risk based capital plan.

The RCAP Capital Plan document provides a summary of recommended improvements, however most costs are not included. Additionally, asset replacements were scheduled based *solely on expected*

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useful life, without factoring in operating conditions, District input, or the consequences of failure. For example, if two water mains of the same age and material exist—one serving a hospital and the other a low-density residential neighborhood—the plan does not account for the higher priority of replacing the hospital-serving main due to its greater consequence of failure.

While the RCAP evaluation focused primarily on mortality failure, a Water Distribution Study prepared by Tata & Howard in 2018 evaluated the system from several perspectives including a hydraulic analysis which pertains to performance related (vs. mortality) failures. The hydraulic analysis identified over $17M in distribution system improvements, primarily related to fire flow deficiencies.

Capital Plan Recommendations:

1. **Tata & Howard recommendations.** All watermain improvements were included in the rate model and scheduled from a pragmatic / cost perspective (and **NOT** based upon risk or criticality) the District would be well served to review the recommendations with Tata & Howard to better understand risk and criticality of projects by discussing:
    a. The ranking methodology used in the report
    b. The potential for Phase 1 projects also improving Phase 2 deficiencies (note: this may require additional analysis).

    Additionally, the District should consider meeting with the Fire Department(s) to review the project locations versus their ability to fight fires at each location which is likely to provide useful decision-making context.

RCAP Asset Inventory. Developing the asset inventory is often one of the most labor-intensive components of an asset management plan. The District would be well served to use the data to develop a top-down evaluation starting with developing Level of Service (LOS) goals and vetting / ranking them with the Commission to develop the consequence factors and subsequent risk values. From there, for vertical assets, review the asset inventory against the LOS goals to determine critical assets and then determine their condition and likelihood of failure. For the distribution system, critical factors can be assigned to customers based upon their user class (hospital vs single family home) and roadways can be ranked according to the State's roadway classification system. The District's experience with pipe failures and hydrant and valve condition can be incorporated to better understand the likelihood of failure. Note that the Tata & Howard evaluation was conducted in an ArcGIS environment which could be used to associate hydrants and valve with water mains to simplify the evaluation.

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Water Rate Study:

Establishing Revenue Requirements. One of primary goals of rate evaluations is to fund the "complete cost of service". This is best defined as what is required to meet all of the LOS goals defined in the asset management evaluation.

Revenue requirements are represented by the total expenses for each year. The term "Revenue Requirements" is used as it reinforces the fact that purpose of water rates is to recover the cost of a utility or benefit from those that receive the use/benefits of that utility in an equitable manner. Revenue requirements consist of all budgeted items which consist of operating cost and debt service. While non-debt capital costs are funded by free cash, rate revenue is required to replenish free cash to maintain the desired balance, thus they are indirectly related.

To assist with further development of the asset management program, functional categories (p. 6) were assigned to budgetary costs. Annual budgets from 2022 to 2026 (proposed) budgets with the year-end actual expenditures were used for the evaluation. Escalation factors for 2027 – 2035 were developed by reviewing the last three years of budget values and turnback values (unexpended budget) were developed by comparing budget to actuals (p.7). Projected water purchase costs were based upon the assumption that the District would produce 50,000 gallons per day and purchase the remainder of projected demand from Worcester.

Annual capital expenditures were developed by incorporating the data described previously and assigning both a year and a funding method for each item. For distribution system improvements, annual costs were based upon **30-year term bonds** (constant principal @ 3.5%).

The District has previously funded projects through the Department of Agriculture's Rural Development (RD) program. As part of this evaluation, we reached out to the RD program's State Director, Joseph Delbove to discuss future eligibility (Leicester does not meet the income requirements of population required by certain programs, although Cherry Valley may, it is not a Census designated place, so income and poverty information is not readily available). The discussion was very encouraging and included approaches to evaluating income eligibility by either using Census block level data or an income survey, a service which RCAP provides. We strongly recommend that the District meet with RD representatives to review the complete range of grant and loan offerings.

Revenue Evaluation. The revenue requirements identify the total funding required for each year, and although most of the revenue is comprised of user charges, it is important to evaluate all other sources of revenue, these sources and assumed projections can be found on p. 12. An important aspect of the revenue evaluation is the usage evaluation which is used for model calibration (p.13) and the evaluation of the existing rate structure.

Projected Usage. In addition to analyzing usage patterns, the usage evaluation is also typically used for projecting future usage. Annual usage is summarized in the report (p.16). This summary indicates that

usage since 2017 has decreased due to the imposition of usage limitations in the District's agreement with Worcester, however, there appears to be significant available capacity. This is important to point out as increasing usage, presumably through adding customers, is an effective way to improve economy of scale and spread costs out across more customers. The District's boundaries are defined by metes and bounds similar to a parcel of land. Initial discussions suggested that expanding these boundaries would be a complex and burdensome process. In reviewing Chapter 105 of the Acts of 1996 however, Section 15 describes what appears to be a straightforward method to expand the District. We recommend that the District review Section 15 with legal counsel if required and meet with Leicester to discuss identified needs and desired growth goals.

Rate Evaluation & Design. An important aspect of a rate evaluation is to review the effectiveness and equity of the existing rate structure. CVRWD's existing rate structure consists of a base charge and a tiered or increasing step usage charge which is applied to all customers. Residential users account for 94% of all users and residential usage is 78% of total usage.

To evaluate the equity of the existing rate structure we first summarized usage by customer class included in the billing data. Unsurprisingly, residential customers make up 85% of the District's customer base. Next, we prepared a histogram of residential customer usage for the month of July 2023 (the peak usage month) and overlaid the existing tier boundaries onto the histogram (p. 14). This shows that 90% of all residential bills were below the Tier 1 threshold (1,000 CF), compared to the 50% value typically used to define Tier 1 (400 CF).

Rate Alternative B

The goal of developing and evaluating alternative rate structures is to meet the identified revenue needs while increasing equity and decreasing rate impacts if possible. The efficacy of the alternate rate structure is readily determined by reviewing the customer impacts.

When developing an alternate to a single base charge structure, the first choice would be to replace the single base charge with one that increases by meter size (p.16) as this is an industry standard and an appropriate way to incorporate the 'readiness to serve' charge which considers not only *actual* usage but *potential* usage. However, since most of the District's meters are <1" this option was eliminated and instead a dual structure was developed for residential and non-residential customers.

The residential structure is a modification of the existing base charge & tiered usage charge; however, tier 1 is split into two and the base charge is reduced. For non-residential customers the base charge is increased, however the tier charges are all set at the same cost (a flat usage charge). The flat usage charge for non-residential users was selected as tiered usage rates are designed to discourage wasteful use and as such should be based upon the usage patterns specific to each customer class lest large commercial users get 'penalized' for high usage despite how efficiently the water is used.

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Rate Alternative C

Alternative C is a variation of Alternative B where the residential usage rates are less, and the commercial rates are higher. This alternative was developed to evaluate the impact on non-residential users resulting from further reducing the cost for low and typical usage residential users.

Rate Setting

Rate increases are based upon projected usage (broken down into the appropriate tiers) and revenue needs. As discussed, revenue needs are based upon annual expenses, however, to stabilize or 'smooth out' year to year rate increases free cash is used strategically and rates increases consider maintaining the desired free cash balance (pp. 18-21).

Customer Impacts

Customer impacts are the ultimate test of rate structures, understanding which customers pay less, and more importantly, which customers pay more is a key element of informed decision making. It is important to recognize that Alternatives B and C are designed to produce the same amount of revenue, therefore by decreasing the cost for one user class, the others must pay more.

A summary of rate impacts for all three alternatives can be found on pp. 24 & 25 where we can see that under alternative B a low usage residential customer would pay 15% less ($91/$7.58 per year/month) than current and under Alternative C 26% ($159/$13.25 annually/monthly). While this is significant, it is important to remember that each alternative is designed to produce the same amount of revenue, thus for one user class to pay less the other user classes must pay more.

To provide the District with more context in terms of rate impacts, a summary of rate impacts for all customer classes has been developed (p.26). The summary shows total costs for the June 2024 period for all user classes.

Conclusions.

The District is to be commended for both its concerted efforts related to managing expenses and subsequent rate impacts, however it is also important to maintain investments in the system to prevent potentially costly impacts from both a public health and financial perspective.

This evaluation also shows that under the rate structure B, the majority of customers will pay less, however, it is also based upon a number of assumptions relative to capital needs which have not been fully developed. Therefore, although this evaluation is based upon a ten-year period, it should be considered to be a living document that is updated as required based upon changes in growth, funding options and additional asset management program development.

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