

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

DOCKET NO. DW 13-126

PENNICHUCK EAST UTILITY, INC.

PREFILED TESTIMONY OF

CHRISTOPHER P.N. WOODCOCK

Woodcock & Associates, Inc.

18 Increase Ward Drive

Northborough, MA 01532

With

Raftelis Financial Consultants, Inc.

Charlotte, NC

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**PREFILED TESTIMONY OF
CHRISTOPHER P.N. WOODCOCK**

4 **Q: Please state your name and business address?**

5 A: My name is Christopher P.N. Woodcock and my business address is 18 Increase
6 Ward Drive, Northborough, Massachusetts 01532.

7 **Q: By whom are you employed and in what capacity?**

8 A: I am the President of Woodcock & Associates, Inc. a consulting firm specializing in
9 water and wastewater rate and financial studies.

10 **Prior Experience**

11 **Q: Please describe your qualifications and experience.**

12 A: I have undergraduate degrees in Economics and in Civil Engineering from Tufts
13 University in Medford, Massachusetts. After graduating in 1974, I was employed by
14 the environmental consulting firm of Camp, Dresser, and McKee Inc. (now CDM-
15 Smith). For approximately 18 months I worked in the firm's environmental engineer-
16 ing group performing such tasks as designing water distribution and transmission
17 pipes, sewer collection and interception systems, pumping facilities and portions of
18 a wastewater treatment facility. From approximately January 1976, I worked in the
19 firm's management and financial consulting services group, gaining increasing re-
20 sponsibility. At the time of my resignation, I was a corporate Vice President and
21 appointed the leader of the group overseeing all rate and financial studies. In my
22 career, I have worked on more than 400 water and wastewater rate and financial

1 studies, primarily in the United States, but also for government agencies overseas.
2 I also have worked on a number of engineering and financial feasibility studies in
3 support of revenue bond issues, I have helped draft and review revenue bond in-
4 dentures, and I worked on several valuation studies, capital improvement financing
5 analyses, and management audits of public works agencies. In addition to my pro-
6 fessional experience I have held elected and appointed positions on municipal
7 boards overseeing public works functions.

8 **Q: Have you previously testified before state regulatory commissions or courts**
9 **on rate related matters?**

10 **A:** Yes, in addition to testimony I have provided before the New Hampshire Public Utili-
11 ties Commission, I have provided testimony on rate related matters before utility
12 commissions in Rhode Island, Maine, Massachusetts, Connecticut, New York, Mar-
13 yland, Texas, and Alberta, Canada. I have been retained as an expert witness on
14 utility rate related matters in proceedings in state courts in Arkansas, Florida, Mas-
15 sachusetts, Michigan, New Jersey, Maryland, Ohio, Virginia, and Pennsylvania, as
16 well as the Federal Court in Michigan. I have been selected to several arbitration
17 panels related to disputes over water rates and charges; I have provided testimony
18 on rate related matters to the Michigan and Massachusetts legislatures, and I have
19 provided testimony at administrative hearings on a number of occasions.

1 **Q: Do you belong to any professional organizations or committees?**

2 A: Yes, I am a member of the Water Environment Federation, the Rhode Island Water
3 Works Association, the Massachusetts Water Works Association, the New England
4 Water Works Association, and the American Water Works Association. For the Wa-
5 ter Environment Federation, I was a member of the committee that prepared the
6 manual on Wastewater Rates and Financing. I am past chairman and a current
7 member of the New England Water Works Association's Financial Management
8 Committee. In my capacity as Past President of the New England Water Works As-
9 sociation I also sat on the Board of Directors as well as chairing and sitting on a
10 number of other administrative committees. For the American Water Works Asso-
11 ciation, I am past chairman of the Financial Management Committee and the Rates
12 and Charges Committee that has prepared the manuals on Revenue Requirements,
13 Water Rates, Alternative Rate Structures, and Water Rates and Related Charges. I
14 have been reappointed to and am currently the longest standing member of the
15 AWWA Rates & Charges Committee.

16 **Summary**

17 **Q: What is your role in this proceeding?**

18 A: Raftelis Financial Consultants, Inc. (RFC) has been retained by Pennichuck East
19 Utility, Inc. (the Company) to prepare a cost allocation and rate design study.
20 Woodcock & Associates, Inc. (W-A) has a formal working arrangement with RFC,
21 and for this project I am serving as the lead consultant. I have worked closely with

1 RFC in preparing the study and will be the witness regarding the results of the cost
2 allocation and rate design study.

3 **Q: Will you summarize your findings and conclusions?**

4 A: The Company has undergone some significant changes since the last cost alloca-
5 tion study some six years ago, including a change in ownership and the acquisition
6 of some additional service areas.

7
8 The Company is seeking a permanent rate increase that will provide overall reve-
9 nues of some \$6.8 million, with \$6,526,303 to be derived from water rates and
10 charges plus \$300,353 from the Capital Recovery Surcharge (CRS). The bulk of
11 our study addresses the recovery of the \$6,526,303 from the permanent rates and
12 charges. Schedule CW 17 also presents the proposed rates and charges under the
13 Company's proposed step increase and combined rates. The step rates were simp-
14 ly increased across the board from those that are proposed for the permanent in-
15 crease to provide total revenues from rates and charges under the combined in-
16 crease of \$6,659,734 (because of rounding, the proposed rates provide a slightly
17 different amount).

18
19 We have generally followed the procedures outlined in the American Water Works
20 Association's (AWWA) Manual of Practice M1 – *Principles of Water Rates, Fees,*
21 *and Charges*. In general, we have first allocated costs to three main categories or
22 types of service: Water Sales, Fire Protection, and Customer Service

1 The costs associated with Water Sales are those that are related to the provision of
2 potable water and have nothing to do with metering, billing or fire protection. It in-
3 cludes the costs to provide potable water under all demand conditions.

4

5 The costs associated with Fire Protection are the portion of the overall costs that
6 are associated with the provision of fire protection service; both public and private.
7 While there are some direct costs associated with public fire hydrants, the majority
8 of fire protection costs are associated with the provision of sufficient system capaci-
9 ty to provide large volumes of water to help extinguish fires at a moment's notice.

10

11 Customer costs are those expenses associated with billing, collection, meter read-
12 ing, meter installation and testing, and service installations and repairs. These
13 costs do not vary with water use and are instead a function of the number of cus-
14 tomer bills and the size of the customer's meter and service lines.

15 **Content of Schedules**

16 **Q: Please describe the schedules included with your prefiled direct testimony.**

17 A: There are 18 main schedules, plus several supporting schedules related to the pub-
18 lic fire protection charges. The schedules included in this filing are:

- 19 • CW 1 summarizes the allocation of the pro forma costs to various types of ser-
20 vice: metered water sales, fire protection (both public and private) and customer
21 service (billing, metering and services). The detail for many of these allocations
22 can be found in the following schedules.

- 1 • CW 2 presents the allocation of the pro forma operation & maintenance expens-
2 es to the various types of service.
- 3 • CW 3 presents the allocation of the Company's plant investment to the various
4 types of service. The results of this allocation are used to allocate various capital
5 related components such as the City bond fixed revenue requirements, the utility
6 operating income, and property taxes. It is common water rate making practice
7 to assign costs associated with long term capital costs based on the overall allo-
8 cation of assets. This practice helps maintain long term stability in rates.
- 9 • CW 4 presents the allocation by asset type of the total depreciation on the Com-
10 pany's assets. The detail amounts are reflected in the Company's Annual Report.
11 The resulting percentages are utilized to properly allocate the portion of the reve-
12 nue requirement associated with depreciation. This schedule derives those
13 overall percentages.
- 14 • CW 5 presents the various allocation symbols or factors that are used within the
15 previous schedules to allocate various line items.
- 16 • CW 6 presents the number of meters by size and water sales. As discussed in
17 more detail later in our testimony, this schedule also presents two equivalency
18 factors that are used to equitably assign meter and service line related costs and
19 to assign capacity related costs to the various size water meters.
- 20 • CW 7 presents the number of private and public fire services by size of connec-
21 tion. It also shows the equivalency or capacity factor that is used to assign the
22 allocated costs to the various size connections.

- 1 • CW 8 shows the derivation of the total fire service costs associated with public
2 fire hydrants and the assignment of the remaining capacity related costs to public
3 and private fire service. This schedule also presents the calculation of the cost
4 per hydrant for public fire hydrants and the cost per inch-foot of main for the ca-
5 pacity related public fire service costs. Lastly, this schedule presents the calcula-
6 tion of the cost based private service costs by size of connection.
- 7 • CW 9 summarizes the allocation of the customer costs from Schedule CW-1 to
8 the two customer components: the meters and services component, and the bill-
9 ing component. Many of these costs are based on more detailed allocations in
10 the subsequent schedules.
- 11 • CW 10 presents the allocation of the customer service O&M costs to me-
12 ters/services and billing.
- 13 • CW 11 presents the allocation of the customer service plant investment to me-
14 ters/services and billing. As with some of the overall costs, this allocation served
15 as the basis for a number of capital related, customer service costs.
- 16 • CW 12 shows the allocation of the customer service depreciation expense.
- 17 • CW 13 presents the symbols that were used to allocate the customer service
18 costs in the previous schedules.
- 19 • CW 14 shows the calculation of the proposed customer service charges. As
20 presented on this schedule, there are three components that are proposed:

- 1 ○ a billing and collection component that is spread equally to each custom-
2 er since these costs do not vary with the customer's water use or meter
3 size.
- 4 ○ a meter/service component that does vary with the size of the customer's
5 water meter and service line.
- 6 ○ a ready-to-serve or capacity component that recovers a portion of the
7 Company's fixed costs and varies with the capacity of the customer's wa-
8 ter meter.
- 9 ● CW 15 is a summary of the three customer service charge components that
10 were derived in the previous schedule and shows the derivation of the total cost
11 based customer service charge.
- 12 ● CW 16 presents the calculation of the cost based and the proposed metered wa-
13 ter rate. In essence, all costs that are not recovered elsewhere through the cus-
14 tomer service charges or fire protection charges are proposed to be recovered
15 through the metered water rate. Nearly 2/3 of the total costs are proposed to be
16 recovered through the metered water rates. Page 1 of this schedule presents the
17 metered rates based on the cost of service based customer service and fire pro-
18 tection charges. As discussed later, the Company proposes to modify the cost
19 based customer service and private fire protection charges. These modifications
20 reduce the amounts that need to be recovered through the metered rate. The
21 calculation of the proposed meter rate is presented on the second page of this
22 schedule.

- 1 • CW 17 This schedule presents a summary of the current rates, the rates derived
2 from the cost of service study, and the proposed rates. In order to preserve rate
3 continuity and provide gradualism in some charges, we have proposed several
4 modifications to the cost based rates. Schedule CW 17 also presents the Com-
5 pany's proposed step increase and the overall combined rates that are proposed
6 with the step increase.
- 7 • CW 18 This schedule contains the proof of revenues, showing the annual reve-
8 nues under the proposed permanent and combined rates. Because the rates are
9 rounded to the nearest penny, the proposed permanent and combined rates pro-
10 vide slightly different total revenues from those required.
- 11 • CW F1 This schedule summarizes the public fire service allocation to each
12 community. It shows the inch-feet of pipe in excess of 6" as well as the number
13 of public fire hydrants in each community. This schedule also shows the month-
14 ly cost per customer—for those communities with a monthly customer charge—
15 and the monthly cost per community—for those communities paying a monthly
16 community charge.

17 **Comparison of Cost Allocations**

18 **Q: Have you compared your cost allocations with the previous study?**

19 **A:** In general, the studies are quite similar. In both cases we have made the primary
20 allocations to volume/sales, to fire service, and to customer service. The following
21 table presents a summary of the allocations for the major components from the pre-
22 vious study (2007) and from our study.

		<u>Sales</u>	<u>Fire</u>	<u>Customer</u>
1	Plant Investment			
2	Prior Study	57%	15%	28%
3	Current Study	64%	23%	13%
4	Depreciation			
5	Prior Study	61%	11%	28%
6	Current Study	68%	17%	15%
7	Operation & Maintenance			
8	Prior Study	75%	18%	6%
9	Current Study	76%	8%	16%

10
11

12 I noticed that the prior study allocated a significant portion of the investments and
13 depreciation associated with transmission and distribution mains to the Customer
14 category. This is unusual. However, in our study I have reassigned approximately
15 \$500,000 of Sales or Volume costs to the Customer Service charges to recover a
16 portion of fixed capital costs through the fixed charges. Our adjustment would have
17 the same impact as a greater allocation to Customer component.

18

19 I also examined the allocation of Fire costs between public and private fire service.
20 The prior study assigned 85% of the fire costs to public fire protection and 15% to
21 private fire service. Our study assigns 76% to public fire service and 24% to private
22 fire service. I believe much of this can be explained by the change in the numbers
23 of services. Since the study in 2007 there has been a slight increase in the number
24 of public fire hydrants but a more than doubling of the number of private fire ser-
25 vices. In addition, the prior study allocated fire related costs based on the area of
26 the service. We have used a different factor that reflects the flow capacity of differ-
27 ent size pipes. The simple cross-sectional area does not account for the friction
28 losses along pipe walls while the use of the Manning Equation factor (2.63 times di-

1 ameter) does account for the greater friction losses (lesser volumes) available with
2 the smaller diameter pipes.

3 **Rate Design**

4 **Q: Are you proposing changes to the Company's existing rate structure?**

5 A: While I am not proposing any major change to the general structure of the rates, the
6 changes to individual rates and charges vary by different percentages. In part, the-
7 se shifts are a result of different cost allocations and methods in comparison to the
8 previous study. They are also due to the use of different capacity or equivalency ra-
9 tios for fire services and meters.

10

11 For example, it is unclear what meter equivalency factors were used in the prior
12 study; however, they are not the same as those that we have used. For the meter
13 and service costs, we used factors that reflect the typical costs of testing meters as
14 well as the relative depreciation and asset values. This is a good representation of
15 the relative costs for buying, testing, and maintaining meters and services. For the
16 portion of overall system depreciation and city bond costs that we have proposed to
17 assign to the customer service charges, we used the rated capacity of each size
18 meter as provided for in AWWA standards. Because these costs are related to sys-
19 tem capacity, assigning them based on the capacity available is the fairest method.

20

21 As discussed earlier, the prior study used equivalency factors or weighted various
22 size fire services based on the cross sectional area of the service pipes. We used
23 the more widely accepted Manning Equation factor for flow through pressure con-

1 duits that better reflects the flow capacity than a simple weighting of the cross sec-
2 tion.

3 **Q: Please expand on the development of the public and private fire charges on**
4 **Schedule CW-8 and CW-17.**

5 A: This schedule presents the breakdown of the overall fire service costs between pub-
6 lic and private fire service. The first step was to break out the costs directly associ-
7 ated with public fire hydrants as these have no bearing on the private fire service.
8 To do this we identified the direct O&M costs associated with hydrants. Next we
9 add an allowance for overhead and administration based on the percent of total
10 O&M costs associated with administration. Next we determined the portion of all
11 assets associated with hydrants and applied that percentage to various capital cost
12 categories such as operating income, depreciation and the City bond fixed revenue
13 requirement. The sum of the hydrant related costs were deducted from the overall
14 fire protection costs leaving us with the costs associated with providing capacity and
15 water to the fire hydrants and services. This is by far the largest component of the
16 fire protection costs. These remaining, non-hydrant costs were then allocated be-
17 tween public and private fire service based on the relative capacity of all public fire
18 hydrants and all private fire services.

19
20 We next determined the cost of the two public fire service components: hydrants
21 and capacity (recovered through an inch-foot allocation). The derivation of hydrant
22 portion was discussed above. This was divided by the number of public fire hy-

1 drants to derive the cost per hydrant. The remaining capacity costs were divided by
2 the inch-feet of water mains to get a cost per inch-foot of pipe.

3

4 Currently there is a mix in methods that are used to assess public fire service
5 charges. In some cases there are direct charges to the communities based on the
6 number of hydrants and inch-feet of pipe. In others, direct charges are made to the
7 customers that have public fire service through an availability charge. In all cases
8 we first determined the public fire protection charge for each community based on
9 the total number of public fire hydrants and inch-feet of water mains that are 6" or
10 greater. For those communities where a direct charge is made, the calculated inch-
11 foot and hydrant charges are proposed to be assessed; these include Derry, Litch-
12 field, Londonderry and Pelham. For the remaining communities we have taken the
13 total revenues that would be derived from the hydrant and inch-foot charges and di-
14 vided these amounts by the number of customers that have public fire protection
15 service to derive a charge per customer. In the case of Raymond, the Town has
16 agreed to pay \$7200 per year of the public fire protection charges, so the per cus-
17 tomer charges in Raymond were reduced to account for this direct payment.

18 **Q: How were the cost based private fire service charges derived?**

19 **A:** For the private fire services, we spread the costs that were allocated to the private
20 service across the various size services based on relative capacity of each size ser-
21 vice. These factors were presented on schedule CW-7.

22

1 The overall allocation of the fire protection costs among public and private fire ser-
2 vice, and then within each type of service follows the guidance presented in the
3 AWWA M1 Manual on water rates.

4 **Q: Turning to schedules CW-9 through CW-14, can you describe the process**
5 **used for the derivation of the customer service charges?**

6 A: As discussed earlier, we have included three distinct components in the customer
7 service charge; each component is assigned across the various meter sizes differ-
8 ently to reflect the different costs.

- 9 • Costs associated with meter reading, billing, collection and general customer
10 accounting do not vary with meter size or water use. These costs are more a
11 function of the number of customers or numbers of bills. For example, the
12 cost of postage is the same for a large volume customer with a large meter
13 as it is for smaller residential customer with a 5/8" meter. In this case, these
14 costs are simply assigned based on the total number of billings.
- 15 • The cost of purchasing, installing, repairing and testing meters does depend
16 on the size of the water meter – larger meters cost more than smaller meters.
17 Similarly, larger customer service pipes cost more to install, tap into the
18 main, and repair. For these costs we have used an accepted equivalency ra-
19 tio that reflects the relative cost of installing typical meter and service pipes.
- 20 • Lastly, we have proposed to include a portion of the Company's fixed capital
21 costs in the proposed customer service charge. As water sales have
22 dropped over the past decade, water utilities across the country have found

1 that revenues are becoming more volatile. Water utilities are particularly
2 capital intensive with very long lived assets. Nearly all costs are fixed in the
3 short term, yet the vast majority of water revenues are based on consump-
4 tion which can be quite variable. As a result, there is a growing trend to in-
5 crease the portion of revenues that are fixed. One such way is to include a
6 portion of fixed capital related costs in a readiness-to-serve component of the
7 fixed minimum or service charges. In this case we are proposing to include
8 100% of the annual depreciation expense for the Company plus 35% of the
9 City Bond Fixed Revenue Requirement as part of a fixed customer service
10 charge. Because these are capacity related costs, we propose spreading
11 these across the various meter sizes using the rated maximum capacity of
12 each size meter.

13 **Q: Is the Company proposing to adopt the rates from the cost of service study?**

14 **A:** Not entirely. In the case of the customer service charges there are some significant
15 drops in the monthly charge for larger meter sizes under the cost based rates. In
16 order to avoid in drop in these charges now that will likely be followed by increases
17 in later years, we are proposing that all the customer service charges be increase
18 by the same percentage increase as that indicated for the 5/8" meters (about
19 6.25%). This increase is less than the overall revenue increase that is proposed.
20 For the private fire service charges, the charges for some sizes increased and for
21 some sizes decreased under the cost based rates. In this case we have proposed

1 that the private fire service charges be set at the greater of the cost based rate or
2 the current rates.

3 **Q: Won't the proposed adjustments to the customer service and private fire ser-**
4 **vice charges result in different overall revenues from the cost based rates you**
5 **derived?**

6 A: Yes they will. To adjust for these changes in revenues, we propose to modify the
7 metered rate to ensure that the overall revenues remain the same.

8 **Q: Have you prepared a comparison of the current rates and those derived from**
9 **your study?**

10 A: Yes I have. This is shown on Schedule CW-17. This schedule shows the current
11 rates, the rates derived from the cost allocation study, and the rates that are pro-
12 posed by the Company.

13 **Q: What is the overall impact of the proposed rates on a typical residential cus-**
14 **tomers?**

15 A: A typical residential customer with a 5/8" water meter that uses 640 cubic feet per
16 month (about 160 gallons/day) will see their monthly water bill increase about \$4
17 from \$52.39 to \$56.43.

18 **Q: Have you prepared a summary of revenues under the proposed rates?**

19 A: Yes I have. The revenues under the proposed permanent rates and under the
20 combined rates (with the step increase) are presented in Schedule CW-18.

1 **Summary**

2 **Q: Does this conclude your testimony?**

3 **A: Yes it does.**