Water Utility Valuation: Beyond the Dartboard Approach

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Introduction

Valuation analysts with experience valuing a wide range of companies in non-price regulated industries such as auto, restaurant, and retail clothing may have a very difficult time applying their experience and skills to regulated utilities and, in particular, to the water utility industry.[1] This problem of transferring experience is similar to that of a dentist performing brain surgery. While the dentist has a medical background and training (and may be considered a good dentist), the application of his or her skills is not necessarily appropriate in the context of brain surgery. The unique environment of regulated water utilities is exacerbated given the dollar magnitude involved in a water utility valuation. For instance, for large investor-owned water utilities (Class A-1), average assets are in the range of $360 million.[2] [3] In contrast, the restaurant industry (other than fast foods) has approximately $.5 million in average assets.

In the water utility industry valuation mistakes or shortcuts could cost a client MEGA dollars. For instance, in one of our[4] valuation assignments - the valuation of the assets of Westpac Utilities (a large water utility located in northern Nevada and owned by Sierra Pacific Resources, Inc.)[5] - overlooking an arsenic problem would have resulted in a serious mistake. While it was difficult for the utility to estimate the total cost of fully complying with the arsenic regulations in the Safe Drinking Water Act (SDWA), one estimate was up to $30 million.[6] In this

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[1] The comments in this article pertain primarily to business valuations in the context of mergers and acquisitions.
[2] The National Association of Water Companies (NAWC) groups investor-owned water utilities into four classes: (a) Class A-1 are utilities with gross annual revenues of $10 million or more; (b) Class A-2, gross revenues of $5-10 million; Class A-3, gross revenues of $1-5 million; and (d) Class A-4, gross revenues of $1 million or less.
[3] Many of the issues and commitment of resources for a water utility valuation are the same regardless of utility size.
[4] In this paper, the words "HCG," "me," "firm," "we," "I," "our," and "my" are used interchangeably.
[5] David L. Hayward, "**Confidential** Valuation Report For NV Nuon – Westpac Utilities," (Leucadia, CA: Hayward Consulting Group, 2000). HCG's assignment was to value the assets including using a DCF approach. Listing the project's valuation-related issues required 11 pages.
[6] Lehman Brothers, "Information Memorandum Regarding the Sale of a Water Business: Sierra Pacific Resources," (New York: Lehman Brothers, September 2000), p. 38.

case, Westpac had $250 million book value of net plant. In our valuation study, we utilized eight different methods. Two of those commonly used approaches yielded results of: (a) $213.6 million (discounted cash flow or DCF), and (b) $314.5 million (capitalized earnings). The significance? Approximately $101 million differential! The low end of our recommended value was $213 million, partially because the utility had a long history of under-earning its authorized rate of return. (This recommended value was later informally confirmed by another large investor-owned water utility interested in purchasing the assets.) The assets were eventually sold to a newly-formed government entity for $350 million. Thus, we saved our client $37 million had they paid book value and even more (i.e., $137 million) had they paid the full sales price.

With respect to the $101 million range, referenced above: What would your banker say if you paid the higher amount by using a simple approach such as capitalized earnings? Bankers and equity investors want and require substantive analysis - not something superficial such as capitalized earnings or "comparable sales." Bankers who loan money to water utilities want to see, among other filing requirements, pro forma financial statements as well as capital/operating budgets for the next five years.[7] Why would you, the client, want a valuation study that cannot even assist you in securing various forms of capital? Also, assuming that you are a potential buyer; can you sleep at night knowing this difference? This second point is particularly true if you are a purchaser paying the higher price (above book value) and not knowing if your company can recover the premium from its ratepayers.[8]

The preceding example illustrates how performing a thorough analysis can save a client a significant amount of money. That range of values confirms what (in a different utility project) another client of ours said about the importance of a thorough valuation:

[7] Mr. Steve Gustafson, Vice President, CoBank, October 15, 2004 e-mail to David Hayward. In addition to the preceding information, Cobank, for example, requires the following information in support of a loan: (a) 3 years of audited financial statements; (b) The current year and interim year financial statements; (c) The current year operating budget; (d) A copy of the utility's last rate case; and (e) The utility's rate application, if applicable.
[8] In the utility business, the difference between the price paid and the book value of the assets is called an acquisition adjustment.

"…if we don't get a (sic) expert valuation then ***we are pretty much guessing*** *as to whether this is a great, a good, a fair, or a not-so-good purchase as currently presented."*[9] *(Emphasis added)*

This quote was so "on point" that, during my utility valuation seminars, I used a dart and a dartboard to illustrate the questionable usefulness of various utility valuation studies that I had seen.

After interviewing numerous professional consultants in the water utility industry, and recognizing that superficial valuation results were not useful, another of our clients finally concluded:

"There are no reliable shortcuts that can be used to assess the acquisition value and prospective future value of a multi-faceted utility company…"[10]

The remainder of this article provides: (a) an overview of the regulated water utility industry; (b) discussion of the differences between the water utility and other industries; (c) critique of common valuation approaches in the context of the utility industry, and (d) A unique valuation model – FinMod, Copyright © 2005 by Hayward Consulting Group, all rights reserved - which allows an analyst to value a water utility using up to 12 valuation approaches.[11]

Overview of the Regulated Water Utility Industry

Today, more than 50,000 water systems exist. Eighty-four percent of those systems serve less than 3,300 people each.[12][13] In general, the water utility industry is too inefficient. For example, less than 1% of the water systems serve more than 100,000 people each.[14] For this reason, most utilities have been unable to achieve economies of scale or scope necessary to

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[9] Mr. Eli Castronova, project manager, October 19, 2004 e-mail to Ms. Judy Windisch with respect to the proposed acquisition of Johnson Utilities (a water utility in Arizona).
[10] Mr. Donald L. Meyers, President of Aspen Enterprises, LLC, August 19, 2004 letter to Mr. Conley Wolfswinkel, Vistoso Partners regarding the acquisition of Johnson Utilities.
[11] FinMod can be obtained from the National Association of Water Companies (NAWC). Their web site is: www.NAWC.com.
[12] Mr. Nicholas DeBenedictis, Chairman and CEO, Aqua America Inc., presentation, National Association of Water Companies 2004 Annual Conference, La Quinta, California, October 2004.
[13] The EPA's definition of a small water utility is 3,300 customers or fewer.
[14] Op. cit.

actually maximize their individual performance. Throughout the U.S., the water utility industry is a patchwork of thousands of privately-owned and government-owned water systems. The majority of water systems are government owned.

For investor-owned water utilities, two very different categories exist. The first category consists of publicly-traded companies. The second category includes thousands of smaller non-publicly traded companies which in many cases are family-owned- and- operated businesses. Typically, these smaller water utilities evolved from land developers for whom the water business was not their primary interest. Furthermore, this group has little experience, if any, in the utility regulatory process.

For the past several years, the water utility industry has been experiencing a consolidation phase.[15] In the pre-consolidation phase, 23 U.S. based investor-owned water utilities were publicly traded. Today, the number has declined to 11. The business plans of several large investor-owned water utilities are based upon growth through acquisition of smaller water systems (e.g., Aqua America, Inc.).

A clear consensus among experts in the water utility industry includes:

1. Water rates do not reflect the true costs of providing service, or the value of service. In addition, concerning household income, Americans pay 0.5% for water and wastewater services as compared to 2%-5% for other utility costs.[16] Thus, on the basis of the "affordability" argument frequently used by regulators and other stakeholders, water rates could be increased substantially.
2. The capital requirements for rehabilitation, growth, and meeting environmental standards are enormous. According to Mr. Jeremy Pelczer, President and CEO of American Water, approximately $1 trillion of capital investment requirements is

[15] The consolidations include the takeover of government-owned water systems by investor-owned water utilities (IOU) referred to as privatizations; or the takeover of IOU water systems by a government entity referred to as municipalization.
[16] Testimony of Mr. Donald L. Correll, President and CEO of Pennichuck Corporation, The Subcommittee on Environment and Hazardous Materials, and Committee on Energy and Commerce, United States House of Representatives, July 22, 2004.

needed over the next 20 years.[17] In some cases, water utilities face a 225 year replacement cycle.[18] In addition, as of September 2003, one-third of U.S. surface waters do not meet water quality standards.[19]

3. Some utility regulators are overly cautious about authorizing full rate increases for water utilities even though the water utilities' proposed rates do not allow them to fully recover their costs.
4. The public believes that water is a "free good" and suppliers (i.e., water utilities) should provide service that is either free or very inexpensive.[20]

In the U.S., in terms of rates and service, the investor-owned water utility industry is regulated, for the most part, by individual state public service commissions (PSC) or public utility commissions (PUC). Usually, these commissions have been awarded power to regulate utilities by their state legislatures. Some states regulate hundreds of water utilities. For example, in Arizona, the Arizona Corporation Commission (ACC) regulates approximately 400 water utilities with 300 owners. Typically, the scope of a PSC's regulation encompasses:

1. Setting tariffs (i.e., establishing prices and terms of service);
2. Transferring ownership. (State PSCs have different tests used to evaluate utility mergers and acquisitions. In most cases, the PSCs must find that the merger is "in the public interest.")
3. Approving financing;
4. Establishing accounting policies;
5. Issuing Certificates of Public Convenience and Necessity (CCN);[21]

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[17] 2005 NAWC Water Policy Forum, "Summary Report," (Washington: National Association of Water Companies, April 2004), p. 10.
[18] Janice A. Beecher, Ph.D. "Mandatory Takeover Policy," *Sourcebook of Regulatory Techniques for Water Utilities*, (Washington: National Association of Water Companies, 2003), Chapter 3.1.
[19] Melissa J. Stanford, "Replacing and Securing Water Utility Infrastructure," (Columbus, OH: The National Regulatory Research Institute, February 2004), p. 6.
[20] David L. Hayward, *Valuing A Water Utility*, (Leucadia, CA: Hayward Consulting Group, 2000), p. vi. This is a very common belief in developing countries where the public believes the government should provide <u>all</u> utility services at low cost if not free. In the United Kingdom, a country that is dominated by nine regional water systems, critics of Margaret Thatcher's privatization polices said: "Look she's even privatizing the rain which falls from the heavens." Thatcher's response was: "The rain may come from the Almighty, but He did not send the pipes, plumbing, and engineering to go with it."

6. Ensuring safety;
7. Specifying reporting requirements; and
8. Authorizing diversification.

Many people believe that the utility business is nearly a "risk-free" business and that utilities are guaranteed a profit. This belief is simply wrong. Bankruptcies of huge utilities such as Pacific Gas and Electric Company, El Paso Electric Company, and Public Service Company of New Hampshire result in major news headline coverage and document that the utility business is not risk free. Unfortunately, many small water utilities around the U.S. have filed for bankruptcy. Hundreds of others are experiencing serious financial trouble.[22] To further emphasize that water utilities are not necessarily money-making machines, a General Accounting Office (GAO) study reported:

> *"…more than half of the utilities whose revenues from user charges and local sources did not provide sufficient funds to cover their cost of providing service, raised their rates only two times or fewer between 1992-2001."*[23]

Finally, for the two smallest classes of water utilities (as defined by NAWC), the actual earned rate of return on equity (ROE) for the period 1975-1997 was 3.2% and 1.8%.[24] One possible explanation for these low ROE numbers is that many small water utilities are created by land developers who are more concerned about selling land than earning a reasonable return for the water utility. We have experience with many small water utilities that have never paid a dividend and have plowed most, if not, all of their excess earnings back into the utility. In addition, small water utilities may be more interested in avoiding income taxes than showing a profit since they have few, if any, shareholders that are interested in the utility's quarterly earnings per share.

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[21] State agencies must have U.S. EPA approved procedures in place that prevent certification of new, non-viable systems or a portion of their State Revolving Fund could be withheld.
[22] The data regarding the financial condition of investor-owned water utilities is difficult to find. See, Janice A. Beecher, Ph.D., G. Richard Dreese, Ph.D., and James R. Landers, "Viability Policies and Assessment Methods For Small Water Utilities," (Columbus, OH: The National Regulatory Research Institute, 1992), pp. 42, 184.
[23] "Replacing and Securing Water Utility Infrastructure," p. 5.
[24] David L. Hayward, *Valuing A Water Utility*, Appendix D, p. 10.

Perhaps one of the most troubling issues currently facing the water utility is meeting the Environmental Protection Agency's (EPA) new arsenic requirements.[25] By January 2006, water utilities must reduce their arsenic levels from 50 parts per billion to 10 parts per billion. Some states agencies such as the California Public Service Commission (CPUC) have the authority to impose even stricter limits.[26] In some states, utility regulators do not know how many water utilities will actually comply with this standard. For example, one of our clients in Arizona has eight wells out-of-compliance with an estimate of $200,000 per well needed to bring them into compliance. (This is a utility that, as of 1996, had approximately $4 million in net plant in service.)

A final major issue relates to security costs. The Bioterrorism Response Act of 2001 requires every public water system serving over 3,300 people to prepare Vulnerability Assessments (VA) of their critical assets.[27] For some water utilities these costs have been substantial and may not have been fully recovered in rates.

In conclusion to this overview, the water utility industry is the only major utility industry in which:

1. Partial deregulation has not occurred;
2. The product is ingested; and
3. The primary raw material (i.e., water) is "free."
4. Small water utilities: (a) are regarded as inefficient (i.e., little or no economies of scale); (b) have a disproportionate number of environmental violations; and (c) lack financial and operational expertise.[28]

What Is Different About Water Utilities Regulated By State PSCs?

[25] The EPA sets maximum contaminant levels (MCL) for 87 substances.
[26] Southwest Water Company 2004 Annual Report, p. 9.
[27] Connecticut Water Service, Inc., 2004 Annual Report, p. 17.
[28] Mr. DeBenedictis 2004 NAWC presentation.

For the most part, the U.S. investor-owned water utility business is called a "cost-plus business." Most states' PSCs allow regulated water utilities to recover their "prudent" expenses plus a reasonable rate of return on their "prudent" and "used and useful property" (i.e., rate base) necessary to provide non-discriminatory service to the public. The definition of rate base may vary by regulatory jurisdiction but usually includes: utility net plant and equipment *plus* prepayments, deferred credits (occasionally), inventories, materials and supplies, and cash working capital; *minus* customer advances for construction, customer contributions in aid of construction (CIAC),[29] customer deposits, investment tax credits (ITC), and accumulated deferred income taxes. The water utility industry differs from other industries with respect to three major categories. These categories are:

- Regulatory/legal environment
- Accounting issues
- Economic issues

Table 1 identifies some major differences between the water utility industry and other industries (in this particular case, the retail clothing industry). Comparisons of the water utility industry with other non-regulated industries would provide many of the same conclusions and should be considered.

[29] Customer advances and CIAC are either assets or money contributed by (usually) a developer to the utility. Some of these contributions may be returned to the developer under various conditions.

Table 1
Comparison of Water Utilities and Retail Industries

Issue	Water IOU	Retail Clothing
Accounting standards	PSCs set	GAAP
Fixed Assets	High	Low
Prices	Regulated	Non-regulated
Public Policy	Very important	N.A.
Leverage	High	Low
Inventory Valuation	Limited importance	Potentially important
Quality of Earnings	Potentially important	N.A.
Stock & Bond Prices	Highly correlated	Low correlation
Competition	Usually none 1/	Very high
Risk	Low Beta (ave. of .56)	High Beta (1.3)
Deferred Assets	Potentially important	N.A.
Inflation	Potentially a big problem	Not major
Earnings	Very cyclical 3/	Potentially cyclical
Sales Growth	Usually very limited	Not limited
Legal Exposure	Very high	Usually not major
Barriers To Entry	Very high	Low
Weather	Very important	Usually not significant

Source: David L. Hayward, *Valuing A Water Utility*, (Leucadia, CA: Hayward Consulting Group, 2000), Chapter 1, p. 14.

Notes:

N.A. – Not applicable

1/ Competition for bottled water, some contestable markets

2/ Clothing

3/ Throughout the year

Regulatory/Legal Environment. A utility's regulatory/legal environment (e.g., EPA; state health agencies; PSC; federal, state, and local laws; etc.) wields perhaps the most influence over a utility's risk. A regulatory environment (broadly defined as laws, rules, and regulations) can either encourage or discourage investment in the water utility industry. *The Value Line Investment Survey* frequently comments on the impact of regulatory decisions on a particular water utility. The regulatory environment contains a variety of uncertainties including, but not limited to a commission's authorized rate of return, rate increases, expense recovery, policies, and legal actions.[30] A key risk associated with a regulatory environment (sometimes referred to as "climate") includes the continuity and predictability of commissioners and commission staff. In addition, a water utility may be regulated by two or more state PSCs - increasing the difficulty of its valuation.

In utility regulation and valuation work in developing countries,[31] HCG has witnessed significant problems related to a country's basic infrastructure utilities (i.e., electric, natural gas, and water utilities). These problems include, but are not limited to, rolling blackouts; chronic shortages; utilities with serious cash deficiencies; and utility regulatory environments that are uncertain at best and, in some cases, non-existent. The bottom-line result of these problems is environments that do not attract the necessary investment capital (particularly from outside the country) necessary for economic development and growth. The water utility industry in the U.S. faces similar problems. These problems are sometimes referred to as the "funding gap." The funding gap represents the shortage of capital necessary to fund investment projects. In profitable industries, this gap usually does not exist because the return on investment for the industry is sufficient to attract the necessary capital.

<u>Cost of capital</u>. In utility rate proceedings, because the expected return on common equity for a water utility cannot be observed and must be estimated, a PSC usually has a great deal of discretion as to cost of capital used in setting a particular utility's rates. Throughout the

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[30] In April 1998, the Arizona Corporation Commission in Decision No. 62993 established a "Task Force" to study the problems in the water utility industry and provide possible regulatory solutions. As of the date of this article, the docket remains open and without a conclusion.

[31] These countries include: Armenia, Bolivia, Czech Republic, Egypt, Guyana, India, Pakistan, the Philippines, Poland, and Serbia-Montenegro.

U.S., commission-authorized rates of return on equity for water utilities can range significantly (e.g., 13.65% in California to the 9%-10% range). In order for a water utility to be eligible for funds from the Drinking Water State Revolving Fund (DWSRF), it must have the financial capability to maintain SDWA compliance.[32] In cases where subsidized debt is available (*Value Line* notes that "…local and federal funds appear to be depleted"),[33] water utilities may wait a long time to get the funds. For example, in 2002 the California Department of Water Resources approved San Jose Water Company's application for a loan of approximately $2.5 million from the Safe Drinking Water State Revolving Fund (SDWSRF). As of mid 2005, San Jose Water Company still had not received those funds.[34]

Some experts in utility finance believe that water utilities' cost of capital for ratemaking purposes is too low given the risks (particularly true for small water utilities). For example, in January 2005 the overall rate of return on rate base (using a combination of debt and equity) for large water utilities in Arizona was approximately 7.2%.[35] Also in January 2005, the cost of subsidized debt from the Water Infrastructure Finance Authority of Arizona (WIFA) started at approximately 7.25%. (WIFA administers funds from the Clean and Drinking Water Revolving Funds.)[36]

Rate Increases. A proper utility valuation study should account for potential rate increases. In other industries, the owners or managers have significant control over the timing and amount of price increases. This is not true for regulated utilities. Because utilities operate in a political environment, the ultimate pricing test is frequently the willingness of regulators to authorize rate increases. As previously mentioned in this article, water utility owners/managers have been reluctant to file for rate increases even though the utility's rates are not covering costs. In many cases, the approval (by regulators) of utility mergers and acquisitions are conditioned

[32] David W. Wirick, John D. Borrows, and Steven Goldberg, "Evaluating Water Utility Capacity With Ratio Analysis and Discounted Cash Flows," (Columbus, OH: The National Regulatory Research Institute, 1997), p. 3.
[33] *The Value Line Investment Survey*, April 29, 2005, p. 1420.
[34] SJW Corp., 2004 Form 10-K, p. 20.
[35] Interview with Mr. Steve Olea, Assistant Director, Utilities Division, Arizona Corporation Commission, Phoenix, AZ, January 26, 2005. This was the rate for Class A, B, and C water utilities.
[36] Mr. Jay R. Spector, Executive Director, Water Infrastructure Finance Authority of Arizona, "Valuing Your Water Utility Conference," Phoenix Arizona, Crowne Plaza Phoenix Airport, January 8, 2005. (This rate was derived by adding a 2% premium onto the prime rate, then 5.5%.)

upon the new utility avoiding a rate increase for a specified period, sharing future profits, or cost savings,[37] or perhaps even lowering rates. Finally, regulators generally try to show ratepayers that they are deriving some benefit from the merger (e.g., lower or more stable rates, better service, etc.).

Regulatory adjustment mechanisms and policies. Since, generally, the mid 1990s and some times before, many state PSCs implemented various regulatory mechanisms intended to reduce the risk of investor-owned water utilities. Many such mechanisms were designed to allow the utility to recover expenses and capital investments more quickly than under normal utility regulation. Examples of regulatory adjustment mechanisms and policies include:

1. Purchased water and power adjustment clauses;
2. "Nonviable"[38] water utilities acquisition incentives;
3. Distribution system improvement charges (DSIC);
4. Construction Work In Progress (CWIP), and excess plant capacity allowances in the utility's rate base; and
5. Revenue adjustment mechanisms between formal rate cases.

Clearly, a valuation analyst should consider rather than overlook these regulatory policies in that they have clear implications on a water utility's value.

Legal issues. In addition to the normal legal issues any company faces, in recent years investor-owned water utilities have been subject to "wrongful death" lawsuits. Southwest Water Company and other water utilities were sued in several water quality lawsuits dating back to 1997. In August 2004, a Los Angeles Superior Court Judge dismissed the charges.[39] Some water

[37] 1999 NAWC Water Policy Forum, "Regulatory Incentives for Consolidation: The Public Utility Commission Role in Restructuring the Water Industry, Summary Report and Discussion Paper," (Washington: National Association of Water Companies, April 2004), p. 2-21.
[38] In the water utility industry, the term "viability" is sometimes used casually. In this paper we follow the definition from NRRI - with three components under the SDWA Amendments– technical, managerial, and financial. A 1992 NRRI report on water system viability suggested that financial viability addressed the three questions: (1) Does the system have or can it acquire capital? (2) Do the rates accurately, adequately, and equitably reflect the full cost of water service? and (3) Are the system's customers willing and able to pay the necessary rates? "Evaluating Water Utility Capacity With Ratio Analysis and Discounted Cash Flows," p. 2.
[39] Southwest Water Company 2004 Annual Report, p. 4.

utilities report that their customers have been solicited by tort lawyers. This tort litigation issue is very significant in that, throughout the U.S., water utilities are being sued for providing unsafe water *even though they are in compliance with relevant state and federal drinking water regulations*. This obviously adds to the water utility's risks.

Another major legal issue facing the investor-owned water utility industry pertains to if a water utility can retain the book value of the CIAC in the event the water utility sells its assets to a municipality in the context of an eminent domain proceeding. The NAWC has argued in a Maryland case[40] that utilities are entitled to be compensated for the acquisition by a governmental entity of property directly or indirectly funded through CIAC.

Accounting Issues. In terms of utility accounting, most rate-regulated water utilities follow the National Association of Regulatory Utility Commissioner's (NARUC) Uniform System of Accounts. This System of Accounts prescribes very specific accounting rules which water utilities must follow. For valuation purposes, one of the most significant accounting issues pertains to the acquisition adjustment. Normally, the cost of an asset (e.g., utility plant and equipment) is recorded on the books of the first water utility to place the plant in service. However, in a case involving Indiana-American Water Company,[41] the Indiana Utility Regulatory Commission allowed the new owner to earn a return based on the higher purchase price.[42] In a more typical example, in an Arizona case involving the sale of Citizens Utilities water assets to Arizona-American Water Company, the price of the asset sale was $276.5 million (including a $71 million acquisition adjustment),[43] or about a 38% premium above book asset value. In this case, the Arizona Corporation Commission (ACC) said:

> *"future authorization of any acquisition adjustment recovery should be based on Arizona-American's ability to demonstrate that clear, quantifiable and substantial net benefits have been realized by ratepayers in the affected areas, which would not have been realized had the transaction not occurred."*[44]

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[40] Beecher, *Sourcebook of Regulatory Techniques for Water Utilities*, January 1999 update, p. 1.5-1.
[41] Cause No. 40103, May 30, 1996.
[42] Mr. Fred E. Schlegal, presentation, "2nd International Conference – Valuing Your Water Utility," New Orleans, LA, January 14, 2002.
[43] Arizona Corporation Commission, Decision No. 67093, p. 12.
[44] Ibid., p. 6.

Concerning the relationship between the market price and the value of the assets for ratemaking purposes, the ACC stated:

> *"While the approximately $71 million over book cost price the Company freely chose to pay for the Citizens assets may represent the value of the acquisition to Arizona-American and its shareholders, it does not automatically follow that the price paid equates to the fair value of those assets for ratemaking purposes."*[45]

The Financial Accounting Standards Board (FASB) has set new rules that potentially affect the acquisition adjustment. Under FAS No. 142, "Goodwill and Other Intangible Assets," these assets must be tested for impairment annually, or more often, if certain circumstances indicate that impairment may exist. In the above Arizona case, the impairment could be as high as $71 million.

Another major difference between water utilities and other non rate-regulated companies is that publicly traded investor-owned water utilities are allowed to deviate from generally accepted accounting principles (GAAP) under FASB No. 71 – "Accounting for the Effects of Certain Types of Regulation." FAS No. 71 requires cost-based, rate-regulated utilities to reflect the impact of regulatory decisions in their financial statements. Regulators can create regulatory assets that result when costs are allowed for ratemaking purposes in a period after the costs would be charged to expense by an unregulated enterprise. The necessary conditions for the applicability of FAS No. 71 include that the utility's rates are:

1. Approved by the regulator;
2. Designed to recover specific costs; and
3. Set to allow the utility to recover its costs (in view of its demand and competition).

The major significance of FAS No. 71 is that if a regulatory commission shifts from a cost-based form of regulation to another form (e.g., incentive regulation), the utility's costs and

[45] ACC decision No. 67093, p. 15.

assets may not be recovered. Thus, if a utility has a form of incentive regulation in place, using the asset approach for valuation purposes becomes less useful. One example from the electric utility industry is a case where Pacific Gas and Electric Company (PG&E) was allowed a form of incentive ratemaking on its nuclear power plant, Diablo Canyon. In this case, the book value of Diablo Canyon was taken out of PG&E's rate base.

Some other important FAS rules applicable to publicly traded investor-owned water utilities include: 109 (Accounting for Income Taxes); 101 (Accounting for the Discontinuation of Application No. 71); 144 (Accounting for the Impairment or Disposal of Long-Lived Assets); 90 (Regulated Enterprises – Accounting for Abandonments and Disallowances of Plant Costs); 92 (Regulated Enterprises - Accounting for Phase-In Plans); 13 (Accounting for Leases); 34 (Capitalization of Interest Cost); and 106 (Employers Accounting for Post-retirement Benefits Other Than Pensions).

A PSC's accounting policies regarding depreciation and amortization will also affect a utility's profits, cash flow, and ultimately its value. Many experts believe that depreciation rates for water utilities have been too low historically - thus exacerbating the infrastructure rehabilitation challenges facing the industry. Because the water industry is capital intensive, deferred income taxes can be substantial. These taxes are created primarily by the difference between accelerated depression for income tax purposes and straight line depreciation for financial reporting and ratemaking purposes.

Economic Issues. Valuation analysts frequently overlook a thorough analysis of economic issues. In the context of utility valuation studies, this oversight can result in serious errors. Many valuation reports discuss the overall *macroeconomic* conditions faced by a company. Valuation analysts should include both *macroeconomic* and *microeconomic* analyses of the company. The fundamental rationale for rate regulation is based on the theory that water utilities have characteristics of natural monopolies such as:

1. Providing an essential public service (and a commodity for which there are no substitutes); and

2. Providing more efficient service by one or two large companies where economics of scale exist (i.e., declining average costs as quantities increase).

Unlike other industries, some water utilities engage in integrated resource planning (IRP) - also referred to as "least-cost planning." (This is considered an industry "best practice.") Twenty PSCs require water utilities to file various forms of plans including least-cost plans.[46] In an IRP analysis, utility planners consider all possible demand-side (e.g., conservation) and supply-side resources (e.g., water from wells or purchased water)[47] that will allow the utility to provide reliable service at reasonable prices. A key issue for valuation purposes is the difference between surplus capacity and excess capacity. All major utilities design their systems to provide a reserve margin during peak customer demand. However, commission regulators may determine that some of a utility's surplus capacity is "excess capacity" and not allow the utility an opportunity to earn a return on this investment. If this were to occur, a water utility's value would decline.

Another valuation issue related to the utility's underlying economic condition relates to the potential for growth - particularly through the acquisition of adjacent or nearby water utilities. The likelihood of merging two or more adjacent water systems is often based on engineering-economics where the benefits of economies of scale related to the acquisition of water supplies are measured against the diseconomies of scale related to the transmission and distribution of the water.

The water utility should also obtain an estimate of its customers' price elasticity of demand (i.e., the percentage change in consumption given a percentage change in price). Finally, regulated water utilities go through a process of cost allocation and rate design to establish rates for their customer classes (e.g., residential, commercial, industrial, etc.). In many cases, ultimate rates to customers are distorted by a variety of factors. An analyst should

[46] David L. Hayward, *Valuing A Water Utility*, Chapter 3, p.16.
[47] In order for a water utility to obtain a Certificate of Public Convenience and Necessity (CCN) it may be required by the regulators to show or prove that it has a reliable supply of water for a specified period. In Arizona, the period is 100 years.

consider this in a valuation assignment in that a major rate redesign could have a significant impact on the utility's revenues, earnings, cash flow, and, ultimately, its total value.

Thus, to complete a comprehensive valuation study, the analyst should know and incorporate the utility's

- short-run average and marginal costs;
- long-run average and marginal costs;
- demand and price elasticity by customer class; and
- marginal revenues.

In most cases, a water utility's marginal costs are higher than its average costs. For example, in some cases a water utility's marginal cost of installing water mains is $100-$200 per linear foot (depending on location) as compared to its original cost of $2 per linear foot.[48] Unfortunately, in many cases, the valuation analyst does not have any understanding about the utility's fundamental cost structure (including its average and marginal costs).

[48] Commissioner Henry M. Duque, "The Regulatory View of Valuation of Water Assets," Valuing Your Water Utility Conference, Embassy Suites Hotel, San Diego, CA, January 11, 2000, p.17.

Critique of Common Valuation Approaches

Our experience in water utility valuation studies is that many people outside the industry believe valuing these companies is a simple task. It is not. They typically use words like "give us a preliminary valuation opinion." In some cases, they expect a valuation analyst to look up comparable sales in a book or data base. The National Association of Certified Valuation Analysts (NACVA) has "rules of thumb" for many industries; however, they do not have anything for investor-owned water utilities.[49] Often, this mindset results in no real analysis. For that reason, this section discusses the application of traditional valuation approaches in the context of the water utility industry.

Market. Most valuation analysts give significant weight to the market approach and, in particular, "comparable transactions." The problems with using this approach for water utilities generally involve some combination of the following factors: timeliness of the data;[50] number of companies in the analysis; size of the utilities; and location of assets or utilities. (This last fact is particularly important from a regulatory perspective). To be comparable, the water utilities in the sample should:

1. Be in the same primary business;
2. Have a similar capital structure;
3. Have a similar history of profitability;
4. Be similar in size (e.g., revenues, assets); and
5. Have similar growth rates (sales, customers, assets).

[49] Stephen M. Zamucen, John Kinross-Kennedy, Daniel C. Curren, and Jamie Holmes, *How To Value Over 100 Closely Held Businesses*, (Salt Lake City: The National Alliance of Consultants, Valuers and Analysts, 2002), Section III.

[50] Mr. DeBenedictis, presentation, NAWC's 2004 Annual Conference. He stated that most premiums paid for water utilities have ended. (This remark was in the context of a wave of acquisitions of major investor-owned water utilities by European utilities in the late 1990s and the first part of the 21st century.)

To illustrate the market approach in the water utility industry, Table 2 shows data from the proposed condemnation of Tennessee-American Water Company by the City of Chattanooga, Tennessee.

Table 2
Comparison of Investor-Owned Water Utility Transactions[51]

Utility	Date	Rate Base ($M)	Price ($M)	Multiple
Ohio Suburban	1993	8.3	8.2	1.0
Missouri Cities	1993	25.3	15.7	.6
Indiana Cities	1993	49.3	37.3	.8
Clovis Water Co.	1986	12.2	13.8	1.1

In these cases, the benchmark for the acquisitions was rate base. The above data shows an 83% differential in the multiples. Clearly the size, location, and the date of transactions suggest that these are not comparable sales.

Table 3 shows comparable transactions in terms of earnings before interest, income taxes, depreciation, and amortization or (EBITDA).

[51] David L. Hayward, "Rate Base (Asset) & Other Valuation Methodologies," Presentation, The Institute of Public Utilities, Michigan State University, April 26, 2005.

Table 3
Comparison of EBITDA Multiples[52]

Utility	EBITDA Multiple
Aquarion	9.80
United Water	15.80
Citizens Water Assets	19.30
SJW Corp.	11.90
E'Town	14.00
Average	**14.16**

EBITDA demonstrates advantages for analytical purposes in that it is not dependent on a utility management's decision such as depreciation, amortization, or financing. The disadvantages of EBITDA include:

1. To make the information meaningful, a comparable group is needed; and
2. This is primarily a historical analysis. Estimating next year's EBITDA for a comparable group may be difficult. Moreover, historical EBITDA multiples may be distorted by events such as the sale of land (common in the water utility industry).

As with the case in the rate base multiples (Table 2), the above data reflects a wide range of EBITDA multiples. In this case, the range is 97%. Furthermore, EBITDA multiples do not provide any insight as to the amount of capital necessary to generate the EBITDA. So, for decision-making purposes, the above analysis is not very useful.

Finally, another market measure is the so-called multiple of book equity.[53] This approach is obviously useful for publicly traded water utilities. Again, an analyst must be careful using this method. For example, consider the acquisition of American Water Works Company (AWW) by

[52] Hayward, Michigan State University presentation.
[53] Another questionable valuation measure frequently cited by the press is "dollars per customer."

the German mega-utility – RWE AG. In this case, RWE paid over two times book equity for AWW and it has not yet generated any significant return on investment.[54] AWW, however, was the largest investor-owned water utility in the U.S. with operations in 22 states. For the reasons described earlier, we do not believe this transaction would be a useful comparison in valuing an individual water utility, particularly a small water utility. Because of the ratemaking process, a rate-regulated, publicly-traded IOU would expect that, in the long run, its market-to-book ratio would equal one.

As mentioned in the introduction to this article, to further emphasize the point about finding comparable sales, after burning through most of their budget in search of comparable transactions, and despite my recommendations to the contrary, our client finally concluded:

> *"…if we don't get a (sic) expert valuation then* ***we are pretty much guessing*** *as to whether this is a great, a good, a fair, or a not so good purchase as currently presented."*(Emphasis added.)

In the same correspondence and recognizing the limitations of the market approach, *the project manager recommended that the scope of our firm's involvement be expanded to include building a company cash flow and DCF model*.

Asset. Asset-based approaches used in valuing water utilities include:[55]

1. Total net book value (total assets at original cost less accumulated depreciation);
2. Reproduction or replacement cost (less accumulated depreciation);
3. Rate base;
4. "Prudent investment" (i.e., property, plant, and equipment which the regulators believe are "prudently" incurred by the utility in order to provide service to the public) - also called "adjusted book value."

[54] Melissa Stanford, "A Report on the Second National Drinking Water Symposium," (Columbus, OH: The National Regulatory Research Institute, June 2004), p. 14.
[55] Another method is an asset auction. In some cases, utilities have sold their assets (particularly electric utility generation plants) through an auction process. Some state commissions, however, prevent this form of piecemeal dismantling of a utility system for obvious reasons.

5. "Fair value." This approach defies any precise definition. Usually, a PSC will first determine a primary approach (e.g., original cost, reproduction cost) and then adjust its determination by various factors it deems appropriate in order to achieve a just and reasonable end result. For example, the ACC uses a mix of original cost and reproduction cost in deriving the value of a utility's property, plant and equipment as part of the rate base.
6. Economic value added (EVA).

In a capital intensive industry, and in most cases utilities derive their earnings from their rate base, the asset approach seems a logical choice. However, in the water utility business, for some utilities, it is common that the plant in service is nearly fully depreciated (and hence requires the staggering amount of infrastructure investment referenced earlier). Frequently, small water utilities do not even have a current inventory and installation dates of their assets. In some cases, with potential liabilities (particularly environmental) added to a utility's assets, the net worth of the utility could be negative.[56] In many cases, water utilities cannot raise capital at reasonable costs, yet they have a continuing obligation to provide service to the public. Some states have the authority to require other utilities to take over what are called "nonviable" utilities.[57] In short, a major difference may exist between the utility's earnings (derived from its rate base) and the value it provides to its customers. And, the original cost of the plant and equipment may or may not be adjusted for its physical condition.

Valuation analysts outside the water utility industry also recognize the limitations of the asset (or cost) approach. For example, The National Alliance of Consultants, Valuers and Analysts stated:

"Valuations for rate-making purposes typically use some form of the cost approach or a prudent investment basis. The allowed rate of return may be linked to the experienced cost of senior capital. ***It is clear that this would not represent fair market value****, which is concerned with current and future economic conditions…"* (Emphasis added.)[58]

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[56] Janice A. Beecher, Ph.D., *Viability Policies and Assessment Methods For Small Water Utilities*, p. 42.
[57] Beecher, *Sourcebook of Regulatory Techniques for Water Utilities*, Chapter 10.2.
[58] Zamucen, p. Section III.

A second limitation of the asset approach relates to a category of assets called "deferred charges." These charges represent expenses paid by the utility in expectation of recovering the costs from ratepayers sometime in the future. Without a clear understanding of particular state case law and regulatory practices, a valuation analyst would not know: (a) if these assets are likely to be recovered, and (b) if the utility would earn a return on the balance during the interim period. In some utilities, this category has equaled up to 40% of total assets. As previously mentioned, the $71 million acquisition adjustment paid by Arizona-American is an example of a deferred charge.

A third asset approach limitation relates to various other intangible assets with potentially huge value, yet not included in utility ratemaking. For example, if an investor-owned water utility held $1 billion in water rights, the value of these water rights would be reflected as zero for financial accounting and ratemaking purposes. In other industries, portfolio managers of $1 billion in assets would receive approximately $20 million in annual revenues (i.e., 2% of total assets) for managing the assets. (The significance of this issue can be illustrated by noting that 2004 profits of a large California-based investor-owned and publicly traded water utility - San Jose Water Company - were $14.7 million).[59]

A fourth limitation of the book value approach is that a direct connection does not exist between the utility's after-tax weighted average cost of capital (WACC) and its return on invested capital (ROIC). In a non-regulated business environment, if a company consistently under-earned its required rate of return, the value of the company would decline. A fifth limitation of the asset approach (particularly the reproduction and reconstruction methods) is that these asset amounts neither necessarily correlate with the utility's earnings nor are always used for ratemaking purposes.

Finally, as discussed previously, utilities often make investments described as "lumpy." This lumpy investment trend results from the utility periodically going through a construction phase. If plant and equipment are not immediately "used and useful" for the utility's ratepayers, portions of the investment may be excluded from that utility's rate base. In some cases, a utility

[59] SJW Corp., 2004 Form 10-K, p. 52.

may make an investment and then wait a considerable period before the investment is included in its rate base. To remedy this problem, some regulators have allowed CWIP in rate base.

A final asset approach is the economic value added (EVA) model (also called economic profit) developed in the 1800s by Alfred Marshall, an English economist. Essentially, in this model, a company's economic profit is measured by the difference between the WACC and the ROIC and then multiplied by the amount of invested capital. Credit Suisse First Boston, Goldman Sachs, and other firms in the investment community use the EVA model. Although not historically used for utilities, the model can provide important insights into a utility's value. Importantly, this model can identify year-to-year changes in a utility's value, allowing an analyst to isolate the reasons for the changes.

Income. Two common income approaches used in valuing utilities are the capitalized earnings method and the discounted cash flow (DCF) method. In the capitalized earnings method, the "economic benefits" (e.g., net income) are divided by a capitalization rate. The general steps in the income approach are the same for utilities as well as other industries. These steps include:

1. Analyzing, and normalizing historical data if necessary;
2. Projecting the utility's future performance;
3. Estimating an appropriate discount or capitalization rate;
4. Estimating the utility's continuing value (CV); and
5. Calculating, analyzing, and interpreting the results.

The first problem involves the measurement of "economic benefits." Of the common choices – (a) net income, (b) dividends, or (c) cash flow, we strongly recommend using cash flow. Our reasoning is that, for utilities, net income (profits) can be misleading because they may:

1. Include extraordinary items;
2. Use unrealistic depreciation rates;
3. Ignore deferred income taxes; and

4. Include debt and equity allowances for funds used during construction (AFUDC).

Our recommended income approach is the enterprise DCF model using free cash flows to the firm (FCFF). This model is widely used in practice and includes earnings before interest and taxes (EBIT), *plus* depreciation and amortization expenses, *plus* deferred income taxes; *minus* capital expenditures, *minus* changes in working capital. The characteristics of this model are that it:

1. Provides a forward looking analysis of a company's operations;
2. Uses multiple time periods (eight years in our model – FinMod);
3. Adjusts accounting data to include only cash; and
4. Explicitly incorporates yearly investment.

Advantages of the DCF model using FCFF are that it:

1. Is not dependent on the accountants' definition of earnings;
2. Is *useful for closely held and small water utilities*;
3. Has strong theoretical support; and
4. Incorporates the timing and amount of investment, deferred income taxes, and the appropriate WACC.

In contrast to the DCF model, some valuation analysts use a capitalized earnings approach which may yield misleading results. For example, in a valuation study of a small water system in Missoula County, Montana, a capitalization rate of between 9%-10% taken from *Value Line* was applied to the utility's net operating income for a single year.[60] At least three major flaws exist with this analysis. First, a capitalization rate taken from *Value Line* (representing very large, investor-owned, publicly traded water utilities) usually does not accurately represent the risks of a small, isolated water utility with a different regulatory environment. Second, capitalizing net operating income can lead to inaccurate estimates of a utility's value. For reasons

[60] Sue Hoell, "Valuation of a Privately Owned Water System and a Privately Operated Water System in Missoula, Montana," (Chicago: *Assessment Journal*, Nov./Dec. 1997), pp. 68-71.

mentioned earlier, cash flow is a better measure of economic benefits. Third, using a capitalization rate for a fast growing water utility can be unreasonable. Because of the substantial amount of tangible assets (and the timing of the investments), the DCF model is more appropriate for water utilities.

FinMod: A Valuation Model For Water Utilities

In 2000, HCG was asked to value the assets of Westpac Utilities using the DCF model. Noting the limitations with the market and asset approaches in the context of valuing water utilities, improvements were made such that in May 2005 FinMod became commercially available through NAWC. (The development of the model took approximately one year.) FinMod, Version 2.00.1, is an Excel spreadsheet which enables water utility participants (e.g., utilities, commercial bankers, other lenders providing low-cost loans, regulators, and other investors) to estimate a utility's value and future revenue requirements (for rate case purposes). Data for the model and valuation report originates from a client questionnaire.[61] Table 4 provides example of such.

[61] Water Utility Valuation Client Questionnaire Copyright ©2005 Hayward Consulting Group. All rights reserved.

Table 4
Summary Valuation Results ($M)
Majestic Water Company

Income	
Enterprise DCF	$163.3
Capitalized Earnings	
Growth	$99.4
Constant growth	$196.3
Variable growth	$433.5
Asset (Rate Base)	
Original Cost Less Depreciation	$240.8
Replacement Cost Less Depreciation	$483.0
Composite Less Depreciation	$361.9
Economic Profit	$233.7
Market (Transaction Based)	
Dollars per customer	$188.4
Capital/EBITDA	$141.7
Sales/EBITDA	$155.3
Capital/EBIT	$124.7

For valuation and regulatory purposes, the model provides key benefits in that it:

1. Analyzes the value of a utility using up to 12 valuation approaches;
2. Compares a utility's financial and operating performance to comparable utilities;
3. Identifies how the utility's expected performance compares to the National Regulatory Research Institute's (NRRI) "financial distress" benchmarks (useful for regulators in making policy decisions);
4. Captures the key regulatory policy issues in a state;
5. Identifies year-to-year changes in a utility's value (allowing the user to isolate the reasons for the changes); and

6. Creates reports which meet the requirements of suppliers of capital (e.g., bankers).

Summary and Conclusion

Valuing water utilities, a truly complex task today, requires a detailed computer model to capture all appropriate relevant variables. Intelligent water utility valuation discussion minus such a formal model is nearly impossible. Missing or overlooking any single issue (e.g., the amount of investment necessary to correct an arsenic problem) could be very costly for a potential purchaser. Finally, the list of due diligence issues is both long and complex. In the context of a water utility valuation assignment, one client finally concluded that there were:

> **"…no reliable shortcuts…"** and **"…if we don't get an expert valuation then we are pretty much guessing [about the] purchase..."**

The industry is experiencing a consolidation phase primarily through acquisitions of smaller water utilities by larger utilities. In utility valuation projects with sophisticated buyers and sellers, insistence upon a DCF model as the primary valuation approach is usual. Investors or others with more limited budgets frequently (and sometimes in ways ultimately painful to their pocketbooks) realize that relevant data regarding comparable sales is very difficult to find and/or not useful. Similarly, using the asset approach solely may provide results which inaccurately reflect the utility's underlying value. Thus, market, asset, and capitalized earnings approaches may provide utility valuation estimates only slightly better than those created using a dart and a dartboard.

In the area of accounting, companies which pay premiums above book value of a water utility's assets (i.e., a positive acquisition adjustment) may face significant uncertainties as to the future recovery of them. The recovery of various deferred assets (also called regulatory assets) is also uncertain for water utility owners. Utility regulators come and they go. Meanwhile, a utility waiting 20 years or longer to recover its assets may not then recover all of them. In particular, the water industry requires massive amounts of capital to address its infrastructure replacement, growth, and environmental requirements.

To recap, the water utility environment is very different from other non-regulated industries - particularly in the areas of regulation, accounting, legal issues, and economics. In this business:

- Long-run planning is required;
- Rates to customers often do not reflect the costs of providing service to them;
- ROEs are historically low for small water utilities; and
- In some cases, the PSCs' authorized rates of return on capital do not fully reflect the utility's risk.

Because of some water utilities' sizes, clients requesting valuation studies can save substantial sums of money by engaging valuation analysts to prepare thorough reports. Even smaller water utilities with book assets in the $5 million range or less can experience significant gain or avoid potentially large losses through a limited, and possibly qualified, valuation report. A properly prepared and thoroughly researched valuation study can keep a client out of both the poorhouse and the courthouse. The major savings versus the cost of being wrong usually justifies both time and expense necessary to conduct such.

David L. Hayward, president of Hayward Consulting Group (HCG) located in Encinitas, California has over 20 years experience in the utility industry. With a M.S. in Economics, Mr. Hayward is a Certified Rate of Return Analyst (CRRA) – a specialist in utility finance. Having written numerous utility valuation-related articles and books including: *Valuing A Water Utility* for the National Association of Water Companies (NAWC) and presented 13 workshops and seminars on utility valuation issues, he also has been involved in 13 utility valuation projects and teaches economics at the University of Phoenix. HCG's web site is: www.haywardconsultinggroup.com.
Thanks to Debbie Moyer, DJpi Editing, LLC, for her assistance in editing this article.