

MILFORD WATER COMPANY EVALUATION ANALYSIS



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293 BOSTON POST ROAD WEST, SUITE 500
MARLBOROUGH MASSACHUSETTS, 01532

Milford Water Company Valuation Analysis

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INTRODUCTION

Concentric Energy Advisors (“Concentric”) has been asked to prepare an independent expert report for the Town of Milford (“Town”) providing a valuation of the Milford Water Company (“Company” or “Milford Water”). John J. Reed, the Chairman and Chief Executive Officer of Concentric, and its subsidiary, CE Capital Advisors, Inc., was retained as the expert.

JOHN J. REED

I have 42 years of experience in the energy industry, having served as an executive in energy consulting firms, including the position of Co-CEO of the nation’s largest publicly-traded management consulting firm, Navigant Consulting, Inc., and as Corporate Economist for the nation’s largest gas utility, Southern California Gas Company. I have provided advisory services in the areas of energy contract negotiations, mergers and acquisitions, asset divestitures and purchases, strategic planning, project finance, corporate valuation, energy market analysis, as well as rate and regulatory matters to clients across North and Central America. My experience and expertise most relevant to this report is that relating to the valuation of utility assets in North America.

I have worked for dozens of utilities across North America on utility rates, terms of service, resource planning, construction, regulatory policy, contracting, and financial and economic analysis assignments. As part of this work, I have often been asked to appear as an expert witness in regulatory, legislative, arbitration and civil litigation processes, including proceedings related to regulatory approvals of mergers, acquisitions, and asset sales. I have submitted expert testimony in approximately 200 matters over the past 42 years, including providing testimony in several proceedings on issues involving contracts, terms of utility service, damages and power plant valuation before state courts, utility commissions, U.S. District Courts, U.S. Bankruptcy Court, U.S. Tax Court and the U.S. Court of Federal Claims. A copy of my



curriculum vitae, including a list of my appearances as an expert witness is attached to this report as Appendix A.

CONCENTRIC ENERGY ADVISORS AND CE CAPITAL ADVISORS

Concentric is a financial advisory and management consulting firm, headquartered in Marlborough, Massachusetts, that provides services relating to transactions involving energy and water industry firms and assets, energy market analysis, litigation and regulatory support. Our regulatory support services include preparing testimony on valuation, mergers, return on equity, rate design, cost allocation, cost of service studies, and other economic and financial matters involved in rate setting. CE Capital Advisors, Inc. is a fully-licensed FINRA-member securities and financial advisory firm providing services relating to corporate mergers and acquisitions, the valuation of securities, and capital market advisory services to the energy industry.

CLIENT AND EXPERT REPORT REQUEST

On behalf of the Town, the law firm of Brown Rudnick retained me to provide professional services in connection with valuation of Milford Water. This retention agreement was effective February 26, 2018.

ISSUES CONSIDERED

This case involves the Town's petition currently before the Massachusetts Department of Public Utilities ("DPU" or "Department") in D.P.U. 18-60 to acquire the assets of the water company serving the Town. Under the charter that created the water franchise in 1881 ("Charter")¹, the Town has the right to purchase the property and acquire the rights and privileges of Milford Water (the "Assets") by one of two methods described in the Charter. The Town and the Milford Water Company may set a price that is mutually agreeable, and the Milford Water can sell at that price. If Town and the Company are unable to agree, then the compensation for the Assets will be determined by commissioners appointed by the

¹ Statutes of 1881, Chapter 77, Section 9 ("The town of Milford shall have the right at any time during the continuance of the charter hereby granted, to purchase the corporate property and all the rights and privileges of said company, at a price which may be mutually agreed upon between said corporation and the said town of Milford ; and the said corporation is authorized to make sale of the same to said town. In case said corporation and said town are unable to agree, then the compensation to be paid shall be determined by three commissioners, to be appointed by the supreme judicial court upon application of either party and notice to the other, whose award, when accepted by said court, shall be binding upon both parties.")



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Supreme Judicial Court (the “Court”). Over the past several years the Town and the Water Company have engaged in negotiations over the price, but have been unable to agree to the terms of a sale.² The matter has been referred by the Court to the Department for a determination of compensation.³ I have been asked to prepare an expert report that assesses the following issues:

- 1) What is the appropriate valuation method to apply to Milford Water to determine compensation for the Assets?
- 2) What is the compensation to be paid by the Town to acquire the Assets?

This report considers and addresses these issues based on information and analysis performed by me, and by others under my direction and supervision, to date. I reserve the right to update and supplement my expert report as may be necessary.

SUMMARY OPINION

The Charter that granted the franchise for Milford Water provided two ways for determining a price for the Town to acquire the Assets. First, the Water Company and the Town could agree on a price. Second, if no price could be agreed upon for the Assets, then upon petition the Court would refer the request for compensation to three commissioners appointed by the Court. The Department now fulfills the role of the appointed commissioners to determine the compensation in the event the Town and Milford Water were unable to agree on a price.⁴ It is my understanding that the Town and the Milford Water engaged in negotiations and were unable to reach agreement on a price. The Town has made a petition to the Court, and the Court in turn has referred this matter to the Department to determine compensation for the

² *Milford Water Company*, D.P.U. 17-107, page 1, footnote 1 (“The negotiations between the Town and Milford Water for the purchase of the Company did not result in agreed upon terms or a purchase price.”)

³ *In Re: Milford Water Company*, No. SJ-2018-0029, Order, p. 3 (May 31, 2018).

⁴ Although the Charter refers to three commissions appointed by the Court, the Court refers the determination to the Department instead. Massachusetts General Laws Chapter 165, Section 5 (“In all proceedings for the acquisition by a town of the water works and other property of a water company created by special law in the commonwealth providing for the appointment of commissioners for the determination of the price to be paid for such water works and property, the matters to be referred to, heard and determined by, such commissioners shall be referred to, heard and determined by, the department, and its determination and award shall have the same force and effect as if the determination and award had been made by the commissioners provided for in the charters of such companies.”)



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Assets. The Department has precedents which speak to the determination of fair value for utility acquisitions.⁵ Those decisions, and recent market data, are reflected in my analysis.

1) What is the appropriate valuation method to apply to Milford Water to determine compensation for the Assets?

The Department has previously addressed the approach for valuation of a utility system and determined that a blended approach combining original cost less depreciation (“OCLD”) and reproduction cost new less depreciation (“RCNLD”) is appropriate for valuing the sale of utility systems. I generally concur with this decision, although replacement cost is more valid than reproduction cost for a water utility, and determining the appropriate weight for the OCLD and RCNLD components requires further examination.

2) What is the valuation to be paid by the Town to acquire the Assets?

Using the Department’s blended approach as a framework, I conducted a survey and analysis of recent water company transactions and publicly-traded company valuations (“Market Metrics”) to determine the appropriate weight to assign OCLD and RCNLD components of the valuation. Applying the Market Metrics and valuation considerations, I have determined that the fair value of Milford Water should be \$40 million.

The remainder of this report is organized into three main sections: a Background section that provides necessary context for my review of valuation, an Analysis section that addresses the main issues identified above as well as the relevant valuation considerations and, finally, a Conclusion section.

⁵ *Stow Municipal Electric Department*, D.P.U. 94-176, page 58 (1996) (“Fair value is defined as the highest price a willing buyer would pay a willing seller for the property.”) (citation omitted)



BACKGROUND

THE 1881 CHARTER

The Commonwealth of Massachusetts has granted Milford Water a charter for the provision of water utility service within the franchised service territory of the Company.⁶ Public policy favors the provision of certain essential services, like water, through a state franchised entity which can achieve lower overall social costs than could be achieved if services within the same territory were provided by multiple market participants under a competitive model.⁷ In exchange for this exclusive franchise right as a natural monopoly, the utility enters into a broad implicit regulatory compact with the state,⁸ which imposes several requirements on the company, including that it provide safe and reliable service at just and reasonable rates.⁹

⁶ Statutes of 1881, Chapter 77, Section 1 (“[The named people] their associates and successors, are hereby made a corporation by the name of the Milford Water Company, for the purpose of furnishing the inhabitants of Milford with pure water for the extinguishment of fires, and for domestic and other purposes, with all the powers and privileges, and subject to all the duties, restrictions and liabilities set forth in the general laws which now are or may hereafter be in force regulating such corporation.”); Massachusetts General Laws, Chapter 165 (Water and Aqueduct Companies).

⁷ *Natural Monopoly And Its Regulation*, Richard A. Posner, 30th Anniversary Ed. (1999), page 1 (“A firm that is the only seller of a product or service having no close substitutes is said to enjoy a monopoly. Monopoly is an important concept to this Article but even more important is the related but somewhat less familiar concept of ‘natural monopoly.’ The term does not refer to the actual number of sellers in a market but to the relationship between demand and the technology of supply. If the entire demand within a relevant market can be satisfied at lowest cost by one firm rather than by two or more, the market is a natural monopoly, whatever the actual number of firms in it.”) A natural monopoly involves high initial capital investment (like the large capital costs associated with constructing an water distribution system) and exhibits benefits of scale (declining unit cost at high levels of output).

⁸ *Fundamentals of Energy Regulation*, Jonathan A. Lesser & Leonardo R. Giacchino, 2nd (2013), page 50 (“There is also a long-standing, but unwritten, rule that governs cost recovery and lies at the heart of establishing *regulated* prices. This rule, which was applied to electric and gas distribution utilities who were awarded with exclusive geographic franchises, is generally known as the *regulatory compact*. Under the regulatory compact, the regulator grants an exclusive franchise to a company, essentially a protected monopoly, for the sale and distribution of electricity or natural gas to customers in its defined service territory. In return, the company commits to supply the full quantities demanded by those customers at a price calculated to cover all operating costs plus a ‘reasonable’ return on the capital invested in the enterprise.”) (emphasis in original) (footnote omitted).

⁹ *The Regulation of Public Utilities*, Charles F. Phillips, 3rd Ed. (1993), pages 171-172 (“As to the rate structure, public utilities are permitted to establish rates, that at a minimum, will cover their revenue requirements. Such rates must be ‘just and reasonable’ with no ‘undue’ discrimination.”); *Electric Utility Cost Allocation Manual*, National



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As a grant created by the state, a charter details the terms under which the regulated business operates, including how it can be transferred.¹⁰ For Milford Water, the Charter provided two methods for the Town to obtain a price to acquire the Assets: mutual agreement on the price, and if mutual agreement could not be reached, then either the Town or Milford Water could petition the Court for a determination of compensation. The compensation is determined by three Court-appointed commissioners, a function now performed by the Department. The Charter itself does not identify specific factors to be considered or excluded by the Department in the determination of compensation,¹¹ although the Department has decisions regarding the valuation for utility acquisitions.¹² Once the Department determines compensation, and it is accepted by the Court, the price for the Assets will be set.

THE MILFORD WATER COMPANY

Milford Water is a small, privately owned Massachusetts public utility in the business of the development, treatment and distribution and sale of water in Milford and has approximately 8,970 customers.¹³ The Company first began to sell and distribute water in 1882.¹⁴ David H. White is the president of the Company that has offices at 66 Dilla Street in Milford.¹⁵ According to the Company's Annual Return the system consists of approximately 117 miles of pipe of various diameters and types of material, 1,837

Association of Regulatory Utility Commissioners (1992), page 10 ("State commissions are charged with setting just and reasonable rates, in both level and design, and assuring safe and reliable service.")

¹⁰ Statutes of 1881, Chapter 77, Section 9 ("The town of Milford shall have the right at any time during the continuance of the charter hereby granted, to purchase the corporate property and all the rights and privileges of said company, at a price which may be mutually agreed upon between said corporation and the said town of Milford ; and the said corporation is authorized to make sale of the same to said town. In case said corporation and said town are unable to agree, then the compensation to be paid shall be determined by three commissioners, to be appointed by the supreme judicial court upon application of either party and notice to the other, whose award, when accepted by said court, shall be binding upon both parties.)

¹¹ *Stow Municipal Electric Department*, D.P.U. 94-176, page 58 (1996) ("The Legislature authorizes the Department to weigh a set of factors in determining fair value, but does not specify what factors the Department ought to consider. Some items are expressly excluded from the set of factors to be considered. These are future earning capacity, good will, and exclusive privileges derived from the rights in public ways.")

¹² *Stow Municipal Electric Department*, D.P.U. 94-176 (1996).

¹³ *Milford Water Company, Petition for Approval*, D.P.U. 17-107, page 1 (June 15, 2017).

¹⁴ Annual Return of Milford Water Company, page 103 (2017).

¹⁵ Annual Return of Milford Water Company, page 102 (2017).



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gates and valves, 9,291 meters, pumping equipment, wells, standpipes, and the Echo Lake and Wildcat Pond reservoirs, both of which have dam structures.¹⁶

The Town has retained the services of the engineering firm of Woodard & Curran to assess the condition of the Milford Water system. A copy of that report from Woodard & Curran, is separately filed by the Town, and contains additional details about the physical condition of the water distribution system and associated infrastructure. Woodard & Curran also provides an RCNLD analysis. Prior to retaining Woodward & Curran for this case, the Town had engaged the services of consultants over the last few years as it considered the feasibility of acquiring Milford Water.¹⁷ While the Company and the Town engaged in negotiations over the purchase of the Assets, the parties were ultimately unable to reach an agreement.

RATE SETTING FOR MONOPOLY SERVICES

A state grant to a company of an exclusive service territory to offer utility services as the sole provider of that service, free from competition, comes with the broad understanding that the utility will accept a duty to serve customers within that service territory, on a non-preferential basis, and free of unjust discrimination.¹⁸ Under this long-recognized and implicit regulatory compact, the utility accepts near-complete regulation of its business functions used to supply the monopoly service.¹⁹ In exchange, it is permitted recovery of its costs plus a reasonable opportunity to earn a fair return on its investments.²⁰ In order to ensure that a utility has a fair opportunity to recover its expenses, and a fair return on and the

¹⁶ Annual Return of Milford Water Company, page 401- 413 (2017).

¹⁷ The Town engaged Russel Consulting, LLC, to perform a feasibility study (2014), Lincoln Group LLC to conduct Financial and Business Due Diligence (2017) and Woodard & Curran to perform a facilities condition asset and to estimate replacement cost new (2017).

¹⁸ *The Regulation of Public Utilities*, Charles F. Phillips, 3rd Ed. (1993), pages 171-172 (“Such rates must be ‘just and reasonable’ with no ‘undue’ discrimination.”)

¹⁹ Massachusetts General Laws Chapter 165, Section 4 (“The department shall have general supervision of all corporations and companies subject to this chapter, and shall make all necessary examinations and inquiries and keep itself informed as to the compliance by all such corporations and companies with the law.”); 220 CMR Section 52.00 (Uniform System of Accounts for Water Companies).

²⁰ *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).



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return of invested capital, a public utility commission will use its ratemaking authority to set both the price a utility may charge as well as the terms and conditions for the provision of service.²¹

The Department has long determined the propriety of base rates using a historical test year cost of service model.²² While the Department uses an historical 12-month test period, the resulting rates are set based on the theory that they reflect both the current financial circumstances of the company as well as the future performance.²³ Under this approach the Department allows, after investigation, a utility to set rates to recover reasonable utility operating costs, taxes, and depreciation, along with other approved businesses expenses, plus a reasonable return on investment capital.²⁴ This return includes the recovery of interest on debt used to finance the investment in the assets, as well as an allowed profit on the equity portion of that investment, as determined by the Department.²⁵ The aggregate of these capital and operating costs that are recoverable by the utility is referred to as the utility's "cost of service" or

²¹ *Natural Monopoly And Its Regulation*, Richard A. Posner, 30th Anniversary Ed. (1999), page 54 ("The heart of the process is the determination of the overall revenue requirements of the regulated firm. A test year (ordinarily the most recent typical year of operations for which complete data are available) is selected and the firm is asked to submit its operating and other expenses for that year. The regulatory commission reviews the submission and may disallow expense items that either were imprudently incurred or are not properly expenses ...") *Electric Utility Cost Allocation Manual*, National Association of Regulatory Utility Commissioners (1992), page 10 ("State commissions are charged with setting just and reasonable rates, in both level and design, and assuring safe and reliable service.")

²² *Investigation by the Department of Public Utilities into Rate Structures that will Promote Efficient Deployment of Demand Resources*, D.P.U. 07-50-A, page 51-53 (2008) ("The Department's application of an historic test year to establish rates has served ratepayers well, and the record in this proceeding does not prompt us to abandon a clear policy that has existed for many decades. Using the actual financial results of the most recent twelve-month period as a test year constitutes sound, long-standing regulatory practice, a practice rooted in foundational principles of regulatory economics and public policy.")

²³ *Fitchburg Gas & Electric Light Company*, D.T.E. 99-118, page 8 (2001) ("When considering a § 94 rate case, the Department examines a test year, which usually represents the most recent twelve-month period for which complete financial information exists, on the theory that the revenue, expense, and rate base figures during that period accurately reflect the utility's present financial situation and fairly predict the company's future performance.")

²⁴ *Boston Gas Company v. Department of Telecommunications & Energy*, 436 Mass. 233, page 234 (2002).

²⁵ *Milford Water Company*, D.P.U. 17-107, page 159 ("A company's capital structure typically consists of long-term debt, preferred stock, and common equity. The ratio of each component in the total capital structure is used to weight the cost (or return) of each component to derive a weighted average cost of capital ('WACC'). The WACC is used to determine the return on rate base for calculating the appropriate debt service and capital costs for the company to be included in its revenue requirement.") (citations omitted).



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“revenue requirement”, meaning the revenue required by the utility to fully recover the cost of providing the regulated service, including a return on its investment.

The return on investment component of the cost of service is determined as a percentage of the utility’s rate base²⁶, a key driver of profitability. The Department will include in rate base prudently incurred investment in utility plant that is used and useful in the provision of utility service to customers, in service at the end of the test year period,²⁷ and as may be adjusted for known and measurable changes.²⁸ The cost of the plant in rate base is based on the original cost of the asset,²⁹ (“book value”); for ratemaking purposes, the value of the plant is the original cost less accrued depreciation³⁰ (OCLD or more commonly referred to as “net book value”). The following formula presents the calculation of the revenue requirement under cost of service regulation:

$$\text{REVENUE REQUIREMENT} = ((\text{BOOK VALUE} - \text{ACCUMULATED DEPRECIATION}) * \text{AUTHORIZED RATE OF RETURN}) + \text{OPERATING EXPENSES} + \text{DEPRECIATION EXPENSE} + \text{TAXES}$$

As can be seen from this formula, cost of service regulation provides the utility with an opportunity to earn a return on its plant until those assets are fully depreciated and also to recover the original cost of those investments over time through the depreciation expense component of the formula.³¹ Depreciation expense allows a utility to recover its capital investments in a timely and equitable manner over the service lives of the investments.

For regulatory accounting purposes, the depreciation rate applied to a particular plant account is the rate at which an asset is expensed (on a non-cash basis) over time to represent a gradual reduction in

²⁶ *Boston Gas Company v. Department of Telecommunications & Energy*, 436 Mass. 233, page 234 (2002).

²⁷ *Boston Gas Company*, D.P.U. 96-50, page 15 (1996).

²⁸ *Dedham Water Company*, D.P.U. 84-32, page 17 (1984).

²⁹ *Boston Edison Company*, D.P.U. 84-47, page 5 (1985).

³⁰ *Boston Gas Company v. Board of Assessors of Boston*, 458 Mass. 715, page 718 (2011).

³¹ *The Regulation of Public Utilities*, Charles F. Phillips, 3rd Ed. (1993), page 277 (“The basic purpose of depreciation accounting is the recovery of past investment in plant and equipment, and is properly a cost of providing service.”)



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value, and which may be established based on a formal depreciation study of assets³² or through other means (for example, regulatory settlement or simplified method).³³ Depreciation rates reflect the period of time over which an asset is expensed for cost recovery purposes in ratemaking, but these rates do not affect the underlying actual useful physical life of an asset installed on a utility system. Certain long-lived assets may be performing in the field well after the original cost of the assets has been fully depreciated for ratemaking purposes.

THE DEPARTMENT'S VALUATION APPROACH

The Department has addressed the valuation of utility systems in the context of a town purchasing a regulated system and developed a method for determining a fair value in a case that is relevant to an analysis of Milford Water.³⁴ In that proceeding, the Stow Municipal Electric Department (“Stow Municipal”) submitted a petition to the Department for a determination of purchase price for Stow Municipal’s anticipated separation from the adjacent Hudson Municipal Light & Power Department’s (“Hudson Municipal”) system.³⁵ After discussing the different type of valuations approaches used in different contexts (ratemaking, mergers and acquisitions, eminent domain, and utility property taxes)³⁶,

³² *Aquarion Water Company of Massachusetts*, D.P.U. 08-27, page 110 (2009) (“The Department recognizes that the determination of depreciation accrual rates requires both statistical analysis and the application of the preparer’s judgment and expertise.”)

³³ In its last rate case, Milford Water apparently did not conduct a full depreciation study. Response to Discovery Request TOWN-MWC-2-2 (“Tab SD4 was prepared and submitted to the Department for rate setting purposes, not valuation purposes. Concerning Column C and the data in the ‘Useful Life (yr)’ column, the basis for the average service lives, for rate setting purposes, is determined using guidelines set forth in the NARUC Depreciation Manual in coordination with the Company’s rate consultant. The Department approves depreciation rates as part of its adjudication of rate applications.”); *Stow Municipal Electric Department*, D.P.U. 94-176, page 61 (1996) (“The Department has previously accepted, in the case of small utilities, the use of statistical analyses prepared by industry associations as a reasonable estimate of plant service live. Milford Water Company. D.P.U. 84-135, at 23 (1985).”)

³⁴ See generally *Stow Municipal Electric Department*, D.P.U. 94-176 (1996) (“Stow”).

³⁵ *Stow Municipal Electric Department*, D.P.U. 94-176, page 1 (1996). Stow municipal also sought a determination of damages associated with the severance of the systems in light.

³⁶ *Stow Municipal Electric Department*, D.P.U. 94-176, page 59 (1996) (“Utility plant is valued differently for ratemaking purposes, mergers and acquisitions, eminent domain, and tax assessments. The analysis below addresses the concept of valuation in each of these contexts and how they apply specifically to this situation, in order to determine a method that reflects the fair value of this property.”)



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and identifying the guiding principles derived from the charter and other legislation³⁷, the Department adopted a hybrid method of combining both OCLD and RCNLD.³⁸

The Department reasoned that there were several advantages to using a blended approach since OCLD and RCNLD represent different types of value streams to sellers and buyers, respectively. Supporting the OCLD component, the Department noted that using net book value agreed with the relevant legislative language³⁹, and “[m]oreover, our ratemaking principles make it appropriate to use OCLD as part of the valuation, since OCLD reflects the utility’s investment in the property.”⁴⁰ The Department then noted that the OCLD did not represent a full measure of fair value in that case, and that RCNLD should be taken into account since RCNLD “reflects the value that is being taken and that [the buyer, Stow Municipal] is receiving, i.e., the value of a reliable system in good condition.”⁴¹ RCNLD also took into account anticipated regulatory change (electric restructuring at that time) and negated the need for a plant allocation method particular to that case.⁴² Although the Department did not elaborate on the underlying analysis that supported the development of the relative weights for the OCLD and RCNLD factors, the Department assigned an even 50% weight to reach the results of each method. I appeared

³⁷ *Stow Municipal Electric Department*, D.P.U. 94-176, pages, 48-49, 54, 65 (1996); page 65 (“In summary, to determine the purchase price, the statute requires the Department to take into consideration the cost of the property less depreciation, and any other element that goes to fair value, while disregarding future earning capacity, good will or exclusive privileges derived from rights in the public way. Our goal in this valuation is to facilitate the transfer of the property at fair value.”)

³⁸ *Stow Municipal Electric Department*, D.P.U. 94-176, page 65 (1996). The Massachusetts Supreme Judicial Court affirmed the valuation methodology on appeal. *Stow Municipal Electric Department v. Department of Public Utilities*, 426 Mass. 341, page 347 (1997) (“In sum, we conclude that the 50-50 valuation set forth in the department’s order was supported by substantial evidence and not arbitrary or capricious.”)

³⁹ Chapter 165, Section 43 (“[a] municipality may apply to the department . . . for a determination as to what property ought in the public interest to be included in the purchase and what price should be paid, having in view the cost of the property less a reasonable allowance for depreciation and obsolescence, and any other element which may enter into a determination of a fair value of the property so purchased, but such value shall be estimated without enhancement on account of future earning capacity or good will, or of exclusive privileges derived from rights in the public ways”).

⁴⁰ *Stow Municipal Electric Department*, D.P.U. 94-176, page 65 (1996).

⁴¹ *Stow Municipal Electric Department*, D.P.U. 94-176, page 65 (1996).

⁴² *Stow Municipal Electric Department*, D.P.U. 94-176, pages 64- 65 (1996).



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as an expert on behalf of Hudson Municipal in that proceeding, and offered my opinions on the valuation approach that was appropriate for that case.

Since the Department decided the case involving Stow Municipal, OCLD remains a bedrock ratemaking principle before the Department. While OCLD consequently retains its relevance for valuation purposes under the Department's approach, there are instances where the "special circumstances" merit consideration of fair value at an amount above net book value for assessing the value of a utility.⁴³ Those circumstances include whether a utility's net earnings exceed Department's approved rate of return.⁴⁴ The underlying rationale for this valuation principle is that a potential willing private buyer would pay an amount over OCLD if a company shows a pattern of generating super-normal returns for shareholders. The converse of this principle, however, should also be true from a valuation perspective: a regulated company that persistently underearned its authorized return should expect a potential buyer to pay an amount less than net book value.

ANALYSIS

ORIGINAL COST LESS DEPRECIATION

Under the Department's blended approach to determining fair value for a municipal purchase of a utility system, the first step in that process is determining OCLD. As described above, original cost rate base is a cornerstone of the ratemaking process for regulated utilities in Massachusetts, and common for municipally-owned utilities. Regulated utility rates are driven by the net book value of the Company's assets. The earnings of a rate-regulated company will be controlled by the regulator. When evaluating

⁴³*Boston Gas Co. v. Board of Assessors of Boston*, 458 Mass. 715, pages 718 to 719 (2011) ("As a result of this regulation, we have stated that net book value of utility assets is the proper value for assessment purposes, absent 'special circumstances' that would induce a buyer to pay more than net book value.") (citation omitted)

⁴⁴ *Boston Gas Co. v. Board of Assessors of Boston*, 458 Mass. 715, pages 718 to 719 ("Such circumstances may include (1) that 'the utility company's net earnings actually may exceed the rate of return approved by the regulatory agency'; (2) that 'the profit available from this transaction may exceed that which an investment of comparable risk could bring in the open market'; (3) that 'the applicable regulatory agency may change its policies and abandon the carry-over rate base principle, thereby making an investment in the company more attractive,' *Montaup Elec. Co. v. Assessors of Whitman*, *supra* at 852–853, 460 N.E.2d 583; or (4) '[t]he potential for growth in a utility's business.' *Boston Edison Co. v. Assessors of Watertown*, 387 Mass. 298, 305–306, 439 N.E.2d 763 (1982).")



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a potential purchase of a small privately owned rate-regulated utility, like Milford Water, this type of regulation would materially influence the price a prospective buyer would be willing to offer. Although I am not an attorney, my business level understanding of the term “compensation” as used in the Charter suggests a level of recognition that Milford Water should expect a price that takes into consideration that it is in a rate-regulated business, and certainly a willing private buyer would recognize this fact.

To determine an OCLD for Milford Water, data from Milford Water’s 2017 Annual Return to the Department of Public Utilities were examined. According to this analysis, the OCLD for the Company is \$31,720,028. This calculation reflects the same methodology that the Department has used to establish the rate base of Milford Water.

Figure 1: Original Cost Less Depreciation

Line No.	Item	Source	2017 Values
1	Total Plant Investment	<i>Annual Return, P. 202, L. 19</i>	\$50,358,504
2	Plus: Total General Equipment	<i>Annual Return, P. 202, L. 27</i>	\$1,014,728
3	Plus: Unfinished Construction	<i>Annual Return, P. 301, L. 25</i>	\$942,411
4	Gross Utility Plant	<i>L1 + L2 + L3</i>	\$52,315,644
5	Less: Depreciation Reserve	<i>Annual Return, P. 201, L. 34</i>	\$12,262,558
6	Subtotal	<i>L4 - L5</i>	\$40,053,085
Adjustments			
7	Less: Contributions for Extensions	<i>Annual Return, P. 201, L. 39</i>	\$8,333,017
8	Original Cost Less Depreciation	<i>L6 - L7</i>	\$31,720,068

This figure accounts for plant in service up to December 31, 2017, as detailed in the Company’s last available Annual Return to the Department.⁴⁵

⁴⁵ After the 2018 Annual Return to the Department becomes available, Figure 1 will be updated as appropriate.



REPRODUCTION COST NEW LESS DEPRECIATION

As discussed above, the Department considers RCNLD as part of its valuation of the sale of utility systems. In general, a reproduction costs analysis measures the costs associated with making a duplicate or replica, to the extent possible, using the same materials, design, construction standards and other features of the asset being evaluated.⁴⁶ Replacement cost analysis measures the costs associated with creating a substitute using contemporary materials, design standards and other features.⁴⁷ Both approaches are measured as of the date of the valuation, and in order to reflect the vintage of the of the assets being purchased, are adjusted for inflation and depreciation.

The Town has requested that Woodard & Curran conduct an evaluation of the physical assets of Milford Water. A copy of those reports and supporting testimony has been filed separately by the Town.

Woodard & Curran's report includes four distinct measures of RCNLD.⁴⁸ To be consistent with Department decision in the *Stow* case, the analysis contained in this report reflects the average of the RCNLD measure calculated using physical depreciation and the RCNLD measure calculated using book depreciation.⁴⁹ Figure 2 below reflects the average RCNLD value produced by those two measures. Woodard & Curran's report also contains two estimates of "Indexed RCNLD" (i.e., one calculated using "physical depreciation" and the other using "book depreciation") that are useful surrogates for the net book value of Milford Water's assets. These values provide confirmation that Woodard & Curran's

⁴⁶ *The Appraisal of Real Estate* (14th ed.), The Appraisal Institute, pages 569-570 (2013) ("Reproduction cost is the estimated cost to construct, as of the effective appraisal date, an exact duplicate or replica of the building being appraised, insofar as possible, using the same materials, construction standards, design, layout, and quality of workmanship, and embodying all the deficiencies, superadequacies, and obsolescence of the subject improvements.")

⁴⁷ *The Appraisal of Real Estate* (14th ed.), The Appraisal Institute, page 570 (2013) ("Replacement cost is the estimated cost to construct, as of the effective appraisal date, a substitute for the building being appraised using contemporary materials, standards, design, and layout. When this cost basis is used, some existing obsolescence in the property may be cured. Replacement cost may be the only alternative if reproduction cost cannot be estimated.")

⁴⁸ Exhibit TOWN-RF-3.

⁴⁹ *Stow Municipal Electric Department*, D.P.U. 94-176, page 73 (1996). ("Accordingly, the Department finds that the appropriate method of calculating depreciation for RCNLD is a composite calculation derived from the HL&PD method, consisting of 50 percent straight line depreciation, and 50 percent observed condition.")



Milford Water Company Valuation Analysis

RCNLD results are reasonable because the Indexed RCNLD estimates are relatively consistent with the actual net book value of the Company's assets. However, the remainder of this report reflects the OCLD analysis developed using Milford Water's 2017 Annual Return to the Department rather than Woodard & Curran's "Indexed RCNLD" analysis. This is to be consistent with the *Stow* valuation method. The OCLD analysis developed using Milford Water's 2017 Annual Return to the Department reflects the actual net book value, and rate base, of Milford Water's assets, which makes the use of a surrogate value unnecessary.

Certain assets of Milford Water need to be added to the results of Woodard & Curran's engineering study. The analysis conducted by Woodard & Curran did not include Milford Water's land, certain buildings, rolling stock or office equipment. Figure 2 below also reflects the value of each of those assets. The value of Milford Water's land in the towns of Milford and Hopkinton, as well as the value of its buildings, is added to the results of Woodard & Curran's analysis at its assessed value for tax assessment purposes. The value of Milford Water's rolling stock and office equipment is added to the results of Woodard & Curran's analysis at its net book value.⁵⁰ As summarized in Figure 2, the final RCNLD analysis used in the remainder of this report is \$69,188,837.

⁵⁰ Specifically, Figure 2, Line 7 reflects the net book value of Milford Water's assets in Account Numbers 114 through 119 as provided by Milford Water in the response to Town-MWC 1-18-A, Attachment. Net book value is a reasonable measure of the market value of these types of asset because these assets have relatively short useful lives.



Figure 2: RCNLD Results Summary

Line No.	Item	Source	Value
	(a)	(b)	(c)
1	RCNLD: "Physical Depreciation"	W&C	\$63,505,539
2	RCNLD: "Book Depreciation"	W&C	\$57,248,220
3	RCNLD - Average	<i>Avg L1 & L2</i>	\$60,376,880
4	Plus: Land - Milford	<i>Tax Assessments</i>	\$3,890,000
5	Plus: Land - Hopkinton	<i>Tax Assessments</i>	\$3,059,700
6	Plus: Buildings	<i>Tax Assessments</i>	\$1,632,400
7	Plus: Equipment & Rolling Stock	<i>Town-MWC-1-18-A</i>	\$229,858
8	Subtotal	<i>Sum L4 thru L7</i>	\$8,811,958
9	RCNLD	<i>L3 + L8</i>	\$69,188,837

MARKET METRIC ANALYSIS

The fair market value of Milford Water should be evaluated in the context of the market for water utilities generally and the specific financial situation of Company. Market metrics provide important indicators of the value that a willing buyer and a willing seller, neither under any compulsion to transact, would assign to Milford Water in an arms-length transaction. These market metrics act as a yardstick to gauge the appropriate level of compensation to be paid for the Company. The market metrics analyzed here come from two sources: (1) publicly-traded valuations for water systems (*i.e.*, the comparison group analysis), and (2) comparable sales of water systems (*i.e.*, the comparable sales analysis). In addition, this section of the report examines how the market would likely respond to the relative size of Milford Water, the liquidity of its common shares, as well as uncertainties associated with the Company.

The Industry Comparison Group Analysis

Because fair market value is a market-based concept and the Company is not publicly-traded, it is helpful to establish a group of companies that are both publicly-traded and generally comparable to the Company in certain fundamental business and financial respects. This group of companies will serve as a basis of comparison for Milford Water. The companies used in this analysis are all generally comparable to Milford Water in their operating and financial risk characteristics. They therefore provide a reasonable range of valuations that a willing buyer and a willing seller would consider in an arms-length transaction for the Company.



Milford Water Company Valuation Analysis

The *Value Line Investment Survey* (“*Value Line*”) classifies nine U.S. companies as water utilities. Of those nine companies, eight derive more than 80% of their total operating income from regulated water operations. Those eight companies that comprise this group and are identified in Figure 3 below.

Figure 3: Comparison Group

Company	Ticker
American States Water Company	AWR
American Water Works Company, Inc.	AWK
Aqua American, Inc.	WTR
California Water Service Group	CWT
Connecticut Water Service Inc.	CTWS
Middlesex Water Company	MSEX
SJW Corporation	SJW
York Water Company	YORW

Certain of the companies in this industry group have been involved in merger and acquisition activity within the last year. For example, SJW Corporation and Connecticut Water Service Inc. had a pending all-stock merger for much of 2018. Because of the relatively small number of companies classified by *Value Line* as water utilities, the financial metrics presented throughout this report reflect the results of those companies despite the pending merger and acquisition activity. The effect of including the SJW Corporation and Connecticut Water Service in this comparison group is likely to slightly overstate the fair market value of Milford Water.

Two financial ratios were analyzed from the comparison group: the price-to-earnings ratio (“P/E Ratio”) and the market-to-book ratio (“M/B Ratio”).

The P/E Ratio Metric

The P/E ratio is a measure of the market value of a company’s stock as compared to its earnings. For publicly-traded companies, the P/E ratio is the ratio of the price of the company’s stock and the company’s earnings per share. The P/E ratio is a common valuation tool that is used to analyze investment opportunities. For companies with relatively stable earnings (e.g., water utilities), this metric provides a useful measure of what investors are willing pay per dollar of income.



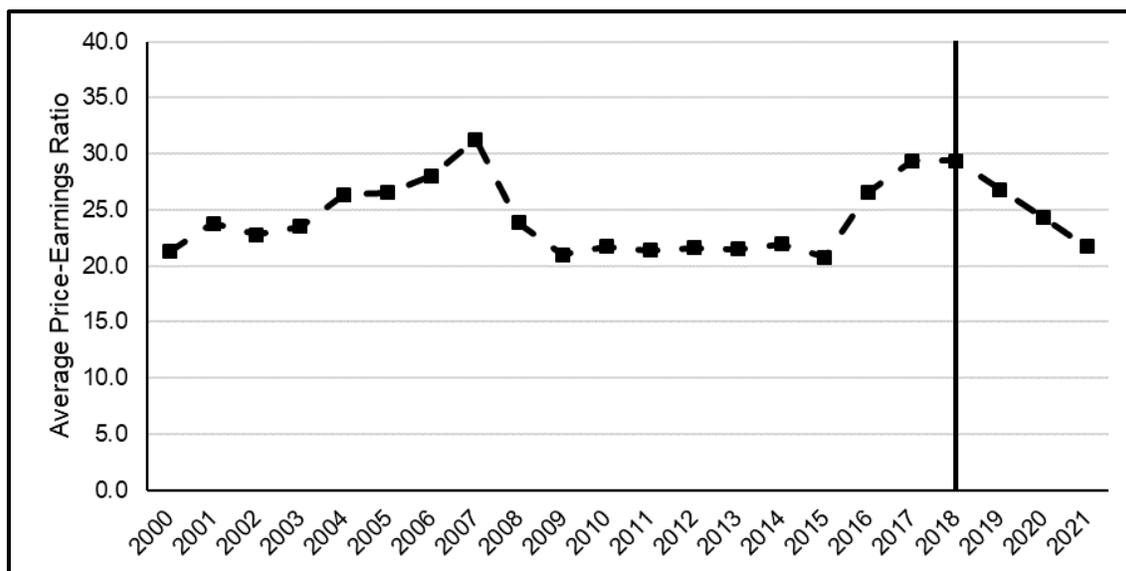
Milford Water Company Valuation Analysis

Water utility P/E ratios are near their high-water mark since 2000. Figure 4 below provides the average P/E ratio of the comparison group in every year since 2000. Figure 4 also provides *Value Line's* average P/E ratio projection for the comparison group in the 2021-2023 timeframe. The 2018 average P/E ratio was 29.4, just below the high of 31.3 set in 2007. Value Line projects that water utility valuations will come down to an average P/E ratio of 21.8 over the coming three to five years as the anticipated rising interest rate environment puts downward pressure on water utility stocks.⁵¹ This observation suggests that the current valuation range established by the P/E ratio analysis will fall in the coming years. Schedule JJR-3 provides the 2017 and 2018 P/E ratios for each company in the comparison group.

⁵¹ *Value Line Investment Survey, Water Utility Industry*, page 1783 (July 13, 2018) (“The Federal Reserve increased the key federal funds rate by 25 basis points last month. Moreover, citing historically low unemployment, the Fed stated that it planned on increasing rates in a gradual manner through 2020. How does this impact water utilities? For starters, dividend paying stocks and fixed-income vehicles have always been in competition for income-oriented investors. Over the past decade, the extraordinary easy monetary policy (along with quantitative easing), had made dividend stocks much more appealing. This is no longer the case, however. The median yield on all dividend paying stocks in the Value Line universe is just about 2.0%. Individuals can now purchase an extremely secure three-month Treasury bill and get almost 2%, with as close to zero risk as possible. Moreover, should an investor be willing to extend slightly further out on the yield curve to one- or two-year Treasury notes, yields of 2.31% and 2.54% can be had. As the front end of the curve continues to rise over the next several years, utility stocks may continue to lose much of their former luster.”)



Figure 4: Average Comparison Group P/E Ratios⁵²



After having determined the 2017 and 2018 P/E ratios of the comparison group, the next step in the analysis is to use those ratios to develop a range of valuations for Milford Water using these market metrics. This step in the analysis involves multiplying the net income of the Company by the appropriate P/E ratio and adding the total debt of the Company to the result. Schedule JJR-1 provides the financial data for Milford Water that is necessary to complete this analysis. The financial data reflected in Schedule JJR-1 are as of December 31, 2017, which is the most recently available financial data as of the writing of this report, and December 31, 2016. Schedule JJR-2 utilizes the information reflected in Schedule JJR-1 and Schedule JJR-3 to calculate a range of valuations based on the P/E ratio metric.⁵³

The valuation range established by the comparison group’s P/E ratios is significantly impacted by the earnings of Milford Water. The earned return on equity (“Earned ROE”) of Milford Water is well below

⁵² Historical data per Bloomberg Finance. Projections per *Value Line Investment Survey, Reports* (October 11, 2018).

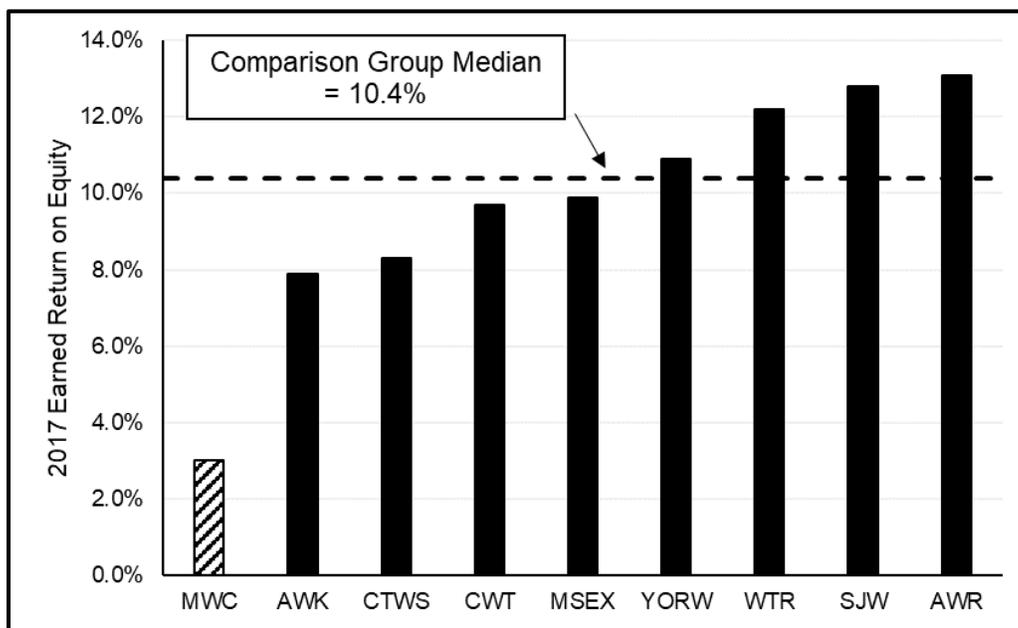
⁵³ The calculations in Schedule JJR-2 reflect a lagged calculation for both the 2017 and 2018 results. In other words, the “2016/17 Value” column in Schedule JJR-2 applies the 2016 financial data of Milford Water from Schedule JJR-1 to the 2017 financial data of the comparison group from Schedule JJR-3.



Milford Water Company Valuation Analysis

that of the comparison group.⁵⁴ Figure 5 below compares Milford Water’s 2017 earned ROE of 3.0% to the 2017 earned ROE of each company in the comparison group.

Figure 5: 2017 Earned Return on Equity⁵⁵



Milford Water has routinely under-earned over the last 10 years. Schedule JJR-1 provides the Company’s annual Earned ROE from 2008-2017. As shown in Schedule JJR-1, Milford Water’s average Earned ROE over that period is approximately 4.1%. In fact, since 2008, Milford Water’s earned ROE has never exceeded 8.0%. This level of performance would be considered negatively by a potential purchaser of Milford Water because it is evidence of an ongoing inability to earn a compensatory return. The consistent under-earning over the past decade supports a valuation at the lower end of the range established by the OCLD and RCNLD valuation methods. All else being equal, a potential purchaser in an arms-length transaction would pay less for an asset with lower earnings.

⁵⁴ Milford Water is denoted as “MWC” in Figure 5.

⁵⁵ Value Line Investment Survey, reports (October 11, 2018). Milford Water data can be found in Schedule JJR-1.



Milford Water Company Valuation Analysis

Finally, to analyze the sensitivity of the results to Milford Water’s under-earning, an alternate scenario was developed. In this alternate scenario, it was assumed that Milford Water would exactly earn its allowed 10% return on equity recently granted by the Department.⁵⁶ The valuation ranges for Milford Water resulting from the P/E ratio metric for 2017, 2018, and the alternate scenario are summarized in Figure 6 below.

Figure 6: Valuation Ranges per P/E Ratio Metric

Valuation Results (\$M) (See Sch. JJR-2)	2017 P/E Ratio Metric	2018 P/E Ratio Metric	2018 P/E Ratio and Adjusted Earnings @ A. ROE Metric
Minimum	\$36.0	\$28.0	\$50.1
1st Quartile	\$37.0	\$28.7	\$52.7
Median	\$38.5	\$29.3	\$54.8
3rd Quartile	\$39.4	\$30.1	\$57.3
Maximum	\$43.9	\$31.7	\$62.8

The 2017 and 2018 P/E Ratio Metric columns reflect by quartile the value the market would place on Milford Water using reported Company earnings and applying the market P/E ratios. The 2018 P/E Ratio and Adjusted Earnings Metric column prices Milford Water assuming it earned its currently allowed return.⁵⁷ Comparing the median valuations for 2017 and 2018 based on reported earnings to the median hypothetical case where the Company earns in 2018 its allowed return, demonstrates that Milford Water’s earnings history, if it was projected to persist, warrants a \$16.3 Million to \$25.5 Million value deduction compared to the comparison group metrics.⁵⁸ This comparison makes two implicit assumptions that favor Milford Water: that it is a larger and publicly traded company. These ownership

⁵⁶ *Milford Water Company*, D.P.U. 17-107, page 175 (2018). (“Based on our review of the evidence, argument of the parties, and the Department’s judgment and considerable agency expertise, the Department finds that an allowed ROE of 10.0 percent is within a reasonable range of rates that will preserve the Company’s financial integrity, allow it to attract capital on reasonable terms, is comparable to earnings of companies of similar risk and, therefore, is appropriate in this case.”)

⁵⁸ In the event that Milford Water earns its allowed return in 2018, a prospective buyer would likely want to see that performance repeated as a trend before heavily weighing it in a valuation analysis given the ten years of substantial under-earnings the Company has reported.



Milford Water Company Valuation Analysis

liquidity and size assumptions are further considered towards the end of this Market Metrics section of my report.

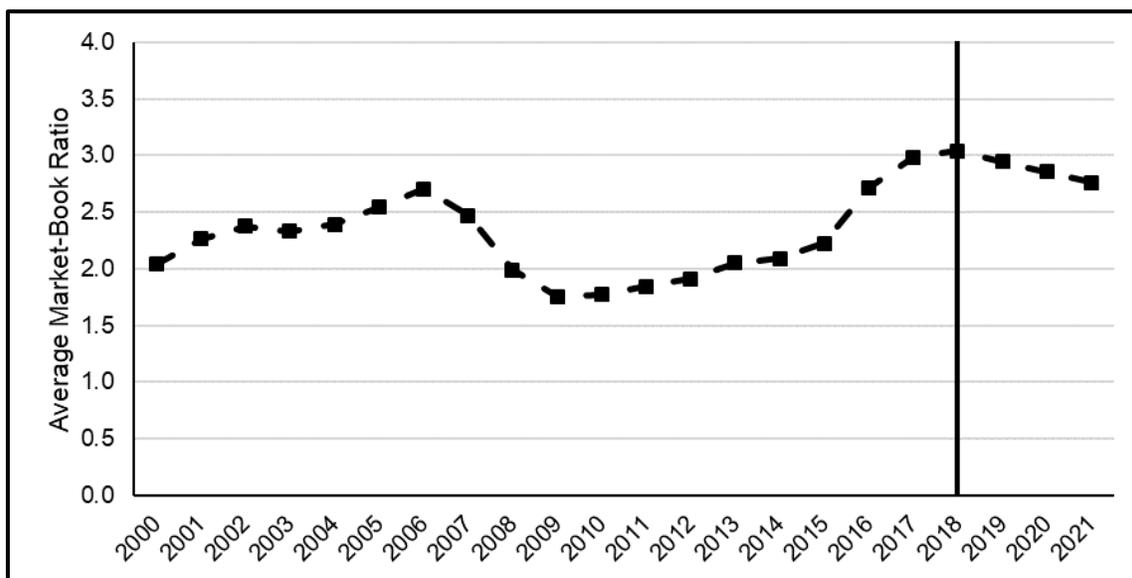
The M/B Ratio Metric

The M/B ratio is a measure of the market value of a company's stock as compared to the book value of its assets. For publicly-traded companies, the M/B ratio is the ratio of the stock price to the book value per share. The M/B ratio is a frequently used valuation metric because it provides a measure of what investors are willing to pay for one dollar of book value of a company's assets.

M/B ratios for water utilities are at historic highs since 2000. Figure 7 provides the average annual M/B ratios of the comparison group since 2000. The 2018 average M/B ratio of 3.0 is well above the historical average M/B ratio of 2.3. *Value Line* projects that M/B ratios for water utilities will decline modestly over the next three to five years from the 2018 level, to approximately 2.8. A potential purchaser would not rely solely on the M/B ratio when valuing the Company. As discussed above, a potential purchaser would consider Milford Water's history of under-earning when analyzing the comparison group's M/B ratio. Nonetheless, this projected decline in water utility M/B ratios offers further support for the lower-end of the valuation ranges discussed above.



Figure 7: Average Comparison Group M/B Ratios⁵⁹



The results of the M/B ratio analysis are presented in a similar manner as the results of the P/E ratio analysis. Schedule JJR-3 provides the 2017 and 2018 M/B ratios for each company in the comparison group based on data from Bloomberg Finance. After having determined the 2017 and 2018 M/B ratios of the comparison group, the next step in the analysis is to use those ratios to develop a range of valuations for Milford Water based on these ratios. This analysis involves multiplying the book value of the Company’s equity by the appropriate M/B ratio and adding the total debt of the Company to the result. Schedule JJR-1 provides the financial data of the Milford Water Company that is necessary to develop valuation ranges from each ratio. Schedule JJR-2 uses the information reflected in Schedule JJR-1 and Schedule JJR-3 to calculate a range of valuations from the M/B ratio metric.⁶⁰ The results of that analysis are presented in Figure 8 below by quartile.

⁵⁹ Historical data per Bloomberg Finance. Projections per *Value Line Investment Survey*, (October 11, 2018). *Value Line* does not provide a M/B ratio projection for water utilities. M/B ratios were imputed using *Value Line*’s book value per share and stock price projections.

⁶⁰ As with the P/E ratio metric, the M/B ratio calculations in Schedule JJR-2 reflect a lagged calculation for both the 2017 and 2018 results. In other words, the “2016/17 Value” column in Schedule JJR-2 applies the 2016 financial data of Milford Water from Schedule JJR-1 to the 2017 financial data of the comparison group from Schedule JJR-3.



Figure 8: Valuation Ranges per M/B Ratio Metric

Valuation Results (\$M) (See Sch. JJR-2)	2017 M/B Ratio Metric	2018 M/B Ratio Metric
Minimum	\$50.9	\$51.5
1st Quartile	\$52.5	\$52.5
Median	\$54.4	\$55.2
3rd Quartile	\$59.6	\$58.4
Maximum	\$68.0	\$68.3

Based on the M/B ratio metric analysis, the median value for Milford Water would be \$54.4 million in 2017 and \$55.2 million in 2018. As with the P/E ratio analysis, the M/B comparison makes the implicit assumptions that Milford Water is a larger and publicly traded company; the liquidity and size aspects of the metrics will be considered later in this report.

The Comparable Sales Analysis

The review of whether there were sufficiently comparable sales began with a review of all recent water utility transactions. The Bloomberg Finance Merger & Acquisition (“Bloomberg Finance”) database was utilized to identify such transactions. The following screening criteria were applied to that database:

- The target company is located in North America
- The transaction’s industry is labelled as “water utility” by Bloomberg Finance
- The transaction was announced after January 1, 2011
- and before December 31, 2018
- The transaction has a listed transaction value in the Bloomberg Finance database
- The transaction has a total value of at least \$10 million

The resulting list of transactions was manually filtered to develop a list of transactions where the target company was a water utility. The following types of transactions were thus manually excluded:

- Transactions where the target was not a water utility (e.g., where the buyer, but not the target, was a water utility)



Milford Water Company Valuation Analysis

- Duplicate transactions (i.e., multiple bids for the same utility were only included once)
- Transactions involving the purchase of assets unrelated to the provision of water utility service

Despite filtering to only include transactions with publicly available transaction values, Bloomberg Finance maintained only limited financial data on the identified transactions resulting in only 2 transactions where M/E and P/E metrics could be calculated.⁶¹ These two water company transactions are detailed in the Figure 9, below:

Figure 9: Comparable Sales

Target Company	Deal Status	Announced Total Value (Millions)	Announced Equity Value (Millions)	P/E Ratio	M/B Ratio	Earned ROE - 1 Year Before	Earned ROE - 2 Years Before
Aquarion	Complete	\$1,118.0	\$844.0	20.9	2.2	10.47%	8.78%
Connecticut Water Service	Pending	\$1,675.0	\$880.0	33.7	2.9	8.53%	9.91%

While the results of the comparable sales transactions are presented here, the sample size was not large enough to rely upon to adjust the results of the publicly available valuation data from the comparison group. If the simple average of these two transactions had been used, the valuation of Milford Water would have been reduced, because both the P/E ratios and the M/B ratios of these transactions were below the average values for the publicly-traded comparison group.

Market Metric Analysis Results

Figure 10 below provides a visual summary of the valuation ranges that result from each of the metrics discussed above. For each metric, the dotted rectangles reflect the absolute range, from the minimum to the maximum value, produced by each metric. The dark shaded portions within each dotted rectangle reflect the first quartile to the third quartile results produced by each metric. The white dashed lines represent the median valuations produced by each metric. For context on how these Market Metrics

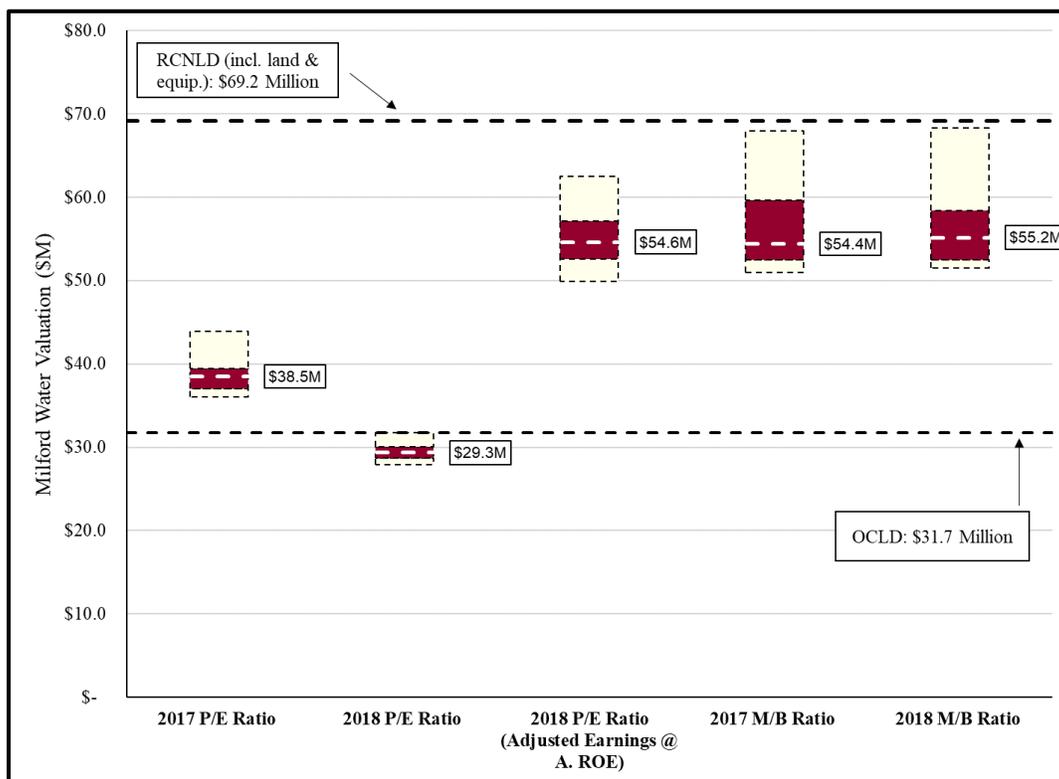
⁶¹ Where possible, the data in the Bloomberg Finance Merger & Acquisition database was supplemented with publicly available information on each transaction from annual returns.



Milford Water Company Valuation Analysis

compare to the blended valuation approach from Stow, the values that result from the OCLD and RCNLD⁶² methods discussed above are also shown.

Figure 10: Milford Water Company Valuation Ranges



As Figure 10 illustrates⁶³, the valuation of Milford Water varies significantly based on the valuation method employed. A hypothetical willing buyer and willing seller involved in an arms-length transaction for the Company would likely consider each of the above market metrics, as well as the outlook for lower P/E ratios and M/B ratios over the next few years. However, each market metric would likely not be given equal weight. For example, M/B ratios do not consider the profitability of the underlying business, which would produce a result which is not consistent with my experience in advising purchasers and sellers

⁶² The RCNLD figure show below is from Line 9 of Figure 2 of this report, and includes land, building, equipment and rolling stock.

⁶³ Schedule JJR-2.



Milford Water Company Valuation Analysis

in utility transactions. Profitability is an important consideration to prospective buyers. For that reason, earnings multiples, such as the P/E, would generally be given greater weight.

A hypothetical willing buyer and willing seller involved in an arms-length transaction for the Company would consider the results of both the P/E ratio and the M/B ratio valuation metrics. However, these two publicly-traded valuation metrics result in widely disparate valuation ranges for Milford Water. If Milford Water's earned ROE were consistently in line with the earned ROE of the industry comparison group, the valuation ranges produced by those two metrics would be more aligned. In other words, the hypothetical 2018 P/E Ratio and Adjusted Earnings Metric median valuation of \$54.8 million from Figure 6 is in the same general range as the 2018 M/B median valuation of \$55.2 million from Figure 8.

A hypothetical buyer would also consider its ability to bring Milford Water's earned ROE in line with its authorized ROE. Milford Water has a persistent history of underearning, and thus bringing Milford Water's earned ROE in line with its authorized ROE is a significant undertaking. A hypothetical buyer would discount the compensation it would be willing to pay by its expected earnings shortfall while the buyer works to increase Milford Water's earnings. Figure 11 provides an estimate of the net present value ("NPV") of that earnings shortfall. The analysis reflected in Figure 11 assumes that the hypothetical buyer would be able to linearly increase the earnings of Milford Water from 4.10% (i.e., Milford Water's average earned ROE in 2016 and 2017) to 10% (i.e., Milford Water's most recently authorized ROE) over a period of five years, and that this higher earnings level would persist for the balance of the valuation period. In my experience, this assumption would be considered by most purchasers to be quite aggressive.



Figure 11: Earnings Shortfall

Line No.	Item	Source	Year 1	Year 2	Year 3	Year 4	Year 5
1	Total Equity (Constant)	Sch. JJR-2			\$12,484,467		
2	Authorized ROE	D.P.U. 17-107	10.0%	10.0%	10.0%	10.0%	10.0%
3	Hypothetical Earned ROE		4.10%	5.58%	7.05%	8.53%	10.0%
4	Earnings Shortfall (%)	L2 - L3	5.90%	4.43%	2.95%	1.48%	0.00%
5	Earnings Shortfall (\$)	L1 x L4	\$736,584	\$552,438	\$368,292	\$184,146	\$0
6	PV Factor @ 10% Discount Rate & Mid-Year Convention		0.9535	0.8668	0.7880	0.7164	0.6512
7	NPV of Earnings Shortfall	L5 x L6	\$702,305	\$478,844	\$290,209	\$131,913	\$0
8	NPV of Earnings Shortfall	Sum L7			\$1,603,271		

Under the assumption that the business conditions creating the long-term underearning can be identified and permanently corrected by new owners of Milford Water, the analysis calculates that a prospective buyer would adjust the value of the Company down by \$1.6 million to account for the temporary earnings shortfall.

Additional Valuation Considerations

A potential purchaser of Milford Water would consider three additional valuation factors when applying the results of the OCLD, RCNLD and market metric analysis to the Company: (1) Milford Water is not publicly traded, and is thus an illiquid investment⁶⁴, (2) Milford Water is significantly smaller than the companies in the industry comparison group, and (3) Milford Water's policies and documentation result in substantial uncertainty.

⁶⁴ *The Cost of Illiquidity*, Aswath Damodaran, page 48 ("Illiquidity matters to investors. They pay lower prices and demand higher returns from less liquid assets than from otherwise similar more liquid assets.") (<http://people.stern.nyu.edu/adamodar/pdfiles/country/illiquidity.pdf>).



Illiquidity

Illiquidity has been defined as “the inability of the owner of an entire business enterprise to convert his or her investment into cash quickly and at a reasonably low and predictable cost,” by *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (“*Valuing a Business*”).⁶⁵ The access to public equity markets facilitates the exchange of equity interest for cash for publicly traded companies. Price/earnings multiples for the acquisition of private companies versus publicly-traded companies have been studied, and “[a]most every year, the average price/earnings multiple for the acquisitions of private companies is significantly lower than the average price/earnings multiple for the acquisitions of public companies.”⁶⁶ These differences are attributed to factors such as: (1) exposure to market; (2) the quality of accounting and other data; and (3) the size effect.⁶⁷

There is theoretical and empirical support for applying a discount to a privately-held company due to a lack of marketability for the corporation’s stock, and its relative illiquidity.⁶⁸ There is a wide range of discounts that have been found through empirical study over time, and in general, published studies have found a discount to be in the 37.5% to 68% range.⁶⁹

⁶⁵ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 416 (2008).

⁶⁶ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 443 (2008).

⁶⁷ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 443 (2008).

⁶⁸ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 445 (2008) (“Empirical data clearly suggest that a valuation discount is appropriate for controlling ownership interests (and, for that matter 100 percent ownership interests) in closely held businesses. This illiquidity discount applies – although to varying degrees – regardless of whether the subject business is valued by reference to discounted or capitalized economic income analyses, to guideline publicly traded companies, to consummated guideline acquisitions, or to an asset-based valuation method.”); *The Cost of Illiquidity*, Aswath Damodaran, page 26 (“If we accept that illiquidity affects value, and both the theory and empirical evidence suggest that it does, the question becomes how best to bring it into the value.”) (<http://people.stern.nyu.edu/adamodar/pdfiles/country/illiquidity.pdf>).

⁶⁹ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 440 (2008), Exhibit 17-10. The median discount for transactions in the 91-180 days to 1-2 year range is 37.5% to 68% respectively over the seven year study period involving over 2,100 transactions.



Small Size

Smaller companies are generally riskier than larger companies, and thus investors require a higher return for investment in smaller firms. That higher return requirement is known as the “size premium.” As shown in Figure 12, the mean market capitalization for the water company comparison group in 2018 was approximately \$3.62 billion, which places the comparison group in the 4th decile in terms of market capitalization, as reported in the *Valuation Handbook - U.S. Guide to Cost of Capital 2017* (“*Valuation Handbook*”).⁷⁰ The 10th decile market capitalization as reported in the *Valuation Handbook* is approximately \$263 million, which is considerably larger than the book value of the Company’s equity. Analyzing the difference in size premiums between 4th decile and 10th decile companies provides an indication of the size premium that would be assigned to Milford Water relative to the industry comparison group. That difference is approximately 4.6 percentage points in required return, as illustrated in Schedule JJR-4.⁷¹

This figure is conservative because it potentially understates the size premium as it relates to a valuation of company near the bottom of the 10th decile.⁷² In other words, a 4.6 percentage point increase in the required return on base of a 10% return on equity for a large water company represents a 46% increase in the cost of capital, and a corresponding reduction in the value of the company.

⁷⁰ *Valuation Handbook – U.S. Guide to Cost of Capital*, Duff & Phelps (2017), Exhibit 7.2. Schedule JJR-4.

⁷¹ *Valuation Handbook – U.S. Guide to Cost of Capital*, Duff & Phelps (2017), Exhibit 7.3. 4.6 percentage point size premium is equal to the 10th decile market capitalization size premium of 5.59 percentage points less the 4th decile market capitalization size premium of 0.98 of a percentage point.

⁷² It is important to note that the 4.6 percentage point size premium in required return is not directly comparable to the 37.5-68% illiquidity discounts. The size premium relates to the discount rate that would be used in an income approach valuation, not the actual resulting reduction in value.



Figure 12: Comparison Group Market Capitalization⁷³

Company	Ticker	2018 Average Market Capitalization (\$M)
American States Water Company	AWR	\$2,148
American Water Works Company, Inc.	AWK	\$15,409
Aqua American, Inc.	WTR	\$6,258
California Water Service Group	CWT	\$1,977
Connecticut Water Service Inc.	CTWS	\$769
Middlesex Water Company	MSEX	\$710
SJW Corporation	SJW	\$1,262
York Water Company	YORW	\$406
Mean		\$3,617

The size premium would be considered in conjunction with the illiquidity discount discussed above. *Valuation Handbook* analysis of the size premium was developed by analyzing publicly-traded companies. The *Valuing a Business* analysis of the illiquidity discount measures, in part, the discount the market would assign a company that is not publicly-traded. As a small, privately held company, each factor would reduce what a potential purchaser of Milford Water would be willing to pay.

Other Uncertainties

Milford Water is a small water utility over 130 years old.⁷⁴ A prospective buyer conducting due diligence would note that the Company's Echo Lake Dam, originally constructed in the late 1800s⁷⁵ is

⁷³ Bloomberg Finance.

⁷⁴ ("In 1881, a Corporation was formed for the purpose of introducing water into the Town of Milford. Explicit records as to the extent of the plant at that time were not kept, but is believed that the Water Works then comprised a Reservoir with a Dam 22 feet in height and some 80 acres of land; a receiving basin formed by a low dam at Wildcat Deer Brook; a small diverting dam at Dilla Street; one collecting well; a number of driven wells; a pump station with one pump (1.5 MGD); a distribution pipe system aggregating in length of about 10.5 miles; and about 80 hydrants and 325 services; and a house for the Engineer.") <http://www.milfordwater.com/our-history-2/>

⁷⁵ Response to TOWN-MWC 1-24 (Attachment), page 2 of 208 ("The dam was built in 1898, raised 10 feet with stone masonry in 1901, and raised again with stop planks in 1987.")



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classified as a “Class I (High) hazard potential dam.”⁷⁶ When asked in discovery about Asset Retirement Obligations (“AROs”) the Company responded that it has not adopted ARO standards.⁷⁷ The age of the dam and its classification as a high hazard potential would nonetheless be considered to be a significant risk factor.

When asked in discovery regarding the inventory of pipe “linear footage by diameter, year installed, [and] material type”, the Company did not produce spreadsheets with all the requested information but instead produced some of the information reflected on system maps, dated 2011.⁷⁸ The discovery response did not state whether the requested pipe data existed in the Company as asked, however, the lack of production of more precise pipe inventory data suggests a lack of complete business records of the type that would facilitate the valuation of buried pipes by a prospective buyer conducting due-diligence.

Quantifying Business Risk

As discussed above, the Market Metrics graphed on Figure 10 were developed based on publicly traded companies that are significantly larger than Milford Water. In order to adjust those figures to reflect market conditions that would face a small and illiquid company like Milford Water, Figure 13 below provides a revised version of the analysis reflected in Figure 10. In Figure 13, the equity portion of the valuation ranges reflected in Figure 10 were reduced by 30% to reflect illiquidity and size; the debt portion of the valuation was not altered by this discount. While a larger discount could be justified, this is a conservative measure of the overall discount the market would assign to Milford Water’s common

⁷⁶ Response to TOWN-MWC 1-24 (Attachment), page 11 of 208 (“Echo Lake Dam is located upstream of residential and commercial development along with roadways and utilities within the downstream area. It appears that a failure of the dam at maximum pool will likely cause loss of life and serious damage to downstream homes, commercial properties, important public utilities, bridges and State Highway 85. Therefore, in accordance with Department of Conservation and Recreation classification procedures, under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 as amended by Chapter 330 of the Acts of 2002, Echo Lake Dam should be classified as a Class I (High) hazard potential dam.”)

⁷⁷ Response to TOWN-MWC 2-1 (“The Company has not adopted asset retirement obligation (‘ARO’) standards, has no AROs and has no AROs planned.”)

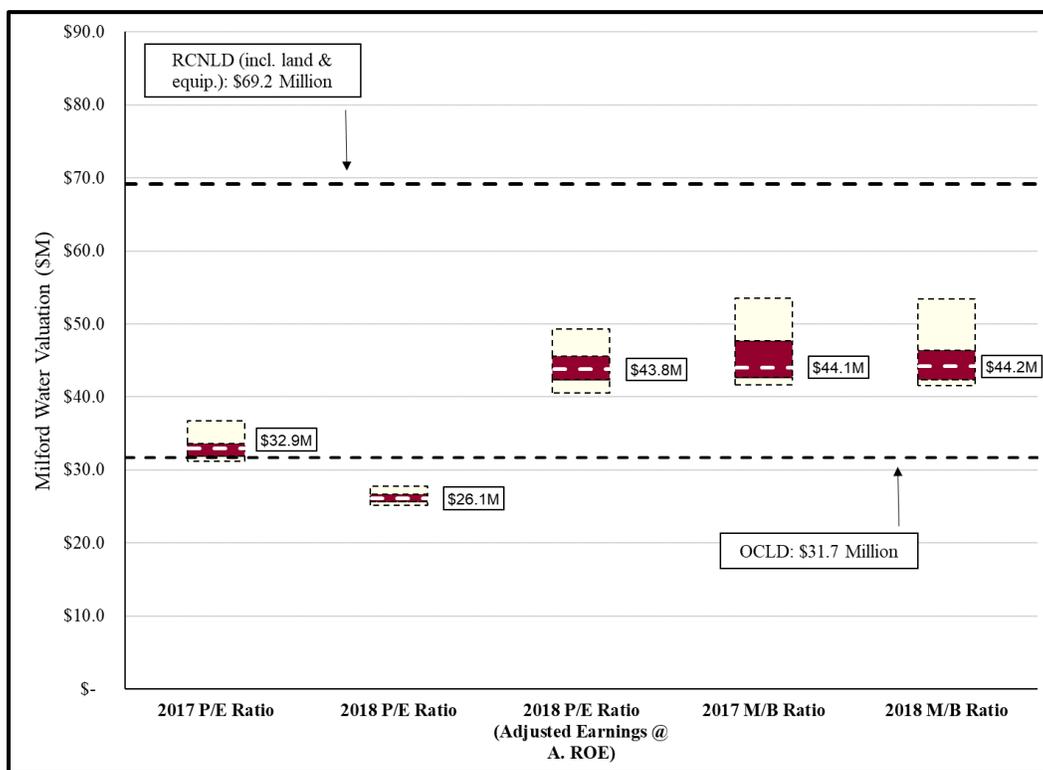
⁷⁸ Response to TOWN-MWC 1-23-C (“Please refer to Attachment Town-MWC-1-23-C related to mains, hydrants and valves and Attachment Town-MWC-1-23-D related to services. Please note that the age of hydrants and valves were not tracked.”)



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equity relative to valuations of the publicly-traded comparison group of companies. It is at the low-end of the range of illiquidity discounts provided by empirical studies.⁷⁹ This further assumes that no additional specific discount would be assigned to Milford Water for Other Uncertainties noted above. It is appropriate to apply this 30% discount for size and illiquidity to the equity portion of all of the valuation approaches discussed above. As noted above, the OCLD and RCNLD blended valuation and the market metrics valuation are highly consistent if one assumes that the purchaser of the company is confident that it can permanently correct its under-earnings problem.⁸⁰

Figure 13: Valuation Ranges Reflecting a Size and Illiquidity Adjustment



⁷⁹ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (5th ed.) Shannon V. Pratt and Alina Niculita, page 440 (2008), Exhibit 17-10.

⁸⁰ I am cognizant that the Department did not consider or apply a size or illiquidity discount in determining the fair value of Hudson Municipal's utility property in the *Stow* case. However, it is my understanding that the Department has recognized the appropriateness of a higher cost of equity for small water companies, as compared to large utilities, for rate setting purposes.



ADJUSTMENTS FOR CLOSING

The fair value for the Company has been developed as of December 31, 2017.⁸¹ However, given the requirement that the residents of the Town subsequently vote to accept the price approved by the Court, the time involved in the regulatory process needed to conclude this proceeding, and any delays otherwise inherent in the closing of the transition, considerable time may elapse before the financial close of the transaction. It is not unusual for transactions involving the sale of regulated assets to encounter delays between when the agreements are executed and the transaction receives regulatory approval, and then finally consummated, however, my report updates will address only those changes that come before the Department prior to the conclusion of the proceeding. In order to account for changes in value that may occur during that time, the valuation should be updated to include prudently incurred known and measurable changes, including changes in net plant and working capital, and there should be no changes in accounting rules or practice followed by the Company. Milford Water should otherwise maintain the plant in good working order.⁸²

CONCLUSION

1) What is the appropriate valuation method to apply to Milford Water determine compensation for the Assets?

While the value of a utility system varies based on the purpose and goals of the evaluation, the approach should be grounded in the analytical framework established by the regulator. The Department has investigated the standards for fair value of a utility system for purposes of a system sale to a municipality, and determined that a blended method combining two distinct approaches for asset values best suited the applicable goals. The Department found OCLD an essential aspect of value to consider since regulated rates are based on net plant in service. A potential purchaser of a utility system would consider the rate regulated nature of the utility business. The Department also adopted RCNLD as another aspect of fair value as being representative of what is being taken from the seller and what a purchaser would be receiving in

⁸¹ Based on the current anticipated procedural schedule, the 2018 Annual Return to the Department should be filed before the start of hearings, and I will update my analysis as appropriate.

⁸² *Cohasset Water Company v. Cohasset*, 321 Mass. 137, pages 146-147 (1947).



terms system condition and reliability. I generally concur with this precedent, although replacement cost is more valid than reproduction cost for a water utility, and determining the weighting between the OCLD and RCNLD components could be informed by market analysis.

2) What is the valuation to be paid by the Town to acquire the Assets?

Using the Department's blended approach as a framework, I conducted a survey and analysis of publicly-traded water company valuations, and recent transactions, to determine the appropriate weight to assign OCLD and RCNLD components of the valuation. Because the application of even weights to the OCLD and RCNLD in Figure 14(line 3), below, roughly approximates the median of the hypothetical 2018 P/E Ratio and Adjusted Earnings Metric valuation from Figure 6 and the median M/B ratios from Figure 8, I conclude that the 50/50 weighing of the OCLD and RCNLD from the *Stow* case is justified as the starting point here based on these Market Metrics. The compensation for Milford Water would reasonably be adjusted by considering two additional factors. A potential purchaser would consider the persistent underearning of the Company over the last decade, and would also consider the valuation effects associated with purchasing a small, privately owned company. Applying these Market Metrics and valuation considerations, I have determined that the fair value for the Company to be \$40 million, as calculated in the figure below:



Figure 14: Summary Results⁸³

Line No.	Description (a)	Source (b)	Value (c)
1	OCLD	Figure 1	\$31,720,068
2	RCNLD	Figure 2	\$69,188,837
3	50/50 Average OCLD / RCNLD	<i>Avg L1 & L2</i>	\$50,454,453
4	Less: Earnings Shortfall Adjustment	Figure 10	\$1,603,271
5	Less: Illiquidity & Small, Non-Public Discount (30% of Equity)	See Footnote	\$9,086,430
6	Fair Market Value of Milford Water	<i>L3 - L4 - L5</i>	\$39,764,752
7	Fair Market Value of Milford Water (Rounded)		\$40,000,000

I consider the compensation determined by my valuation analysis to be reasonable. Applying the Department's valuation method, I weighted evenly the OCLD and RCNLD components at 50% each. I did not assume that management's history of sub-par performance in achieving its allowed return would continue over the long-term. Rather, I assumed that management's performance could be corrected over the medium term and applied an Earnings Shortfall adjustment in the amount of \$1,603,271 to account for the NPV of earnings a potential new owner would forgo before management could be reformed to the point where the allowed return could be earned on a consistent basis. While the 50/50 OCLD and RCNLD weightings is substantiated by the P/E and M/B Market Metrics analysis, these market measures do not capture the equity ownership liquidity or size aspects of Milford Water. As a consequence, I also adjusted the compensation in an amount of \$9,086,430 to account for the discount the market would apply to an illiquid and risky investment in a small privately held water company. I consider this valuation to be above what many buyers would be willing to pay for the Company, since I made no adjustment for the expected decline in trading multiples for publicly-traded

⁸³ The 30% discount applies only to the equity portion of the value of Milford Water. The equity portion of the value of Milford Water was calculated by subtracting both the earnings shortfall adjustment and the 2017 total debt of the Company (provided in Schedule JJR-1) from the 50/50 Average OCLD / RCNLD value. The 30% discount was applied to that result.



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companies, no adjustment for the fact that Milford Water is far below the median size for the lowest decile in reported firm sizes, and only applied a 30% reduction for size and illiquidity combined, when a significantly larger discount could be justified based on empirical studies.



APPENDIX A: JOHN J. REED CURRICULUM VITAE

Curriculum Vitae and case list as expert witness.

REPORT SCHEDULES

Schedule 1 (Historical Earned Return on Equity)

Schedule 2 (Comparison Group Approach Valuation Results)

Schedule 3 (Comparison Group Approach Market Data)

Schedule 4 (Size Premium Calculation, Industry Group Market Capitalization and Market-to-Book Ratio)

