BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES
OFFICE OF ADMINISTRATIVE LAW

In the Matter of:

THE PETITION OF MONTAGUE SEWER COMPANY FOR AN INCREASE IN RATES AND CHARGES FOR SEWER SERVICE	**BPU Docket No. WR05121056** **OAL Docket No. PUC 1862-06**

DIRECT TESTIMONY

AND EXHIBITS

OF

HOWARD J. WOODS, JR., P.E.

On Behalf of the New Jersey
Division of the Ratepayer Advocate

May 19, 2006

Montague Sewer Company
BPU Docket No. WR05121056
Direct Testimony of Howard J. Woods, Jr., P.E.

TABLE OF CONTENTS

Page

I. STATEMENT OF QUALIFICATIONS 1

II. SCOPE AND PURPOSE OF TESTIMONY 3

III. SUMMARY OF FINDINGS AND CONCLUSIONS 4

IV. ENGINEERING & OPERATIONS ISSUES 6

A. Background & Tariff Language Changes 6

B. Leach Field Alternatives 12

C. Analysis of Company Claimed Costs 15

APPENDIX A 24

I. STATEMENT OF QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Howard J. Woods, Jr. and my address is 138 Liberty Drive, Newtown, Pennsylvania 18940-1111.

Q. BY WHOM ARE YOU EMPLOYED?

A. I am an independent consultant and the Division of the Ratepayer Advocate has engaged me in this matter.

Q. **PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.**

A. I hold a Bachelor of Civil Engineering Degree from Villanova University (1977) and a Master of Civil Engineering Degree with a concentration in water resources engineering also from Villanova University (1985). I am a registered professional engineer in New Jersey, New York, Maryland, Pennsylvania, Delaware and New Mexico. I am also licensed to perform RAM-W^{SM} security assessments of public water systems. I am an active member of the American Society of Civil Engineers, the National Ground Water Association, the American Water Works Association, the Water Environment Federation and the International Water Association.

Q. HAVE YOU PROVIDED TESTIMONY IN MATTERS ASSOCIATED WITH SEWER SERVICE AND RATES ON PRIOR OCCASIONS?

A. Yes. I have testified in numerous rate setting proceedings and quality of service evaluations in matters before the Public Utility Commissions in New Jersey, New York, Connecticut, Delaware and Kentucky. I also testified on behalf of the New Jersey Ratepayer Advocate with regard to the rates recently established for Montague Sewer Company in Docket Number WR03121035, decided on September 15, 2005. In addition, I have provided expert opinions in generic hearings related to water resource planning and drought management in New Jersey and Delaware. These hearings were sponsored by the respective utility commissions in these jurisdictions.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. A detailed description of my professional experience is provided in Appendix A of this Testimony. In summary, I have over 28 years experience in the planning, design, construction and operation of water and wastewater facilities. I have worked for a Federal regulatory agency, a large investor-owned water and wastewater utility, a firm engaged in contract operations of municipally-owned water and wastewater utilities, and in engineering and operational consulting for the water and wastewater industry.

II. SCOPE AND PURPOSE OF TESTIMONY

Q. ARE YOU GENERALLY FAMILIAR WITH THE MONTAGUE SEWER COMPANY?

A. Yes, I am.

Q. MR. WOODS, PLEASE DESCRIBE YOUR AREA OF RESPONSIBILITY IN THIS MATTER.

A. I have been engaged by Division of the Ratepayer Advocate to review the actions the Company took to address the failure of two of its subsurface disposal fields and the costs incurred in restoring these facilities to proper operation.

III. SUMMARY OF FINDINGS AND CONCLUSIONS

Q. HAVE YOU REVIEWED THE MONTAGUE SEWER COMPANY'S FILING FOR A RATE ADJUSTMENT, INCLUDING THE COMPANY'S RESPONSES TO VARIOUS DISCOVERY REQUESTS?

A. Yes, I have.

Q. WHAT DOES THE COMPANY'S FILING REQUEST?

A. The Company filing seeks to adjust rates to recover the costs of renovating two of its subsurface disposal fields referred to as "Leach Field 3A/3B" and "Leach Field 2A/2B." Their petition claims total capital costs of approximately $795,000 for this work.[1] The filing requests an increase of $129,237 in sewer revenues, which represents a 90.44% increase in present rate revenues.[2] If granted, the average residential sewer bill would climb from $464.40 per year[3] to $884.40 per year.[4]

Q. DO YOU BELIEVE THAT THIS RATE INCREASE SHOULD BE GRANTED?

A. No. Some of the costs included in the Company's accounting of the total capital costs for these projects should be disallowed. These costs are associated with a

[1] The Petition of Montague Sewer Company for an Increase in Rates for Sewer Service; Montague Company; Montague, NJ; December 8, 2005; Paragraph 4, page 2.
[2] The Petition of Montague Sewer Company for an Increase in Rates for Sewer Service; Montague Company; Montague, NJ; December 8, 2005; Paragraph 5, page 2.
[3] The Petition of Montague Sewer Company for an Increase in Rates for Sewer Service; Montague Company; Montague, NJ; December 8, 2005; Exhibit A.
[4] The Petition of Montague Sewer Company for an Increase in Rates for Sewer Service; Montague Company; Montague, NJ; December 8, 2005; Exhibit B.

design that was abandoned by the Company after the New Jersey Department of Environmental Protection issued an Order to correct the failure of Leach Field 3A/3B and a permit to the Company to completely replace this subsurface disposal field. The ratepayers should not be required to bear the cost of this abandoned design. In addition, the Company's accounting of the total project cost includes expenses associated with the operation and maintenance of collection system facilities and these costs should not be included in the capital cost of the Leach Field replacements.

Q. IS IT YOUR OPINION THAT THE WORK TO REPAIR LEACH FIELD 3A/3B AND REPLACE LEACH FIELD 2A/2B WAS AN APPROPRIATE MEANS OF ADDRESSING THE FAILURE OF EACH OF THESE SUBSURFACE DISPOSAL FIELDS?

A. Yes. I believe that the Company's approach to this problem was the least costly feasible alternative.

Q. ARE YOU PROPOSING ANY ADJUSTMENTS TO THE COSTS CLAIMED BY THE COMPANY IN THIS MATTER?

A. Yes. I believe the allowed capital cost for the replacement of Leach Field 3A/3B and Leach Field 2A/2B should be reduced from $795,372.26 to $557,055.73, a reduction of $238,316.53.

IV. ENGINEERING & OPERATIONS ISSUES

A. Background & Tariff Language Changes

Q. PLEASE DESCRIBE THE MONTAGUE SEWER SYSTEM.

A. The Company's sewer system is actually comprised of six separate wastewater collection systems. Each system is essentially a community septic system. Raw wastewater is treated in individual customer owned and operated septic tanks located on the customer's property. The liquid effluent from these privately owned septic tanks is collected in the Company's wastewater collection system and discharged to a series of six independent subsurface disposal fields located throughout the service area. Of the Company's 282 sewer accounts, 163 are served by Leach Field 3A/3B.[5] This is roughly 58% of the Company's sewer accounts. Only 22 accounts are served by Leach Field 2A/2B.[6] The remaining four subsurface disposal fields serve an average of 24 accounts each.

Q. WHO IS RESPONSIBLE FOR THE REMOVAL OF SOLIDS FROM THE SEPTIC TANKS?

A. The individual owners, who are the Company's customers, are responsible for maintaining their own septic tanks.

[5] Company response to discovery request SE-MSC-7.
[6] Company response to discovery request SE-MSC-7.

Q. WHAT IS THE PURPOSE OF THE COMPANY OWNED SUBSURFACE DISPOSAL BEDS?

A. The disposal beds are a buried grid of perforated pipes that distributes wastewater over an area of land. The disposal beds serve two beneficial purposes. First, water is returned to the local aquifer system or evaporated through evapotranspiration through grass growing on top of the bed. To the extent that water is recharged to the local aquifer system, as opposed to being discharged to a surface stream, a valuable resource is conserved for the area. Second, the beds are biologically active and serve to eliminate harmful bacteria. Proper drainage of the bed is essential if harmful bacteria are to be controlled. In the case of Disposal Bed 3A/3B, this was a very significant issue because the disposal area is essentially the outfield of a Little League baseball field. Water ponding in the disposal area is basically settled but otherwise untreated sanitary wastewater. Similarly, in the case of Leach Field 2A/2B, the disposal bed is located in a lot adjacent to nearby homes. The lot is easily accessible by the public, so any ponded wastewater resulting from a failure of the field to drain properly would represent a potential threat to public health.

Q. IS IT NORMAL FOR A DISPOSAL FIELD TO LOOSE CAPACITY OVER TIME?

A. Like any engineering structure, disposal beds have a useful service life and we should expect that a replacement will be needed at some point. Typically, disposal fields last between 20 and 30 years. Bed failure usually results from changes in the

soils that make up the bed. The bed can loose porosity because solids are introduced from the system or as a result of chemical changes in the soil caused by interactions with the wastewater being treated. Also, surface activities could compact the soil making it less permeable. Finally, a change in the way a disposal field is operated could result in soil compaction. For example, a bed used seasonally and allowed extended drainage periods could see rapid loss in capacity if it is constantly surcharged by continuous flow.

Q. WAS THE ORIGINAL DESIGN OF THE WASTEWATER SYSTEM A FACTOR IN THE FAILURE OF LEACH FIELD 3A/3B AND LEACH FIELD 2A/2B?

A. Yes. Each customer connection is alleged to have a wastewater collection tank intended to act like a residential septic tank. Wastewater flowing from an individual structure to each of these tanks would settle, allowing solid material to be deposited in the bottom of the tank while grease and floatable materials are retained in the upper few inches of the tank. Only gray water would flow into the central collection system. The same process occurs in an individual septic system. Wastewater is settled in a tank, generally of 1,000 to 2,500 gallons capacity. Solid material drops to the bottom of the tank and decomposes. Floatable materials including fats, oils and grease are stored in the top few inches of the tank, floating on the liquid in the body of the tank. Liquid ("gray water") is drawn off just below the top of the tank and spread throughout a disposal bed. In this case, instead of

each structure having its own disposal bed, the gray water is collected for disposal in a common bed. In spite of the fact that solids decompose in the septic tank, there is some accumulation and these tanks need to be pumped out periodically. Fats, oils and grease must also be removed before the thickness of the floating layer reaches down to the point when gray water is drawn off of the tank. For a single family home this is generally needed once every two or three years. Most of the structures served by Disposal Bed 3A/3B are multifamily dwellings and more frequent pumping of these tanks would probably be necessary.

At Montague, the individual septic tanks are not owned or maintained by the Company. This responsibility falls to the individual building owner. Absent an overflow or complete backup of one of these tanks, there is nothing to alert the homeowner or building owner of a need for maintenance. Without scheduled maintenance, we can presume that at some point, these tanks filled with solids and grease to the point where no settling, or very limited settling, was occurring and both solids and liquids were being discharged on a regular basis to the wastewater collection system.

The six community sewer systems that make up Montague Sewer Company were not designed to manage solids. Wastewater collected in the each system typically drains to a small below ground tank at each disposal bed and from this point it is pumped into the disposal field. Pumping is cyclical as opposed to continuous. Sewage collects in the "point tank" until a predetermined level is reached and this automatically initiates pumping to the disposal beds. The small

size of the point tanks and the pumping configuration almost assures that solids will be pumped into the disposal fields.

The Company discovered and corrected defects in the collection system served by Leach Field 3A/3B including a direct storm water drain connection. The storm water line drained at least three properties and most likely introduced a significant amount of soils, gravel and debris to the system. Such material is fatal to a disposal field.

The community was originally intended to be a vacation resort with seasonal occupancy centered on the Lake and golf course. Presently, typical residences are occupied year-round.[7] The change in occupancy represents a significant deviation from the original design condition for these sewer systems. As a seasonal community, the individual wastewater holding tanks would have had more time to digest solids, so the likelihood of solids carryover into the central collection system would have been much less than it is today with year-round use. Also, as a seasonal community, much of the capacity of the disposal beds would have had a significant rest period. With year-round operations, the beds are constantly being dosed with new nutrient materials.

Q. COULD THE COMPANY HAVE CONTRIBUTED TO THE FAILURE OF THE DISPOSAL BEDS IN ANY WAY?

[7] Response to RAR-E-27 in Docket WR03121035.

A. Hypothetically, yes. However, I believe the recent problems with Leach Field 3A/3B and Leach Field 2A/2B were the result of the original design of the system, not its recent operation. With regard to the Company's operations, I find that they have done what is both reasonable and proper. They have thoroughly inspected the collection systems and eliminated extraneous flows (notably the storm drain from three of the properties served by Leach Field 3A/3B) and corrected deficiencies in the system (e.g. repaired manholes, relined sewers, etc.). Prior to the January 2003 New Jersey Department of Environmental Protection directive concerning Leach Field 3A/3B, the Company removed solids from the point tank on a quarterly basis. Approximately 12,000 gallons of material at 1% solids was removed from this system annually.[8] On a dry weight basis, this would represent roughly 1,000 pounds of solids per year. This is something that should not be necessary if the system were operating as originally designed with solids being captured and removed in the customer holding tanks. The Company had also installed clean-outs on the disposal field laterals in Leach Field 3A/3B and had the system cleaned. This involved physical cleaning (e.g. jetting) and the addition of biologically active agents to enhance the operation of the disposal bed.

Q. ARE YOU FAMILIAR WITH THE TARIFF LANGUAGE CHANGES PROPOSED BY THE COMPANY TO COMPEL CUSTOMER MAINTENANCE OF THE CUSTOMER OWNED SEPTIC TANKS?

[8] Response to RAR-E-29 in Docket WR03121035.

A. Yes. I believe it is important to adopt such language to provide some reasonable assurance that solids are periodically removed from these tanks. If the tanks are not properly maintained, each of the six leach fields could be damaged by solids and the Company and its Customers could be faced with repair and replacement costs similar to those considered in this proceeding.

B. Leach Field Alternatives

Q. ARE THERE ANY ALTERNATIVES TO THE CONSTRUCTION OF ADDITIONAL DISPOSAL BED CAPACITY AT LEACH FIELD 3A/3B OR THE REPLACEMENT OF LEACH FIELD 2A/2B?

A. Yes, but these alternatives are more costly. Wastewater could be collected at the point where it is pumped into the disposal fields and it could be diverted to a new wastewater treatment facility. For small flows such as those being treated at Leach Fields 3A/3B, a sequencing batch reactor is generally a cost effective treatment technology. These treatment plants, often referred to as SBR plants, offer the advantages of a small footprint and relatively simple operations. Typical process performance results in effluent with a total suspended solids level and final BOD below 10 mg/L, total nitrogen of less than 8 mg/L and total phosphorus below 2 mg/L. Although this would be considered a high quality effluent, there is a possibility that the New Jersey Department of Environmental Protection would require further polishing treatment such as final effluent filtration for a surface water discharge in the Montague area. However, for preliminary cost estimating

purposes, this possibility was eliminated due to its cost. The probable cost of an SBR plant to treat only flow from the existing 3A/3B service area would be on the order of $590,000.[9] This cost estimate is for the treatment works alone and does not include the cost of either an outfall sewer to a suitable receiving stream or the cost of constructing a subsurface disposal field for the treated effluent. The nearest stream that could receive treated wastewater from this facility is Shimers Brook. This stream is designated as an FW2-TPC1 (**F**resh **W**ater-2, **T**rout **P**roduction, **C**ategory 1) category water. This designation applies to those waters of the State designated for purposes of implementing the anti-degradation policies of N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resource(s). Assuming DEP would consent to modifications of the water quality designation for Shimers Brook, an outfall sewer would need to be constructed from the proposed treatment plant to the Brook. The probable cost of this project would be $160,000. Thus, for Leach Field 3A/3B portion of this project, the anticipated capital cost of an alternative to the Leach Field reconstruction is on the order of $750,000.

It is also possible to expand the proposed treatment plant and construct a pressure sewer and a pump station from the site of Leach Field 2A/2B to the

[9] In BPU Docket WR03121035, I estimated this cost to be $560,000. This represents an update of that cost based on the current (April 2006) Engineering News Record Construction Cost Index value of 7,695.1.

3A/3B site to treat wastewater from both collection systems in one location. The probable cost of pressure sewer and pump station is approximately $210,000. Allowing for an expansion of the proposed plant to accommodate the additional flow, the likely cost of constructing a single treatment facility and the interconnecting pipelines is $1,010,000. This cost is roughly $215,000 more than the total cost for the two disposal bed projects claimed by the Company.

I also note that the operating expenses for such a plant for power, chemicals and sludge disposal would be significantly higher than the normal operating expenses incurred by the Company in its disposal field operations.

Q. DID YOU CONSIDER ANY OTHER TREATMENT ALTERNATIVES?

A. Yes. I considered the possibility of abandoning both leach fields in favor of individual on-lot disposal systems. At an average cost of $10,000 per unit, the total cost of providing on-lot disposal would be approximately $1,850,000 for both Leach Fields. This is significantly greater than the cost of centralized treatment using SBR technology or using the leach fields constructed by the Company. In addition, I have serious reservations that an on-lot disposal option would be feasible considering environmental and public health matters. Many of the homes served by the Company are on small lots so there may not be sufficient land area on each lot to accommodate a complete septic system.

Q. SO IS IT YOUR CONCLUSION THAT THE COMPANY CHOSE THE LEAST COSTLY APPROACH TO RECTIFY THE CONDITIONS AT LEACH FIELD 3A/3B AND LEACH FIELD 2A/2B?

A. Yes.

C. Analysis of Company Claimed Costs

Q. WHAT IS THE TOTAL COST CLAIMED BY THE COMPANY FOR THE COST OF REHABILITATING LEACH FIELDS 2A/2B AND 3A/3B?

A. The Company claims a total project cost of $795,372.26. The basis for this claim is presented in Schedule 2-2 of its Petition.

Q. DID THE COMPANY SOLICIT BIDS TO CONSTRUCT THE IMPROVEMENTS AT LEACH FIELDS 2A/2B AND 3A/3B?

A. Yes. The Company solicited independent bids for the proposed work at Leach Field 2A/2B and Leach Field 3A/3B. Four contractors provided quotes for the proposed construction. One contractor, Brookside Excavating, offered a discount of $31,000 should Brookside be awarded both construction contracts. No other contractor offered such a discount.

Q. SINCE THE COMPANY SOLICITED INDEPENDENT BIDS FOR EACH PROPOSED CONSTRUCTION PROJECT, COULD THEY HAVE AWARDED THE WORK AT LEACH FIELD 2A/2B TO ONE

CONTRACTOR WHILE AWARDING THE WORK AT LEACH FIELD 3A/3B TO ANOTHER CONTRACTOR?

A. Yes.

Q. BY ACCEPTING THE DISCOUNT OFFERED BY BROOKSIDE EXCAVATING AND AWARDING BOTH CONTRACTS TO BROOKSIDE, DID THE COMPANY AVAIL ITSELF OF THE LOWEST COMBINATION OF OFFERED BIDS?

A. No, the Company actually accepted a proposal that cost more. I have tabulated the bids received by the Company in Schedule HJW-1. The Company accepted the discount offered by Brookside Excavating and made their award based on a bid price of $512,000. However, the Company could have accepted the bid from Zitone Construction for the work proposed at Leach Field 3A/3B in the amount of $327,977 and the bid offered by Brookside for work to be done at Leach Field 2A/2B in the un-discounted amount of $125,000. The total amount for these two contracts would have been $452,977, or $59,023 less than the consolidated contract awarded to Brookside.

Q. DO YOU BELIEVE THAT THE COMPANY COULD HAVE REALIZED THE FULL SAVINGS OF $59,023 HAD THEY SPLIT THE AWARD OF THIS WORK BETWEEN ZITONE AND BROOKSIDE?

A. No. As the work progressed, the Company encountered conditions that required contract modifications and these changed conditions resulted in extra costs. These extras totaled $28,000. However, I also note that one of the extras charged by Brookside was related to the need to provide an electrical panel not fully described in the contract documents. Zitone had anticipated this problem and included an allowance of $10,000 in its bid price for the work at Leach Field 3A/3B. Therefore, had the award been split, at least this portion of the extras could have been avoided. I believe that the split award would have resulted in savings of $41,023 after making allowances for the extra costs incurred during these projects and the allowance for the electrical panel offered by Zitone.

Q. HOW SHOULD THIS MATTER BE ADDRESSED?

A. I believe the total project cost of $795,372.26 should be reduced by $41,023 to reflect the benefit to the ratepayers had the Company selected the most advantageous bids.

Q. IN REVIEWING THE COSTS CLAIMED BY THE COMPANY IN THIS PROCEEDING, HAVE YOU IDENTIFIED ANY COSTS THAT, IN YOUR OPINION, SHOULD NOT BE ALLOWED?

A. Yes. Included within the costs claimed by the Company are expenses for hauling and disposal of wastewater prior to the start of construction at Leach Field 3A/3B, costs for engineering work that was ultimately abandoned by the Company after its

first engineer was dismissed, collection system maintenance expenses that should be expensed rather than capitalized, coding errors that inflated the total of the Leach Field 3A/3B construction costs presented on Company Schedule 2-2, and AFUDC charged to the project after the facilities were placed in service. A summary of these expenses is presented in Schedule HJW-2. The total amount of the expenses accounted for by the Company that should not be allowed is $109,035.91.

Q. HAVE YOU ANALYZED THE ENGINEERING CHARGES FOR THE TWO LEACH FIELD PROJECTS?

A. Yes. The preliminary engineering cost estimate for Leach Field 2A/2B was $32,500.[10] The pre-construction cost estimate for the cost of building the replacement for Leach Field 2A/2B was $150,000. The estimated engineering fees are 22% of the estimated construction cost for this project. This is a favorable comparison but it is slightly higher than the charges one would expect based on national averages. I would expect the engineering effort associated with a project of this nature to be 20% or less of the anticipated construction cost. Similarly, the estimated engineering fees for Leach Field 3A/3B were $50,250 and the estimated construction cost for this project was $287,000. The engineering fee is 17.5% of the estimated construction cost. This is somewhat less than the typical for a project of this nature and magnitude. The average for the two projects considered together is 18.9%, a perfectly reasonable level.

[10] Company response to SE-MSC-5.

Q. HOW DID THE FINAL ENGINEERING AND CONSTRUCTION COSTS COMPARE?

A. For Leach Field 2A/2B the Company has claimed total engineering costs of $75,912.86.[11] Based on the response to RAR-E-30, I have reduced this amount by $1,752 to a total of $74,160.86. The construction cost for this project amounted to $138,306.76. Thus, engineering fees for Leach Field 2A/2B represent 54% of the construction cost. The engineering costs for Leach Field 3A/3B total $113,776.55 after deducting the charges from Environtures, Inc, Niclaus Engineering and Trenchless Technologies shown in Schedule HJW-2. The construction cost for this project was $360,092.18. Thus, engineering fees amounted to 32% of the construction costs. In both cases, the billed engineering fees were well above the level typical for such projects.

In making these comparisons, I have discounted charges accumulated as capitalized labor of Company employees. The Company utilized its own employees to inspect the construction and project progress through completion. It is not unusual for a project owner to engage the services of a professional engineer to inspect construction progress and such charges would normally be considered as part of the total engineering services required in producing the completed project. Due to the utilization of existing employees, I have discounted these charges in my analysis and allow only the charges for external entities in producing the

[11] The Petition of Montague Sewer Company for an Increase in Rates for Sewer Service; Montague Company; Montague, NJ; December 8, 2005; Schedule 2-2, Line 4.

engineering design and readying the project for construction. Taking both projects together in this manner, engineering fees totaled $187,937.41 or 38% of the final construction cost of $498,398.94. This is a significant deviation from the initial estimates for these projects and it is well above the level typically found in the industry.

Q. DO YOU RECOMMEND AN ADJUSTMENT TO LIMIT THE AMOUNT OF ENGINEERING FEES INCLUDED IN THE FINAL PROJECT AMOUNT?

A. Yes. I believe the engineering fees should be limited to 20% of the project construction cost or $99,679.79. This is the upper end of the range of costs that one would typically expect to encounter on such projects. By limiting the allowed engineering expenses to this amount, a deduction of $88,257.62 should be recorded against the Company's project total.

Q. WHAT NATIONAL GUIDELINES SUPPORT YOUR RECOMMENDATION THAT ENGINEERING FEES SHOULD BE LIMITED TO 20% OF THE CONSTRUCTION COST?

A. The American Society of Civil Engineers (ASCE) conducted a nationwide survey of consulting firm practices and solicited data on more than 1,000 projects of varying complexity and scope. ASCE then produced a series of cost curves relating project design fees to total construction cost. The results of this effort were

summarized in Engineering Practice Manual No. 45. I have provided a copy of the ASCE cost curve applicable to projects that are "modifications" as Exhibit HJW-1. For small projects that have a high degree of complexity, the ASCE curve shows that engineering fees typically range as high as 20%. Although the actual design of these leach field projects are of average complexity, suggesting a 10% cap on design fees, the site settings and environmental permitting requirements add a degree of complexity to these specific projects. Both projects required careful coordination to maintain existing wastewater disposal operations. As a result of these factors, it is my opinion that the higher 20% cost for engineering design is appropriate.

Q. SO, IN YOUR OPINION, WHAT IS THE ADJUSTED TOTAL PROJECT COST THAT SHOULD BE RECOGNIZED IN THIS MATTER?

A. The Company claims a cost of $795,372.26. This should be reduced first by $41,023 to reflect a more efficient bid award, then by an additional $109,035.91 to discount costs that should not be allowed and finally by $88,257.62 to reflect the adjustment of engineering fees to reasonable and customary levels. The final adjusted amount is $557,055.73.

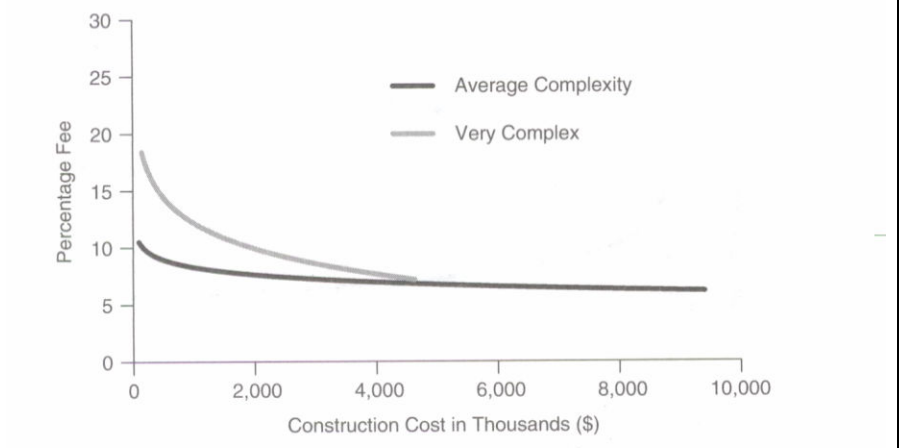
Q. DOES THIS COMPLETE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does.

SCHEDULE HJW-1		
BID TABULATION AND ANAYLSIS		
Construction Bid	**Amount**	**Notes**
Leach Field 3A/3B		
Zitone Construction	$ 327,977.00	
Brookside Excavating	$ 418,000.00	Discount Offered for the Award of Both Projects
Earthcare - All County	$ 515,250.00	
The Entech Group, Inc.	$ 540,000.00	
Leach Fields 2A/2B		
Brookside Excavating	$ 125,000.00	Discount Offered for the Award of Both Projects
Zitone Construction	$ 188,457.00	
Earthcare - All County	$ 222,450.00	
The Entech Group, Inc.	$ 250,000.00	
TOTAL - Both Projects		
Brookside Excavating	$ 512,000.00	Reflects Discount for Dual Award of $31,000
Zitone Construction	$ 516,434.00	
Earthcare - All County	$ 737,700.00	
The Entech Group, Inc.	$ 790,000.00	
Split Award Alternative		
Zitone Construction (3A/3B)	$ 327,977.00	
Brookside Excavating (2A/2B)	$ 125,000.00	
Total	$ 452,977.00	
Savings for Split Award	**$ 59,023.00**	
Construction Extras	$ (28,000.00)	RAR-E-19
Panel Included by Zitone for 3A/3B	$ 10,000.00	SR-MSC-4
Net Savings From Split Award	**$ 41,023.00**	

SCHEDULE HJW-2		
RPA DISALLOWED EXPENSES		
Project ID/Payee	**Amount**	**Explanation**
2002-400/Environtures Inc.	$ 9,999.99	Expense incurred in 2003 to pump and haul grey water during DEP ordered shut-down of Leach Fields 3A/3B. (RAR-E-6 and RAR-E-7) Not related to construction, which did not begin until May 2005. (SR-MSC-1)
2002-1267/Niclaus Engineering Corp	$ 11,007.09	Engineering Work discredited by Company and not used in the final design effort. (RAR-E-2, RAR-E-3, RAR-E-4, RAR-E-5)
2002-1267/Trenchless Rehabilitation	$ 2,745.00	Collection system maintenance expense that should not be capitalized.(RAR-E-8, RAR-E-9)
925/Coding Error Additions	$ 83,531.83	Coding Errors resulting in additional expenses being recorded against Project 925 and 1903 removed on correction provided in RAR-E-27
2240/AFUDC	$ 1,752.00	AFUDC incurred after the project in-service date. (RAR-E-30)
TOTAL	**$ 109,035.91**	

Exhibit HJW-1: ASCE Cost Curves



GRAPH 2. Design Fee vs. Construction Cost for Modifications.

Source: ASCE Manuals and Reports On Engineering Practice No. 45, Updated Edition; American Society of Civil Engineers; Reston, VA 2003; p. 43.

APPENDIX A

Detailed Discussion of Professional Qualifications

Of

Howard J. Woods, Jr., P.E.

Q. PLEASE PROVIDE A MORE DETAILED DESCRIPTION OF YOUR PROFESSIONAL EXPERIENCE.

A. From October 1977 through October 1981, I worked with the U.S. Environmental Protection Agency's Region III Water Supply Branch. In this position I developed system surveillance programs, evaluated the sanitary integrity of existing water supply facilities, provided technical assistance to water suppliers and engineers in regard to water treatment and the construction, operation and maintenance of water supply facilities. I recommended treatment techniques and the addition of sanitary facilities to municipal and investor owned utilities, coordinated emergency responses to cases of water supply contamination and was individually responsible for the implementation of the Safe Drinking Water Act in a 14 county area of Pennsylvania.

From October 1981 through May 1983, I worked as a project engineer for the engineering firm of Johnson, Mirmiran and Thompson, P.A. of Silver Spring, Maryland. While working for this firm I designed numerous water supply systems wastewater treatment and conveyance systems and storm drainage facilities. I investigated the suitability and condition of various existing water supply systems and developed comprehensive facility plans for a number of the firm's clients. In this position I functioned as a project engineer responsible for defining and carrying out engineering work necessary for the timely and accurate completion of design projects. As a client’s representative, I also bid projects involving the construction of facilities using construction documents I prepared for the client.

These were for new projects as well as for projects requiring the renovation of existing facilities.

From May 1983 through November 1984, I served as Director of Engineering for American Water Works Service Company's Eastern Division. In this position I directed the long-range planning and design functions of New York-American Water Company and New Jersey-American Water Company. I supervised the execution of engineering projects related to the design, construction, operation and maintenance of company water and sewer facilities. In this position, I was responsible for the successful completion of an annual construction budget of approximately $15 million and a facility maintenance budget of approximately $10 million. This work included the maintenance and renovation of wells in Burlington and Camden Counties and the construction of new wells in Atlantic and Warren Counties. I evaluated facilities, prepared or directed the preparation of engineering designs, pre-qualified bidders, solicited bids, and served as the Company's representative in managing construction and maintenance projects. I had authority to review and execute change orders on construction projects when actual field conditions were found to differ from anticipated conditions.

From November 1984 through December 1985, I served as Manager of Operations for the Eastern Division of American Water Works Service Company. In this position I supervised all aspects of engineering, water quality, materials management and risk management for the Company's Eastern Division. This

included the Company's operations in New York and New Jersey. I managed a $120 million maintenance and operations budget and a $20 million construction budget. I directed the procurement of engineering design services and construction services on approximately sixty major capital projects and hundreds of smaller maintenance and repair projects. During this period, I was responsible for the rehabilitation of the Company's Canoe Brook Well Field in Millburn, New Jersey. I also completed nearly $3 million in renovation work at Company wells in Burlington and Camden Counties.

From December 1985 through August of 1988, I served as System Director of Planning for American Water Works Service Company. In this position I directed the development of strategic and comprehensive plans for all American System companies located throughout the country through a staff of engineers and technical personnel working under my direction. I evaluated the suitability of existing source, treatment and distribution facilities, wastewater conveyance and treatment facilities and made long range projections concerning the need for new facilities or operational modifications to existing facilities.

In the next three assignments with American Water Works Company, I directed operations and maintenance budgets that averaged $150 million per year and capital budgets that ranged from $30 million to $120 million per year for the Company's operations in New Jersey, New York and Connecticut. Engineering designs were prepared under my direction. I directed the competitive bidding of capital and maintenance projects. The largest of these was the design and

construction of the Delaware River Regional Water Treatment Plant; a $192 million treatment plant and pipeline system that now serves much of Burlington, Camden and Gloucester Counties.

From August 1988 through April 1989, I served as Regional Manager of Engineering for American Water Works Service Company's Eastern Region. In this position I developed engineering goals and objectives for each of the Company's operating systems in Connecticut, New York and New Jersey. I analyzed operating reports to determine the status of all phases of engineering, administration, planning, design and construction necessary to meet the Company's goals and objectives in providing safe, adequate and proper water supply service.

From April of 1989 to July 1993, I served as Regional Manager of Operational Services for American Water Works Service Company's Eastern Region. In this position I was responsible for the provision of administrative, engineering, loss control, resource conservation and water quality services required by the operating companies in the Eastern Region. In this position I directed water company operations to assure compliance with approved operating and maintenance budgets, capital construction programs, long range corporate and comprehensive plans, risk exposure reduction, safety and loss control procedures, water conservation programs and water quality objectives. In this position I also served as Vice President of New Jersey-American Water Company, Connecticut-American Water Company and New York-American Water Company.

From July 1993 through May 1997, I served as Vice-President of New Jersey-American Water Company. In this position, I served as chief operations officer for the Company. I was responsible for all operations functions including production, distribution, maintenance services and commercial services. I directed a staff of 450 management and unionized employees. These responsibilities included the maintenance of over 150 wells located throughout New Jersey, several large surface water treatment facilities, nearly 100 distribution storage tanks and approximately 4,000 miles of water distribution mains. I was also responsible for the Company's sanitary sewer operations. These facilities were composed of several hundred miles of pipe and numerous pump stations. I planned and directed work required to maintain these facilities in peak operating performance. This work included electrical and mechanical maintenance associated with pumping equipment and controls.

In June of 1991, I was appointed by Governor Florio to serve as the investor-owned water supplier representative on the New Jersey Water Supply Advisory Council. The Council advises the New Jersey Department of Environmental Protection ("NJDEP," formerly the New Jersey Department of Environmental Protection and Energy") on a wide range of water supply issues such as water quality, facility construction requirements, statewide water supply planning and water supply management. Governor Whitman reappointed me to the Council 1994 and I served through mid 1997.

From May of 1997 through July 2000, I directed the acquisition and business development activities of American Water Works Service Company and a joint venture operation of the Company known as AmericanAnglian Environmental Technologies. I directed the development of bids on operations and maintenance contracts to operate municipally owned water and wastewater systems. I reviewed contract documents and directed a staff of engineers and analysts in preparing responsive bids and proposals for prospective municipal clients. In 1999, my team returned the second best business development performance in the United States and we won the largest operations and maintenance contract awarded that year (Scranton Sewer Authority, Scranton, Pennsylvania). I also directed the operations of the joint venture. This business unit was the seventh largest private municipal water and wastewater contractor in the United States. I directed the maintenance and operations functions of over 175 contracts dedicated to the operation of municipal water and wastewater utilities and industrial and commercial clients.

Since July 2000, I have worked as an independent consultant. Representative clients include the New Jersey Division of the Ratepayer Advocate, the Delaware Public Advocate, Passaic Valley Water Commission, Consumers New Jersey Water Company, PricewaterhouseCoopers LLP, BOC Gases Inc., the Pittsburgh Water & Sewer Authority/U.S. Water L.L.C., Upper Dublin Township (PA) and the Elmira (NY) Water Board.

I directed and managed the procurement process leading to the sale of a municipal wastewater system in Southeastern Pennsylvania. The Upper Dublin Township Sanitary Sewer System sold for $20,000,000. This system serves approximately 8,000 connections and has annual revenues of $3,000,000. I advised the Township on alternative outsourcing and contracting approaches, reduced interim operating expenses by 30% by renegotiating the plant operations contract prior to the sale of the system.

I completed an energy management evaluation for the Elmira (NY) Water Board and provided operator training on energy management strategies. Recommendations from the study allowed the client to reduce energy expenses by 30% through a series of operational modifications.

I completed an energy management audit of the Pittsburgh Water and Sewer Authority and identified strategies for reducing power consumption. The results of this investigation provided the foundation for the Authority and its contract manager (U.S. Water L.L.C.) to develop and implement more effective maintenance and operations procedures to reduce energy costs.

I assisted the Banco Gubernamental de Fomento para Puerto Rico, Autoridad para el Financiamiento de la Infrastructura de Puerto Rico and PricewaterhouseCoopers in developing a new operating contract for the Puerto Rico Aqueduct and Sewer Authority (PRASA). The contract was developed, bid and awarded in less than six months, cutting the normal procurement time by nearly two-thirds. The new ten-year agreement with Ondeo will allow the

government of Puerto Rico to eliminate the annual operations subsidy while service is improved. The value of the contract is $300 million per year.

I reviewed engineering plans and operational practices in numerous water and wastewater rate adjustment proceedings and quality of service proceedings for the New Jersey Division of the Ratepayer Advocate. These reviews involved an assessment of utility engineering design and construction plans, the development of alternatives to utility proposed projects, and evaluations of the utility companies' ability to render safe, adequate and proper water or wastewater service. I these proceedings, I served as a civil/water resources engineering expert:

- Acacia Lumberton Manor Fire Service Complaint
  BPU Docket No. WC01080495
- Applied Waste Water Management Rates
  BPU Docket No. WR03030222
- Applied Waste Water Management Franchise
  BPU Docket No. WE03070530
- Applied Waste Water Management Andover Franchise
  BPU Docket No. WE04111466
- Applied Waste Water Management Hillsborough Franchise
  BPU Docket No. WE04101349
- Applied Waste Water Management Oakland Franchise
  BPU Docket No. WE04111467
- Applied Waste Water Management Union Twp Franchise
  BPU Docket No. WE050414
- Aqua NJ Pine Hill Franchise
  BPU Docket No. WE05070581
- Aqua NJ Upper Freehold Franchise
  BPU Docket No. WE05100822
- Bayview Water Company Rates
  BPU Docket No. WR01120818
- Borough of Haledon Rates
  BPU Docket No. WR01080532
- City of Orange Privatization Review
  BPU Docket No. WO03080614

- Crestwood Village Loan Approval
  BPU Docket No. WF04091042
- Elizabethtown Water Co. v. Clinton Board of Adjustment
  BPU Docket No. WE02050289
- Elizabethtown Water Company Franklin Franchise
  BPU Docket No. WE05020125
- Elizabethtown Water Company Rates
  BPU Docket No. WR03070510
- Elizabethtown Water Company Purchased Water Adjustment Clause
  BPU Docket No. WR04070683
- Environmental Disposal Corporation Main Extension Agreement
  BPU Docket No. WO04091030
- Environmental Disposal Corporation Rates
  BPU Docket No. WR04080760
- Fayson Lake Water Company Rates
  BPU Docket No. WR03040278
- Gordon's Corner Water Company Rates
  BPU Docket No. WR03090714
- Lake Valley Water Company Rates
  BPU Docket No. WR04070722
- Middlesex Water Company Rates
  BPU Docket No. WR03110900
- Middlesex Water Company Rates
  BPU Docket No. WR05050451
- Mount Holly Water Company Rates
  BPU Docket No. WR03070509
- Montague Water & Sewer Companies Rates
  BPU Docket Nos. WR03121034 & WR03121035
- Mount Olive Villages Water & Sewer Franchise
  BPU Docket No. WE03120970
- New Jersey American Water Company Rates
  BPU Docket No. WR03070511
- New Jersey American Water Company Purchased Water Adjustment & Purchased Sewage Treatment Adjustment Clauses
  BPU Docket No. WR04070684
- Parkway Water Company Rates
  BPU Docket No. WR05070634
- Pinelands Water Company Rates
  BPU Docket No. WR03121016
- Pinelands Wastewater Company Rates
  BPU Docket No. WR03121017
- Seabrook Water Company Franchise
  BPU Docket No. WC02060340
- United Water Acquisitions Evaluation
  BPU Docket No. WM02060354

I prepared a long-range water supply needs forecast for the Passaic Valley Water Commission. I analyzed water use patterns within the Commission's retail service area and for over two dozen large contract customers. I produced population forecasts for the service area and individual water demand forecasts for each contract sale-for-resale customer using statistical and numeric forecasting techniques. The forecast projects total annual demand, average day, maximum month and maximum day demands and forms the basis for other ongoing facility and operations planning efforts. Current efforts involve the preparation and support of a renewed surface water diversion permit for the Commission which will support more flexible operations and more efficient source utilization. The Commission serves a retail service population of 325,000 and effectively serves an additional 260,000 people through sale-for-resale connections.

I have also developed, on behalf of Passaic Valley Water Commission, a model of the major water resources facilities in the Passaic, Pompton, Ramapo and Hackensack River Basin that allows the calculation of the safe and dependable yield of the Wanaque/Monksville, Point View and Oradell Reservoir systems under varying drought conditions. The model is being used by Passaic Valley Water Commission to evaluate long term water supply management strategies and to plan for future water supply needs.