Application of Pennsylvania-American Water Company for Acquisition of the Wastewater Assets of Upper Pottsgrove Township
66 Pa. C.S. § 1329
Application Filing Checklist – Water/Wastewater
Docket No. A-2020-3021460

5. Provide copies of two independent appraisals by separate utility valuation experts for use in establishing the fair market value of the Selling Utility.

RESPONSE: See enclosed appraisals performed by Jerome C. Weinert, P.E., Principal and Director for AUS Consultants on behalf of PAWC at **Appendix A-5.1** and by Harold Walker III, Manager – Financial Studies for Gannett Fleming on behalf of Upper Pottsgrove at **Appendix A-5.2**.

Jerome C. Weinert
Principal & Director

AUS Consultants
Depreciation and Valuation
8555 West Forest Home Avenue
Suite 201
Greenfield, WI 53228
Telephone 414-529-5755
Fax 414-529-5750
Cell 414-698-8371

E-Mail weinertj@auswest.net

October 23, 2020

Mr. Scott D. Fogelsanger
Senior Manager - Business Development
Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

RE: UVE Market Value Appraisal of Upper Pottsgrove Township's Wastewater Collection System

Enclosed is AUS Consultants' fair market value appraisal report for Upper Pottsgrove Township's wastewater collection system (System) as of April 28, 2020 prepared for Pennsylvania American Water Company (PAWC). The report was prepared based on the 2020-2021 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) Paragraph 1329 "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission.

Based on our appraisal the Fair Market Value of Upper Pottsgrove Township's wastewater collection system's property, plant, and equipment operating as a Pennsylvania rate regulated wastewater utility is $17,023,691 determined based on the cost, income, and market approaches to value, as detailed in the following table:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

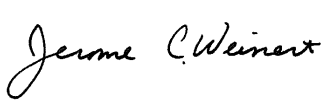
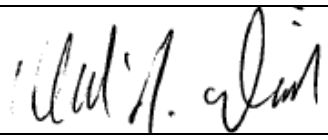
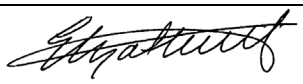
Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (7-2019)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (9-30-2019)				
Replacement Cost New (COR)		25,786,184		
Depreciated Replacement Cost New (CORLD)	**$**	**18,460,028**		
Cost Approach Conclusion		**18,460,028**	**50%**	**9,230,014**
Income Approach				
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)		15,611,283		
Income Approach Conclusion		**15,611,283**	**40%**	**6,244,513**
Market Approach				
Market Comparables (to)				
OCLD		23,539,850		
CORLD		17,167,826	Use	
Customers		12,393,612	Use	
Cash Flows (EBITDA)		16,913,468	Use	
Market Financials (to)				
OCLD		32,602,692		
Market Approach Conclusion		**15,491,635**	**10%**	**1,549,164**
Appraisal Conclusion	**$**	**17,023,691**	**100%**	**17,023,691**
Conclusion (cost approach)	**$**	**18,460,028**		

As the purpose of this appraisal was to fulfill the requirements of Act 12 in the establishment of value for rate making of the Upper Pottsgrove Township's wastewater collection system's property, plant and equipment the appraisal's conclusion of $17,023,691 is consistent with the purpose of this appraisal. As the cost approach work papers detail our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property this detail can be used to allocate the appraisal conclusion to establish the booked value for future accounting and rate making.

Respectfully Submitted,
AUS Consultants, Depreciation & Valuation
October 23, 2020

By:

	
Jerome C. Weinert, AM, P.E., CDP Principal and Director	David A. Sheffer Principal
	
Michael J. Diedrich, ASA, P.E., CDP Certified General Appraiser Principal	Elizabeth A. Weinert Associate

ASA: Accredited Senior Appraiser in the Machinery and Equipment (Public Utilities) discipline of the American Society of Appraisers
AMA: Accredited Member Appraiser in the Machinery and Equipment (Public Utilities) discipline of the American Society of Appraisers
P.E.: Registered Professional Engineer State of Wisconsin
CDP: Certified Depreciation Professions in the Society of Depreciation Professionals

Upper Pottsgrove Township's (Pennsylvania) Wastewater Collection System

Fair Market Value Appraisal Report
As of April 28, 2020
for
Pennsylvania American Water Company

AUS Consultants
Depreciation and Depreciation
8555 West Forest Home Avenue Suite 201
Greenfield, Wisconsin 53228
Office: 414-529-5755
Cell: 414-698-8371
E-Mail: weinertj@auswest.net

AUS CONSULTANTS

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October 24, 2020

Pennsylvania American Water Company
Mechanicsburg, Pennsylvania

AUS Consultants
Depreciation and Valuation
8555 West Forest Home Avenue
Suite 201
Greenfield, WI 53228
Telephone 414-529-5755
Fax 414-529-5750
Cell 414-698-8371
E-Mail weinertj@auswest.net

RE: UVE Market Value Appraisal of Upper Pottsgrove Township's Wastewater Collection System

Enclosed is AUS Consultants' fair market value appraisal report of the Upper Pottsgrove Township's (Pennsylvania) wastewater collection system (System) as of April 28, 2020 prepared for our client Pennsylvania American Water Company (PAWC). The report was prepared based on the 2020-2021 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated (PA CS) Statues Section 1329 "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission.

Based on our appraisal, the Fair Market Value of the Upper Pottsgrove Township's (Pennsylvania) wastewater collection system's property, plant, and equipment operating as Pennsylvania rate regulated wastewater utility is $17,023,691 determined based on the cost, income, and market approaches to value, as detailed in the following table:

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (7-2019)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (9-30-2019)				
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Market Comparables (to)				
OCLD		23,539,850		
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Market Financials (to)				
OCLD		32,602,692		
Market Approach Conclusion		**15,491,635**	**10%**	**1,549,164**
Appraisal Conclusion	$	**17,023,691**	**100%**	**17,023,691**
Conclusion (cost approach)	$	**18,460,028**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of the Upper Pottsgrove Township's wastewater collection system's property, plant and equipment this appraisal's conclusion of $17,023,691 is consistent with the purpose of the appraisal. As the cost approach work papers detail our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property, this detail can be used to allocate the appraisal conclusion to establish the booked value for future accounting and rate making.

Respectfully Submitted,
AUS Consultants, Depreciation & Valuation
October 23, 2020

By:

Jerome C. Weinert, AM, P.E., CDP Principal and Director	David A. Sheffer Principal
Michael J. Diedrich, ASA, P.E., CDP Certified General Appraiser Principal	Elizabeth A. Weinert Associate

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APPRAISAL CERTIFICATION
for the Fair Market Appraisal of
The Upper Pottsgrove Township Pennsylvania's
Wastewater Collection System
As of April 28, 2020
Prepared for
Pennsylvania American Water Company

AUS Consultants, Depreciation & Valuation, certifies that, to the best of its knowledge and belief:

- The statements of fact contained in this report are true and correct.

- Prior to this appraisal during the last three-year period, AUS Consultants has previously appraised these properties.

- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.

- Neither AUS Consultants, Depreciation & Valuation, nor its professional staff has no present or prospective interest in the property that is the subject of this report and has no personal interest with respect to the parties involved.

- Neither AUS Consultants, Depreciation & Valuation, nor its professional staff has any bias with respect to the property that is the subject of this report or to the parties involved.

- Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

- Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice 2020-2021 Edition.

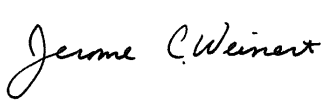
- The signers of this report has made personal inspections of the property that is the subject of this report.

AUS CONSULTANTS

- No individuals provided significant professional assistance to the persons signing this report. However, Scott Fogelsanger of Pennsylvania American Wastewater Company provided assistance in obtaining information and data from the Upper Pottsgrove Township, Pennsylvania and the Engineer's Assessment report prepared by LTL Consultants and AUS Consultants which was the inventory starting point of the Cost Approach.

AUS Consultants, Depreciation & Valuation
October 23, 2020

By: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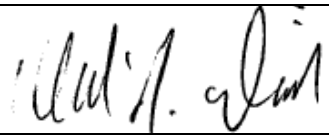	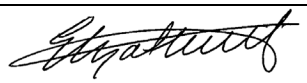
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AUS CONSULTANTS

NARRATIVE REPORT

EXECUTIVE SUMMARY

The purpose of this value appraisal is the determination of the fair market value of the property plant and equipment of the Upper Pottsgrove Township's wastewater collection system (System) for our client Pennsylvania American Water Company (PAWC). The report was prepared based on the 2020-2021 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues Paragraph 1329: "Valuation of acquired water and wastewater systems", collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12) and the Pennsylvania Public Utility Commission's Final Implementation Order M-2016-2543193 adopted October 27, 2016. The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission (PA PUC).

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress." The Appraisal of Real Estate, 14th Edition, page 58.*

In arriving at our opinion of value of the System's property, plant, and equipment as it is operated as an investor-owned Pennsylvania PUC rate regulated wastewater utility the cost, income, and market approaches to value were considered. Detailed explanations of each approach to value are included below in the section "Appraisal Procedures and Results". The following summarizes the data, analysis and conclusions of each of those valuation approaches.

Cost Approach - The philosophy in the cost approach to value is that the maximum value of a property's tangible assets is established by the cost to acquire or build a similar property. In this appraisal, the cost approach to value was analyzed using reproduction/replacement cost approach.

Reproduction cost and replacement cost are defined as:

> Reproduction cost – "Reproduction cost is the estimated cost to construct, as of the effective appraisal date, an exact duplicate or replica of the building [property] being appraised, insofar as possible, using the same materials, construction standards, design, layout, and quality of workmanship and embodying all the deficiencies, super-adequacies, and obsolescence of the subject improvements [property]."[1]
>
> Replacement cost – "Replacement cost is the estimated cost to construct, as of the effective appraisal date, a substitute for the building [property] being appraised using contemporary materials, standards, design and layout. When this cost basis is used, some existing obsolescence in the property may be cured. Replacement cost may be the only alternative if reproduction cost cannot be estimated"[2]
>
> In the wastewater industry the property's reproduction costs and replacement costs are quite similar; therefore, the property's cost new was determined based on its replacement cost new estimated by the trended original cost and the inventory-unit cost methods.

The trended original cost method was utilized in preparing the replacement cost new. "Trending is a method of estimating a property's replacement cost new in which an *index* or *trend factor* is applied to the property's *historical costs* to convert the known historical costs into an indication of current (appraisal date) costs. Simply put, trending reflects the movement of price over time."[3] In the trended original cost method, Upper Pottsgrove Township's investment in wastewater collection plant and equipment is restated to costs reflective of the appraisal date, by the application of cost trends to the property's original investment. AUS Consultants utilized the Engineer's Assessment performed by LTL Consultants and AUS Consultants (Engineer's Assessment tab) as the starting point of the Cost Approach. Utilizing the Engineer's Assessment AUS Consultants developed the System's original cost less depreciation (OCLD) and replacement cost new less depreciation (CORLD) in property, plant and equipment at April 28, 2020 (Cost Approach tab).

[1] The Appraisal of Real Estate, 14th Edition. pages 569-570
[2] Ibid, page 570
[3] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Third Edition. Page 50

The cost trends were applied to each of the System's various investment categories (NARUC plant accounts) by original year of placement for that investment. The cost indexes used in these studies were the Handy-Whitman Index of Public Utility Construction Costs for the water industry in the northeastern region of the United States which includes the Commonwealth of Pennsylvania, the AUS General Plant Indexes, and various United States Bureau of Labor Statistics (US BLS) indexes as detailed in the following table:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3)				
		(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input
353.00	Land & Land Rights	USBLS	PPI	3.00	USBLS3	1.00
354.00	Stuctures & Improvements - Pumping	HW	W-1	15.00	HWW-115	1.00
355.00	Generating Equipment	USBLS	PPI	4.00	USBLS4	1.00
360.10	Collection Sewers - Force - Mains - 4" & Under	HW	W-1	44.00	HWW-144	1.00
360.20	Collection Sewers - Force - Mains - 6"-8"	HW	W-1	44.00	HWW-144	1.00
360.90	Collection Sewers - Force - Air Release Valve	HW	W-1	44.00	HWW-144	1.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	HW	W-1	44.00	HWW-144	1.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	HW	W-1	44.00	HWW-144	1.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	HW	W-1	44.00	HWW-144	1.00
361.98	Collection Sewers - Gravity - Manholes	HW	W-1	45.00	HWW-145	1.00
361.99	Collection Sewers - Gravity - Miscellaneous	HW	W-1	44.00	HWW-144	1.00
363.00	Service Laterals	HW	W-1	39.00	HWW-139	1.00
380.00	Treatment and Disposal Equipment Purchased Capacity	HW	W-1	17.00	HWW-117	1.00

Using the trended original cost method, the System's investment in plant, property and equipment of $15,295,347 was determined to have a reproduction cost new of $25,786,184 as summarized in the following table:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(9)	(10)	(13)	(14)	(15) Reproduction Cost New (RCN) to Replacement Cost New (COR)	(16)
Account	Account	Asset Description	Original Cost	Costing Parameter	Cost Translator	Reproduction Cost New (RCN)		Replacement Cost New (COR)
			OC $s			RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input			AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Original Cost	Cost Index Table	Translator	RCN	COR / RCN Factor	COR
353.00	353.00	Land & Land Rights	8,865	USBLS3	15.32	135,794	1.00	135,794
354.00	354.00	Stuctures & Improvements - Pumping	1,612,326	HWW-115	1.48	2,380,438	1.00	2,380,438
355.00	355.00	Generating Equipment	47,512	USBLS4	1.45	69,012	1.00	69,012
360.10	360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	HWW-144	1.58	309,812	1.00	309,812
360.20	360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	HWW-144	1.39	610,719	1.00	610,719
360.90	360.90	Collection Sewers - Force - Air Release Valve	11,934	HWW-144	1.22	14,511	1.00	14,511
361.11	361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	HWW-144	1.62	7,196,371	1.00	7,196,371
361.12	361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	HWW-144	1.61	1,752,280	1.00	1,752,280
361.13	361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	HWW-144	1.30	966,046	1.00	966,046
361.98	361.98	Collection Sewers - Gravity - Manholes	1,586,684	HWW-145	1.40	2,220,312	1.00	2,220,312
361.99	361.99	Collection Sewers - Gravity - Miscellaneous	261,971	HWW-144	1.36	355,575	1.00	355,575
363.00	363.00	Service Laterals	1,731,294	HWW-139	1.63	2,819,318	1.00	2,819,318
380.00	380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	HWW-117	2.23	6,955,996	1.00	6,955,996
		Total Upper Pottsgrove Township Wastewater Utility	15,295,347			25,786,184		25,786,184

Replacement Cost New Less Depreciation - The replacement cost described above reflects the cost of new property; however, Upper Pottsgrove Township's wastewater collection system property is not new and has experienced normal depreciation and potentially functional and/or economic obsolescence. These various forms of depreciation are defined as follows:

> Normal depreciation/deterioration, akin to physical deterioration, is "loss in value caused by wear, tear, age and use."[4]
>
> Functional obsolescence is "the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more efficient of less costly replacement property that new technology has developed."[5]

[4] The Dictionary of Real Estate Appraisal, 4th Edition
[5] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 67.

> Economic, or external, obsolescence is defined as "a loss in value caused by factors outside a property"[6] and is most often indicated by insufficient earning.

Based on our experience in regard to water and wastewater depreciation studies and our analysis of Upper Pottsgrove Township's wastewater collection system operating performance; we found that the Upper Pottsgrove Township's wastewater utility's property experiences normal depreciation but not any significant functional obsolescence; economic obsolescence is best evaluated after the results of the income and market approaches to values are determined (see Cost Approach Revisited).

The service lives used in the depreciation and functional obsolescence calculations were developed based on the property and its use, AUS Consultants' experience in developing depreciation studies for the water and wastewater industries and depreciation studies filed with PAWC and Aqua America rate cases. With each of their recent rate case filings PAWC and Aqua America have filed depreciation studies in support of their depreciation service lives and associated depreciation expenses contained within their revenue requirements. The depreciation studies were prepared by Gannett Fleming Rate Consultants a recognized firm in the depreciation consulting area. AUS Consultants has reviewed the PAWC studies which are summarized in the following table:

[6] The Appraisal of Real Estate, 13th Edition, page 442.

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)		(5)	(6)	
		(4a)	(4b)		(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence	Tax Depreciation	
			years	% of CORLD	Table	Life
353.00	Land & Land Rights	ZNonDep	0.00	0.00%	Non-Depr	0.00
354.00	Stuctures & Improvements - Pumping	R4.0	55.00	0.00%	MACRS	25.00
355.00	Generating Equipment	R3.0	35.00	0.00%	MACRS	25.00
360.10	Collection Sewers - Force - Mains - 4" & Under	R3.0	75.00	0.00%	MACRS	25.00
360.20	Collection Sewers - Force - Mains - 6"-8"	R3.0	75.00	0.00%	MACRS	25.00
360.90	Collection Sewers - Force - Air Release Valve	R3.0	45.00	0.00%	MACRS	25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	R2.5	80.00	0.00%	MACRS	25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	R2.5	80.00	0.00%	MACRS	25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	R2.5	80.00	0.00%	MACRS	25.00
361.98	Collection Sewers - Gravity - Manholes	S2.0	80.00	0.00%	MACRS	25.00
361.99	Collection Sewers - Gravity - Miscellaneous	R2.5	80.00	0.00%	MACRS	25.00
363.00	Service Laterals	R3.0	70.00	0.00%	MACRS	25.00
380.00	Treatment and Disposal Equipment Purchased Capacity	R2.0	45.00	0.00%	MACRS	25.00

Normal Depreciation – The extent of the normal depreciation in the property was evaluated using age-life depreciation techniques. In age-life depreciation, the property's depreciation or condition is estimated using the following formulas:

$$\text{Depreciation (\%)} = \frac{\text{Age (years)} \times 100\%}{\text{Service Life (years)}}$$

$$\text{Condition (\%)} = \frac{\text{Remaining Life (years)} \times (100\%)}{\text{Service Life (years)}}$$

where: the property's Service Life = Age + Remaining Life and
Remaining Life = *f*(Survival Characteristic, Service Life, and Age)

However, due to the age of some of the assets the extent of the depreciation was limited to 85% of the asset's original cost and its replacement cost new.

When the above depreciation lives are used to quantify the property's depreciation is applied to the replacement cost new (COR) of $25,786,184 the resultant COR less normal depreciation (CORLD) was found to be $18,460,028 detailed as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(21)	(22)	(23)	(24)	(28)	(29)	(30)	(31)
Account	Description	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)
		years	COR $s		years	years	years	% of COR	CORLD $s
Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	LTL Consultants & AUS Consultants Engineers Assessment		Col (16)	AUS Input	AUS Input		Col (21) + (28)	Col (28) / (29)	Col (22) * (30)
Account	Description	Age	RCN	Iowa	NL	Rem Life	Total Life	Condition	CORLD
353.00	Land & Land Rights	18.00	135,794	ZNonDep	-	-	-	-	135,794
354.00	Stuctures & Improvements - Pumping	13.83	2,380,438	R4.0	45.81	32.29	46.12	45.81	1,664,609
355.00	Generating Equipment	19.70	69,012	R3.0	35.00	17.16	36.85	35.00	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	19.44	309,812	R3.0	75.00	56.77	76.20	75.00	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	13.63	610,719	R3.0	75.00	62.06	75.69	75.00	500,882
360.90	Collection Sewers - Force - Air Release Valve	10.00	14,511	R3.0	45.00	35.43	45.43	45.00	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	18.81	7,196,371	R2.5	80.00	62.82	81.63	80.00	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	18.26	1,752,280	R2.5	80.00	63.35	81.61	80.00	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	12.51	966,046	R2.5	80.00	68.46	80.97	80.00	816,806
361.98	Collection Sewers - Gravity - Manholes	16.61	2,220,312	S2.0	80.00	63.62	80.23	80.00	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	11.60	355,575	R2.5	80.00	69.16	80.76	80.00	304,770
363.00	Service Laterals	16.54	2,819,318	R3.0	70.00	54.20	70.74	70.00	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	21.72	6,955,996	R2.0	45.00	27.27	48.99	45.00	3,924,943
			25,786,184						18,460,028

The preliminary cost approach to value of Upper Pottsgrove Township's wastewater system property was found to be $18,460,028.

Income Approach

The income approach to value establishes the value of the property based on its economic returns. There are two generally accepted procedures in performing an income analysis: the direct capitalization of anticipated income, and the discounted cash flow procedures.

In the direct capitalization approach, anticipated earnings are capitalized directly into value using a market-required capitalization rate. The Upper Pottsgrove Township's wastewater system's operation will be moving from a municipal operation, wherein economic returns are not the primary objective of the operation to a private (investor owned) rate regulated sewer utility operation in which economic returns are one of the objectives of the operation; therefore, the direct capitalization of earnings approach was not utilized in this appraisal.

In the discounted cash flow (DCF) approach, the property's economic returns are forecast for future periods. The cash flows (debt-free after-tax net cash flows) from operations are discounted to the appraisal date using a market derived discount rate resulting in the DCF approach's income indicator of value. Use of the DCF approach allows the appraiser to address the property's historical operating experience and its migration, in future periods, to an operation as a rate regulated income taxed (local, state, and federal) operation; thus, making the DCF approach preferable in this case.

In preparing this appraisal's DCF analysis (Income Approach tab), first the results from the Upper Pottsgrove Township's wastewater system's operations were evaluated based on an analysis of historical operating performances over the period 2013 through 2019 (Financials tab) resulting in operating statistics such as revenues and their growth, various operating expenses stated as function of their typical drivers (revenues, plant investment, income from operations, etc.). Next, the results of future periods operations were forecast for a period of 20 years based on the migration of the Upper Pottsgrove Township's historical operations over time to operations of the wastewater operation similar to a public investor-owned water/wastewater utility. Finally, the resultant cash flows from future period operations on the System were discounted to the appraisal date using a market derived discount rate for a public investor-owned water/wastewater utility. The following table details the market discount rate developed using the weighted average cost of capital (WACC) of the market debt and equity:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	**100.0%**						**8.09%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.16%**

The following table presents the results of the discounted cash flow analysis:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate: 8.09%
Capitalization Rate: 6.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
					(3)-(4)	(6)-(5)	(7) *28.89%			(3)-(4)-(8)-(9)-(10)		(11)*(12)	Sum (13)
1	0.5	1,488,089	365,169	595,743	1,122,920	527,177	152,301	191,054	796	778,769	0.962	749,176	749,176
2	1.5	1,726,183	376,124	602,538	1,350,059	747,521	215,959	192,660	12,857	928,583	0.89	826,439	1,575,615
3	2.5	1,743,445	387,408	609,455	1,356,037	746,582	215,688	194,235	932	945,182	0.823	777,885	2,353,500
4	3.5	1,760,879	399,030	616,496	1,361,849	745,353	215,332	195,825	941	949,751	0.762	723,710	3,077,210
5	4.5	1,778,488	411,001	623,664	1,367,487	743,823	214,890	197,427	952	954,218	0.705	672,724	3,749,934
6	5.5	1,974,122	423,331	630,961	1,550,791	919,830	265,739	199,042	10,563	1,075,447	0.652	701,191	4,451,125
7	6.5	1,993,863	436,031	623,251	1,557,832	934,581	270,000	145,622	1,067	1,141,143	0.603	688,109	5,139,234
8	7.5	2,013,802	449,112	628,997	1,564,690	935,693	270,322	146,852	1,077	1,146,439	0.558	639,713	5,778,947
9	8.5	2,154,768	462,585	634,846	1,692,183	1,057,337	305,465	148,092	7,611	1,231,015	0.516	635,204	6,414,151
10	9.5	2,176,316	476,463	640,799	1,699,853	1,059,054	305,961	149,342	1,164	1,243,386	0.478	594,339	7,008,490
11	10.5	2,198,079	490,757	646,857	1,707,322	1,060,465	306,368	150,604	1,175	1,249,175	0.442	552,135	7,560,625
12	11.5	2,351,945	505,480	653,021	1,846,465	1,193,444	344,786	151,875	8,309	1,341,495	0.409	548,671	8,109,296
13	12.5	2,375,464	520,644	659,295	1,854,820	1,195,525	345,387	153,160	1,270	1,355,003	0.378	512,191	8,621,487
14	13.5	2,399,219	536,263	665,679	1,862,956	1,197,277	345,893	154,457	1,283	1,361,323	0.350	476,463	9,097,950
15	14.5	2,567,164	552,351	672,173	2,014,813	1,342,640	387,889	155,763	9,069	1,462,092	0.324	473,718	9,571,668
16	15.5	2,592,836	557,875	575,782	2,034,961	1,459,179	421,557	157,077	1,386	1,454,941	0.299	435,027	10,006,695
17	16.5	2,618,764	563,454	581,310	2,055,310	1,474,000	425,839	158,408	1,400	1,469,663	0.277	407,097	10,413,792
18	17.5	2,802,077	569,089	586,929	2,232,988	1,646,059	475,547	159,746	9,900	1,587,795	0.256	406,476	10,820,268
19	18.5	2,830,098	574,780	592,646	2,255,318	1,662,672	480,346	161,099	1,512	1,612,361	0.237	382,130	11,202,398
20 and beyond	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,698	2.707	4,408,885	15,611,283
								3,324,802					
Age				19.5									
PW(Age) = 1/(1+Discount Rate)$^{(Age)}$				0.219				Net Plant		10,732,792			
PW to Perpetuity = 1/Capitalization Rate				12.361				ADIT		(1,762,467)			
$PW_{(20and\ Beyond)}$ = PW to Perpetuity * $PW\ Factor_{(19.5)}$				2.707				Rate Base		8,970,325	0.219	1,964,501	13,166,899
								Annual Plant Construction Inflation Rate		0.0422 Input			
								Plant Inflation over 19.5 years		20,503,573	0.219	4,490,282	15,692,680
								PP	13,750,000				
								OCLD	11,769,925				
								PP/OCLD	1.168				
								RCNLD	18,460,028				
								RCNLD/PP		1.342547521			
										12,043,087.31	0.219	2,637,436	13,839,834
								Average					14,577,674

Based on the above described discounted cash flow analysis, the Income Approach to value of the System's property operating as a rate regulated wastewater utility under the regulation of the Pennsylvania Public Utility Commission (PA PUC) was determined to be $15,611,283. To ensure that the above described forecast captured the entire economic returns of the property an additional 40-year period beyond the original 20-year forecast was made. This additional forecast indicated the reasonableness of the initial forecast results.

Market Approach

The market or comparable sales approach to value looks to market sales of comparable properties in order to arrive at value. In this appraisal, the market approach was

addressed from a comparable sales approach of Pennsylvania water and wastewater systems and market value to book value ratios based on investor owned water utilities' financial performance as reported in Value Line Investment Survey (April 10, 2020).

Market Sales – In the comparable sale market approach, the sales of Pennsylvania municipal water and wastewater systems to investor owned water/wastewater utilities were used to insure comparability. As the purpose of this appraisal is to define the value of Upper Pottsgrove Township's wastewater collection system under Section 1329 of the PA CS the market comparable sales were limited to sales subsequent to the passage of Section 1329 in 2016. The following sales were considered:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Approximate Date	Buyer	Seller	County	Type of Facility	Initial Purchase Price	Final Purchase Price[1]	Number of Total Customers	OCA Market Value per customer	Relationship to the passage of Section 1329	Average Purchase Price per Customer
6/1/2016	PA American Water	City of McKeesport	Allegheny	Wastewater Collection and Treatment	180,000,000	159,000,000	21,953	7,197	Post	7,242.75
8/1/2016	Aqua PA	New Garden Twp. SA	Chester	Wastewater Collection and Paid for and Owned Treatment	29,500,000	29,500,000	2,106	14,008	Post	14,007.60
12/1/2017	Aqua PA	Limerick Township	Montgomery		64,373,000	64,373,000	5,434	11,846	Post	9,264
12/10/2017	Aqua PA	East Bradford Township	Chester	Wastewater Collection and paid for treatment Capacity	5,000,000	5,000,000	1,248	4,006	Post	4,006.41
	SUEZ	Mahoning	Carbon	Water Treatment and Distribution System	4,734,800	4,734,800	2,806		Post	
	SUEZ	Mahoning	Carbon	Wastewater Collection and Treatment	4,765,200	4,765,200	2,806		Post	
6/1/2018	Aqua PA	Cheltenham	Montgomery	Wastewater Collection	50,250,000	50,250,000	10,500		Post	4,785.71
11/14/2018	PA American Water	Steelton	Dauphin	Water Distribution and Treatment	22,500,000	21,750,000	2,325		Post	9,354.84
	PA American Water	Sadsbury	Chester	Wastewater Collection	9,250,000	8,600,000	998		Post	8,617.23
5/28/2018	PA American Water	Exeter	Berks	Wastewater Collection and Treatment	96,000,000	96,000,000	9,000		Post	10,666.67
10/29/2018	Aqua PA	East Norriton	Montgomery	Wastewater Collection	21,000,000	21,000,000	4,950		Post	4,242.42
9/30/2018	PA American	Kane	McKean	Wastewater Collection and Treatment	17,560,000	17,560,000	2,006		Post	8,753.74
12/10/2019	PA American	Royersford	Montgomery	Wastewater Collection and Treatment	13,000,000	13,000,000	1,596		Post	8,145.36
12/17/2019	PA American	Valley	Chester	Water Treatment and Distribution System	7,325,000	7,325,000	1,459		Post	5,020.56
12/17/2019	PA American	Valley	Chester	Wastewater Collection System	13,950,000	13,950,000	1,644		Post	8,485.40

In order to arrive at a measure of comparability these system sales were analyzed in relationship of the purchase price to the properties' depreciated original cost (OCLD) and depreciated replacement cost (CORLD) (Market Approach tab).

Financial Market Ratios – In the market approach based on market financial ratios the market data of companies (nine) in the water/wastewater industry as reported in Value Line Investment Surveys (April 2020) were analyzed. In the analysis the companies' stock (market) and debt (book value) per share are compared as a ratio to the book investment value per share.

The following table summarizes both the comparable sales and financial market ratio analysis and the Market Approach conclusion of this appraisal:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Central Tendancy and Reliability Analysis

Market Sales Analysis - PP/OCLD

	Simple	Weighted	
Mean	2.082	1.9992	
Standard Deviation	0.8607	0.6008	
Median	1.608	1.5597	
Mode	Not Applicable	1.5601	
Conclusion		2.0000	AUS Input
Upper Pottsgrove Township OCLD		11,769,925	Cost Approach - OCLD
Market Value Indication		**23,539,850**	

Market Sales Analysis - PP/CORLD

	Simple	Weighted	
Mean	0.813	0.9285	
Standard Deviation	0.1852	0.1086	
Median	0.8908	0.9637	
Mode	Not Applicable	0.9919	
Conclusion		0.93	AUS Input
Upper Pottsgrove Township CORLD		18,460,028	Cost Approach - CORLD
Market Value Indication		**17,167,826**	

Market Sales Analysis - PP/Customer

	Simple	Weighted	
Mean	7441	9,157	
Standard Deviation	4031	3,158	
Median	8221	6,322	
Mode	Not Applicable	7,825	
Forecast	7,251		
Conclusion		8,679	Valley Wastewater Info
Upper Pottsgrove Township Customers		1,428	AUS Input
Market Value Indication		**12,393,612**	

Financial Basis[1]

Financial Markets	Market Value per Share to Book Value per Share	
Market to Book (equity and debt)	2.77	
Use (equity and debt)	2.77	AUS Input
Upper Pottsgrove Township OCLD	11,769,925	Cost Approach - OCLD
Market Value Indication	**32,602,692**	

Market Sales Analysis - PP/Cash Flows (EBITDA)

	Simple	Weighted	
Mean	22.38	21.58	
Standard Deviation	11.60	8.02	
Median	20.93	13.52	
Mode	Not Applicable	Not Applicable	
Forecast			
Conclusion		22.00	AUS Input
Upper Pottsgrove Township Cash Flows		768,794	Income Approach
Market Value Indication		**16,913,468**	

Summary of Market Analyses

Indicators		
OCLD	23,539,850	
CORLD	17,167,826	Use
Customers	12,393,612	Use
Cash Flows	16,913,468	Use
Value Line	32,602,692	
Mean	20,523,490	15,491,635
Median	17,167,826	16,913,468
Conclusion	**17,167,826**	15,491,635

The market approach conclusion of this appraisal was determined to be $15,491,635.

Cost Approach Revisited – Before concluding this appraisal's fair market value, the preliminary cost approach conclusion of $18,460,028 needs to be reviewed in light of the above described income and market analyses in order to evaluate if external obsolescence exists in the preliminary replacement cost new less depreciation conclusion. The appraisal literature in regard to developing a cost approach states:

> "The last step in the implementation of the cost approach is to estimate *economic obsolescence*. Economic obsolescence (sometimes called "external obsolescence") has been previously defined as the loss in value or usefulness of a property caused by factors external to the asset. These factors include increased cost of raw materials, labor, utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; environmental or other regulations; or similar factors.
>
> The difficulty in measuring the full effect of economic obsolescence is one of the weaknesses of the cost approach. Because economic obsolescence is usually a function of outside influences that affect an entire business (i.e., all tangible and intangible assets) rather than individual assets or isolated groups of assets, it is sometimes measured using the income approach or by using the income approach to help identify the existence of economic influences on value. However, the cost approach can be used to measure some forms of economic obsolescence."[7]

The above described income approach value conclusion of $15,611,283 and the market approach conclusion of $15,491,635 for the Upper Pottsgrove Township's future wastewater system compared to the preliminary cost approach conclusion of $18,460,028 indicates no significant external obsolescence exists in the cost approach conclusion of $18,460,028 detailed as follows:

[7] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, pp. 96-97.

Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value

(36)	(37)	(39)	(40)	(41)
Account	Description	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
		CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Prelim CORLD	EO%	FMV
353.00	Land & Land Rights	135,794	0.00%	135,794
354.00	Stuctures & Improvements - Pumping	1,664,609	0.00%	1,664,609
355.00	Generating Equipment	32,303	0.00%	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	231,310	0.00%	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	500,882	0.00%	500,882
360.90	Collection Sewers - Force - Air Release Valve	11,317	0.00%	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	5,551,319	0.00%	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,361,639	0.00%	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	816,806	0.00%	816,806
361.98	Collection Sewers - Gravity - Manholes	1,762,386	0.00%	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	304,770	0.00%	304,770
363.00	Service Laterals	2,161,952	0.00%	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	3,924,943	0.00%	3,924,943
		18,460,028		18,460,028

Value Conclusion

The Fair Market Value of the Upper Pottsgrove Township's wastewater collection system's property, plant and equipment and its operation was determined to be $17,023,691 as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (7-2019)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (9-30-2019)				
Replacement Cost New (COR)		25,786,184		
Depreciated Replacement Cost New (CORLD)	**$**	**18,460,028**		
Cost Approach Conclusion		**18,460,028**	**50%**	**9,230,014**
Income Approach				
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)		15,611,283		
Income Approach Conclusion		**15,611,283**	**40%**	**6,244,513**
Market Approach				
Market Comparables (to)				
OCLD		23,539,850		
CORLD		17,167,826	Use	
Customers		12,393,612	Use	
Cash Flows (EBITDA)		16,913,468	Use	
Market Financials (to)				
OCLD		32,602,692		
Market Approach Conclusion		**15,491,635**	**10%**	**1,549,164**
Appraisal Conclusion	**$**	**17,023,691**	**100%**	**17,023,691**
Conclusion (cost approach)	**$**	**18,460,028**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of the Upper Pottsgrove Township's property, plant and equipment this appraisal's conclusion of $17,023,691 is consistent with the purpose of the appraisal. As the cost approach work papers detail our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the wastewater industry account classifications and the installation year of the property this detail can be used to allocate the appraisal conclusion to establish the booked value for future accounting and rate making.

PURPOSE AND SCOPE OF WORK

The purpose of this appraisal of the Upper Pottsgrove Township's wastewater collection and treatment system is the determination of the fair market value of the property plant and equipment of wastewater utility. The report was prepared based on the 2020-2021 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) Paragraph 1329: Valuation of acquired water and wastewater systems, collectively referred to as Act 12 of the 2016 Pennsylvania legislative session (Act 12). The intended users of this appraisal are our client Pennsylvania American Water Company and the Pennsylvania Public Utility Commission.

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress."* *The Appraisal of Real Estate, 14th Edition, page 58.*

In conducting this appraisal, we utilized several sources of data:

- Annual (year-ending December 31) Upper Pottsgrove Township (Pennsylvania) wastewater collection operational financial statements cover the period 2013 through 2019.

- The LTL Consultants and AUS Consultants' Engineer's Assessment and inventory of the Upper Pottsgrove Township's wastewater system's property at August 31, 2020.

- The Handy-Whitman (water industry) Index of Public Utilities Construction Costs for northeastern United States, AUS Consultant General Plant Cost Indexes for the period 1912 through January 1, 2020, and various cost indexes published by the United States Bureau of Labor Statistics (US BLS).

In preparing this fair market value appraisal of the System's property, plant and equipment, and its operations: the cost, income, and market approaches to value were considered. Primary reliance was placed on the cost approach for the property, plant and equipment, with the income approach and market approaches being utilized to confirm the overall value of the sewer system's operation. A detailed explanation of each approach to value is included below in the section "Appraisal Procedures and Results".

WATER/WASTEWATER INDUSTRY NATIONALLY AND IN PENNSYLVANIA
AND
UPPER POTTSGROVE TOWNSHIP'S WASTEWATER COLLECTION SYSTEM FACILITIES

Water/wastewater Industry

The water and wastewater industry in the United States consist of both municipal authorities (literally thousands) and private investor owned companies. Of the investor owned there are nine which are large enough to be tracked by Value Line Investment Surveys, of which, two are major players in the northeast portion of the United States, American Water Works Company, Inc. and Aqua America, Inc. (on February 3, 2020 Aqua's name changed to Essential Utilities, Inc.) American and Aqua have been particularly active in the acquisition of municipal water and wastewater systems.

Pennsylvania Water / Wastewater Industry

The water and wastewater industry in Pennsylvania also consist of both municipal and investor owned systems. Over last several years the need for infrastructure improvements has led the Pennsylvania legislature to pass legislation facilitating the acquisition of municipal water and/or wastewater systems to a private investor owned rate regulated companies such as American Water and Aqua America. This legislation was Act 12 of the Pennsylvania legislator's 2016 legislative session (Act 12). The Act 12 legislation added a section (1329) modifying Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PA CS) adding Section 1329: Valuation of acquired water and wastewater systems, collectively referred to as Act 12. This appraisal was developed to meet the valuation criteria established by Section 1329 and the PA PUC's subsequent Implementation Orders in the valuation of acquired water and wastewater systems.

Upper Pottsgrove Township's Wastewater Collection System Facilities, its Property and Operations[8]

The wastewater system owned by the Township to be acquired by PAWC, provides wastewater collection services to over 1,400 commercial, public and residential customers throughout the Township of Upper Pottsgrove. Upper Pottsgrove Township, Montgomery County covers approximately an area of 5 square miles with a population of approximately 5,500. The system is comprised of four lift stations and forced sewer and gravity collection mains of approximately 118,000 feet. Gravity collection mains make up much of the system with the majority consisting of 8" PVC pipe. The four lift stations are Pine Ford Road, Regal Oaks, Hollyberry Court and Evans Road. The sewage flows to an interceptor for treatment at the Pottstown Borough Authority Sewage Treatment Plant for which the Township has purchased capacity.

[8] Extracted from Engineer's Assessment page 1-1

APPRAISAL PROCEDURES AND RESULTS

The purpose of this appraisal of the Upper Pottsgrove Township's wastewater collection system is the determination of the fair market value of the wastewater's property plant and equipment as of April 28, 2020. The report was prepared based on the 2020-2021 Uniform Standards of Professional Practices (USPAP) and is intended to meet the criteria established with Title 66 (Public Utilities) of the Pennsylvania Consolidated Statues (PS CS) Section 1329: Valuation of acquired water and wastewater systems, collectively referred to as Act 12 of the Pennsylvania legislator's 2016 legislative session (Act 12). The intended users of this appraisal are Pennsylvania American Water Company and the Pennsylvania Public Utility Commission (PA PUC).

The value established in this appraisal was based on the definition of Market Value as:

> *"The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress." The Appraisal of Real Estate, 14th Edition, page 58.*

In conducting this appraisal, we utilized several sources of data:

- Annual (year-ending December 31) Upper Pottsgrove Township's wastewater system's operational financial statements cover the period 2013 through 2019.

- The LTL Consultants and AUS Consultants' Engineer's Assessment and inventory of the Upper Pottsgrove Township's wastewater system's property at August 31, 2020.

- The Handy-Whitman (water industry) Index of Public Utilities Construction Costs for northeastern United States, AUS Consultant General Plant Cost Indexes for the period 1912 through July 1, 2020, and various cost indexes published by the United States Bureau of Labor Statistics (US BLS).

In preparing this fair market value appraisal of the System's wastewater system's property, plant and equipment, and its operations; the cost, income, and market approaches to value were considered. Primary reliance was placed on the cost approach for the property, plant and equipment, with the income approach and market approaches being utilized to confirm the overall value of the sewer system's operation. Detailed explanation of each approach to value is included below.

Cost Approach (Cost Approach tab) - The philosophy in the cost approach to value is that the maximum value of a property's tangible assets is established by the cost to acquire or build a similar property. In this appraisal, the cost approach to value was analyzed using reproduction/replacement cost approach.

Reproduction cost and replacement cost are defined as:

> Reproduction cost – "The estimated cost to construct, at current prices as of the effective date of the appraisal, an exact duplicate or replica of the [property] being appraised, using the same materials, construction standards, design, layout, and quality of workmanship and embodying all the deficiencies, super-adequacies, and obsolescence of the subject [property]."[9]
>
> Replacement cost – "The estimated cost to construct, at current prices as of the effective appraisal date, a substitute for the [property] being appraised using modern materials and current standards, design and layout."[10]
>
> In the wastewater industry the property's reproduction costs and replacement costs are quite similar; therefore, the property's cost new was determined based on its replacement cost new.

[9] The Appraisal of Real Estate, 13th Edition. Page 385
[10] ibid

The trended original cost method was utilized in preparing the replacement cost new. "Trending is a method of estimating a property's replacement cost new in which an *index* or *trend factor* is applied to the property's *historical cost* to convert the known cost into an indication of current cost. Simply put, trending reflects the movement of price over time."[11] In the trended original cost method, the System's investment in wastewater plant and equipment is restated to costs reflective of the appraisal date, by the application of cost trends to the property's original investment. AUS Consultants utilized the Engineer's Assessment performed by LTL Consultants and AUS Consultants (Engineer's Assessment tab) as the starting point of the Cost Approach. Utilizing the Engineer's Assessment of the System's original cost in property, plant and equipment AUS Consultants developed the plant's depreciated original cost (OCLD) and depreciated replacement cost (RCNLD) at April 28, 2020 (Cost Approach tab).

The cost trends are applied to each of the various investment categories (NARUC plant accounts) by original year of placement for that investment. The cost indexes used in these studies were the Handy-Whitman Index of Public Utility Construction Costs for the water industry of the northeastern region of the United States which includes the Commonwealth of Pennsylvania (HW), the AUS Consultants of General Plant Indexes AUS), and various United States Bureau of Labor Statistics (US BLS) indexes. The following table details the costing parameters using in the trending costing procedures:

[11] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 59

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3)				
		(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input
353.00	Land & Land Rights	USBLS	PPI	3.00	USBLS3	1.00
354.00	Stuctures & Improvements - Pumping	HW	W-1	15.00	HWW-115	1.00
355.00	Generating Equipment	USBLS	PPI	4.00	USBLS4	1.00
360.10	Collection Sewers - Force - Mains - 4" & Under	HW	W-1	44.00	HWW-144	1.00
360.20	Collection Sewers - Force - Mains - 6"-8"	HW	W-1	44.00	HWW-144	1.00
360.90	Collection Sewers - Force - Air Release Valve	HW	W-1	44.00	HWW-144	1.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	HW	W-1	44.00	HWW-144	1.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	HW	W-1	44.00	HWW-144	1.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	HW	W-1	44.00	HWW-144	1.00
361.98	Collection Sewers - Gravity - Manholes	HW	W-1	45.00	HWW-145	1.00
361.99	Collection Sewers - Gravity - Miscellaneous	HW	W-1	44.00	HWW-144	1.00
363.00	Service Laterals	HW	W-1	39.00	HWW-139	1.00
380.00	Treatment and Disposal Equipment Purchased Capacity	HW	W-1	17.00	HWW-117	1.00

The following table presents the development of the cost approach for the 10" – 12" Gravity Collection Mains (Account 361.12) portion of the Upper Pottsgrove wastewater service area this example will be used to describe the entire cost approach process:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(1)	(2)	(3)	(4)	(5)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Average Year Installed	Average Year Installed	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
					OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	Year Installed	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
		10" - 12" Gravity Collection Sewer										
361.12	361.12	10" - 12" Gravity Collection Sewer	1995	1995	377,721.52	HWW-144	277.5	616.2	2.221	838,920	1.000	838,920
361.12	361.12	10" - 12" Gravity Collection Sewer	2007	2007	474,784.52	HWW-144	465.8	616.2	1.323	628,140	1.000	628,140
361.12	361.12	10" - 12" Gravity Collection Sewer	2010	2010	234,556.68	HWW-144	506.6	616.2	1.216	285,221	1.000	285,221
		TOTAL Account 361.12 - 10" - 12" Collection Sewer			**1,087,062.72**					**1,752,280**		**1,752,280**

Using the trended original cost method, Upper Pottsgrove Township's investment in this example of $1,087,062.72 was determined to have a replacement cost new of $1,752,280.

When the trended cost method is applied to each of Upper Pottsgrove Township's investment in plant, property and equipment of $15,295,347 was determined to have a replacement cost new of $25,786,184 detailed as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(9)	(10)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Original Cost	Costing Parameter	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
			OC $s			RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input			AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Original Cost	Cost Index Table	Translator	RCN	COR / RCN Factor	COR
353.00	353.00	Land & Land Rights	8,865	USBLS3	15.32	135,794	1.00	135,794
354.00	354.00	Stuctures & Improvements - Pumping	1,612,326	HWW-115	1.48	2,380,438	1.00	2,380,438
355.00	355.00	Generating Equipment	47,512	USBLS4	1.45	69,012	1.00	69,012
360.10	360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	HWW-144	1.58	309,812	1.00	309,812
360.20	360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	HWW-144	1.39	610,719	1.00	610,719
360.90	360.90	Collection Sewers - Force - Air Release Valve	11,934	HWW-144	1.22	14,511	1.00	14,511
361.11	361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	HWW-144	1.62	7,196,371	1.00	7,196,371
361.12	361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	HWW-144	1.61	1,752,280	1.00	1,752,280
361.13	361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	HWW-144	1.30	966,046	1.00	966,046
361.98	361.98	Collection Sewers - Gravity - Manholes	1,586,684	HWW-145	1.40	2,220,312	1.00	2,220,312
361.99	361.99	Collection Sewers - Gravity - Miscellaneous	261,971	HWW-144	1.36	355,575	1.00	355,575
363.00	363.00	Service Laterals	1,731,294	HWW-139	1.63	2,819,318	1.00	2,819,318
380.00	380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	HWW-117	2.23	6,955,996	1.00	6,955,996
		Total Upper Pottsgrove Township Wastewater Utility	15,295,347			25,786,184		25,786,184

Replacement Cost New less Depreciation - The replacement cost described above reflects the cost of new property; however, the Upper Pottsgrove Township's wastewater system property is not new and has experienced normal depreciation and potentially functional and or economic obsolescence. These various forms of depreciation are defined as follows:

> Normal depreciation/deterioration, akin to physical deterioration, is "loss in value caused by wear, tear, age and use."[12]
>
> Functional obsolescence is "the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more

[12] The Dictionary of Real Estate Appraisal, 4th Edition

efficient of less costly replacement property that new technology has developed."[13]

Economic, or external, obsolescence is defined as "A loss in value caused by factors outside a property"[14] and is most often indicated by insufficient earning.

Wastewater Depreciation Service Life Experience in Pennsylvania

The service lives used in the depreciation and functional obsolescence calculations were developed based on the property and its use, AUS Consultants' experience in developing depreciation studies for the water and wastewater industries and depreciation studies filed with PAWC and Aqua America rate cases. With each of their recent rate case filings PAWC and Aqua America have filed depreciation studies in support of their depreciation service lives and associated depreciation expenses contained within their revenue requirements. The depreciation studies were prepared by Gannett Fleming Rate Consultants a recognized firm in the depreciation consulting area. AUS Consultants has reviewed the PAWC studies which are summarized in the following table:

[13] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition. Page 67.
[14] The Appraisal of Real Estate, 13th Edition, page 442.

Summary of PAWC Depreciation Studies Prepared for Rate Case

Account	Account Description	Iowa Curves		Service Life		Remaining Life	
		12/31/2016	12/31/2019	12/31/2016	12/31/2019	12/31/2016	12/31/2019
				years	years	years	years
354.20	STRUCTURES AND IMPROVEMENTS - COLLECTION	R3	R3	45	45	39.1	33.3
354.30	STRUCTURES AND IMPROVEMENTS - SPP	R2.5	S0	50	55	45.2	32.6
354.40	STRUCTURES AND IMPROVEMENTS - TDP	R2	S0	65	55	56.6	31.7
354.70	STRUCTURES AND IMPROVEMENTS - GENERAL	S1	S1	35	35	33.3	23.2
355.00	POWER GENERATION EQUIPMENT	R2.5	S0.5	35	35	29.7	19.3
360.10	COLLECTION SEWERS - FORCE MAINS	S2	R3	70	75	53.1	52.5
361.10	COLLECTION SEWERS - GRAVITY MAINS	R2.5	R2.5	70	80	56.9	54.8
361.20	MANHOLES	S1.5	S2.5	50	50	41.3	32.2
363.00	SERVICES	R3	R3	38	47	22.9	30.2
364.00	FLOW MEASURING DEVICES	L3	L2.5	20	15	13.3	5.1
365.00	FLOW MEASURING INSTALLATIONS	S1.5	S2	30	25	23.1	10.8
370.00	RECEIVING WELLS	R3	R3	50	50	42.7	33.7
371.00	PUMPING EQUIPMENT	SO	S0.5	40	30	35.5	18.2
380.00	TREATMENT EQUIPMENT	5-R2	S1.5	45	35	37.1	20.1
381.00	PLANT SEWERS	R3	R3	50	50	43.1	32.7
382.00	OUTFALL SEWER LINES	R3	R3	50	50	37.8	28.3
389.10	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - INTANGIBLES	52.5	S2.5	20	20	13.6	11.3
389.60	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - CPS	SQ	SQ	20	5	12.3	3.5
390.00	OFFICE FURNITURE AND EQUIPMENT	L4	SQ	15	20	9.5	10.1
391.00	TRANSPORTATION EQUIPMENT	SQ	L4	25	14	19,9	9.8
392.00	STORES EQUIPMENT	SQ	SQ	20	25	16.4	17.2
393.00	TOOLS, SHOP AND GARAGE EQUIPMENT	SQ	SQ	15	20	11,3	15.4
394.00	LABORATORY EQUIPMENT	L2.5	SQ	16	15	8.7	10.4
395.00	POWER OPERATED EQUIPMENT	SQ	R2	15	22	10.3	13.2
396.00	COMMUNICATION EQUIPMENT	SQ	SQ	15	15	9.6	6.9
397.00	MISCELLANEOUS EQUIPMENT		SQ		15		12.8
398.00	OTHER TANGIBLE PLANT		SQ		25		21.5
	TOTAL DEPRECIABLE PLANT						

It is of particular importance in the above table the service life extension of the mains plant categories between the 2016 and the 2020 studies. The mains service lives increased as follows:

Account	Description	Service Life	
		2016	2020
360.10	COLLECTION SEWERS - FORCE MAINS	70	75
361.10	COLLECTION SEWERS - GRAVITY MAINS	70	80

AUS Consultants believe this increase in service lives is attributable to the widespread use of relining older mains instead of replacing mains which are in need of repair. The practice of relining mains with a cured in place plastic liner not only repairs specific main but has the effect of extending the life of the original mains by the length of time which the relining can be expected to last. Most relining vendors warranty their product and procedure for 50 years. Thus, in essence the original main's service life will be extended

by 50 plus years at the date the relining occurred. For those mains associated with relining their installation date was established at the date of their relining and their depreciation parameters were established the same as the depreciation parameters of the relining, i.e., R2.5 – 60 years.

The following table details the lives used in the depreciation portion of the replacement cost new less depreciation analysis:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)		(5)	(6)	
		(4a)	(4b)		(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence	Tax Depreciation	
			years	% of CORLD	Table	Life
353.00	Land & Land Rights	ZNonDep	0.00	0.00%	Non-Depr	0.00
354.00	Stuctures & Improvements - Pumping	R4.0	55.00	0.00%	MACRS	25.00
355.00	Generating Equipment	R3.0	35.00	0.00%	MACRS	25.00
360.10	Collection Sewers - Force - Mains - 4" & Under	R3.0	75.00	0.00%	MACRS	25.00
360.20	Collection Sewers - Force - Mains - 6"-8"	R3.0	75.00	0.00%	MACRS	25.00
360.90	Collection Sewers - Force - Air Release Valve	R3.0	45.00	0.00%	MACRS	25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	R2.5	80.00	0.00%	MACRS	25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	R2.5	80.00	0.00%	MACRS	25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	R2.5	80.00	0.00%	MACRS	25.00
361.98	Collection Sewers - Gravity - Manholes	S2.0	80.00	0.00%	MACRS	25.00
361.99	Collection Sewers - Gravity - Miscellaneous	R2.5	80.00	0.00%	MACRS	25.00
363.00	Service Laterals	R3.0	70.00	0.00%	MACRS	25.00
380.00	Treatment and Disposal Equipment Purchased Capacity	R2.0	45.00	0.00%	MACRS	25.00

As the above table demonstrates, the depreciation lives selected for the AUS Consultants appraisal are consistent with the depreciation studies' finding for wastewater plant.

Normal Depreciation – The extent of the depreciation in the property was evaluated using age-life depreciation techniques. In age-life depreciation, the property's depreciation or condition is estimated using the following formulas:

$$\text{Depreciation (\%)} = \frac{\text{Age (years)} \times 100\%}{\text{Service Life (years)}}$$

$$\text{Condition (\%)} = \frac{\text{Remaining Life (years)} \times (100\%)}{\text{Service Life (years)}}$$

where: the property's Service Life = Age + Remaining Life
and Remaining Life = f(Survival Characteristic, Service Life, Age)

However due to the age of some of the property the extent of the depreciation was limited to 85% of the assets original cost and its replacement cost new.

When the above depreciation lives are used to quantify the property's depreciation is applied to the replacement cost new of the example 10" – 12" Gravity Collection Mains portion of the Upper Pottsgrove wastewater service area of $1,752,280, the replacement cost new less depreciation was determined to be $1,361,639 detailed as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	2020.5-[(20)+0.5]	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)	Lookup Iowa Curves Life Tables @ col (26)	Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)
Account	Description	Year1	Age	RCN	Iowa	NLife	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD
	#REF!												
361.12	10" - 12" Gravity Collection Sewer	1995	25.00	838,920	R2.5	80.0	31	R2.5031	0.71785	57.43	82.43	69.671236%	584,485.58
361.12	10" - 12" Gravity Collection Sewer	2007	13.00	628,140	R2.5	80.0	16	R2.5016	0.85124	68.10	81.10	83.970407%	527,451.65
361.12	10" - 12" Gravity Collection Sewer	2010	10.00	285,221	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	249,701.50
				1,752,280									**1,361,639**

When the above depreciation lives are used to quantify the property's depreciation is applied to each of the Upper Pottsgrove Township's investment in plant, property and equipment the replacement cost new (RCN) of $25,786,184 the resultant RCN less depreciation (RCNLD) was found to be $18,460,028 detailed as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(21)	(22)	(23)	(24)	(28)	(29)	(30)	(31)
Account	Description	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)
		years	COR $s		years	years	years	% of COR	CORLD $s
Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	LTL Consultants & AUS Consultants Engineers Assessment		Col (16)	AUS Input	AUS Input		Col (21) + (28)	Col (28) / (29)	Col (22) * (30)
Account	Description	Age	RCN	Iowa	NL	Rem Life	Total Life	Condition	CORLD
353.00	Land & Land Rights	18.00	135,794	ZNonDep	-	-	-	-	135,794
354.00	Stuctures & Improvements - Pumping	13.83	2,380,438	R4.0	45.81	32.29	46.12	45.81	1,664,609
355.00	Generating Equipment	19.70	69,012	R3.0	35.00	17.16	36.85	35.00	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	19.44	309,812	R3.0	75.00	56.77	76.20	75.00	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	13.63	610,719	R3.0	75.00	62.06	75.69	75.00	500,882
360.90	Collection Sewers - Force - Air Release Valve	10.00	14,511	R3.0	45.00	35.43	45.43	45.00	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	18.81	7,196,371	R2.5	80.00	62.82	81.63	80.00	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	18.26	1,752,280	R2.5	80.00	63.35	81.61	80.00	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	12.51	966,046	R2.5	80.00	68.46	80.97	80.00	816,806
361.98	Collection Sewers - Gravity - Manholes	16.61	2,220,312	S2.0	80.00	63.62	80.23	80.00	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	11.60	355,575	R2.5	80.00	69.16	80.76	80.00	304,770
363.00	Service Laterals	16.54	2,819,318	R3.0	70.00	54.20	70.74	70.00	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	21.72	6,955,996	R2.0	45.00	27.27	48.99	45.00	3,924,943
			25,786,184						18,460,028

The preliminary cost approach to value of the Upper Pottsgrove Township's wastewater utility property was found to be $18,460,028.

Income Approach (Income Approach tabs)

The income approach to value establishes the value of the property based on its economic returns. There are two generally accepted procedures in performing an income analysis: the direct capitalization of anticipated income, and the discounted cash flow procedures.

In the direct capitalization approach, anticipated earnings are capitalized directly into value using a market-required capitalization rate. The Upper Pottsgrove Township's wastewater operation will be moving from a municipal operation, wherein economic returns are not the primary objective of the operation to a private (investor owned) rate regulated sewer utility operation in which economic returns are one of the objectives of the operation; therefore, the direct capitalization of earnings approach was not utilized in this appraisal.

In the discounted cash flow (DCF) approach, the property's economic returns are forecast for future periods. The cash flows (debt-free after-tax net cash flows) from operations are discounted to the appraisal date using a market derived discount rate resulting in the DCF approach's income indicator of value. Use of the DCF approach allows the appraiser to address the property's historical operating experience and its migration, in future periods, to an operation as a rate regulated income taxed (local, state and federal) operation; thus, making the DCF approach preferable in this case.

In preparing this appraisal's DCF analysis first the results from the Upper Pottsgrove Township's wastewater utility's operations was evaluated based on an analysis of historical operating performances over the period 2013 through 2019 (Financials tab). In this analysis operating statistics such as revenues and their growth, various operating expenses were stated as function of their typical drivers (revenues, plant investment, income from operations, etc.) were analyzed. Details are provided in Income Approach tab. Using the above described analyses, the results of future periods operations were forecast based on the migration of the Upper Pottsgrove Township's of historical operations type experience over time to operations of the wastewater operation similar to a public investor-owned water/wastewater utilities. These forecasts are detailed in the Income Approach tab.

In this appraisal, future operating results were forecasted as follows:

Revenues
Operating Expenses
    Operating and Maintenance Expense
    Depreciation & Amortization
Total Operating Expenses
Operating Income (Revenues less Operating Expenses)
Taxes
    Property
    Income (state & federal)
Total Taxes
After Tax Income (Operating Income less Total Taxes)
Net Cash Flows
    Plus: After Tax Income
    Plus: Depreciation
    Less: Capital Expenditures
    Plus/less: Change in Working Capital
Equals: Debt-free after-tax net cash flows

In the above described table, the depreciation expense (both book and tax) and the capital expenditures were forecast based on the investment in property plant and equipment at the appraisal date and in subsequent periods. The initial investment in the plant and depreciation forecast were based on the criteria established in Section 1329 for the acquisition and subsequent regulation (rate base) of the acquired property by the acquiring investor owned utility company. The following table details the forecasts of plant investment, book depreciation, tax depreciation forecast, and the resultant net plant investment and rate base as follows:

Plant Investment
    Initial Investment/ Beginning Plant Balance
    Additions (Capital Expenditures)
    Retirements

Ending Plant Balance

Depreciation (book)

Initial Book Depreciation Reserve / Beginning Book Reserve Balance

Book Depreciation & Amortization

Retirements

Ending Book Reserve Balance

Depreciation (tax)

Initial Tax Reserve / Beginning Tax Reserve

Tax Depreciation

Retirement

Ending Tax Reserve Balance

In these forecasts, the initial plant investment was based on the allocated purchase price of $13,750,000. Initially, the Cost Approach results are utilized to allocate the purchase price by category of plant (NARUC account). The Cost Approach results also define the property's ages and remaining lives of the various plant investment categories. Using these inputs, the future periods book and tax depreciation can be forecast, as well as the accumulated deferred taxes and resulting rate base.

With a forecast of the future rate base and an estimate of the Pennsylvania Commission's authorized return on rate base, the future return on rate base can be estimated which along with the forecast operating expenses (operating expenses, depreciation, and taxes) the future period revenue requirement forecasts can be made. An estimate of the PA Commission return on rate base is detailed as follows:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	**100.0%**						**8.09%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.16%**

Based on a comparison of the forecast revenues and the forecast of the estimated revenue requirement, future period rate increases were forecast. The criteria in making future period rate adjustments was to bring the forecast achieved return in line with the required return. Based on this process the results of future operations were forecast for the next 20-year period. Period 20 of the forecast was treated in the discounted cash flow as the forecast for period 20 through perpetuity.

Finally, the resultant cash flows from future period operations of the System were discounted to the appraisal date using a market derived discount rate for a public investor-owned water/wastewater utility (Cost of Capital / Required Return tab). The following table details the market discount rate developed using the weighted average cost of capital (WACC) of the market debt and equity:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Rate of Return on Rate Base)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Required Return on Rate Base (2)*(3)
Debt	45%	Embedded	4.14%	Embedded	Not Applicable	Not Applicable	1.86%
Equity	55%	Embedded	9.90%	Market	Not Applicable	Not Applicable	5.45%
Total Capital r	**100.0%**						**7.31%**
Growth (g)						Not Applicable	**0.00%**
Rate without Growth: [(1+r)/(1+g)]-1							**7.31%**

The market cost of debt was developed based on market returns for utilities debt as reported in the Value Line Investment Survey. The market cost of equity was developed

using the capital asset pricing model (CAPM) and the dividend-growth model (DGM). Input to these equity costing models were developed based on Value Line Investment Surveys for the water industry published for April 10, 2020 consisting of the following nine companies:

Company	
American States Water (NYSE-AWR)	Consolidated Water Company (NDQ-CWCO)
American Water ((NYSE-AWK)	Middlesex Water (NDQ-MSEX)
Essential Utilities, Inc. (NYSE-WTRG)	SJW Corporation (NYSE-SJW)
California Water (NYSE-CWT)	York Water (NDQ-YORW)
In the January 2020 Issue Value Line dropped Connecticut Water (NDQ-CTWS) out of its list of Water Utility Industry companies	

The Value Line data was also used to develop the market capital structure used in the WACC determination. The market required return analysis can be found in the Cost of Capital / Required Return tab.

The following table presents the results of the discounted cash flow analysis:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate: 8.09%
Capitalization Rate: 6.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
					(3)-(4)	(6)-(5)	(7) *28.89%			(3)-(4)-(8)-(9)-(10)		(11)*(12)	Sum (13)
1	0.5	1,488,089	365,169	595,743	1,122,920	527,177	152,301	191,054	796	778,769	0.962	749,176	749,176
2	1.5	1,726,183	376,124	602,538	1,350,059	747,521	215,959	192,660	12,857	928,583	0.89	826,439	1,575,615
3	2.5	1,743,445	387,408	609,455	1,356,037	746,582	215,688	194,235	932	945,182	0.823	777,885	2,353,500
4	3.5	1,760,879	399,030	616,496	1,361,849	745,353	215,332	195,825	941	949,751	0.762	723,710	3,077,210
5	4.5	1,778,488	411,001	623,664	1,367,487	743,823	214,890	197,427	952	954,218	0.705	672,724	3,749,934
6	5.5	1,974,122	423,331	630,961	1,550,791	919,830	265,739	199,042	10,563	1,075,447	0.652	701,191	4,451,125
7	6.5	1,993,863	436,031	623,251	1,557,832	934,581	270,000	145,622	1,067	1,141,143	0.603	688,109	5,139,234
8	7.5	2,013,802	449,112	628,997	1,564,690	935,693	270,322	146,852	1,077	1,146,439	0.558	639,713	5,778,947
9	8.5	2,154,768	462,585	634,846	1,692,183	1,057,337	305,465	148,092	7,611	1,231,015	0.516	635,204	6,414,151
10	9.5	2,176,316	476,463	640,799	1,699,853	1,059,054	305,961	149,342	1,164	1,243,386	0.478	594,339	7,008,490
11	10.5	2,198,079	490,757	646,857	1,707,322	1,060,465	306,368	150,604	1,175	1,249,175	0.442	552,135	7,560,625
12	11.5	2,351,945	505,480	653,021	1,846,465	1,193,444	344,786	151,875	8,309	1,341,495	0.409	548,671	8,109,296
13	12.5	2,375,464	520,644	659,295	1,854,820	1,195,525	345,387	153,160	1,270	1,355,003	0.378	512,191	8,621,487
14	13.5	2,399,219	536,263	665,679	1,862,956	1,197,277	345,893	154,457	1,283	1,361,323	0.350	476,463	9,097,950
15	14.5	2,567,164	552,351	672,173	2,014,813	1,342,640	387,889	155,763	9,069	1,462,092	0.324	473,718	9,571,668
16	15.5	2,592,836	557,875	575,782	2,034,961	1,459,179	421,557	157,077	1,386	1,454,941	0.299	435,027	10,006,695
17	16.5	2,618,764	563,454	581,310	2,055,310	1,474,000	425,839	158,408	1,400	1,469,663	0.277	407,097	10,413,792
18	17.5	2,802,077	569,089	586,929	2,232,988	1,646,059	475,547	159,746	9,900	1,587,795	0.256	406,476	10,820,268
19	18.5	2,830,098	574,780	592,646	2,255,318	1,662,672	480,346	161,099	1,512	1,612,361	0.237	382,130	11,202,398
20 and beyond	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,698	2.707	4,408,885	15,611,283
								3,324,802					
Age				19.5									
PW(Age) = 1/(1+Discount Rate)$^{(Age)}$				0.219				Net Plant		10,732,792			
PW to Perpetuity = 1/Capitalization Rate				12.361				ADIT		(1,762,467)			
$PW_{(20and\ Beyond)}$ = PW to Perpetuity * PW $Factor_{(19.5)}$				2.707				Rate Base		8,970,325	0.219	1,964,501	13,166,899
								Annual Plant Construction Inflation Rate		0.0422 Input			
								Plant Inflation over 19.5 years		20,503,573	0.219	4,490,282	15,692,680
								PP	13,750,000				
								OCLD	11,769,925				
								PP/OCLD	1.168				
								RCNLD	18,460,028				
								RCNLD/PP		1.342547521			
										12,043,087.31	0.219	2,637,436	13,839,834
								Average					14,577,674

Based on the above described discounted cash flow analysis, the Income Approach to value of the System's wastewater property and its operations was determined to be $15,611,283. To ensure that the above described forecast captured the entire economic returns of the property an additional 40-year period beyond the original 20-year forecast was made. This additional forecast indicated the reasonableness of the initial forecast results.

Market Approach (Market Approach tab)

The market or comparable sales approach to value looks to market sales of comparable properties in order to arrive at value. In this appraisal, the market approach was

addressed from a comparable sales approach using Pennsylvania water and wastewater systems and market value to book value ratios based on investor owned water utilities reported in Value Line Investment Survey.

Market Sales – In the comparable sales market approach the sales of Pennsylvania municipal water and wastewater systems to investor owned water/wastewater utilities following the passage of Section 1329 were used to insure comparability. The following sales were considered:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Approximate Date	Buyer	Seller	County	Type of Facility	Initial Purchase Price	Final Purchase Price[1]	Number of Total Customers	OCA Market Value per customer	Relationship to the passage of Section 1329	Average Purchase Price per Customer
6/1/2016	PA American Water	City of McKeesport	Allegheny	Wastewater Collection and Treatment	180,000,000	159,000,000	21,953	7,197	Post	7,242.75
8/1/2016	Aqua PA	New Garden Twp. SA	Chester	Wastewater Collection and Paid for and Owned Treatment	29,500,000	29,500,000	2,106	14,008	Post	14,007.60
12/1/2017	Aqua PA	Limerick Township	Montgomery		64,373,000	64,373,000	5,434	11,846	Post	9,264
12/10/2017	Aqua PA	East Bradford Township	Chester	Wastewater Collection and paid for treatment Capacity	5,000,000	5,000,000	1,248	4,006	Post	4,006.41
	SUEZ	Mahoning	Carbon	Water Treatment and Distribution System	4,734,800	4,734,800	2,806		Post	
	SUEZ	Mahoning	Carbon	Wastewater Collection and Treatment	4,765,200	4,765,200	2,806		Post	
6/1/2018	Aqua PA	Cheltenham	Montgomery	Wastewater Collection	50,250,000	50,250,000	10,500		Post	4,785.71
11/14/2018	PA American Water	Steelton	Dauphin	Water Distribution and Treatment	22,500,000	21,750,000	2,325		Post	9,354.84
	PA American Water	Sadsbury	Chester	Wastewater Collection	9,250,000	8,600,000	998		Post	8,617.23
5/28/2018	PA American Water	Exeter	Berks	Wastewater Collection and Treatment	96,000,000	96,000,000	9,000		Post	10,666.67
10/29/2018	Aqua PA	East Norriton	Montgomery	Wastewater Collection	21,000,000	21,000,000	4,950		Post	4,242.42
9/30/2018	PA American	Kane	McKean	Wastewater Collection and Treatment	17,560,000	17,560,000	2,006		Post	8,753.74
12/10/2019	PA American	Royersford	Montgomery	Wastewater Collection and Treatment	13,000,000	13,000,000	1,596		Post	8,145.36
12/17/2019	PA American	Valley	Chester	Water Treatment and Distribution System	7,325,000	7,325,000	1,459		Post	5,020.56
12/17/2019	PA American	Valley	Chester	Wastewater Collection System	13,950,000	13,950,000	1,644		Post	8,485.40

In order to arrive at a measure of comparability these system sales were analyzed in relationship of the purchase price to the properties' depreciated original cost (OCLD) and depreciated replacement cost (RCNLD) (Market Approach tab).

The following tables details the market sales analyses:

Purchase Price to Original Cost less Depreciation (OCLD)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/OCLD

Property Acquired		Purchase Price (PP)	Proportion of Purchase Price to Total	Depreciated Original Cost (OCLD) (AUS Consultants Determination	Purchase Price to (PP/OCLD)
New Garden Wastewater System	Wastewater	29,500,000	6%	18,567,728	1.5888
McKeesport Wastewater System	Wastewater	159,000,000	32%	101,915,080	1.5601
Limerick Wastewater System	Wastewater	75,100,000	15%	46,153,867	1.6272
Mahoning Water System	Water	4,734,800	1%	1,194,489	3.9639
Mahoning Wastewater System	Wastewater	4,765,200	1%	1,658,678	2.8729
East Bradford Wastewater Collection System	Wastewater	5,000,000	1%	5,383,591	0.9287
Sadsbury Wastewater Collection System	Wastewater	8,600,000	2%	6,128,876	1.4032
Exeter Wastwater Collection System	Wastewater	96,000,000	19%	40,057,634	2.3965
Steelton Water System	Water	21,750,000	4%	14,433,435	1.5069
Cheltenham Wastewarer Collection System	Wastewater-collection	50,250,000	10%	15,784,463	3.1835
East Norriton Wastewater	Wastewater-collection	21,000,000	4%	8,407,007	2.4979
Kane Wastewater	Wastewater	17,560,000	4%	12,070,455	1.4548
Royersford Wastewater	Wastewater	13,000,000	3%	5,173,559	2.5128
Valley Water	Water	7,325,000	1%	5,370,438	1.3639
Valley Wastewater	Wastewater	13,950,000	3%	9,214,738	1.5139
		493,260,000	100%	271,755,303	1.8151

Simple Mean	2.082
Standard Deviation	0.8607
SimpleMedian	1.608
Simple Mode	Not Applicable

Weighted Mean	1.999
Standard Deviation	0.6008
Wtd Median	1.5597
Wtd Mode	1.5601

Purchase Price to Replacement Cost New less Depreciation (CORLD)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/CORLD

Property Acquired		Purchase Price (PP)	Proportion of Purchase Price to Total	Replacement Cost New less Depreciation (CORLD)	Purchase Price to CORLD
New Garden Wastewater System	Wastewater	29,500,000	6%	30,615,410	0.9636
McKeesport Wastewater System	Wastewater	159,000,000	32%	160,301,491	0.9919
Limerick Wastewater System	Wastewater	75,100,000	15%	86,086,756	0.8724
Mahoning Water System	Water	4,734,800	1%	8,899,336	0.532
Mahoning Wastewater System	Wastewater	4,765,200	1%	7,991,234	0.5963
East Bradford Wastewater Collection System	Wastewater	5,000,000	1%	9,236,581	0.5413
Sadsbury Wastewater Collection System	Wastewater	8,600,000	2%	8,517,587	1.0097
Exeter Wastwater Collection System	Wastewater	96,000,000	19%	99,589,819	0.964
Steelton Water System	Water	21,750,000	4%	23,921,473	0.9092
Cheltenham Wastewarer Collection System	Wastewater-collection	50,250,000	10%	49,940,486	1.0062
East Norriton Wastewater	Wastewater-collection	21,000,000	4%	27,461,356	0.7647
Kane Wastewater	Wastewater	17,560,000	4%	29,015,055	0.6052
Royersford Wastewater	Wastewater	13,000,000	3%	13,376,109	0.9719
Valley Water	Water	7,325,000	1%	11,664,026	0.628
Valley Wastewater	Wastewater	13,950,000	3%	19,252,333	0.7246
		493,260,000	100%	541,576,584	0.9108

Simple Mean	0.8130
Standard Deviation	0.1852
SimpleMedian	0.8908
Simple Mode	Not Applicable

Weighted Mean	0.9285
Standard Deviation	0.1086
Wtd Median	0.9637
Wtd Mode	0.9919

Purchase Price to Customers

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/Customer

Property Acquired		Asset Purchase Agreement (APA) Date	Purchase Price (PP)	Proportion of Purchase Price to Total	$Customers	Purchase Price to Customers
New Garden Wastewater System	Wastewater	2016.59	29,500,000	6%	2,100	14,048
McKeesport Wastewater System	Wastewater	2016.67	159,000,000	32%	20,320	7,825
Limerick Wastewater System	Wastewater	2018.57	75,100,000	15%	5,434	13,820
Mahoning Water System	Water	2017.79	4,734,800	1%	2,806	1,687
Mahoning Wastewater System	Wastewater	2017.79	4,765,200	1%	2,806	1,698
East Bradford Wastewater Collection System	Wastewater	2017.97	5,000,000	1%	1,248	4,006
Sadsbury Wastewater Collection System	Wastewater	2019.19	8,600,000	2%	998	8,617
Exeter Wastwater Collection System	Wastewater	2018.41	96,000,000	19%	9,000	10,667
Steelton Water System	Water	2018.87	21,750,000	4%	2,412	9,017
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.42	50,250,000	10%	10,219	4,917
East Norriton Wastewater	Wastewater-collection	2018.76	21,000,000	4%	4,952	4,241
Kane Wastewater	Wastewater	2019.75	17,560,000	4%	2,006	8,754
Royersford Wastewater	Wastewater	2019.94	13,000,000	3%	1,596	8,145
Valley Water	Water	2019.96	7,325,000	1%	1,459	5,021
Valley Wastewater	Wastewater	2019.96	13,950,000	3%	1,644	8,485
			493,260,000	100%	64,301	7,671

Simple Mean	7441
Standard Deviation	4031
SimpleMedian	8,221
Simple Mode	Not Applicable

Weighted Mean	9157
Standard Deviation	3158
Wtd Median	6,322
Wtd Mode	7825

Forecast	2019.944064	7,251
	2021	7,139

Purchase Price to Cash Flows (EBITDA)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/Cash Flow (EBITDA)

Property Acquired		Asset Purchase Agreement (APA) Date	Purchase Price (PP)	Proportion of Purchase Price to Total	Cash Flows (EBITDA)	Purchase Price to Cash Flow
New Garden Wastewater System	Wastewater	2016.59	29,500,000	7%	1,409,768	20.93
McKeesport Wastewater System	Wastewater	2016.67	159,000,000	39%	5,247,843	30.30
Limerick Wastewater System	Wastewater	2018.57	75,100,000			
Mahoning Water System	Water	2017.79	4,734,800			
Mahoning Wastewater System	Wastewater	2017.79	4,765,200			
East Bradford Wastewater Collection System	Wastewater	2017.97	5,000,000	1%	100,053	49.97
Sadsbury Wastewater Collection System	Wastewater	2019.19	8,600,000	2%	580,238	14.82
Exeter Wastwater Collection System	Wastewater	2018.41	96,000,000	23%	7,099,396	13.52
Steelton Water System	Water	2018.87	21,750,000	5%	1,568,999	13.86
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.42	50,250,000	12%	5,270,576	9.53
East Norriton Wastewater	Wastewater-collection	2018.76	21,000,000	5%	925,477	22.69
Kane Wastewater	Wastewater	2019.75	17,560,000	4%	680,463	25.81
Royersford Wastewater	Wastewater	2019.94	13,000,000	3%	692,724	18.77
Valley Water	Water	2019.96	7,325,000	2%	520,405	14.08
Valley Wastewater	Wastewater	2019.96	13,950,000	3%	685,766	20.34
			408,660,000	100%	22,882,813	17.86
Simple Mean						22.38
Standard Deviation						11.60
SimpleMedian						20.93
Simple Mode						Not Applicable
Weighted Mean						21.58
Standard Deviation						8.02
Wtd Median						13.52
Wtd Mode						Not Applicable
Forecast		2019.944064				17.24
		2021				13.95

Financial Market Ratios – In the market approach based on market financial ratios the market data of companies (nine) in the water industry as reported in Value Line Investment Surveys (April 2020) were analyzed. In the analysis the companies' stock (market) and debt (book) per share are compared as a ratio to the book value per share which is detailed in the following table:

Pennsylvania American Water Company
Upper Pottsgrove Township
Montgomery County, PA

Comparable Sales Approach
04/01/2020
Financial Basis[1]

Company	Exchange	Ticker	Value Line No.	Value Line Issue Date	Market Price per share	Book Value per share	Market to Book Equity Ratio	Debt (Total) $millions	Outstanding Shares millions	Debt per share	Market Value per share (Debt + Equity)	Book Value per share (Debt + Equity)	Market to Book Value Ratio	Market Value Wtd Market to Book Ratio
Value Line Information														
American States Water	NYSE	AWR	1785	4/10/2020	84.6	17.15	4.93	286.3	36.859505	7.77	92.37	24.92	3.71	342.69
American Water	NYSE	AWK	1786	4/10/2020	126.72	35.35	3.58	9453	180.974719	52.23	178.95	87.58	2.04	365.06
California Water	NYSE	CWT	1787	4/10/2020	52.32	15.7	3.33	983.8	48.532	20.27	72.59	35.97	2.02	146.63
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	15.93	11.2	1.42	0.1	15.078499	0.01	15.94	11.21	1.42	22.63
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	43.05	17.35	2.48	3074.1	222.781536	13.8	56.85	31.15	1.83	104.04
Middlesex Water	NDQ	MSEX	1790	4/10/2020	61.47	16.15	3.81	258	17.434	14.8	76.27	30.95	2.46	187.62
SJW Corporation	NYSE	SJW	1791	4/10/2020	59.78	33.3	1.8	1305.9	28.456508	45.89	105.67	79.19	1.33	140.54
York Water	NDQ	YORW	1792	4/10/2020	46.77	11.2	4.18	101	13.014898	7.76	54.53	18.96	2.88	157.05
											653.17			1466.26

Essential Utilities, Inc. formerly Aqua America

Analysis Summary

Minimum	1.33
Mean	2.21
Standard Deviation	0.74
Wtd Mean	2.24
Median	2.03
Maximum	3.71
American Water & Essential Utilities Averages	2.77
Conclusion (AUS Input)	**2.77**

The following table summarizes both the comparable sales and financial market ratio analysis and the Market Approach conclusion of this appraisal:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Central Tendancy and Reliability Analysis

Market Sales Analysis - PP/OCLD

	Simple	Weighted	
Mean	2.082	1.9992	
Standard Deviation	0.8607	0.6008	
Median	1.608	1.5597	
Mode	Not Applicable	1.5601	
Conclusion		2.0000	AUS Input
Upper Pottsgrove Township OCLD		11,769,925	Cost Approach - OCLD
Market Value Indication		**23,539,850**	

Market Sales Analysis - PP/CORLD

	Simple	Weighted	
Mean	0.813	0.9285	
Standard Deviation	0.1852	0.1086	
Median	0.8908	0.9637	
Mode	Not Applicable	0.9919	
Conclusion		0.93	AUS Input
Upper Pottsgrove Township CORLD		18,460,028	Cost Approach - CORLD
Market Value Indication		**17,167,826**	

Market Sales Analysis - PP/Customer

	Simple	Weighted	
Mean	7441	9,157	
Standard Deviation	4031	3,158	
Median	8221	6,322	
Mode	Not Applicable	7,825	
Forecast	7,251		
Conclusion		8,679	Valley Wastewater Info
Upper Pottsgrove Township Customers		1,428	AUS Input
Market Value Indication		**12,393,612**	

Financial Basis[1]

Financial Markets	Market Value per Share to Book Value per Share	
Market to Book (equity and debt)	2.77	
Use (equity and debt)	2.77	AUS Input
Upper Pottsgrove Township OCLD	11,769,925	Cost Approach - OCLD
Market Value Indication	**32,602,692**	

Market Sales Analysis - PP/Cash Flows (EBITDA)

	Simple	Weighted	
Mean	22.38	21.58	
Standard Deviation	11.60	8.02	
Median	20.93	13.52	
Mode	Not Applicable	Not Applicable	
Forecast			
Conclusion		22.00	AUS Input
Upper Pottsgrove Township Cash Flows		768,794	Income Approach
Market Value Indication		**16,913,468**	

Summary of Market Analyses

Indicators		
OCLD	23,539,850	
CORLD	17,167,826	Use
Customers	12,393,612	Use
Cash Flows	16,913,468	Use
Value Line	32,602,692	
Mean	20,523,490	15,491,635
Median	17,167,826	16,913,468
Conclusion	**17,167,826**	15,491,635

The market approach conclusion of this appraisal was determined to be $15,491,635.

Cost Approach Revisited – Before concluding this appraisal's fair market value, the preliminary cost approach conclusion of $18,460,028 needs to be evaluated to determine if external obsolescence exists in the preliminary replacement cost new less depreciation conclusion of $18,460,028. The appraisal literature regarding developing a cost approach state:

> "The last step in the implementation of the cost approach is to estimate *economic obsolescence*. Economic obsolescence (sometimes called "external obsolescence") has been previously defined as the loss in value or usefulness of a property caused by factors external to the asset. These factors include increased cost of raw materials, labor, utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; environmental or other regulations; or similar factors.
>
> The difficulty in measuring the full effect of economic obsolescence is one of the weaknesses of the cost approach. Because economic obsolescence is usually a function of outside influences that affect an entire business (i.e., all tangible and intangible assets) rather than individual assets or isolated groups of assets, it is sometimes measured using the income approach or by using the income approach to help identify the existence of economic influences on value. However, the cost approach can be used to measure some forms of economic obsolescence."[15]

The above described income approach value conclusion of $15,611,283 and the market approach conclusion of $15,491,635 for the Upper Pottsgrove Township's future wastewater system compared to the preliminary cost approach conclusion of $18,460,028 indicates no significant external obsolescence exists in the cost approach conclusion of $18,460,028 detailed as follows:

[15] Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, pp. 96-97.

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	CORLD	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
	#REF!				
361.12	10" - 12" Gravity Collection Sewer	1995	584,485.58	0.00%	584,485.58
361.12	10" - 12" Gravity Collection Sewer	2007	527,451.65	0.00%	527,451.65
361.12	10" - 12" Gravity Collection Sewer	2010	249,701.50	0.00%	249,701.50
			1,361,639		**1,361,639**

Therefore, the preliminary cost approach conclusion of $18,460,028 can be considered the final cost approach conclusion as follows:

Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value

(36)	(37)	(39)	(40)	(41)
Account	Description	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
		CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Prelim CORLD	EO%	FMV
353.00	Land & Land Rights	135,794	0.00%	135,794
354.00	Stuctures & Improvements - Pumping	1,664,609	0.00%	1,664,609
355.00	Generating Equipment	32,303	0.00%	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	231,310	0.00%	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	500,882	0.00%	500,882
360.90	Collection Sewers - Force - Air Release Valve	11,317	0.00%	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	5,551,319	0.00%	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,361,639	0.00%	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	816,806	0.00%	816,806
361.98	Collection Sewers - Gravity - Manholes	1,762,386	0.00%	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	304,770	0.00%	304,770
363.00	Service Laterals	2,161,952	0.00%	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	3,924,943	0.00%	3,924,943
		18,460,028		18,460,028

Value Conclusion

The Fair Market Value of the Upper Pottsgrove Township's, Pennsylvania's wastewater property, plant and equipment and its operation were determined to be $17,023,691 as follows:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (7-2019)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (9-30-2019)				
Replacement Cost New (COR)		25,786,184		
Depreciated Replacement Cost New (CORLD)	**$**	**18,460,028**		
Cost Approach Conclusion		**18,460,028**	**50%**	**9,230,014**
Income Approach				
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)		15,611,283		
Income Approach Conclusion		**15,611,283**	**40%**	**6,244,513**
Market Approach				
Market Comparables (to)				
OCLD		23,539,850		
CORLD		17,167,826	Use	
Customers		12,393,612	Use	
Cash Flows (EBITDA)		16,913,468	Use	
Market Financials (to)				
OCLD		32,602,692		
Market Approach Conclusion		**15,491,635**	**10%**	**1,549,164**
Appraisal Conclusion	**$**	**17,023,691**	**100%**	**17,023,691**
Conclusion (cost approach)	**$**	**18,460,028**		

As the purpose of this appraisal was to fulfill the requirements of Section 1329 of the PA CS in the establishment of value for rate making of the Upper Pottsgrove Township's wastewater collection system's property, plant and equipment this appraisal's conclusion of $17,023,6391is consistent with the purpose of the appraisal. As the cost approach work papers detail our value conclusion by National Association of Regulatory Utility Commissioners' (NARUC) Uniform System of Accounts (USOA) for the water industry account classifications and the installation year of the property, this detail can be used to allocate the appraisal conclusion to establish the booked value for future accounting and rate making.

Compliance with Uniform Standards of Professional Appraisal Practice (USPAP) 2020-2021

Fulfillment of Requirements for a Personal Property Appraisal and Report

- State the identity of the client and any intended users, by name or type:
  Pennsylvania American Water Company and the Pennsylvania Public Utility Commission

- State the intended use of the appraisal
  To establish the Fair Market Value of Upper Pottsgrove Township's (PA) Wastewater System (System).

- Describe information sufficient to identify the property, real, personal, and intangible, involved in the appraisal, including the physical and economic property characteristics relevant to the assignment.

  The system consists of collection mains and laterals of various sizes and types, pumping structures, improvements and equipment, and purchased treatment capacity. The property is in good condition based on physical inspections and reviews or operating statements. The property is an operating wastewater system the economics of which were analyzed based on seven years of operating financials which were incorporated into the income approach to value analysis in this appraisal.

- State the real property interests appraised
  The system's land and land rights agreements necessary to access its property.

- State the type and definition of value and city the source of the definition, including whether the opinion of value is in terms of cash or of financing terms equivalent to cash, or based on non-market financing or financing with unusual conditions or incentives
  - *Market Value definition:*
    "The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress." The Appraisal of Real Estate, 12th Edition, page 22.

- State the effective date of the appraisal and the date of the report
  The effective date of the appraisal is April 28, 2020 and the appraisal report date is October 23, 2020.

- Describe sufficient information to disclose to the client and any other intended users of the appraisal the scope of work used to develop the appraisal
  The appraisal considered all three approaches to value: the cost, income and market. Briefly the scopes of work for each are as follows:

Compliance with Uniform Standards of Professional Appraisal Practice (USPAP) 2020-2021

Fulfillment of Requirements for a Personal Property Appraisal and Report

Cost Approach – The cost approach utilized the trended cost method utilizing the investment inventory developed by LTL Consultants and AUS Consultants' Engineers Assessment. The Handy Whitman Index of Public Utility Construction Costs for the water industry were used in the trending. Depreciation was assessed based on straight line age-life depreciation method based on service life expectation for each of the various account categories.

Income Approach – The income approach utilized the discounted cash flow (DCF) method that facilitates the development of cash flows from operations as the property migrates from municipal operation to a regulated investor owned operation. The Township's operating experience was analyzed (2013-2019) in order to estimate the initial cash flows. Future customer tariff rates address the rates agreed to by the parties in the Asset Purchase Agreement between the parties. The operations were forecast for 19 periods in the future and a 20th period which is intended to reflect operation beyond that time. The discount rate was developed based on market debt and equity rates at the appraisal date.

Market Approach – The market approach was developed based on market comparable sales of Pennsylvania wastewater properties and market to book ratios developed for the water industry based on information published by Value Line Investment Surveys at the appraisal date.

Valuation Approaches Reconciliation - The appraisal conclusion was based on reconciliation of each of the approaches and the intended purpose of the appraisal.

- Clearly and conspicuously:
  - State all extraordinary assumptions and hypothetical conditions;

    There were no extraordinary assumptions or hypothetical conditions in this appraisal.

  - State that their use might have affected the assignment results

    Not applicable.

- Clearly and accurately disclose all assumptions, extraordinary assumptions, hypothetical conditions, and limiting conditions used in the assignment

  Not applicable.

- Describe the information analyzed, the appraisal procedures followed, and the reasoning that supports the analyses, opinions, and conclusions

Compliance with Uniform Standards of Professional Appraisal Practice (USPAP) 2020-2021

Fulfillment of Requirements for a Personal Property Appraisal and Report

See scope of work above.

- State the use of the real estate existing as of the date of value and the use of the real estate reflected in the appraisal – when reporting an opinion of market value, describe the support and rationale for the appraiser's opinion of the highest and best use of the real estate

- State and explain any permitted departures from specific requirements of STANDARD 1 and the reason for excluding any of the usual valuation approaches. The appraisal then becomes a limited appraisal – a limited appraisal report must contain a prominent section that clearly identifies the extent of the appraisal process performed and the departures taken

  No departures for Standard 1 were made.

- Include a signed certification in accordance with Standards Rule 2-3

  Contained in Narrative Report.

Compliance with Uniform Standards of Professional Appraisal Practice (USPAP) 2020-2021

Fulfillment of Requirements for a Personal Property Appraisal and Report

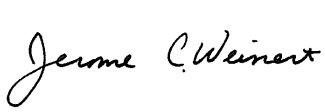
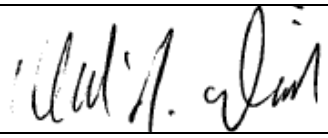
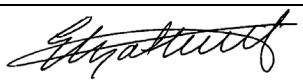
AUS Consultants, Valuation and Depreciation Services Group certify that, to the best of its knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- AUS Consultants, Valuation and Depreciation Services Group has not performed an appraisal of the Upper Pottsgrove Township's sanitary wastewater collection system previously in the last three year.
- AUS Consultants, Valuation and Depreciation Services Group, nor its professional staff has any present or prospective interest in the property that is the subject of this report and has no interest or bias with respect to the parties involved.
- We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- Our engagement in this assignment is not contingent upon developing or reporting predetermined results.
- Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- Our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice 2020-2021.
- The signers of this report have made a personal inspection of the property that is the subject of this report.
- Individuals providing significant appraisal assistance to the person signing this certification include: Scott Fogelsanger of Pennsylvania American Wastewater Company provided information obtained from the Upper Pottsgrove Township and the Engineer's Assessment report prepared by LTL Consultants and AUS Consultants which was the inventory starting point of the Cost Approach.

Compliance with Uniform Standards of Professional Appraisal Practice (USPAP) 2020-2021

Fulfillment of Requirements for a Personal Property Appraisal and Report

AUS Consultants, Depreciation & Valuation
By:

	
Jerome C. Weinert, AM, P.E., CDP Principal and Director	David A. Sheffer Principal
	
Michael J. Diedrich, ASA, P.E., CDP Certified General Appraiser Principal	Elizabeth A. Weinert Associate

ASA: Accredited Senior Appraiser in the Machinery and Equipment (Public Utilities) discipline of the American Society of Appraisers
AMA: Accredited Member Appraiser in the Machinery and Equipment (Public Utilities) discipline of the American Society of Appraisers
P.E.: Registered Professional Engineer State of Wisconsin
CDP: Certified Depreciation Professions in the Society of Depreciation Professionals

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Valuation Summary

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (7-2019)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (9-30-2019)				
Replacement Cost New (COR)		25,786,184		
Depreciated Replacement Cost New (CORLD)	$	**18,460,028**		
Cost Approach Conclusion		**18,460,028**	**50%**	**9,230,014**
Income Approach				
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)		15,611,283		
Income Approach Conclusion		**15,611,283**	**40%**	**6,244,513**
Market Approach				
Market Comparables (to)				
OCLD		23,539,850		
CORLD		17,167,826	Use	
Customers		12,393,612	Use	
Cash Flows (EBITDA)		16,913,468	Use	
Market Financials (to)				
OCLD		32,602,692		
Market Approach Conclusion		**15,491,635**	**10%**	**1,549,164**
Appraisal Conclusion	$	**17,023,691**	**100%**	**17,023,691**
Conclusion (cost approach)	$	**18,460,028**		

Appraisal Approach	Value Indicator	Weight	Wtd Value Indicator
Cost	18,460,028	50%	9,230,014
Income	15,611,283	40%	6,244,513
Market	15,491,635	10%	1,549,164
Appraisal Conclusion			17,023,691

Appendix A-5.1 (AUS)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020
Fair Market Value Appraisal

Appraisal Approach		Investor-owned Utility	Weight	Wtd Valuation Indications
Cost Approach				
Inventory of Assets (12-2017)				
Original Cost ($OC)		15,295,347		
Depreciated Original Cost ($OCLD)		11,769,925		
Replacement Cost (12-2017)				
Replacement Cost New (COR)		25,786,184		
Depreciated Replacement Cost New (CORLD)	$	18,460,028		
Cost Approach Conclusion		18,460,028	50%	9,230,014
Income Approach				
Customer Growth				
Annual Customer Growth				
Annual Subscriber Growth: All Periods 1.0%				
Periodic Customer Growth				
Periodic Customer Growth: All PeriodsS 0.0%				
Revenues				
Base:	$	1,473,355.00		
Forecast				
Operations Expenses				
Expense Level 1. Operations & Maintenance				
Base:	$	354,533.00		
Forecast:		Operations & Maintenance Expense Growth Rate: Periods 1-5 & 6-15 3.0% all remaining Periods 3.0%		
Eexpense Level 2. Not Used				
Base:	$	-		
Forecast:		No Forecast Required		
Expense Level 3. Depreciation				
Base:				
Book	$	304,294.11		
Tax	$	595,743.45		
Forecast:		Book Depreciation Expense Based on CORLD, Plant Depreciation Parameters, and CORLD Aging; Tax Depreciation based on CORLD and MACRS		
Expense Level 4. Not Used				
Base:	$	-		
Forecast:		No Forecast Required		
Expense Level 5. Not Used				
Base:	$	-		
Forecast:		No Forecast Required		
Expense Leve 6. Not Used				
Base:	$	-		
Forecast:		No Forecast Required		
Expense Level 7. Not Used				
Base:	$	-		
Forecast:		No Forecast Required		
Total Operations Expense	$	658,827.11		
Operating Income	$	814,527.89		
Rate Increase Scenario				
No increases (Input 2)		10,511,071		
Modest Rate Increases: 6% every 3 year period starting in period 3 (Input 4)		13,613,123		
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)		15,611,283		
Income Approach Conclusion		15,611,283	40%	6,244,513
Market Approach				
Market Comparables (to)				
CORLD		17,747,845	Use	
OCLD		19,550,630		
Customers		12,393,612	Use	
Cash Flows (EBITDA)		16,913,468	Use	
Market Financials (to)				
OCLD		24,834,542		
Summary				
Mean		15,491,635		
Mediam		16,913,468		
Market Approach Conclusion		15,491,635	10%	1,549,164
Appraisal Conclusion	$	17,023,691	100%	17,023,691
Conclusion (cost approach)	$	18,460,028		

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach
Replacement Cost New

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(9)	(10)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Original Cost	Costing Parameter	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
			OC $s			RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input			AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Original Cost	Cost Index Table	Translator	RCN	COR / RCN Factor	COR
353.00	353.00	Land & Land Rights	8,865	USBLS3	15.32	135,794	1.00	135,794
354.00	354.00	Stuctures & Improvements - Pumping	1,612,326	HWW-115	1.48	2,380,438	1.00	2,380,438
355.00	355.00	Generating Equipment	47,512	USBLS4	1.45	69,012	1.00	69,012
360.10	360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	HWW-144	1.58	309,812	1.00	309,812
360.20	360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	HWW-144	1.39	610,719	1.00	610,719
360.90	360.90	Collection Sewers - Force - Air Release Valve	11,934	HWW-144	1.22	14,511	1.00	14,511
361.11	361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	HWW-144	1.62	7,196,371	1.00	7,196,371
361.12	361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	HWW-144	1.61	1,752,280	1.00	1,752,280
361.13	361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	HWW-144	1.30	966,046	1.00	966,046
361.98	361.98	Collection Sewers - Gravity - Manholes	1,586,684	HWW-145	1.40	2,220,312	1.00	2,220,312
361.99	361.99	Collection Sewers - Gravity - Miscellaneous	261,971	HWW-144	1.36	355,575	1.00	355,575
363.00	363.00	Service Laterals	1,731,294	HWW-139	1.63	2,819,318	1.00	2,819,318
380.00	380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	HWW-117	2.23	6,955,996	1.00	6,955,996
		Total Upper Pottsgrove Township Wastewater Utility	15,295,347			25,786,184		25,786,184

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(1)	(2)	(3)	(4)	(5)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Average Year Installed	Average Year Installed	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
					OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	Year Installed	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
		10" - 12" Gravity Collection Sewer										
361.12	361.12	10" - 12" Gravity Collection Sewer	1995	1995	377,721.52	HWW-144	277.5	616.2	2.221	838,920	1.000	838,920
361.12	361.12	10" - 12" Gravity Collection Sewer	2007	2007	474,784.52	HWW-144	465.8	616.2	1.323	628,140	1.000	628,140
361.12	361.12	10" - 12" Gravity Collection Sewer	2010	2010	234,556.68	HWW-144	506.6	616.2	1.216	285,221	1.000	285,221
		TOTAL Account 361.12 - 10" - 12" Collection Sewer			**1,087,062.72**					**1,752,280**		**1,752,280**

Appendix A-5.1 (AUS)

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

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Pennsylvania American Water Company

Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input
353.00	Land & Land Rights	USBLS	PPI	3.00	USBLS3	1.00
354.00	Stuctures & Improvements - Pumping	HW	W-1	15.00	HWW-115	1.00
355.00	Generating Equipment	USBLS	PPI	4.00	USBLS4	1.00
360.10	Collection Sewers - Force - Mains - 4" & Under	HW	W-1	44.00	HWW-144	1.00
360.20	Collection Sewers - Force - Mains - 6"-8"	HW	W-1	44.00	HWW-144	1.00
360.90	Collection Sewers - Force - Air Release Valve	HW	W-1	44.00	HWW-144	1.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	HW	W-1	44.00	HWW-144	1.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	HW	W-1	44.00	HWW-144	1.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	HW	W-1	44.00	HWW-144	1.00
361.98	Collection Sewers - Gravity - Manholes	HW	W-1	45.00	HWW-145	1.00
361.99	Collection Sewers - Gravity - Miscellaneous	HW	W-1	44.00	HWW-144	1.00
363.00	Service Laterals	HW	W-1	39.00	HWW-139	1.00
380.00	Treatment and Disposal Equipment Purchased Capacity	HW	W-1	17.00	HWW-117	1.00

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach
Replacement Cost New less Depreciation

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(21)	(22)	(23)	(24)	(28)	(29)	(30)	(31)
Account	Description	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa type	Normal Service Life (NSL)	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)
		years	COR $s		years	years	years	% of COR	CORLD $s
Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	LTL Consultants & AUS Consultants Engineers Assessment		Col (16)	AUS Input	AUS Input		Col (21) + (28)	Col (28) / (29)	Col (22) * (30)
Account	Description	Age	RCN	Iowa	NL	Rem Life	Total Life	Condition	CORLD
353.00	Land & Land Rights	18.00	135,794	ZNonDep	-	-	-	-	135,794
354.00	Stuctures & Improvements - Pumping	13.83	2,380,438	R4.0	45.81	32.29	46.12	45.81	1,664,609
355.00	Generating Equipment	19.70	69,012	R3.0	35.00	17.16	36.85	35.00	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	19.44	309,812	R3.0	75.00	56.77	76.20	75.00	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	13.63	610,719	R3.0	75.00	62.06	75.69	75.00	500,882
360.90	Collection Sewers - Force - Air Release Valve	10.00	14,511	R3.0	45.00	35.43	45.43	45.00	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	18.81	7,196,371	R2.5	80.00	62.82	81.63	80.00	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	18.26	1,752,280	R2.5	80.00	63.35	81.61	80.00	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	12.51	966,046	R2.5	80.00	68.46	80.97	80.00	816,806
361.98	Collection Sewers - Gravity - Manholes	16.61	2,220,312	S2.0	80.00	63.62	80.23	80.00	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	11.60	355,575	R2.5	80.00	69.16	80.76	80.00	304,770
363.00	Service Laterals	16.54	2,819,318	R3.0	70.00	54.20	70.74	70.00	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	21.72	6,955,996	R2.0	45.00	27.27	48.99	45.00	3,924,943
			25,786,184						18,460,028

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)		(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup		Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life
			years	COR $s		years	% of NSL	Lookup		%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation		Lookup	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Account		2020 [(20)+(19)]	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)		Lookup Iowa Curves Life Tables @ col (25)	Col (24) * (27)	Col (21) + (28)	Col (29) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description		Year1	Age	RCN	Iowa	NLife	AgeP		IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR *Nlife
	#REF!																	
361.12 10" - 12" Gravity Collection Sewer		1995	25.00	838,920	R2.5	80.0	31	R2.5031		0.71765	57.43	82.43	69.671236%	584,485.58	20,972,988	48,178,147	69,152,134	67,113,560
361.12 10" - 12" Gravity Collection Sewer		2007	13.00	628,140	R2.5	80.0	16	R2.5016		0.85124	68.10	81.10	83.970407%	527,451.85	8,165,819	42,776,329	50,942,148	50,251,194
361.12 10" - 12" Gravity Collection Sewer		2010	10.00	285,221	R2.5	80.0	13	R2.5013		0.87869	70.30	80.30	87.546700%	249,701.50	2,852,209	20,051,031	22,903,240	22,817,674
				1,752,280										1,361,639	31,991,016	111,006,507	142,997,522	140,182,428

9		10	11	12	13
		(5)	(6)		
(4b)			(6a)	(6b)	
Normal Service Life		Economic Obsolescence	Tax Depreciation		Report Depreciation
years		%	Table	Life	

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)		(5)	(6)	
		(4a)	(4b)		(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence	Tax Depreciation	
			years	% of CORLD	Table	Life
353.00	Land & Land Rights	ZNonDep	0.00	0.00%	Non-Depr	0.00
354.00	Stuctures & Improvements - Pumping	R4.0	55.00	0.00%	MACRS	25.00
355.00	Generating Equipment	R3.0	35.00	0.00%	MACRS	25.00
360.10	Collection Sewers - Force - Mains - 4" & Under	R3.0	75.00	0.00%	MACRS	25.00
360.20	Collection Sewers - Force - Mains - 6"-8"	R3.0	75.00	0.00%	MACRS	25.00
360.90	Collection Sewers - Force - Air Release Valve	R3.0	45.00	0.00%	MACRS	25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	R2.5	80.00	0.00%	MACRS	25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	R2.5	80.00	0.00%	MACRS	25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	R2.5	80.00	0.00%	MACRS	25.00
361.98	Collection Sewers - Gravity - Manholes	S2.0	80.00	0.00%	MACRS	25.00
361.99	Collection Sewers - Gravity - Miscellaneous	R2.5	80.00	0.00%	MACRS	25.00
363.00	Service Laterals	R3.0	70.00	0.00%	MACRS	25.00
380.00	Treatment and Disposal Equipment Purchased Capacity	R2.0	45.00	0.00%	MACRS	25.00

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach

Replacement Cost New less Depreciation to Fair Market Value

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value

(36)	(37)	(39)	(40)	(41)
Account	Description	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
		CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Prelim CORLD	EO%	FMV
353.00	Land & Land Rights	135,794	0.00%	135,794
354.00	Stuctures & Improvements - Pumping	1,664,609	0.00%	1,664,609
355.00	Generating Equipment	32,303	0.00%	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	231,310	0.00%	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	500,882	0.00%	500,882
360.90	Collection Sewers - Force - Air Release Valve	11,317	0.00%	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	5,551,319	0.00%	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,361,639	0.00%	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	816,806	0.00%	816,806
361.98	Collection Sewers - Gravity - Manholes	1,762,386	0.00%	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	304,770	0.00%	304,770
363.00	Service Laterals	2,161,952	0.00%	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	3,924,943	0.00%	3,924,943
		18,460,028		18,460,028

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	CORLD	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
	#REF!				
361.12	10" - 12" Gravity Collection Sewer	1995	584,485.58	0.00%	584,485.58
361.12	10" - 12" Gravity Collection Sewer	2007	527,451.65	0.00%	527,451.65
361.12	10" - 12" Gravity Collection Sewer	2010	249,701.50	0.00%	249,701.50
			1,361,639		**1,361,639**

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Original Cost less Depreciation

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Determination of the Depreciated Original Cost

(43)	(44)	(46)	(47)	(48)	(49)	(53)	(54)	(55)	(56)	(57)
Account	Description	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost
Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input			Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)
Acct	Descrip	Original Cost	Iowa	Normal Life	age	Rem Life	Total Life	Theo%	Theo Reserve	Net Book
353.00	Land & Land Rights	8,865	ZNonDep	-	18.00	-	-	-	-	8,865
354.00	Stuctures & Improvements - Pumping	1,612,326	R4.0	45.93	12.29	33.86	46.15	0.27	431,160	1,181,166
355.00	Generating Equipment	47,512	R3.0	35.00	18.98	17.77	36.75	0.51	24,391	23,121
360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	R3.0	75.00	15.40	60.48	75.89	0.20	39,560	156,554
360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	R3.0	75.00	12.52	63.11	75.63	0.17	72,715	367,058
360.90	Collection Sewers - Force - Air Release Valve	11,934	R3.0	45.00	10.00	35.43	45.43	0.22	2,627	9,307
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	R2.5	80.00	15.14	66.08	81.21	0.18	821,593	3,624,114
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	R2.5	80.00	16.52	64.87	81.39	0.20	219,876	867,186
361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	R2.5	80.00	12.48	68.48	80.96	0.15	114,106	626,526
361.98	Collection Sewers - Gravity - Manholes	1,586,684	S2.0	80.00	14.27	65.84	80.11	0.18	281,769	1,304,915
361.99	Collection Sewers - Gravity - Miscellaneous	261,971	R2.5	80.00	10.11	70.47	80.58	0.12	32,711	229,260
363.00	Service Laterals	1,731,294	R3.0	70.00	14.36	56.25	70.61	0.20	351,041	1,380,253
380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	R2.0	45.00	17.93	30.26	48.19	0.36	1,133,873	1,991,599
		15,295,347							3,525,422	11,769,925

Appendix A-5.1 (AUS)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	OC Weighted Normal Life
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020 b-([48]+0.5)	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables (B-tab (51)	Col (48) * (52)	Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Life	age	AgeP	IowaLookup	IowaCondition	Rem Life	Total Lif	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd NLife
	#REF !																	
361.12	10" - 12" Gravity Collection Sewer	1995	377,722	R2.5	80	25.00	31	R2.5031	0.71785	57.43	82.43	0.30329	114,559	263,162	9,443,038	21,692,547	31,135,585	30,217,722
361.12	10" - 12" Gravity Collection Sewer	2007	474,785	R2.5	80	13.00	16	R2.5016	0.95124	68.1	81.1	0.1603	76,108	398,677	6,172,199	32,332,826	38,505,025	37,982,762
361.12	10" - 12" Gravity Collection Sewer	2010	234,557	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	29,209	205,347	2,345,567	16,489,335	18,834,901	18,764,534
			1,087,063										219,876	867,186	17,960,804	70,514,707	88,475,511	86,965,018

9	10	11	12	13

(4b)	(5)	(6a)	(6b)
Normal Service Life	Economic Obsolescence	Tax Depreciation	Report Depreciation
years	%	Table	Life

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)	(4a)	(4b)	(5)	(6)	(6a)	(6b)
Account Number	Description		Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence		Tax Depreciation	
				years	% of CORLD		Table	Life
353.00	Land & Land Rights		ZNonDep	0.00	0.00%		Non-Depr	0.00
354.00	Stuctures & Improvements - Pumping		R4.0	55.00	0.00%		MACRS	25.00
355.00	Generating Equipment		R3.0	35.00	0.00%		MACRS	25.00
360.10	Collection Sewers - Force - Mains - 4" & Under		R3.0	75.00	0.00%		MACRS	25.00
360.20	Collection Sewers - Force - Mains - 6"-8"		R3.0	75.00	0.00%		MACRS	25.00
360.90	Collection Sewers - Force - Air Release Valve		R3.0	45.00	0.00%		MACRS	25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"		R2.5	80.00	0.00%		MACRS	25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"		R2.5	80.00	0.00%		MACRS	25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over		R2.5	80.00	0.00%		MACRS	25.00
361.98	Collection Sewers - Gravity - Manholes		S2.0	80.00	0.00%		MACRS	25.00
361.99	Collection Sewers - Gravity - Miscellaneous		R2.5	80.00	0.00%		MACRS	25.00
363.00	Service Laterals		R3.0	70.00	0.00%		MACRS	25.00
380.00	Treatment and Disposal Equipment Purchased Capacity		R2.0	45.00	0.00%		MACRS	25.00

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach

AUS Consultants
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Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
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Upper Pottsgrove Township's Wastewater System

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Income Approach

Discounted Cash Flow Analysis
Period 1 through 19 and 20 to perpetuity

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate 8.09%
Capitalization Rate 6.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
					(3)-(4)	(6)-(5)	(7) *28.89%			(3)-(4)-(8)-(9)-(10)		(11)*(12)	Sum (13)
1	0.5	1,488,089	365,169	595,743	1,122,920	527,177	152,301	191,054	796	778,769	0.962	749,176	749,176
2	1.5	1,726,183	376,124	602,538	1,350,059	747,521	215,959	192,660	12,857	928,583	0.89	826,439	1,575,615
3	2.5	1,743,445	387,408	609,455	1,356,037	746,582	215,688	194,235	932	945,182	0.823	777,885	2,353,500
4	3.5	1,760,879	399,030	616,496	1,361,849	745,353	215,332	195,825	941	949,751	0.762	723,710	3,077,210
5	4.5	1,778,488	411,001	623,664	1,367,487	743,823	214,890	197,427	952	954,218	0.705	672,724	3,749,934
6	5.5	1,974,122	423,331	630,961	1,550,791	919,830	265,739	199,042	10,563	1,075,447	0.652	701,191	4,451,125
7	6.5	1,993,863	436,031	623,251	1,557,832	934,581	270,000	145,622	1,067	1,141,143	0.603	688,109	5,139,234
8	7.5	2,013,802	449,112	628,997	1,564,690	935,693	270,322	146,852	1,077	1,146,439	0.558	639,713	5,778,947
9	8.5	2,154,768	462,585	634,846	1,692,183	1,057,337	305,465	148,092	7,611	1,231,015	0.516	635,204	6,414,151
10	9.5	2,176,316	476,463	640,799	1,699,853	1,059,054	305,961	149,342	1,164	1,243,386	0.478	594,339	7,008,490
11	10.5	2,198,079	490,757	646,857	1,707,322	1,060,465	306,368	150,604	1,175	1,249,175	0.442	552,135	7,560,625
12	11.5	2,351,945	505,480	653,021	1,846,465	1,193,444	344,786	151,875	8,309	1,341,495	0.409	548,671	8,109,296
13	12.5	2,375,464	520,644	659,295	1,854,820	1,195,525	345,387	153,160	1,270	1,355,003	0.378	512,191	8,621,487
14	13.5	2,399,219	536,263	665,679	1,862,956	1,197,277	345,893	154,457	1,283	1,361,323	0.350	476,463	9,097,950
15	14.5	2,567,164	552,351	672,173	2,014,813	1,342,640	387,889	155,763	9,069	1,462,092	0.324	473,718	9,571,668
16	15.5	2,592,836	557,875	575,782	2,034,961	1,459,179	421,557	157,077	1,386	1,454,941	0.299	435,027	10,006,695
17	16.5	2,618,764	563,454	581,310	2,055,310	1,474,000	425,839	158,408	1,400	1,469,663	0.277	407,097	10,413,792
18	17.5	2,802,077	569,089	586,929	2,232,988	1,646,059	475,547	159,746	9,900	1,587,795	0.256	406,476	10,820,268
19	18.5	2,830,098	574,780	592,646	2,255,318	1,662,672	480,346	161,099	1,512	1,612,361	0.237	382,130	11,202,398
20 and beyond	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,698	2.707	4,408,885	15,611,283
								3,324,802					
Age				19.5									
PW(Age) = 1/(1+Discount Rate)$^{(Age)}$				0.219									
PW to Perpetuity = 1/Capitalization Rate				12.361									
$PW_{(Grand\ Beyond)}$ = PW to Perpetuity * $PW\ Factor_{(19.5)}$				2.707									
								Net Plant		10,732,792			
								ADIT		(1,762,467)			
								Rate Base		8,970,325	0.219	1,964,501	13,166,899
								Annual Plant Construction Inflation Rate		0.0422 Input			
								Plant Inflation over 19.5 years		20,503,573	0.219	4,490,282	15,692,680
								PP	13,750,000				
								OCLD	11,769,925				
								PP/OCLD	1.168				
								RCNLD	18,460,028				
								RCNLD/PP		1.342547521			
										12,043,087.31	0.219	2,637,436	13,839,834
								Average					14,577,674

Deferred Tax

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Calculated Rates of Return on Rate Base and Equity
(Years 1 through 20)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Period	Age	Revenues	O&M Expenses	Book Depreciation	Rademaking Interest Expense	Book Taxable Income (Current + Deferred)	State and Federal Taxes @ 28.89%	Net Operating Income	Net (Equity) Income	Net Plant	Working Capital	Accumulated Deferred Income Taxes (ADIT)	Rate Base	Return on Rate Base	Net Equity	Return on Equity
						(3)-(4)-(5)-(6)	(7) *28.89%	(7)-(8)=(9)	(9) - (6)				(11)+(12)+(13)	(9)/(14)		(10)/(16)
1	0.5	1,488,089	365,169	304,294	205,739	612,887	177,063	641,563	435,824	13,636,760	80,357	(84,200)	13,632,917	4.71%	14,648,576	2.98%
2	1.5	1,726,183	376,124	306,492	201,296	842,271	243,332	800,235	598,939	13,522,928	93,214	(169,728)	13,446,414	5.95%	15,247,515	3.93%
3	2.5	1,743,445	387,408	309,155	197,590	849,292	245,361	801,521	603,931	13,408,008	94,146	(256,485)	13,245,669	6.05%	15,851,446	3.81%
4	3.5	1,760,879	399,030	309,853	191,003	860,993	248,741	803,255	612,252	13,293,980	95,087	(345,074)	13,043,993	6.16%	16,463,698	3.72%
5	4.5	1,778,488	411,001	311,530	184,636	871,321	251,725	804,232	619,596	13,179,877	96,039	(435,250)	12,840,666	6.26%	17,083,294	3.63%
6	5.5	1,974,122	423,331	313,362	178,482	1,058,947	305,930	931,499	753,017	13,065,557	106,602	(527,005)	12,645,154	7.37%	17,836,311	4.22%
7	6.5	1,993,863	436,031	314,153	172,533	1,071,146	309,454	934,225	761,692	12,896,773	107,669	(616,303)	12,388,139	7.54%	18,598,003	4.10%
8	7.5	2,013,802	449,112	316,510	166,781	1,081,399	312,416	935,764	768,983	12,726,860	108,746	(706,580)	12,129,026	7.72%	19,368,986	3.97%
9	8.5	2,154,768	462,585	318,269	161,222	1,212,692	350,347	1,023,567	862,345	12,556,426	116,357	(798,039)	11,874,744	8.62%	20,229,331	4.26%
10	9.5	2,176,316	476,463	316,996	155,848	1,227,009	354,483	1,028,374	872,526	12,388,513	117,521	(891,586)	11,614,448	8.85%	21,101,857	4.13%
11	10.5	2,198,079	490,757	318,650	150,653	1,238,019	357,664	1,031,008	880,355	12,220,206	118,696	(986,405)	11,352,497	9.08%	21,982,212	4.00%
12	11.5	2,351,945	505,480	319,940	145,631	1,380,894	398,940	1,127,585	981,954	12,051,880	127,005	(1,082,632)	11,096,253	10.16%	22,964,167	4.28%
13	12.5	2,375,464	520,644	321,081	140,777	1,392,962	402,427	1,131,312	990,535	11,883,694	128,275	(1,180,342)	10,831,627	10.44%	23,954,701	4.14%
14	13.5	2,399,219	536,263	320,093	136,084	1,406,779	406,418	1,136,445	1,000,361	11,717,792	129,558	(1,280,181)	10,567,169	10.75%	24,955,062	4.01%
15	14.5	2,567,164	552,351	320,658	131,548	1,562,607	451,437	1,242,718	1,111,170	11,552,628	138,627	(1,381,734)	10,309,521	12.05%	26,066,231	4.26%
16	15.5	2,592,836	557,875	322,841	127,163	1,584,957	457,894	1,254,226	1,127,063	11,386,595	140,013	(1,454,809)	10,071,799	12.45%	27,193,295	4.14%
17	16.5	2,618,764	563,454	322,225	122,924	1,610,161	465,175	1,267,910	1,144,986	11,222,506	141,413	(1,529,658)	9,834,261	12.89%	28,338,281	4.04%
18	17.5	2,802,077	569,089	324,976	118,827	1,789,185	516,896	1,391,116	1,272,289	11,057,001	151,313	(1,605,337)	9,602,977	14.49%	29,610,570	4.30%
19	18.5	2,830,098	574,780	323,288	114,866	1,817,164	524,979	1,407,051	1,292,185	10,894,535	152,825	(1,683,155)	9,364,205	15.03%	30,902,755	4.18%
20	19.5	2,858,399	580,528	323,926	111,037	1,842,908	532,416	1,421,529	1,310,492	10,732,792	154,354	(1,762,467)	9,124,679	15.58%	32,213,247	4.07%
										2,350,481.40						

Deferred Tax

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach

Discounted Cash Flow Analysis
Period 20 through 59 and 60 to perpetuity

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate:			8.09%														
Capitalization Rate:			6.16%											Period Present Worth			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)				
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows				
					(3)+(4)	(6)+(5)	(7) *28.89%			(3)+(4)+(8)+(9)+(10)		(11)*(12)	Sum (13)				
20	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,688	0.219	356,685	11,559,083				
21	20.5	3,058,487	586,333	604,370	2,472,154	1,867,784	539,603	163,837	10,804	1,757,910	0.203	356,856	11,915,939				
22	21.5	3,083,072	592,196	610,381	2,490,876	1,886,495	545,008	165,223	1,652	1,784,993	0.188	335,579	12,251,518				
23	22.5	3,119,963	598,118	616,492	2,521,845	1,905,353	550,456	166,621	1,668	1,803,100	0.174	313,739	12,565,257				
24	23.5	3,338,360	604,099	622,708	2,734,261	2,111,553	610,028	168,032	11,794	1,944,407	0.161	313,050	12,878,307				
25	24.5	3,371,744	610,140	629,027	2,761,604	2,132,577	616,102	169,456	1,802	1,974,244	0.149	294,162	13,172,469				
26	25.5	3,405,461	616,241	169,727	2,789,220	2,619,493	756,772	170,893	1,821	1,859,734	0.138	256,643	13,429,112				
27	26.5	3,643,843	622,403	171,165	3,021,440	2,850,275	823,444	172,339	12,872	2,012,785	0.127	255,624	13,684,736				
28	27.5	3,680,281	628,627	172,617	3,051,654	2,879,037	831,754	173,800	1,968	2,044,132	0.118	241,208	13,925,944				
29	28.5	3,717,084	634,913	174,081	3,082,171	2,908,090	840,147	175,273	1,988	2,064,763	0.109	225,059	14,151,003				
30	29.5	3,754,255	641,262	175,554	3,112,993	2,937,439	848,626	176,755	2,006	2,085,606	0.101	210,646	14,361,649				
31	30.5	3,791,798	647,675	177,047	3,144,123	2,967,076	857,188	178,257	2,028	2,106,650	0.093	195,918	14,557,567				
32	31.5	3,829,716	654,152	178,547	3,175,564	2,997,017	865,838	179,766	2,047	2,127,913	0.086	183,001	14,740,568				
33	32.5	3,868,013	660,694	181,841	3,207,319	3,025,478	874,061	181,291	2,069	2,149,898	0.080	171,992	14,912,560				
34	33.5	3,906,693	667,301	185,176	3,239,392	3,054,216	882,363	182,831	2,088	2,172,110	0.074	160,736	15,073,296				
35	34.5	3,945,760	673,974	186,743	3,271,786	3,085,043	891,269	184,380	2,110	2,194,027	0.068	149,194	15,222,490				
36	35.5	3,985,218	680,714	188,326	3,304,504	3,116,178	900,264	185,945	2,131	2,216,164	0.063	139,618	15,362,108				
37	36.5	4,025,070	687,521	189,923	3,337,549	3,147,626	909,349	187,525	2,152	2,238,523	0.058	129,834	15,491,942				
38	37.5	4,065,321	694,396	191,533	3,370,925	3,179,392	918,526	189,116	2,173	2,261,110	0.054	122,100	15,614,042				
39	38.5	4,105,974	701,340	193,155	3,404,634	3,211,479	927,796	190,721	2,196	2,283,921	0.050	114,196	15,728,238				
40	39.5	4,147,034	708,353	194,795	3,438,681	3,243,886	937,159	192,342	2,217	2,306,963	0.046	106,120	15,834,358				
41	40.5	4,188,504	715,437	196,445	3,473,067	3,276,622	946,616	193,974	2,239	2,330,238	0.043	100,200	15,934,558				
42	41.5	4,230,389	722,591	198,112	3,507,798	3,309,686	956,168	195,622	2,262	2,353,746	0.040	94,150	16,028,708				
43	42.5	4,272,693	729,817	206,482	3,542,876	3,336,394	963,884	197,285	2,284	2,379,423	0.037	88,039	16,116,747				
44	43.5	4,315,420	737,115	214,979	3,578,305	3,363,326	971,665	198,959	2,308	2,405,373	0.034	81,783	16,198,530				
45	44.5	4,358,574	744,486	216,806	3,614,088	3,397,282	981,475	200,650	2,330	2,429,633	0.031	75,319	16,273,849				
46	45.5	4,402,160	751,931	218,651	3,650,229	3,431,578	991,383	202,357	2,354	2,454,135	0.029	71,170	16,345,019				
47	46.5	4,446,182	759,450	220,508	3,686,732	3,466,224	1,001,392	204,076	2,377	2,478,887	0.027	66,930	16,411,949				
48	47.5	4,490,644	767,045	222,385	3,723,599	3,501,214	1,011,501	205,813	2,400	2,503,885	0.025	62,597	16,474,546				
49	48.5	4,535,550	774,715	224,275	3,760,835	3,536,560	1,021,712	207,562	2,426	2,529,135	0.023	58,170	16,532,716				
50	49.5	4,580,906	782,462	226,183	3,798,444	3,572,261	1,032,026	209,328	2,449	2,554,641	0.021	53,647	16,586,363				
51	50.5	4,626,715	790,287	228,106	3,836,428	3,608,322	1,042,444	211,107	2,473	2,580,404	0.020	51,608	16,637,971				
52	51.5	4,672,982	798,190	230,048	3,874,792	3,644,744	1,052,967	212,905	2,499	2,606,421	0.018	46,916	16,684,887				
53	52.5	4,719,712	806,172	232,005	3,913,540	3,681,535	1,063,595	214,716	2,523	2,632,706	0.017	44,756	16,729,643				
54	53.5	4,766,909	814,234	233,981	3,952,675	3,718,694	1,074,331	216,545	2,550	2,659,249	0.016	42,548	16,772,191				
55	54.5	4,814,578	822,376	235,973	3,992,202	3,756,229	1,085,175	218,389	2,573	2,686,065	0.014	37,605	16,809,796				
56	55.5	4,862,724	830,600	237,983	4,032,124	3,794,141	1,096,127	220,249	2,600	2,713,148	0.013	35,271	16,845,067				
57	56.5	4,911,351	838,906	240,008	4,072,445	3,832,437	1,107,191	222,124	2,626	2,740,504	0.012	32,886	16,877,953				
58	57.5	4,960,465	847,295	242,051	4,113,170	3,871,119	1,118,366	224,015	2,652	2,768,137	0.011	30,450	16,908,403				
59	58.5	5,010,070	855,768	244,114	4,154,302	3,910,188	1,129,653	225,924	2,679	2,796,046	0.011	30,757	16,939,160				
60	59.5	5,060,171	864,326	246,194	4,195,845	3,949,651	1,141,054	227,849	2,705	2,824,237	0.124	350,205	17,289,365				
								7,926,314									

Age				59.5						Net Plant		5,723,544					
PW(Age) = 1/(1+Discount Rate)^Age				0.010						ADIT		(1,059,994)					
PW to Perpetuity = 1/Capitalization Rate				12.361						Rate Base		4,663,550	0.010	46,635	16,985,795		
PW_Discounted = PW to Perpetuity * PW Factor_Tax w/				0.124						Plant Construction Inflation Rate		0.0422 Input					
										Plant Inflation over 59.5 years		54,551,311	0.010	545,513	17,484,673		
										PP	13,750,000						
										RCNLD	18,460,028						
										RCNLD/PP	1.342547521						
											6,261,036.86		0.010	62,610	17,001,770		

Deferred Tax

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Calculated Rates of Return on Rate Base and Equity
(Years 1 through 20)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Period	Age	Revenues	O&M Expenses	Book Depreciation	Ratemaking Interest Expense	Book Taxable Income (Current + Deferred)	State and Federal Taxes @ 28.89%	Net Operating Income	Net (Equity) Income	Net Plant	Working Capital	Accumulated Deferred Income Taxes (ADIT)	Rate Base	Return on Rate Base	Net Equity	Return on Equity
						(3) (4) (5) (6)	(7) *28.89%	(7) (8)=(6)	(9) (6)				(11)+(12)+(13)	(9)/(14)		(10)/(16)
20	19.5	2,858,399	580,528	323,926	111,037	1,842,908	532,416	1,421,529	1,310,492	10,732,792	154,354	(1,762,467)	9,124,679	15.58%	32,213,247	4.07%
20	20.5	3,058,487	586,333	323,707	107,336	2,041,111	589,677	1,558,770	1,451,434	10,572,641	165,158	(1,843,551)	8,894,248	17.53%	33,664,681	4.31%
20	21.5	3,089,072	592,196	324,487	103,758	2,068,631	597,627	1,574,762	1,471,004	10,413,094	166,810	(1,926,145)	8,653,759	18.20%	35,135,685	4.19%
20	22.5	3,119,963	598,118	323,646	100,300	2,097,899	606,083	1,592,116	1,491,816	10,255,784	168,478	(2,010,748)	8,413,514	18.92%	36,627,501	4.07%
20	23.5	3,338,360	604,099	324,842	96,956	2,312,463	668,071	1,741,348	1,644,392	10,098,687	180,272	(2,096,802)	8,182,157	21.28%	38,271,893	4.30%
20	24.5	3,371,744	610,140	323,788	93,724	2,344,092	677,208	1,760,608	1,666,884	9,944,066	182,074	(2,184,985)	7,941,155	22.17%	39,938,777	4.17%
20	25.5	3,405,461	616,241	324,799	90,600	2,373,821	685,797	1,778,624	1,688,024	9,789,869	183,895	(2,140,185)	7,833,579	22.71%	41,626,801	4.06%
20	26.5	3,643,843	622,403	324,272	87,580	2,609,588	753,910	1,943,258	1,855,678	9,637,642	196,767	(2,095,952)	7,738,457	25.11%	43,482,479	4.27%
20	27.5	3,680,281	628,627	327,186	84,661	2,639,807	762,640	1,961,828	1,877,167	9,483,960	198,735	(2,051,297)	7,631,398	25.71%	45,359,646	4.14%
20	28.5	3,717,084	634,913	324,935	81,839	2,675,397	772,922	1,984,314	1,902,475	9,334,000	200,723	(2,007,715)	7,527,008	26.36%	47,262,121	4.03%
20	29.5	3,754,255	641,262	325,254	79,111	2,708,628	782,523	2,005,216	1,926,105	9,185,201	202,729	(1,964,467)	7,423,463	27.01%	49,188,226	3.92%
20	30.5	3,791,798	647,675	323,289	76,474	2,744,360	792,846	2,037,988	1,951,514	9,039,866	204,757	(1,922,218)	7,322,405	27.70%	51,139,740	3.82%
20	31.5	3,829,716	654,152	323,577	73,925	2,778,062	802,582	2,049,405	1,975,480	8,895,750	206,804	(1,880,319)	7,222,235	28.38%	53,115,220	3.72%
20	32.5	3,868,013	660,694	324,948	71,460	2,810,911	812,072	2,070,299	1,998,839	8,751,786	208,873	(1,838,975)	7,121,684	29.07%	55,114,059	3.63%
20	33.5	3,906,693	667,301	322,439	69,078	2,847,875	822,751	2,094,202	2,025,124	8,611,868	210,861	(1,799,320)	7,023,509	29.82%	57,139,182	3.54%
20	34.5	3,945,760	673,574	323,531	66,776	2,881,479	832,459	2,115,796	2,049,020	8,472,406	213,071	(1,759,802)	6,925,675	30.55%	59,188,203	3.46%
20	35.5	3,985,218	680,714	323,771	64,550	2,916,183	842,485	2,138,248	2,073,688	8,334,266	215,202	(1,720,672)	6,828,796	31.31%	61,261,901	3.38%
20	36.5	4,025,070	687,521	322,123	62,398	2,953,028	853,130	2,162,296	2,099,898	8,199,352	217,354	(1,682,480)	6,734,226	32.11%	63,361,799	3.31%
20	37.5	4,065,321	694,396	322,753	60,318	2,987,854	863,191	2,184,981	2,124,663	8,065,396	219,527	(1,644,570)	6,640,353	32.90%	65,486,462	3.24%
20	38.5	4,105,974	701,340	320,243	58,308	3,026,084	874,236	2,210,156	2,151,848	7,935,553	221,723	(1,607,855)	6,549,421	33.75%	67,638,309	3.18%
20	39.5	4,147,034	708,353	322,553	56,364	3,059,764	883,966	2,232,162	2,175,798	7,805,018	223,940	(1,570,946)	6,458,012	34.56%	69,814,107	3.12%
20	40.5	4,188,504	715,437	320,619	54,485	3,097,963	895,001	2,257,447	2,202,962	7,678,047	226,179	(1,535,072)	6,369,154	35.44%	72,017,069	3.06%
20	41.5	4,230,389	722,591	320,777	52,669	3,134,352	905,514	2,281,507	2,228,838	7,552,565	228,441	(1,499,634)	6,281,372	36.32%	74,245,908	3.00%
20	42.5	4,272,693	729,817	318,651	50,913	3,173,312	916,770	2,307,455	2,256,542	7,430,867	230,725	(1,467,229)	6,194,363	37.25%	76,502,449	2.95%
20	43.5	4,315,420	737,115	318,128	49,216	3,210,961	927,647	2,332,530	2,283,314	7,311,365	233,033	(1,437,430)	6,106,968	38.19%	78,785,763	2.90%
20	44.5	4,358,574	744,486	316,594	47,576	3,249,919	938,901	2,358,594	2,311,018	7,195,085	235,363	(1,408,601)	6,021,847	39.17%	81,096,780	2.85%
20	45.5	4,402,160	751,931	315,922	45,990	3,288,317	949,995	2,384,312	2,338,322	7,081,182	237,717	(1,380,500)	5,938,399	40.15%	83,435,102	2.80%
20	46.5	4,446,182	759,450	317,119	44,457	3,325,156	960,638	2,408,975	2,364,518	6,967,798	240,094	(1,352,590)	5,855,302	41.14%	85,799,620	2.76%
20	47.5	4,490,644	767,045	315,634	42,975	3,364,990	972,146	2,435,819	2,392,844	6,857,633	242,494	(1,325,651)	5,774,476	42.18%	88,192,464	2.71%
20	48.5	4,535,550	774,715	314,988	41,543	3,404,304	983,504	2,462,343	2,420,800	6,749,862	244,920	(1,299,445)	5,695,337	43.23%	90,613,265	2.67%
20	49.5	4,580,906	782,462	313,464	40,158	3,444,822	995,209	2,489,771	2,449,613	6,645,376	247,369	(1,274,229)	5,618,516	44.31%	93,062,877	2.63%
20	50.5	4,626,715	790,287	312,674	38,819	3,484,935	1,006,798	2,516,956	2,478,137	6,543,458	249,842	(1,249,797)	5,543,503	45.40%	95,541,014	2.59%
20	51.5	4,672,582	798,190	314,940	37,525	3,522,327	1,017,600	2,542,252	2,504,727	6,441,069	252,341	(1,225,271)	5,468,139	46.49%	98,045,741	2.55%
20	52.5	4,719,712	806,172	312,506	36,274	3,564,760	1,029,859	2,571,175	2,534,901	6,342,922	254,864	(1,202,014)	5,395,772	47.65%	100,580,642	2.52%
20	53.5	4,766,909	814,234	311,516	35,065	3,606,094	1,041,801	2,599,358	2,564,293	6,247,592	257,414	(1,179,615)	5,325,391	48.81%	103,144,935	2.49%
20	54.5	4,814,578	822,376	311,529	33,896	3,646,777	1,053,554	2,627,119	2,593,223	6,154,090	259,987	(1,157,787)	5,256,290	49.98%	105,738,158	2.45%
20	55.5	4,862,724	830,600	309,505	32,767	3,689,852	1,065,598	2,656,621	2,623,854	6,064,469	262,587	(1,137,124)	5,189,932	51.19%	108,362,012	2.42%
20	56.5	4,911,351	838,906	310,891	31,674	3,729,880	1,077,562	2,683,992	2,652,318	5,975,335	265,213	(1,116,646)	5,123,902	52.38%	111,014,330	2.39%
20	57.5	4,960,465	847,295	310,051	30,619	3,772,500	1,089,875	2,713,244	2,682,625	5,888,529	267,865	(1,097,001)	5,059,793	53.62%	113,696,955	2.36%
20	58.5	5,010,070	855,768	309,045	29,598	3,815,659	1,102,344	2,742,913	2,713,315	5,805,435	270,544	(1,078,243)	4,997,736	54.88%	116,410,270	2.33%
20	59.5	5,060,171	864,326	309,364	28,611	3,857,870	1,114,539	2,771,942	2,743,331	5,723,544	273,249	(1,059,994)	4,936,799	56.15%	119,153,601	2.30%

Deferred Tax

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach
Cost of Capital / Required Return

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	100.0%						**8.09%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.16%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Capitlization Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Market Capital Cost (2)*(3)
Debt	26%	Market	4.12%	Market	Not Applicable	Not Applicable	1.07%
Equity	74%	Market	9.90%	Market	Not Applicable	Not Applicable	7.33%
Total Capital r	100.0%						**8.40%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.46%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Rate of Return on Rate Base)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Required Return on Rate Base (2)*(3)
Debt	45%	Embedded	4.14%	Embedded	Not Applicable	Not Applicable	1.86%
Equity	55%	Embedded	9.90%	Market	Not Applicable	Not Applicable	5.45%
Total Capital r	100.0%						**7.31%**
Growth (g)						Not Applicable	**0.00%**
Rate without Growth: [(1+r)/(1+g)]-1							**7.31%**

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

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As of April 28, 2020

Market Approach

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Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Central Tendancy and Reliability Analysis

Market Sales Analysis - PP/OCLD

	Simple	Weighted	
Mean	2.082	1.9992	
Standard Deviation	0.8607	0.6008	
Median	1.608	1.5597	
Mode	Not Applicable	1.5601	
Conclusion		2.0000	AUS Input
Upper Pottsgrove Township OCLD		11,769,925	Cost Approach - OCLD
Market Value Indication		**23,539,850**	

Market Sales Analysis - PP/CORLD

	Simple	Weighted	
Mean	0.813	0.9285	
Standard Deviation	0.1852	0.1086	
Median	0.8908	0.9637	
Mode	Not Applicable	0.9919	
Conclusion		0.93	AUS Input
Upper Pottsgrove Township CORLD		18,460,028	Cost Approach - CORLD
Market Value Indication		**17,167,826**	

Market Sales Analysis - PP/Customer

	Simple	Weighted	
Mean	7441	9,157	
Standard Deviation	4031	3,158	
Median	8221	6,322	
Mode	Not Applicable	7,825	
Forecast	7,251		
Conclusion		8,679	Valley Wastewater Info
Upper Pottsgrove Township Customers		1,428	AUS Input
Market Value Indication		**12,393,612**	

Financial Basis[1]

Financial Markets	Market Value per Share to Book Value per Share	
Market to Book (equity and debt)	2.77	
Use (equity and debt)	2.77	AUS Input
Upper Pottsgrove Township OCLD	11,769,925	Cost Approach - OCLD
Market Value Indication	**32,602,692**	

Market Sales Analysis - PP/Cash Flows (EBITDA)

	Simple	Weighted	
Mean	22.38	21.58	
Standard Deviation	11.60	8.02	
Median	20.93	13.52	
Mode	Not Applicable	Not Applicable	
Forecast			
Conclusion		22.00	AUS Input
Upper Pottsgrove Township Cash Flows		768,794	Income Approach
Market Value Indication		**16,913,468**	

Summary of Market Analyses

Indicators		
OCLD	23,539,850	
CORLD	17,167,826	Use
Customers	12,393,612	Use
Cash Flows	16,913,468	Use
Value Line	32,602,692	
Mean	20,523,490	15,491,635
Median	17,167,826	16,913,468
Conclusion	**17,167,826**	15,491,635

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Market Approach
Market Transaction

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Greenfield, Wisconsin 53228
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J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Asset(s)	Approximate Date	Buyer	Seller	County	Type of Facility	Initial Purchase Price	Final Purchase Price[1]	Number of Total Customers	OCA Market Value per Customer	Relationship to the passage of Section 1329	Average Purchase Price per Customer	Adj's Market Value per customer	Engineers Assessment	Original Cost	OCLD Depreciation	Original Cost less Depreciation (OCLD)	Purchase Price to OCLD	COR Translation	Cost New	Replacement Cost less Depreciation (COR/LD)	Cost New less Depreciation (RCNLD)	Purchase Price to RCNLD	Rate Base Determination by PA PUC
20	6/1/2016	PA American Water	City of Pittsburgh	Allegheny	Collection and Wastewater Treatment	180,000,000	159,000,000	21,953	7,197	Post	7,242.75	7,241	Gannett Fleming, Inc.	168,231,670	74.0%	80,685,603	1.9854		623,139,630	48.4%	155,534,909	1.0258	198,000,000
21	8/1/2016	Aqua PA	New Garden Twp., PA	Chester	Collection and Field for and Treatment	29,500,000	29,500,000	2,306	14,008	Post	14,067.66	14,008	AUS Consultants	27,346,052	68.4%	18,561,728	1.5888	2.219	90,232,051.00	50.8%	30,835,410	0.9568	29,500,000
22	12/31/2017	Aqua PA	Lemmon Township	Montgomery	Wastewater Collection and pod for Treatment	64,371,000	64,371,000	5,434	11,846	Post	9,264	11,846				44,810,394	1.4364				15,068,177	0.8630	64,371,000
23	12/30/2017	Aqua PA	East Vincent Township	Chester	Wastewater Collection and Treatment Capacity	5,000,000	5,000,000	1,248	4,008	Post	4,006.41	4,008		6,794,940	64.3%	5,383,591	0.9287	1.811	15,073,739	64.3%	9,246,583	0.5413	5,000,000
24	2017	Kirkwood	Carlton	Montgomery	Water Treatment and Distribution System Wastewater Collection and Treatment	4,734,800	4,734,800	2,806		Post		1,687											
25	2017	Mahanoy	Carlton	Montgomery	Wastewater Collection	4,765,200	4,765,200	2,806		Post		1,699									7,993,244	0.5963	
26	6/1/2016	Aqua PA	Chalfont	Montgomery	Water Distribution and Treatment	50,250,000	50,250,000	10,560		Post	4,785.71	4,786	Boucher & James, Inc.	35,838,238	29.6%	15,784,461	3.1825	1.342	145,531,461	34.3%	49,940,486	1.0062	
27	11/14/2016	PA American Water	Scranton	Lackawanna	Water Distribution and Treatment Wastewater Collection	22,500,000	21,750,000	7,375		Post	9,354.84	9,355	Herbert, Rowland & Grubic, Inc. (HRG)	19,799,906	73.1%	14,414,435	1.5089	2.626	51,846,769	46.1%	23,921,873	0.9092	
28	2016	PA American Water	Salisbury	Chester	Collection	9,250,000	8,660,000	998		Post	9,417.23	9,017	Herbert, Rowland & Grubic, Inc. (HRG)	7,886,661	81.9%	6,126,876	1.46	1.424	10,662,193	80.0%	8,517,561	1.0097	
29	5/24/2018	PA American Water	Lemoyne	Berks	Collection and Treatment Wastewater	96,000,000	96,000,000	9,600		Post	10,000.67	10,001	Gannett Fleming	86,008,345	58.0%	40,057,614	2.3965	1.065	209,093,218	47.5%	99,389,819	0.9650	
30	10/29/2018	Aqua PA	Lair Township	Montgomery	Collection Wastewater	21,000,000	21,000,000	4,950		Post	4,242.42		Carroll Engineering corporation	16,246,928	51.7%	8,407,017	2.4979	4.356	70,170,233	38.8%	27,463,356	0.7647	
31	9/30/2016	PA American	Kane	McKean	Collection and Treatment Wastewater Collection and Treatment	17,560,000	17,560,000	2,066		Post	8,753.74		Gannett Fleming	23,023,527	57.4%	12,070,455	1.4548	1.842	55,519,558	52.2%	29,035,055	0.6052	
32	12/30/2019	PA American	Royersford	Montgomery	Wastewater	13,000,000	13,000,000	1,596		Post	8,145.36		PennoniAssociates, Inc.	7,866,492	67.5%	5,176,559	2.5128	5.525	40,823,536	32.8%	13,376,809	0.9719	
33	12/17/2019	PA American	Valley	Chester	Water Treatment and Distribution System Wastewater	7,325,000	7,325,000	1,459		Post	5,020.56		PennoniAssociates, Inc.	6,843,616	78.5%	5,470,438	1.3698	2.239	15,320,598	76.1%	11,664,028	0.6280	
34	12/17/2019	PA American	Valley	Chester	Collection System	13,950,000	13,950,000	1,648		Post	8,465.86		PennoniAssociates, Inc.	11,389,110	66.8%	9,214,738	1.5139	2.470	33,429,231	66.7%	19,252,333	0.7246	

Notes:

[1] Final Purchase Price reflects the agreed upon purchase price adjusted to settled the acquisition application

Sources:
OCA Exhibit AEL-1
Pennsylvania American Water Company
Acquisition of Salisbury Township Wastewater
Docket No. A-2018-3002417
Adjustment to HRG Market Approach

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach
Replacement Cost New

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(9)	(10)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Original Cost	Costing Parameter	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
			OC $s			RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt NARUC Code	AUS Input NARUC Code	LTL Consultants & AUS Consultants Engineers Assessment Asset Description	Eng Assmnt Original Cost	AUS Input Cost Index Table	Translator	RCN	AUS Input COR / RCN Factor	Col (14) * (15) COR
353.00	353.00	Land & Land Rights	8,865	USBLS3	15.32	135,794	1.00	135,794
354.00	354.00	Stuctures & Improvements - Pumping	1,612,326	HWW-115	1.48	2,380,438	1.00	2,380,438
355.00	355.00	Generating Equipment	47,512	USBLS4	1.45	69,012	1.00	69,012
360.10	360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	HWW-144	1.58	309,812	1.00	309,812
360.20	360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	HWW-144	1.39	610,719	1.00	610,719
360.90	360.90	Collection Sewers - Force - Air Release Valve	11,934	HWW-144	1.22	14,511	1.00	14,511
361.11	361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	HWW-144	1.62	7,196,371	1.00	7,196,371
361.12	361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	HWW-144	1.61	1,752,280	1.00	1,752,280
361.13	361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	HWW-144	1.30	966,046	1.00	966,046
361.98	361.98	Collection Sewers - Gravity - Manholes	1,586,684	HWW-145	1.40	2,220,312	1.00	2,220,312
361.99	361.99	Collection Sewers - Gravity - Miscellaneous	261,971	HWW-144	1.36	355,575	1.00	355,575
363.00	363.00	Service Laterals	1,731,294	HWW-139	1.63	2,819,318	1.00	2,819,318
380.00	380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	HWW-117	2.23	6,955,996	1.00	6,955,996
		Total Upper Pottsgrove Township Wastewater Utility	15,295,347			25,786,184		25,786,184

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

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Pennsylvania American Water Company

Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3)				
		(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(3)				
		(3a)	(3b)	(3c)	(3d)	(3e)
Account Number	Description	Costing Parameters				Reproduction to Replacement Cost Factor
		Index Series	Table	Line Reference	Lookup	AUS Input
353.00	Land & Land Rights	USBLS	PPI	3.00	USBLS3	1.00
354.00	Stuctures & Improvements - Pumping	HW	W-1	15.00	HWW-115	1.00
355.00	Generating Equipment	USBLS	PPI	4.00	USBLS4	1.00
360.10	Collection Sewers - Force - Mains - 4" & Under	HW	W-1	44.00	HWW-144	1.00
360.20	Collection Sewers - Force - Mains - 6"-8"	HW	W-1	44.00	HWW-144	1.00
360.90	Collection Sewers - Force - Air Release Valve	HW	W-1	44.00	HWW-144	1.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	HW	W-1	44.00	HWW-144	1.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	HW	W-1	44.00	HWW-144	1.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	HW	W-1	44.00	HWW-144	1.00
361.98	Collection Sewers - Gravity - Manholes	HW	W-1	45.00	HWW-145	1.00
361.99	Collection Sewers - Gravity - Miscellaneous	HW	W-1	44.00	HWW-144	1.00
363.00	Service Laterals	HW	W-1	39.00	HWW-139	1.00
380.00	Treatment and Disposal Equipment Purchased Capacity	HW	W-1	17.00	HWW-117	1.00

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

1	2	3	4	9	10	11	12	13	14	15	16
(1)	(2)	(3)	(4)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Year Installed	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
				OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
		Account 353.00 - Land and Land Rights									
353.00	353.10	409 Evans Road	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	256 Mickletz Road	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1764 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1760 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1637 Kummerer Road	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1714 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1710 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1702 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1698 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1696 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1693 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1688 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1682 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1674 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1664 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1505 Kummerer Road	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1717 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1569 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1577 Farmington Ave.	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1387 Chestnut Grove Rd	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1382 Chestnut Grove Rd	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Renovations By Design	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	149 Pine Ford Road	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.11	Pine Ford Road PS	2002	8,865.00	USBLS3	123	188	1.528	13,546	1.000	13,546
353.00	353.10	1371 N. State Street	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1369 N. State Street	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1407 Heather Place	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1413 Heather Place	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1419 Heather Place	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1429 Heather Place	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	120 Primrose Lane	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Pine Ford Rd SG HOA	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Chestnut Grove Rd SG HOA	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Chestnut Grove Rd UPT	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Fallbrook and Cloverhill	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Fallbrook and Heather Place	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Gravity to PFRPS	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Laura Land UPT	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1804 Joanne Circle	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1811 Joanne Circle	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	10 Cherrytree Lane	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	18 Cherrytree Lane	2002	-	USBLS3	123	188	1.528	1,036	1.000	1,036

1	2	3	4		9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
				RCN / COR $s	OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
353.00	353.10	24 Cherrytree Lane	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	64 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	70 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	76 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	80 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	111 Snyder Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2019 Mimosa Lane	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2136 Hollyberry Ct	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2133 Hollyberry Ct	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	221 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	215 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	209 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	203 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	200 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	207 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	188 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	182 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	176 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	170 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	164 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	156 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	140 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	138 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	132 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	124 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	116 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	102 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	145 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	139 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	135 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	127 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	121 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	113 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	109 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	105 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	99 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	95 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	91 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	85 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	82 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	87 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	93 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	101 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

1	2	3	4		9	10	11	12	13	14	15	16
(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15) Reproduction Cost New (RCN) to Replacement Cost New (COR)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost RCN / COR $s	Original Cost OC $s	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN) RCN $s	COR $s / RCN $s	Replacement Cost New (COR) COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Costs(10) & (9)	Cost Indices Lookup Costs(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Cnv (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
353.00	353.10	107 Rose Valley Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	63 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2160 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2146 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2126 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	94 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	98 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2019 Mimosa Lane	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2038 Mimosa Lane	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	150 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	156 Maple Leaf	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	155 Boxwood Ct	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	161 Boxwood Ct	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2093 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2101 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2115 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	2131 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	256 W. Moyer	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1608 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1614 Gilbertsville Road	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	64 Irwin Place	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	56 Irwin Place	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1275 Whitespire Circle	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1266 N Hanover	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	Glendale Ave	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1537 Meadowview Drive	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1533 Meadowview Drive	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1518 Meadowview Drive	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1522 Meadowview Drive	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1456 Sweetwater Way	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1460 Sweetwater Way	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	1412 Meadwview Drive	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	218 Deerfield Way	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
353.00	353.10	220 Deerfield Way	2002	1,036	-	USBLS3	123	188	1.528	1,036	1.000	1,036
		Total 353 Land and Land Rights			**8,865.00**					**135,794**		**135,794**
		Account 354.00 - Structures and Improvements - Lift Stations										
		Evan Rd Pump Station										
354.00	354.00	Evan Rd. Chopper Pump Station	2010		83,360.28	HWW-115	559.8	731	1.306	108,869	1.000	108,869
354.00	354.00	Evan Rd. Lift Station	2010		21,936.92	HWW-115	559.8	731	1.306	28,650	1.000	28,650
354.00	354.00	Transducers	2010		2,000.54	HWW-115	559.8	731	1.306	2,613	1.000	2,613

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Replacement Cost New (RCN)

(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
				RCN / COR $s	OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
354.00	354.00	Power Supply	2011		8,651.69	HWW-115	583.5	731	1.253	10,841	1.000	10,841
354.00	354.00	Electrical Connections & Appurtenances	2011		8,273.17	HWW-115	583.5	731	1.253	10,366	1.000	10,366
354.00	354.00	Pump Level Control	2011		9,733.15	HWW-115	583.5	731	1.253	12,196	1.000	12,196
354.00	354.00	Auto Dialer	2011		2,162.92	HWW-115	583.5	731	1.253	2,710	1.000	2,710
354.00	354.00	PECO Utility Ext	2011		13,249.44	HWW-115	583.5	731	1.253	16,602	1.000	16,602
		Total Evan Road			**149,368.11**					**192,845**		**192,845**
		Pine Ford Rd. Pump Station										
354.00	354.30	Pine Ford PS Complete in Place	1998		157,559.75	HWW-18	337	731	2.169	341,747	1.000	341,747
354.00	354.30	Fencing	1998		14,022.82	HWW-18	337	731	2.169	30,415	1.000	30,415
354.00	354.30	15Kv Duct	1998		29,300.77	HWW-18	337	731	2.169	63,553	1.000	63,553
354.00	354.30	15Kv Cable	1998		11,538.80	HWW-18	337	731	2.169	25,028	1.000	25,028
354.00	354.30	Secondary Service	1998		4,148.78	HWW-18	337	731	2.169	8,999	1.000	8,999
354.00	354.30	Main Breaker & Cabinet	1998		9,334.76	HWW-18	337	731	2.169	20,247	1.000	20,247
354.00	354.30	ATS Panel PP and Cabinet	1998		16,335.83	HWW-18	337	731	2.169	35,432	1.000	35,432
354.00	354.30	Phone Conduit and TVSS	1998		1,037.20	HWW-18	337	731	2.169	2,250	1.000	2,250
354.00	354.30	Service Entrance TVSS	1998		1,944.74	HWW-18	337	731	2.169	4,218	1.000	4,218
354.00	354.30	Connections	1998		2,852.29	HWW-18	337	731	2.169	6,187	1.000	6,187
354.00	354.30	Pump Control Conduit & Cable	1998		4,019.13	HWW-18	337	731	2.169	8,718	1.000	8,718
354.00	354.30	Site Lighting	1998		3,267.17	HWW-18	337	731	2.169	7,086	1.000	7,086
354.00	354.30	Equipment Pads	1998		3,889.48	HWW-18	337	731	2.169	8,436	1.000	8,436
354.00	354.30	Demolition of Existing 40 HP Pumps	2011		3,676.97	HWW-18	583.5	731	1.253	4,607	1.000	4,607
354.00	354.30	Electric Connections to 50HP Pumps	2011		5,407.30	HWW-18	583.5	731	1.253	6,775	1.000	6,775
354.00	354.30	Upgrade of Existing Electric System	2011		1,948.79	HWW-18	583.5	731	1.253	2,442	1.000	2,442
354.00	354.30	Pine Ford Rd. Lift Station Upgrade	2010		182,345.49	HWW-18	559.8	731	1.306	238,143	1.000	238,143
		Total Pine Ford			**452,630.06**					**814,284**		**814,284**
		Hollyberry Pump Station										
354.00	354.30	Hollyberry PS & Wetwell	1986		36,000.00	HWW-18	233	731	3.137	112,932	1.000	112,932
		Total Hollyberry			**36,000.00**					**112,932**		**112,932**
		Regal Oaks Pump Station										
354.00	354.30	Regal Oaks Pump Station	2010		381,360.79	HWW-18	559.8	731	1.306	498,057	1.000	498,057
354.00	354.30	Regal Oaks Station Site Work	2010		322,245.50	HWW-18	559.8	731	1.306	420,853	1.000	420,853
354.00	354.30	Cherry Tree Pump Station Site Work	2010		42,503.11	HWW-18	559.8	731	1.306	55,509	1.000	55,509
354.00	354.30	Transformer Pad	2011		5,989.16	HWW-18	583.5	731	1.253	7,504	1.000	7,504
354.00	354.30	Concrete Pad	2011		4,728.28	HWW-18	583.5	731	1.253	5,925	1.000	5,925
354.00	354.30	Equipment Stand	2011		1,576.09	HWW-18	583.5	731	1.253	1,975	1.000	1,975
354.00	354.30	ATS	2011		9,456.57	HWW-18	583.5	731	1.253	11,849	1.000	11,849
354.00	354.30	Main Circuit Breaker	2011		1,576.09	HWW-18	583.5	731	1.253	1,975	1.000	1,975

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Replacement Cost New (RCN)

(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15) Reproduction Cost New (RCN) to Replacement Cost New (COR)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)		Replacement Cost New (COR)
				RCN / COR $s	OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	ETL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cost(10) & (5)	Cost Indices Lookup Cost(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
354.00	354.30	Light Standard	2011		7,250.03	HWW-18	583.5	731	1.253	9,084	1.000	9,084
354.00	354.30	PVC Pipe	2011		9,456.57	HWW-18	583.5	731	1.253	11,849	1.000	11,849
354.00	354.30	Copper Wire	2011		7,880.47	HWW-18	583.5	731	1.253	9,874	1.000	9,874
354.00	354.30	Copper Wire	2011		11,032.66	HWW-18	583.5	731	1.253	13,824	1.000	13,824
354.00	354.30	Wet Well Work	2011		8,510.91	HWW-18	583.5	731	1.253	10,664	1.000	10,664
354.00	354.30	Metropolitan Edison Utility Work	2011		160,761.62	HWW-18	583.5	731	1.253	201,434	1.000	201,434
		Total Regal Oaks			**974,327.85**					**1,260,377**		**1,260,377**
		Total Account 354			**1,612,326.02**					**2,380,438**		**2,380,438**
		Account 355.00 - Power Generating Equipment										
355.00	355.00	Pine Ford Road PS-Electrical	1998		36,479.46	USBLS4	139.8	217.6	1.557	56,799	1.000	56,799
355.00	355.00	Regal Oaks PS	2011		11,032.66	USBLS4	196.5	217.6	1.107	12,213	1.000	12,213
		Total Account 355 Power Generation Equipment			**47,512.12**					**69,012**		**69,012**
		Account 360.00 - Collection Sewer - Force										
360.10	360.00	4" and Under Force Collection Sewers	1986		26,880.00	HWW-144	206.3	616.2	2.987	80,291	1.000	80,291
360.10	360.00	4" and Under Force Collection Sewers	1990		21,123.01	HWW-144	268.4	616.2	2.296	48,498	1.000	48,498
360.10	360.00	4" and Under Force Collection Sewers	2007		32,560.00	HWW-144	465.8	616.2	1.323	43,077	1.000	43,077
360.10	360.00	4" and Under Force Collection Sewers	2008		6,192.90	HWW-144	508	616.2	1.213	7,512	1.000	7,512
360.10	360.00	4" and Under Force Collection Sewers	2010		97,577.06	HWW-144	506.6	616.2	1.216	118,654	1.000	118,654
360.10	360.00	4" and Under Force Collection Sewers	2020		11,780.63	HWW-144	616.2	616.2	1.000	11,781	1.000	11,781
		TOTAL Account 360.10 4" and Under Force Collection Sewer			**196,113.60**					**309,812**		**309,812**
		6" - 8" Force Collection Sewer										
360.20	360.00	6" - 8" Force Collection Sewer	1998		81,861.75	HWW-144	295	616.2	2.089	171,009	1.000	171,009
360.20	360.00	6" - 8" Force Collection Sewer	2007		41,952.46	HWW-144	465.8	616.2	1.323	55,503	1.000	55,503
360.20	360.00	6" - 8" Force Collection Sewer	2010		315,959.58	HWW-144	506.6	616.2	1.216	384,207	1.000	384,207
		TOTAL Account 360.11 6" - 8" Force Collection Sewer			**439,773.78**					**610,719**		**610,719**
		Air Release - Force Sewer										
360.90	360.90	Air Release - Force Sewer	2010		11,933.57	HWW-144	506.6	616.2	1.216	14,511	1.000	14,511
		Total Air Release			**11,933.57**					**14,511**		**14,511**
		TOTAL Account 360 - Force Collection Sewer			**647,820.95**					**935,043**		**935,043**
		Account 361.00 - Collection Sewer - Gravity										

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(1)	(2)	(3)	(4)	(9)	(10)	(11)	(12)	(13)	(14)	(15) Reproduction Cost New (RCN) to Replacement Cost New (COR)	(16)
Account	Account	Asset Description	Year Installed	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)		Replacement Cost New (COR)
				OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (9) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
		6" - 8" Gravity Collection Sewer									
361.11	361.11	6" - 8" Gravity Collection Sewer	1984	170,612.28	HWW-144	200.5	616.2	3.073	524,292	1.000	524,292
361.11	361.11	6" - 8" Gravity Collection Sewer	1986	356,488.70	HWW-144	206.3	616.2	2.987	1,064,832	1.000	1,064,832
361.11	361.11	6" - 8" Gravity Collection Sewer	1990	66,275.83	HWW-144	268.4	616.2	2.296	152,169	1.000	152,169
361.11	361.11	6" - 8" Gravity Collection Sewer	1995	203,239.58	HWW-144	277.5	616.2	2.221	451,395	1.000	451,395
361.11	361.11	6" - 8" Gravity Collection Sewer	1996	39,880.78	HWW-144	284.9	616.2	2.163	86,262	1.000	86,262
361.11	361.11	6" - 8" Gravity Collection Sewer	1998	229,712.25	HWW-144	295	616.2	2.089	479,869	1.000	479,869
361.11	361.11	6" - 8" Gravity Collection Sewer	1999	155,043.85	HWW-144	299.7	616.2	2.056	318,770	1.000	318,770
361.11	361.11	6" - 8" Gravity Collection Sewer	2000	72,274.84	HWW-144	313.6	616.2	1.965	142,020	1.000	142,020
361.11	361.11	6" - 8" Gravity Collection Sewer	2001	90,076.13	HWW-144	327.2	616.2	1.883	169,613	1.000	169,613
361.11	361.11	6" - 8" Gravity Collection Sewer	2003	158,426.82	HWW-144	341	616.2	1.807	286,277	1.000	286,277
361.11	361.11	6" - 8" Gravity Collection Sewer	2005	127,473.99	HWW-144	393.8	616.2	1.565	199,497	1.000	199,497
361.11	361.11	6" - 8" Gravity Collection Sewer	2007	803,420.32	HWW-144	465.8	616.2	1.323	1,062,925	1.000	1,062,925
361.11	361.11	6" - 8" Gravity Collection Sewer	2008	663,040.63	HWW-144	508	616.2	1.213	804,268	1.000	804,268
361.11	361.11	6" - 8" Gravity Collection Sewer	2010	533,744.91	HWW-144	506.6	616.2	1.216	649,034	1.000	649,034
361.11	361.11	6" - 8" Gravity Collection Sewer	2017	188,286.56	HWW-144	573.5	616.2	1.074	202,220	1.000	202,220
361.11	361.11	6" - 8" Gravity Collection Sewer	2018	288,464.65	HWW-144	587.2	616.2	1.049	302,599	1.000	302,599
361.11	361.11	6" - 8" Gravity Collection Sewer	2019	45,150.72	HWW-144	601.5	616.2	1.024	46,234	1.000	46,234
361.11	361.11	6" - 8" Gravity Collection Sewer	2020	254,093.54	HWW-144	616.2	616.2	1.000	254,094	1.000	254,094
		TOTAL Account 361.11 - 6" - 8" Collection Sewer		**4,445,706.39**					**7,196,371**		**7,196,371**
361.12	361.12	10" - 12" Gravity Collection Sewer	1995	377,721.52	HWW-144	277.5	616.2	2.221	838,920	1.000	838,920
361.12	361.12	10" - 12" Gravity Collection Sewer	2007	474,784.52	HWW-144	465.8	616.2	1.323	628,140	1.000	628,140
361.12	361.12	10" - 12" Gravity Collection Sewer	2010	234,556.68	HWW-144	506.6	616.2	1.216	285,221	1.000	285,221
		TOTAL Account 361.12 - 10" - 12" Collection Sewer		**1,087,062.72**					**1,752,280**		**1,752,280**
361.13	361.13	18" and Over - Gravity Collection Sewer	2007	611,556.01	HWW-144	465.8	616.2	1.323	809,089	1.000	809,089
361.13	361.13	18" and Over - Gravity Collection Sewer	2010	129,076.81	HWW-144	506.6	616.2	1.216	156,957	1.000	156,957
		TOTAL Account 361.13 - 18" and Over Gravity Collection Sewer		**740,632.82**					**966,046**		**966,046**
361.98	361.98	Manholes	1984	32,609.52	HWW-145	237.5	561.9	2.366	77,154	1.000	77,154
361.98	361.98	Manholes	1986	84,124.42	HWW-145	249	561.9	2.257	189,869	1.000	189,869
361.98	361.98	Manholes	1990	49,462.45	HWW-145	263	561.9	2.137	105,701	1.000	105,701
361.98	361.98	Manholes	1995	104,746.14	HWW-145	299.8	561.9	1.874	196,294	1.000	196,294
361.98	361.98	Manholes	1996	12,366.13	HWW-145	310.5	561.9	1.810	22,383	1.000	22,383
361.98	361.98	Manholes	1998	18,567.53	HWW-145	326.7	561.9	1.720	31,936	1.000	31,936
361.98	361.98	Manholes	1999	69,013.73	HWW-145	333.4	561.9	1.685	116,288	1.000	116,288
361.98	361.98	Manholes	2000	19,939.67	HWW-145	341.5	561.9	1.645	32,801	1.000	32,801
361.98	361.98	Manholes	2001	23,963.62	HWW-145	355.8	561.9	1.579	37,839	1.000	37,839

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(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)	Reproduction Cost New (RCN) to Replacement Cost New (COR)	Replacement Cost New (COR)
				RCN / COR $s	OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cols(10) & (5)	Cost Indices Lookup Cols(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
361.98	361.98	Manholes	2003		79,106.13	HWW-145	377.9	561.9	1.487	117,631	1.000	117,631
361.98	361.98	Manholes	2005		76,013.39	HWW-145	398.8	561.9	1.409	107,103	1.000	107,103
361.98	361.98	Manholes	2007		168,796.46	HWW-145	443.3	561.9	1.268	214,034	1.000	214,034
361.98	361.98	Manholes	2008		201,119.41	HWW-145	459.3	561.9	1.223	245,969	1.000	245,969
361.98	361.98	Manholes	2010		410,712.52	HWW-145	475.5	561.9	1.182	485,462	1.000	485,462
361.98	361.98	Manholes	2017		28,720.38	HWW-145	542.1	561.9	1.037	29,783	1.000	29,783
361.98	361.98	Manholes	2018		90,877.44	HWW-145	548.3	561.9	1.025	93,149	1.000	93,149
361.98	361.98	Manholes	2019		33,712.54	HWW-145	555.8	561.9	1.011	34,083	1.000	34,083
361.98	361.98	Manholes	2020		82,832.58	HWW-145	561.9	561.9	1.000	82,833	1.000	82,833
		Total Account 361.98 - Manholes			**1,586,684.06**					**2,220,312**		**2,220,312**
361.99	361.99	Miscellaneous	1995		12,604.82	HWW-144	277.5	616.2	2.221	27,995	1.000	27,995
361.99	361.99	Miscellaneous	2003		61,978.00	HWW-144	341	616.2	1.807	111,994	1.000	111,994
361.99	361.99	Miscellaneous	2008		5,312.53	HWW-144	508	616.2	1.213	6,444	1.000	6,444
361.99	361.99	Miscellaneous	2010		5,045.49	HWW-144	506.6	616.2	1.216	6,135	1.000	6,135
361.99	361.99	Miscellaneous	2010		88,878.23	HWW-144	506.6	616.2	1.216	108,076	1.000	108,076
361.99	361.99	Miscellaneous	2010		2,354.02	HWW-144	506.6	616.2	1.216	2,862	1.000	2,862
361.99	361.99	Miscellaneous	2017		82,620.00	HWW-144	573.5	616.2	1.074	88,734	1.000	88,734
361.99	361.99	Miscellaneous	2018		3,177.98	HWW-144	587.2	616.2	1.049	3,334	1.000	3,334
		TOTAL Account 361.99 - Miscellaneous			**261,971.08**					**355,575**		**355,575**
		TOTAL ACCOUNT 361.00 - Gravity Collection Sewer			**8,122,057.07**					**12,490,584**		**12,490,584**
		Account 363.00 - Service Laterals										
363.00	363.00	Service - Laterals	1986		43,786.68	HWW-139	226	701	3.102	135,826	1.000	135,826
363.00	363.00	Service - Laterals	1990		10,876.01	HWW-139	262	701	2.676	29,104	1.000	29,104
363.00	363.00	Service - Laterals	1995		237,347.44	HWW-139	307	701	2.283	541,864	1.000	541,864
363.00	363.00	Service - Laterals	1996		21,199.09	HWW-139	321	701	2.184	46,299	1.000	46,299
363.00	363.00	Service - Laterals	1998		16,014.95	HWW-139	330	701	2.124	34,016	1.000	34,016
363.00	363.00	Service - Laterals	1999		74,731.02	HWW-139	334	701	2.099	156,860	1.000	156,860
363.00	363.00	Service - Laterals	2000		29,417.49	HWW-139	348	701	2.014	59,247	1.000	59,247
363.00	363.00	Service - Laterals	2001		57,110.25	HWW-139	304	701	2.306	131,696	1.000	131,696
363.00	363.00	Service - Laterals	2003		77,263.05	HWW-139	367.5	701	1.907	147,341	1.000	147,341
363.00	363.00	Service - Laterals	2005		106,617.79	HWW-139	409.8	701	1.711	182,423	1.000	182,423
363.00	363.00	Service - Laterals	2007		78,257.99	HWW-139	485.3	701	1.444	113,005	1.000	113,005
363.00	363.00	Service - Laterals	2008		522,841.43	HWW-139	514.3	701	1.363	712,633	1.000	712,633
363.00	363.00	Service - Laterals	2010		261,404.53	HWW-139	555.3	701	1.262	329,893	1.000	329,893
363.00	363.00	Service - Laterals	2017		21,274.36	HWW-139	650.3	701	1.078	22,934	1.000	22,934
363.00	363.00	Service - Laterals	2018		54,387.92	HWW-139	668	701	1.049	57,053	1.000	57,053
363.00	363.00	Service - Laterals	2019		18,996.75	HWW-139	687.8	701	1.019	19,358	1.000	19,358

1	2	3	4		9	10	11	12	13	14	15	16

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New (RCN)

(1)	(2)	(3)	(4)	(6)	(9)	(10)	(11)	(12)	(13)	(14)	(15) Reproduction Cost New (RCN) to Replacement Cost New (COR)	(16)
Account	Account	Asset Description	Year Installed	Reproduction / Replacement Cost	Original Cost	Costing Parameter	Placement Date Cost Index	Appraisal Date Cost Index	Cost Translator	Reproduction Cost New (RCN)		Replacement Cost New (COR)
				RCN / COR $s	OC $s					RCN $s	COR $s / RCN $s	COR $s
Input	Input	Input	Input	Input	Input	Input	Input	Input	Calculation	Calculation	Input	Calculation
Eng Assmnt	AUS Input	LTL Consultants & AUS Consultants Engineers Assessment	Eng Assmnt	AUS Input	Eng Assmnt	AUS Input	Cost Indices Lookup Cost(10) & (5)	Cost Indices Lookup Cost(10) & Study YR	Col (12) / (11)	Col (5) * (13)	AUS Input	Col (14) * (15)
NARUC Code	NARUC Code	Asset Description	Service Date	RCN / COR	Original Cost	Cost Index Table	YearIndex	APPCostIndex	Translator	RCN	COR / RCN Factor	COR
363.00	363.00	Service - Laterals	2020		99,767.24	HWW-139	701	701	1.000	99,767	1.000	99,767
		TOTAL ACCOUNT 363.00 - Service Laterals			**1,731,293.99**					**2,819,318**		**2,819,318**
		Account 380.00 - Treatment										
380.00	380.00	Purchased Treatment Capacity (3%)	1990		1,001,717.00	HWW-117	328	1035	3.155	3,160,417	1.000	3,160,417
380.00	380.00	Purchased Conveyance thru Lower(192,000 GPD)	1994		350,000.00	HWW-117	360	1035	2.875	1,006,250	1.000	1,006,250
380.00	380.00	Purchased Treatment Capacity (188,400 GPD)	2005		604,764.00	HWW-117	505.5	1035	2.047	1,237,952	1.000	1,237,952
380.00	380.00	Purchased Treatment Capacity (53,700 GPD)	2010		234,132.00	HWW-117	694.5	1035	1.490	348,857	1.000	348,857
380.00	380.00	Treatment Plant Expansion (CAPEX)	2010		502,465.00	HWW-117	694.5	1035	1.490	748,673	1.000	748,673
380.00	380.00	Purchased Treatment Capacity (4,500 GPD)	2011		19,755.00	HWW-117	717.5	1035	1.443	28,506	1.000	28,506
380.00	380.00	Purchased Treatment Capacity (6,000 GPD)	2013		28,267.00	HWW-117	780.5	1035	1.326	37,482	1.000	37,482
380.00	380.00	Purchased Treatment Capacity (6,000 GPD)	2018		32,592.00	HWW-117	934.8	1035	1.107	36,079	1.000	36,079
380.00	380.00	Purchased Treatment Capacity (43,500 GPD) Pending	2020		102,960.00	HWW-117	1035	1035	1.000	102,960	1.000	102,960
380.00	380.00	Purchased Treatment Capacity (18,000 GPD)	2020		248,820.00	HWW-117	1035	1035	1.000	248,820	1.000	248,820
		TOTAL Account 380.00 - Treatment			**3,125,472.00**					**6,955,996**		**6,955,996**
		Grand Total Upper Pottsgrove			**15,295,347.15**					**25,786,184**		**25,786,184**
		Inventory Check			15,295,347.15							
		Difference			0.00							

	Engineer	Legal	Fees	
Determine the facilities for which a Easment is need	1	0	0	
Locate the Land owner for the property needing a easement	1	1	0	
Develop a diagram o the Property, the facilities, and the easement	2	0	0	
Develop the easement document	1	1	0	
Visit the property owner to obtain permission for the easement and sign the easment documentation	4	0	0	
Register the easement with the Municipal Clerk	0	1	250	
Total	9	3	250	
Labor Costs per Hour	54	100		
Total Cost	486	300	250	1036

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach
Replacement Cost New less Depreciation

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(21)	(22)	(23)	(24)	(28)	(29)	(30)	(31)
Account	Description	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa type	Normal Service Life (NSL)	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)
		years	COR $s		years	years	years	% of COR	CORLD $s
Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	LTL Consultants & AUS Consultants Engineers Assessment		Col (16)	AUS Input	AUS Input		Col (21) + (28)	Col (28) / (29)	Col (22) * (30)
Account	Description	Age	RCN	Iowa	NL	Rem Life	Total Life	Condition	CORLD
353.00	Land & Land Rights	18.00	135,794	ZNonDep	-	-	-	-	135,794
354.00	Stuctures & Improvements - Pumping	13.83	2,380,438	R4.0	45.81	32.29	46.12	45.81	1,664,609
355.00	Generating Equipment	19.70	69,012	R3.0	35.00	17.16	36.85	35.00	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	19.44	309,812	R3.0	75.00	56.77	76.20	75.00	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	13.63	610,719	R3.0	75.00	62.06	75.69	75.00	500,882
360.90	Collection Sewers - Force - Air Release Valve	10.00	14,511	R3.0	45.00	35.43	45.43	45.00	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	18.81	7,196,371	R2.5	80.00	62.82	81.63	80.00	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	18.26	1,752,280	R2.5	80.00	63.35	81.61	80.00	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	12.51	966,046	R2.5	80.00	68.46	80.97	80.00	816,806
361.98	Collection Sewers - Gravity - Manholes	16.61	2,220,312	S2.0	80.00	63.62	80.23	80.00	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	11.60	355,575	R2.5	80.00	69.16	80.76	80.00	304,770
363.00	Service Laterals	16.54	2,819,318	R3.0	70.00	54.20	70.74	70.00	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	21.72	6,955,996	R2.0	45.00	27.27	48.99	45.00	3,924,943
			25,786,184						18,460,028

Appendix A-5.1 (AUS)

9		10	11	12	13
	(5)		(6)		
(4b)			(6a)	(6b)	
Normal Service Life	Economic Obsolescence		Tax Depreciation		Report Depreciation
years	%		Table	Life	

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)		(5)	(6)	
		(4a)	(4b)		(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence	Tax Depreciation	
			years	% of CORLD	Table	Life
353.00	Land & Land Rights	ZNonDep	0.00	0.00%	Non-Depr	0.00
354.00	Stuctures & Improvements - Pumping	R4.0	55.00	0.00%	MACRS	25.00
355.00	Generating Equipment	R3.0	35.00	0.00%	MACRS	25.00
360.10	Collection Sewers - Force - Mains - 4" & Under	R3.0	75.00	0.00%	MACRS	25.00
360.20	Collection Sewers - Force - Mains - 6"-8"	R3.0	75.00	0.00%	MACRS	25.00
360.90	Collection Sewers - Force - Air Release Valve	R3.0	45.00	0.00%	MACRS	25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	R2.5	80.00	0.00%	MACRS	25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	R2.5	80.00	0.00%	MACRS	25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	R2.5	80.00	0.00%	MACRS	25.00
361.98	Collection Sewers - Gravity - Manholes	S2.0	80.00	0.00%	MACRS	25.00
361.99	Collection Sewers - Gravity - Miscellaneous	R2.5	80.00	0.00%	MACRS	25.00
363.00	Service Laterals	R3.0	70.00	0.00%	MACRS	25.00
380.00	Treatment and Disposal Equipment Purchased Capacity	R2.0	45.00	0.00%	MACRS	25.00

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Lookup Iowa Curves Life Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmt	Eng Assmt	Eng Assmt	2020.5 - ((20)+0.5)	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)		Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
Account 353.00 - Land and Land Rights																	
353.1	409 Evans Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	256 Mickletz Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1764 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1760 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1637 Kummerer Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1714 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1710 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1702 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1698 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1696 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1693 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1688 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1682 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1674 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1664 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1505 Kummerer Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1717 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1569 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1577 Farmington Ave.	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1387 Chestnut Grove Rd	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1382 Chestnut Grove Rd	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Renovations By Design	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	149 Pine Ford Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.11	Pine Ford Road PS	2002	18.00	13,546	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	13,545.72	243,823	-	-	-
353.1	1371 N. State Street	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1369 N. State Street	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1407 Heather Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1413 Heather Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1419 Heather Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1429 Heather Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	120 Primrose Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Pine Ford Rd SG HOA	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Chestnut Grove Rd SG HOA	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Chestnut Grove Rd UPT	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Fallbrook and Cloverhill	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Fallbrook and Heather Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Gravity to PFRPS	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Laura Land UPT	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1804 Joanne Circle	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1811 Joanne Circle	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	10 Cherrytree Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	18 Cherrytree Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	24 Cherrytree Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	64 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	70 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	76 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	80 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	111 Snyder Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2019 Mimosa Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2136 Hollyberry Ct	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
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Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Lookup Iowa Curves Life Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	2020 - ((20)+0.5)	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)		Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
353.1	2133 Hollyberry Ct	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	221 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	215 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	209 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	203 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	200 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	207 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	188 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	182 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	176 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	170 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	164 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	156 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	140 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	136 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	132 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	124 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	116 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	102 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	145 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	139 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	135 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	127 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	121 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	113 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	109 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	105 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	99 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	95 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	91 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	85 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	82 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	87 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	93 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	101 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	107 Rose Valley Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	63 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2160 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2146 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2126 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	94 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	98 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2019 Mimosa Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2038 Mimosa Lane	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	150 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	156 Maple Leaf	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	155 Boxwood Ct	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	161 Boxwood Ct	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2093 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2101 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	2115 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Iowa Curves Life Tables @ col 26	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	2020.3-((20)+0.5)	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)	Col (24) * (27)	Col (21) - (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (31)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
353.1	2131 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	256 W. Moyer	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1608 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1614 Gilbertsville Road	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	64 Irwin Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	56 Irwin Place	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1275 Whitespire Circle	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1266 N Hanover	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	Glendale Ave	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1537 Meadowview Drive	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1533 Meadowview Drive	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1518 Meadowview Drive	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1522 Meadowview Drive	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1456 Sweetwater Way	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1460 Sweetwater Way	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	1412 Meadwview Drive	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	218 Deerfield Way	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
353.1	220 Deerfield Way	2002	18.00	1,036	ZNonDep	0.0	0	ZNonDep000	0.00000	0.00	0.00	100.000000%	1,036.00	18,648	-	-	-
				135,794									**135,794**	**2,444,287**	-	-	-
354	Evan Rd. Chopper Pump Station	2010	10.00	108,869	R4.0	55.0	18	R4.0018	0.82054	45.13	55.13	81.861056%	89,120.92	1,088,685	4,913,236	6,001,922	5,987,769
354	Evan Rd. Lift Station	2010	10.00	28,650	R4.0	55.0	18	R4.0018	0.82054	45.13	55.13	81.861056%	23,452.87	286,496	1,292,957	1,579,453	1,575,729
354	Transducers	2010	10.00	2,613	R4.0	55.0	18	R4.0018	0.82054	45.13	55.13	81.861056%	2,138.79	26,127	117,912	144,039	143,699
354	Power Supply	2011	9.00	10,841	R4.0	55.0	16	R4.0016	0.84041	46.22	55.22	83.701557%	9,073.72	97,565	501,051	598,616	596,231
354	Electrical Connections & Appurtenances	2011	9.00	10,366	R4.0	55.0	16	R4.0016	0.84041	46.22	55.22	83.701557%	8,676.75	93,297	479,130	572,427	570,146
354	Pump Level Control	2011	9.00	12,196	R4.0	55.0	16	R4.0016	0.84041	46.22	55.22	83.701557%	10,207.93	109,761	563,682	673,443	670,760
354	Auto Dialer	2011	9.00	2,710	R4.0	55.0	16	R4.0016	0.84041	46.22	55.22	83.701557%	2,268.43	24,391	125,263	149,654	149,058
354	PECO Utility Ext	2011	9.00	16,602	R4.0	55.0	16	R4.0016	0.84041	46.22	55.22	83.701557%	13,895.76	149,414	767,324	916,738	913,085
				192,845									**158,835**	**1,875,736**	**8,760,555**	**10,636,292**	**10,606,477**
354.3	Pine Ford PS Complete in Place	1998	22.00	341,747	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	176,324.96	7,518,436	8,013,969	15,532,406	15,378,620
354.3	Fencing	1998	22.00	30,415	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	15,692.92	669,141	713,243	1,382,384	1,368,697
354.3	15Kv Duct	1998	22.00	63,553	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	32,790.46	1,398,174	1,490,327	2,888,501	2,859,902
354.3	15Kv Cable	1998	22.00	25,028	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	12,913.06	550,608	586,898	1,137,507	1,126,244
354.3	Secondary Service	1998	22.00	8,999	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	4,642.90	197,972	211,020	408,991	404,942
354.3	Main Breaker & Cabinet	1998	22.00	20,247	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	10,446.52	445,436	474,794	920,230	911,119
354.3	ATS Panel PP and Cabinet	1998	22.00	35,432	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	18,281.41	779,513	830,890	1,610,403	1,594,458
354.3	Phone Conduit and TVSS	1998	22.00	2,250	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	1,160.73	49,493	52,755	102,248	101,236
354.3	Service Entrance TVSS	1998	22.00	4,218	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	2,176.36	92,799	98,915	191,714	189,816
354.3	Connections	1998	22.00	6,187	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	3,191.99	136,105	145,076	281,181	278,397
354.3	Pump Control Conduit & Cable	1998	22.00	8,718	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	4,497.81	191,785	204,425	396,210	392,288
354.3	Site Lighting	1998	22.00	7,086	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	3,656.28	155,903	166,178	322,081	318,892
354.3	Equipment Pads	1998	22.00	8,436	R4.0	45.0	49	R4.0049	0.52116	23.45	45.45	51.595160%	4,352.72	185,598	197,831	383,429	379,633
354.3	Demolition of Existing 40 HP Pumps	2011	9.00	4,607	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	3,686.41	41,465	165,999	207,464	207,326
354.3	Electric Connections to 50HP Pumps	2011	9.00	6,775	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	5,421.18	60,978	244,116	305,094	304,891

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Pennsylvania American Water Company **Upper Pottsgrove Township** **Wastewater Collection System** **Investor-Owned Utility** **As of April 28, 2020**																	
Replacement Cost New less Depreciation (RCNLD)																	
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Iowa Curves Life Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	2020.5 - [(20)+0.5]	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)	Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (31)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
354.3	Upgrade of Existing Electric System	2011	9.00	2,442	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	1,953.80	21,977	87,979	109,956	109,883
354.3	Pine Ford Rd. Lift Station Upgrade	2010	10.00	238,143	R4.0	45.0	22	R4.0022	0.78088	35.14	45.14	77.846699%	185,386.63	2,381,432	8,368,352	10,749,784	10,716,444
				814,284									**486,576**	**14,876,815**	**22,052,767**	**36,929,583**	**36,842,788**
354.3	Hollyberry PS & Wetwell	1966	34.00	112,932	R4.0	45.0	76	R4.0076	0.29658	13.35	47.35	28.194298%	31,840.38	3,839,688	1,507,642	5,347,330	5,081,940
				112,932									**31,840**	**3,839,688**	**1,507,642**	**5,347,330**	**5,081,940**
354.3	Regal Oaks Pump Station	2010	10.00	498,057	R4.0	45.0	22	R4.0022	0.78088	35.14	45.14	77.846699%	387,721.08	4,980,572	17,501,730	22,482,302	22,412,574
354.3	Regal Oaks Station Site Work	2010	10.00	420,853	R4.0	45.0	22	R4.0022	0.78088	35.14	45.14	77.846699%	327,619.87	4,208,526	14,788,761	18,997,287	18,938,368
354.3	Cherry Tree Pump Station Site Work	2010	10.00	55,509	R4.0	45.0	22	R4.0022	0.78088	35.14	45.14	77.846699%	43,211.97	555,091	1,950,588	2,505,679	2,497,908
354.3	Transformer Pad	2011	9.00	7,504	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	6,004.54	67,540	270,384	337,924	337,699
354.3	Concrete Pad	2011	9.00	5,925	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	4,740.42	53,321	213,461	266,782	266,604
354.3	Equipment Stand	2011	9.00	1,975	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	1,580.14	17,774	71,154	88,927	88,868
354.3	ATS	2011	9.00	11,849	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	9,480.84	106,642	426,922	533,564	533,209
354.3	Main Circuit Breaker	2011	9.00	1,975	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	1,580.14	17,774	71,154	88,927	88,868
354.3	Light Standard	2011	9.00	9,084	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	7,268.64	81,759	327,307	409,066	408,793
354.3	PVC Pipe	2011	9.00	11,849	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	9,480.84	106,642	426,922	533,564	533,209
354.3	Copper Wire	2011	9.00	9,874	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	7,900.70	88,868	355,769	444,637	444,340
354.3	Copper Wire	2011	9.00	13,824	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	11,060.98	124,415	498,076	622,491	622,076
354.3	Wet Well Work	2011	9.00	10,664	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	8,532.76	95,978	384,230	480,208	479,888
354.3	Metropolitan Edison Utility Work	2011	9.00	201,434	R4.0	45.0	20	R4.0020	0.80069	36.03	45.03	80.013324%	161,174.28	1,812,909	7,257,678	9,070,587	9,064,544
				1,260,377									**987,357**	**12,317,811**	**44,544,136**	**56,861,945**	**56,716,948**
				2,360,438									**1,664,609**	**32,910,050**	**76,865,100**	**109,775,150**	**109,048,153**
355	Pine Ford Road PS-Electrical	1998	22.00	56,799	R3.0	35.0	63	R3.0063	0.43441	15.20	37.20	40.860215%	23,208.00	1,249,567	863,338	2,112,905	1,987,948
355	Regal Oaks PS	2011	9.00	12,213	R3.0	35.0	26	R3.0026	0.74986	26.25	35.25	74.468085%	9,094.90	109,918	320,595	430,514	427,460
				69,012									**32,303**	**1,359,485**	**1,183,933**	**2,543,419**	**2,415,408**
360	4" and Under Force Collection Sewers	1986	34.00	80,291	R3.0	75.0	45	R3.0045	0.58001	43.50	77.50	56.129032%	45,066.31	2,729,879	3,492,639	6,222,518	6,021,792
360	4" and Under Force Collection Sewers	1990	30.00	48,498	R3.0	75.0	40	R3.0040	0.62327	46.75	76.75	60.912052%	29,541.39	1,454,953	2,267,302	3,722,255	3,637,382
360	4" and Under Force Collection Sewers	2007	13.00	43,077	R3.0	75.0	17	R3.0017	0.83474	62.61	75.61	82.806507%	35,670.46	559,999	2,697,043	3,257,043	3,230,766
360	4" and Under Force Collection Sewers	2008	12.00	7,512	R3.0	75.0	16	R3.0016	0.84430	63.32	75.32	84.067977%	6,315.17	90,144	475,659	565,802	563,399
360	4" and Under Force Collection Sewers	2010	10.00	118,654	R3.0	75.0	13	R3.0013	0.87314	65.49	75.49	86.753212%	102,935.90	1,186,537	7,770,631	8,957,169	8,899,028
360	4" and Under Force Collection Sewers	2020	0.00	11,781	R3.0	75.0	0	R3.0000	1.00000	75.00	75.00	100.000000%	11,780.63	-	883,547	883,547	883,547
				309,812									**231,310**	**6,021,512**	**17,586,821**	**23,608,334**	**23,235,914**
360	6" - 8" Force Collection Sewer	1998	22.00	171,009	R3.0	75.0	29	R3.0029	0.72212	54.16	76.16	71.113445%	121,610.53	3,762,202	9,261,858	13,024,060	12,825,689
360	6" - 8" Force Collection Sewer	2007	13.00	55,503	R3.0	75.0	17	R3.0017	0.83474	62.61	75.61	82.806507%	45,960.18	721,540	3,475,049	4,196,589	4,162,733
360	6" - 8" Force Collection Sewer	2010	10.00	384,207	R3.0	75.0	13	R3.0013	0.87314	65.49	75.49	86.753212%	333,311.78	3,842,069	25,161,707	29,003,775	28,815,514

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Iowa Curves Life Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmt	Eng Assmt	Eng Assmt	2020 s [(29)+0.5]	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)	Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (28) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
				610,719									**500,882**	**8,325,811**	**37,898,614**	**46,224,424**	**45,803,936**
360.9 Air Release - Force Sewer		2010	10.00	14,511	R3.0	45.0	22	R3.0022	0.78729	35.43	45.43	77.988114%	11,317.03	145,112	514,133	659,245	653,005
				14,511									**11,317**	**145,112**	**514,133**	**659,245**	**653,005**
				935,043									**743,509**	**14,492,435**	**55,999,568**	**70,492,003**	**69,692,855**
361.11 6" - 8" Gravity Collection Sewer		1984	36.00	524,292	R2.5	80.0	45	R2.5045	0.60049	48.04	84.04	57.163256%	299,702.12	18,874,495	25,186,966	44,061,461	41,943,323
361.11 6" - 8" Gravity Collection Sewer		1986	34.00	1,064,832	R2.5	80.0	43	R2.5043	0.61677	49.34	83.34	59.203264%	630,415.15	36,204,279	52,538,798	88,743,077	85,186,539
361.11 6" - 8" Gravity Collection Sewer		1990	30.00	152,169	R2.5	80.0	38	R2.5038	0.65821	52.66	82.66	63.706751%	96,942.12	4,565,079	8,013,235	12,578,314	12,173,544
361.11 6" - 8" Gravity Collection Sewer		1995	25.00	451,395	R2.5	80.0	31	R2.5031	0.71785	57.43	82.43	69.671236%	314,492.55	11,284,878	25,923,621	37,208,498	36,111,608
361.11 6" - 8" Gravity Collection Sewer		1996	24.00	86,262	R2.5	80.0	30	R2.5030	0.72652	58.12	82.12	70.774476%	61,051.57	2,070,291	5,013,555	7,083,846	6,900,970
361.11 6" - 8" Gravity Collection Sewer		1998	22.00	479,869	R2.5	80.0	28	R2.5028	0.74396	59.52	81.52	73.012758%	350,365.52	10,557,116	28,561,797	39,118,913	38,389,512
361.11 6" - 8" Gravity Collection Sewer		1999	21.00	318,770	R2.5	80.0	26	R2.5026	0.76153	60.92	81.92	74.365234%	237,054.18	6,694,173	19,419,478	26,113,652	25,501,613
361.11 6" - 8" Gravity Collection Sewer		2000	20.00	142,020	R2.5	80.0	25	R2.5025	0.77036	61.63	81.63	75.496204%	107,224.01	2,840,401	8,752,696	11,593,097	11,361,605
361.11 6" - 8" Gravity Collection Sewer		2001	19.00	169,613	R2.5	80.0	24	R2.5024	0.77923	62.34	81.34	76.641259%	129,993.81	3,222,654	10,573,696	13,796,350	13,569,068
361.11 6" - 8" Gravity Collection Sewer		2003	17.00	286,277	R2.5	80.0	21	R2.5021	0.80602	64.48	81.48	79.135984%	226,548.33	4,866,713	18,459,158	23,325,871	22,902,181
361.11 6" - 8" Gravity Collection Sewer		2005	15.00	199,497	R2.5	80.0	19	R2.5019	0.82402	65.92	80.92	81.463174%	162,516.43	2,992,452	13,150,829	16,143,281	15,959,744
361.11 6" - 8" Gravity Collection Sewer		2007	13.00	1,062,925	R2.5	80.0	16	R2.5016	0.85124	68.10	81.10	83.970407%	892,542.52	13,818,026	72,385,198	86,203,224	85,034,006
361.11 6" - 8" Gravity Collection Sewer		2008	12.00	804,268	R2.5	80.0	15	R2.5015	0.86036	68.83	80.83	85.154027%	684,866.84	9,651,219	55,357,786	65,009,006	64,341,463
361.11 6" - 8" Gravity Collection Sewer		2010	10.00	649,034	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	568,207.68	6,490,338	45,627,077	52,117,415	51,922,705
361.11 6" - 8" Gravity Collection Sewer		2017	3.00	202,220	R2.5	80.0	4	R2.5004	0.96231	76.98	79.98	96.249062%	194,634.63	606,659	15,566,878	16,173,537	16,177,582
361.11 6" - 8" Gravity Collection Sewer		2018	2.00	302,599	R2.5	80.0	3	R2.5003	0.97170	77.74	79.74	97.491849%	295,009.77	605,199	23,524,079	24,129,278	24,207,954
361.11 6" - 8" Gravity Collection Sewer		2019	1.00	46,234	R2.5	80.0	1	R2.5001	0.99055	79.24	80.24	98.753739%	45,658.13	46,234	3,663,608	3,709,843	3,698,746
361.11 6" - 8" Gravity Collection Sewer		2020	0.00	254,094	R2.5	80.0	0	R2.5000	1.00000	80.00	80.00	100.000000%	254,093.54	-	20,327,483	20,327,483	20,327,483
				7,196,371									**5,551,319**	**135,390,206**	**452,045,938**	**587,436,146**	**575,709,646**
361.12 10" - 12" Gravity Collection Sewer		1995	25.00	838,920	R2.5	80.0	31	R2.5031	0.71785	57.43	82.43	69.671236%	584,485.58	20,972,988	48,179,147	69,152,134	67,113,560
361.12 10" - 12" Gravity Collection Sewer		2007	13.00	628,140	R2.5	80.0	16	R2.5016	0.85124	68.10	81.10	83.970407%	527,451.65	8,165,819	42,776,329	50,942,148	50,251,194
361.12 10" - 12" Gravity Collection Sewer		2010	10.00	285,221	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	249,701.50	2,852,209	20,051,031	22,903,240	22,817,674
				1,752,280									**1,361,639**	**31,991,016**	**111,006,507**	**142,997,522**	**140,182,428**
361.13 18" and Over - Gravity Collection Sewer		2007	13.00	809,089	R2.5	80.0	16	R2.5016	0.85124	68.10	81.10	83.970407%	679,394.99	10,518,152	55,098,934	65,617,085	64,727,088
361.13 18" and Over - Gravity Collection Sewer		2010	10.00	156,957	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	137,411.02	1,569,574	11,034,105	12,603,679	12,556,592
				966,046									**816,806**	**12,087,726**	**66,133,039**	**78,220,764**	**77,283,680**
361.98 Manholes		1984	36.00	77,154	S2.0	80.0	45	S2.0045	0.57419	45.94	81.94	56.065414%	43,256.78	2,777,548	3,544,460	6,322,009	6,172,330
361.98 Manholes		1986	34.00	189,869	S2.0	80.0	43	S2.0043	0.59062	47.25	81.25	58.153846%	110,416.02	6,455,540	8,971,302	15,426,842	15,189,506
361.98 Manholes		1990	30.00	105,701	S2.0	80.0	38	S2.0038	0.63320	50.66	80.66	62.806844%	66,387.62	3,171,038	5,354,825	8,525,863	8,456,100
361.98 Manholes		1995	25.00	196,294	S2.0	80.0	31	S2.0031	0.69612	55.69	80.69	69.017226%	135,476.85	4,907,357	10,931,627	15,838,984	15,703,541
361.98 Manholes		1996	24.00	22,383	S2.0	80.0	30	S2.0030	0.70539	56.43	80.43	70.160388%	15,703.79	537,185	1,263,056	1,800,241	1,790,616
361.98 Manholes		1998	22.00	31,936	S2.0	80.0	28	S2.0028	0.72411	57.93	79.93	72.475916%	23,146.01	702,585	1,850,061	2,552,656	2,554,891

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Lookup Iowa Curves Life Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmt	Eng Assmt	Eng Assmt	2020 s (20)+6.5	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)		Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
361.98	Manholes	1999	21.00	116,288	S2.0	80.0	26	S2.0026	0.74306	59.44	80.44	73.893585%	85,929.48	2,442,051	6,912,167	9,354,218	9,303,051
361.98	Manholes	2000	20.00	32,801	S2.0	80.0	25	S2.0025	0.75261	60.21	80.21	75.065453%	24,622.04	656,015	1,974,934	2,630,949	2,624,061
361.98	Manholes	2001	19.00	37,839	S2.0	80.0	24	S2.0024	0.76221	60.98	79.98	76.244061%	28,849.65	718,933	2,307,395	3,026,328	3,027,085
361.98	Manholes	2003	17.00	117,631	S2.0	80.0	21	S2.0021	0.79128	63.30	80.30	78.829390%	92,727.66	1,999,724	7,446,031	9,445,755	9,410,466
361.98	Manholes	2005	15.00	107,103	S2.0	80.0	19	S2.0019	0.81084	64.87	79.87	81.219482%	86,988.40	1,606,543	6,947,763	8,554,306	8,568,230
361.98	Manholes	2007	13.00	214,034	S2.0	80.0	16	S2.0016	0.84040	67.23	80.23	83.796585%	179,353.11	2,782,441	14,389,500	17,171,941	17,122,713
361.98	Manholes	2008	12.00	245,969	S2.0	80.0	15	S2.0015	0.85031	68.02	80.02	85.003749%	209,082.90	2,951,628	16,730,813	19,682,442	19,677,522
361.98	Manholes	2010	10.00	485,462	S2.0	80.0	13	S2.0013	0.87016	69.61	79.61	87.438764%	424,482.15	4,854,622	33,793,024	38,647,646	38,836,976
361.98	Manholes	2017	3.00	29,783	S2.0	80.0	4	S2.0004	0.96000	76.80	79.80	96.240602%	28,663.38	89,349	2,287,337	2,376,687	2,382,643
361.98	Manholes	2018	2.00	93,149	S2.0	80.0	3	S2.0003	0.97000	77.60	79.60	97.487437%	90,808.94	186,299	7,228,392	7,414,691	7,451,950
361.98	Manholes	2019	1.00	34,083	S2.0	80.0	1	S2.0001	0.99000	79.20	80.20	98.753117%	33,658.39	34,083	2,699,403	2,733,486	2,726,670
361.98	Manholes	2020	0.00	82,833	S2.0	80.0	0	S2.0000	1.00000	80.00	80.00	100.000000%	82,832.58	-	6,626,606	6,626,606	6,626,606
				2,220,312									**1,762,386**	**36,872,951**	**141,256,696**	**178,131,650**	**177,624,957**
361.99	Miscellaneous	1995	25.00	27,995	R2.5	80.0	31	R2.5031	0.71785	57.43	82.43	69.671236%	19,504.68	699,883	1,607,771	2,307,653	2,239,625
361.99	Miscellaneous	2003	17.00	111,994	R2.5	80.0	21	R2.5021	0.80602	64.48	81.48	79.135984%	88,627.75	1,903,902	7,221,389	9,125,291	8,959,540
361.99	Miscellaneous	2008	12.00	6,444	R2.5	80.0	15	R2.5015	0.86036	68.83	80.83	85.154027%	5,487.41	77,329	443,547	520,877	515,528
361.99	Miscellaneous	2010	10.00	6,135	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	5,371.27	61,353	431,313	492,666	490,826
361.99	Miscellaneous	2010	10.00	108,076	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	94,616.91	1,080,759	7,597,738	8,678,497	8,646,074
361.99	Miscellaneous	2010	10.00	2,862	R2.5	80.0	13	R2.5013	0.87869	70.30	80.30	87.546700%	2,506.02	28,625	201,233	229,858	228,999
361.99	Miscellaneous	2017	3.00	88,734	R2.5	80.0	4	R2.5004	0.96231	76.98	79.98	96.249062%	85,405.53	266,202	6,830,734	7,096,936	7,098,710
361.99	Miscellaneous	2018	2.00	3,334	R2.5	80.0	3	R2.5003	0.97170	77.74	79.74	97.491849%	3,250.10	6,667	259,163	265,830	266,697
				355,575									**304,770**	**4,124,720**	**24,592,888**	**28,717,606**	**28,445,999**
				12,490,584									**9,796,919**	**220,466,619**	**795,037,068**	**1,015,503,690**	**999,246,710**
363	Service - Laterals	1986	34.00	135,826	R3.0	70.0	49	R3.0049	0.54624	38.24	72.24	52.934662%	71,889.18	4,618,094	5,193,997	9,812,090	9,507,840
363	Service - Laterals	1990	30.00	29,104	R3.0	70.0	43	R3.0043	0.59718	41.80	71.80	58.217270%	16,943.68	873,127	1,216,556	2,089,683	2,037,295
363	Service - Laterals	1995	25.00	541,864	R3.0	70.0	36	R3.0036	0.65866	46.11	71.11	64.843201%	351,362.10	13,546,605	24,985,359	38,531,964	37,930,495
363	Service - Laterals	1996	24.00	46,299	R3.0	70.0	34	R3.0034	0.67660	47.36	71.36	66.367713%	30,727.45	1,111,171	2,192,711	3,303,882	3,240,916
363	Service - Laterals	1998	22.00	34,016	R3.0	70.0	31	R3.0031	0.70380	49.27	71.27	69.131472%	23,515.59	748,347	1,675,956	2,424,303	2,381,103
363	Service - Laterals	1999	21.00	156,860	R3.0	70.0	30	R3.0030	0.71294	49.91	70.91	70.384995%	110,406.18	3,294,068	7,828,903	11,122,971	10,980,228
363	Service - Laterals	2000	20.00	59,247	R3.0	70.0	29	R3.0029	0.72212	50.55	70.55	71.651311%	42,451.13	1,184,937	2,994,927	4,179,864	4,147,278
363	Service - Laterals	2001	19.00	131,696	R3.0	70.0	27	R3.0027	0.74058	51.84	70.84	73.178995%	96,373.98	2,502,228	6,827,133	9,329,361	9,218,736
363	Service - Laterals	2003	17.00	147,341	R3.0	70.0	24	R3.0024	0.76851	53.80	70.80	75.988701%	111,962.24	2,504,791	7,926,926	10,431,717	10,313,845
363	Service - Laterals	2005	15.00	182,423	R3.0	70.0	21	R3.0021	0.79673	55.77	70.77	78.804578%	143,757.71	2,736,346	10,173,733	12,910,079	12,769,614
363	Service - Laterals	2007	13.00	113,005	R3.0	70.0	19	R3.0019	0.81568	57.10	70.10	81.455064%	92,047.92	1,469,059	6,452,559	7,921,618	7,910,318
363	Service - Laterals	2008	12.00	712,633	R3.0	70.0	17	R3.0017	0.83474	58.43	70.43	82.961806%	591,213.10	8,551,594	41,639,139	50,190,733	49,884,301
363	Service - Laterals	2010	10.00	329,893	R3.0	70.0	14	R3.0014	0.86350	60.45	70.45	85.805536%	283,066.05	3,298,925	19,942,003	23,240,928	23,092,476
363	Service - Laterals	2017	3.00	22,934	R3.0	70.0	4	R3.0004	0.96069	67.25	70.25	95.729537%	21,954.38	68,801	1,542,295	1,611,097	1,605,363
363	Service - Laterals	2018	2.00	57,053	R3.0	70.0	3	R3.0003	0.97050	67.94	69.94	97.140406%	55,421.45	114,106	3,876,176	3,990,282	3,993,705
363	Service - Laterals	2019	1.00	19,358	R3.0	70.0	1	R3.0001	0.99015	69.31	70.31	98.577727%	19,082.36	19,358	1,341,681	1,361,038	1,355,038
363	Service - Laterals	2020	0.00	99,767	R3.0	70.0	0	R3.0000	1.00000	70.00	70.00	100.000000%	99,767.24	-	6,983,707	6,983,707	6,983,707
				2,819,318									**2,161,952**	**46,641,557**	**152,793,761**	**199,435,317**	**197,352,258**

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Replacement Cost New less Depreciation (RCNLD)

(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Account	Description	Placement Year	Age at April 28, 2020 Appraisal Date	Replacement Cost New (COR)	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Condition	Preliminary Cost Approach (COR less Normal Depreciation)	COR Weighted Age	COR Weighted Normal Remaining Life	COR Weighted Total Life Expectancy	COR Weighted Normal Service Life (NSL)
			years	COR $s		years	% of NSL	Lookup	%	years	years	% of COR	CORLD $s	COR $s * Years	COR $s * Years	COR $s * Years	COR $s * Years
Input	Input	Input	Calculation	Calculation	Input	Input	Calculation	Calculation	Lookup Lookup Iowa Curves Like Tables @ col (26)	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
Eng Assmt	Eng Assmt	Eng Assmt	2020 - (20)+0.5)	Col (16)	AUS Input	AUS Input	Col (21) / (24)	Col (23) & (25)		Col (24) * (27)	Col (21) + (28)	Col (28) / (29)	Col (22) * (30)	Col (22) * (21)	Col (22) * (28)	Col (22) * (29)	Col (22) * (24)
Account	Description	Year1	Age	RCN	Iowa	NL	AgeP	IowaLookup	IowaCondition	Rem Life	Total Life	Condition	CORLD	COR * Age	COR * RL	COR * TL	COR * NL
380	Purchased Treatment Capacity (3%)	1990	30.00	3,160,417	R2.0	45.0	67	R2.0067	0.46519	20.93	50.93	41.095621%	1,298,793.05	94,812,514	66,147,531	160,960,045	142,218,771
380	Purchased Conveyance thru Lower(192,000 GPD)	1994	26.00	1,006,250	R2.0	45.0	58	R2.0058	0.52670	23.70	49.70	47.686117%	479,841.55	26,162,500	23,848,125	50,010,625	45,281,250
380	Purchased Treatment Capacity (188,400 GPD)	2005	15.00	1,237,952	R2.0	45.0	33	R2.0033	0.71617	32.23	47.23	68.240525%	844,784.88	18,569,279	39,899,190	58,468,469	55,707,836
380	Purchased Treatment Capacity (53,700 GPD)	2010	10.00	348,857	R2.0	45.0	22	R2.0022	0.80704	36.32	46.32	78.411054%	273,542.20	3,488,567	12,670,475	16,159,041	15,698,551
380	Treatment Plant Expansion (CAPEX)	2010	10.00	748,673	R2.0	45.0	22	R2.0022	0.80704	36.32	46.32	78.411054%	587,042.27	7,486,729	27,191,798	34,678,526	33,690,278
380	Purchased Treatment Capacity (4,500 GPD)	2011	9.00	28,506	R2.0	45.0	20	R2.0020	0.82399	37.08	46.08	80.468750%	22,938.80	256,558	1,057,020	1,313,578	1,282,791
380	Purchased Treatment Capacity (6,000 GPD)	2013	7.00	37,482	R2.0	45.0	16	R2.0016	0.85828	38.62	45.62	84.655853%	31,730.74	262,374	1,447,556	1,709,931	1,686,692
380	Purchased Treatment Capacity (6,000 GPD)	2018	2.00	36,079	R2.0	45.0	4	R2.0004	0.96393	43.38	45.38	95.592772%	34,489.24	72,159	1,565,122	1,637,280	1,623,570
380	Purchased Treatment Capacity (43,500 GPD) Pending	2020	0.00	102,960	R2.0	45.0	0	R2.0000	1.00000	45.00	45.00	100.000000%	102,960.00	-	4,633,200	4,633,200	4,633,200
380	Purchased Treatment Capacity (18,000 GPD)	2020	0.00	248,820	R2.0	45.0	0	R2.0000	1.00000	45.00	45.00	100.000000%	248,820.00	-	11,196,900	11,196,900	11,196,900
				6,955,996									**3,924,943**	**151,110,680**	**189,656,917**	**340,767,595**	**313,019,839**
				25,786,184									**18,460,028**	**469,425,113**	**1,271,536,347**	**1,738,517,174**	**1,690,775,223**

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Cost Approach

Replacement Cost New less Depreciation to Fair Market Value

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Fair Market Value

(36)	(37)	(39)	(40)	(41)
Account	Description	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
		CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * (1.00-Col (40))
Account	Description	Prelim CORLD	EO%	FMV
353.00	Land & Land Rights	135,794	0.00%	135,794
354.00	Stuctures & Improvements - Pumping	1,664,609	0.00%	1,664,609
355.00	Generating Equipment	32,303	0.00%	32,303
360.10	Collection Sewers - Force - Mains - 4" & Under	231,310	0.00%	231,310
360.20	Collection Sewers - Force - Mains - 6"-8"	500,882	0.00%	500,882
360.90	Collection Sewers - Force - Air Release Valve	11,317	0.00%	11,317
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	5,551,319	0.00%	5,551,319
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,361,639	0.00%	1,361,639
361.13	Collection Sewers - Gravity - Mains - 18" & over	816,806	0.00%	816,806
361.98	Collection Sewers - Gravity - Manholes	1,762,386	0.00%	1,762,386
361.99	Collection Sewers - Gravity - Miscellaneous	304,770	0.00%	304,770
363.00	Service Laterals	2,161,952	0.00%	2,161,952
380.00	Treatment and Disposal Equipment Purchased Capacity	3,924,943	0.00%	3,924,943
		18,460,028		18,460,028

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Pennsylvania American Water Company
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Wastewater Collection System
Investor-Owned Utility
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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
Account 353.00 - Land and Land Rights					
353.1	409 Evans Road	2002	1,036.00	0.00%	1,036.00
353.1	256 Mickletz Road	2002	1,036.00	0.00%	1,036.00
353.1	1764 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1760 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1637 Kummerer Road	2002	1,036.00	0.00%	1,036.00
353.1	1714 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1710 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1702 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1698 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1696 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1693 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1688 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1682 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1674 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1664 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1505 Kummerer Road	2002	1,036.00	0.00%	1,036.00
353.1	1717 Farmington Ave.	2002	1,036.00	0.00%	1,036.00

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	1569 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1577 Farmington Ave.	2002	1,036.00	0.00%	1,036.00
353.1	1387 Chestnut Grove Rd	2002	1,036.00	0.00%	1,036.00
353.1	1382 Chestnut Grove Rd	2002	1,036.00	0.00%	1,036.00
353.1	Renovations By Design	2002	1,036.00	0.00%	1,036.00
353.1	149 Pine Ford Road	2002	1,036.00	0.00%	1,036.00
353.11	Pine Ford Road PS	2002	13,545.72	0.00%	13,545.72
353.1	1371 N. State Street	2002	1,036.00	0.00%	1,036.00
353.1	1369 N. State Street	2002	1,036.00	0.00%	1,036.00
353.1	1407 Heather Place	2002	1,036.00	0.00%	1,036.00
353.1	1413 Heather Place	2002	1,036.00	0.00%	1,036.00
353.1	1419 Heather Place	2002	1,036.00	0.00%	1,036.00
353.1	1429 Heather Place	2002	1,036.00	0.00%	1,036.00
353.1	120 Primrose Lane	2002	1,036.00	0.00%	1,036.00
353.1	Pine Ford Rd SG HOA	2002	1,036.00	0.00%	1,036.00
353.1	Chestnut Grove Rd SG HOA	2002	1,036.00	0.00%	1,036.00
353.1	Chestnut Grove Rd UPT	2002	1,036.00	0.00%	1,036.00
353.1	Fallbrook and Cloverhill	2002	1,036.00	0.00%	1,036.00

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	Fallbrook and Heather Place	2002	1,036.00	0.00%	1,036.00
353.1	Gravity to PFRPS	2002	1,036.00	0.00%	1,036.00
353.1	Laura Land UPT	2002	1,036.00	0.00%	1,036.00
353.1	1804 Joanne Circle	2002	1,036.00	0.00%	1,036.00
353.1	1811 Joanne Circle	2002	1,036.00	0.00%	1,036.00
353.1	10 Cherrytree Lane	2002	1,036.00	0.00%	1,036.00
353.1	18 Cherrytree Lane	2002	1,036.00	0.00%	1,036.00
353.1	24 Cherrytree Lane	2002	1,036.00	0.00%	1,036.00
353.1	64 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	70 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	76 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	80 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	111 Snyder Road	2002	1,036.00	0.00%	1,036.00
353.1	2019 Mimosa Lane	2002	1,036.00	0.00%	1,036.00
353.1	2136 Hollyberry Ct	2002	1,036.00	0.00%	1,036.00
353.1	2133 Hollyberry Ct	2002	1,036.00	0.00%	1,036.00
353.1	221 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	215 Rose Valley Road	2002	1,036.00	0.00%	1,036.00

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	209 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	203 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	200 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	207 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	188 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	182 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	176 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	170 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	164 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	156 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	140 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	138 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	132 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	124 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	116 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	102 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	145 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	139 Maple Leaf	2002	1,036.00	0.00%	1,036.00

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	135 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	127 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	121 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	113 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	109 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	105 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	99 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	95 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	91 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	85 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	82 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	87 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	93 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	101 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	107 Rose Valley Road	2002	1,036.00	0.00%	1,036.00
353.1	63 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	2160 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	2146 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	2126 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	94 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	98 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	2019 Mimosa Lane	2002	1,036.00	0.00%	1,036.00
353.1	2038 Mimosa Lane	2002	1,036.00	0.00%	1,036.00
353.1	150 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	156 Maple Leaf	2002	1,036.00	0.00%	1,036.00
353.1	155 Boxwood Ct	2002	1,036.00	0.00%	1,036.00
353.1	161 Boxwood Ct	2002	1,036.00	0.00%	1,036.00
353.1	2093 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	2101 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	2115 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	2131 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	256 W. Moyer	2002	1,036.00	0.00%	1,036.00
353.1	1608 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	1614 Gilbertsville Road	2002	1,036.00	0.00%	1,036.00
353.1	64 Irwin Place	2002	1,036.00	0.00%	1,036.00
353.1	56 Irwin Place	2002	1,036.00	0.00%	1,036.00

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
353.1	1275 Whitespire Circle	2002	1,036.00	0.00%	1,036.00
353.1	1266 N Hanover	2002	1,036.00	0.00%	1,036.00
353.1	Glendale Ave	2002	1,036.00	0.00%	1,036.00
353.1	1537 Meadowview Drive	2002	1,036.00	0.00%	1,036.00
353.1	1533 Meadowview Drive	2002	1,036.00	0.00%	1,036.00
353.1	1518 Meadowview Drive	2002	1,036.00	0.00%	1,036.00
353.1	1522 Meadowview Drive	2002	1,036.00	0.00%	1,036.00
353.1	1456 Sweetwater Way	2002	1,036.00	0.00%	1,036.00
353.1	1460 Sweetwater Way	2002	1,036.00	0.00%	1,036.00
353.1	1412 Meadwview Drive	2002	1,036.00	0.00%	1,036.00
353.1	218 Deerfield Way	2002	1,036.00	0.00%	1,036.00
353.1	220 Deerfield Way	2002	1,036.00	0.00%	1,036.00
			135,794		**135,794**

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
354	Evan Rd. Chopper Pump Station	2010	89,120.92	0.00%	89,120.92
354	Evan Rd. Lift Station	2010	23,452.87	0.00%	23,452.87
354	Transducers	2010	2,138.79	0.00%	2,138.79
354	Power Supply	2011	9,073.72	0.00%	9,073.72
354	Electrical Connections & Appurtena	2011	8,676.75	0.00%	8,676.75
354	Pump Level Control	2011	10,207.93	0.00%	10,207.93
354	Auto Dialer	2011	2,268.43	0.00%	2,268.43
354	PECO Utility Ext	2011	13,895.76	0.00%	13,895.76
			158,835		**158,835**
354.3	Pine Ford PS Complete in Place	1998	176,324.96	0.00%	176,324.96
354.3	Fencing	1998	15,692.92	0.00%	15,692.92
354.3	15Kv Duct	1998	32,790.46	0.00%	32,790.46
354.3	15Kv Cable	1998	12,913.06	0.00%	12,913.06
354.3	Secondary Service	1998	4,642.90	0.00%	4,642.90
354.3	Main Breaker & Cabinet	1998	10,446.52	0.00%	10,446.52

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
354.3	ATS Panel PP and Cabinet	1998	18,281.41	0.00%	18,281.41
354.3	Phone Conduit and TVSS	1998	1,160.73	0.00%	1,160.73
354.3	Service Entrance TVSS	1998	2,176.36	0.00%	2,176.36
354.3	Connections	1998	3,191.99	0.00%	3,191.99
354.3	Pump Control Conduit & Cable	1998	4,497.81	0.00%	4,497.81
354.3	Site Lighting	1998	3,656.28	0.00%	3,656.28
354.3	Equipment Pads	1998	4,352.72	0.00%	4,352.72
354.3	Demolition of Existing 40 HP Pump	2011	3,686.41	0.00%	3,686.41
354.3	Electric Connections to 50HP Pum	2011	5,421.18	0.00%	5,421.18
354.3	Upgrade of Existing Electric Syster	2011	1,953.80	0.00%	1,953.80
354.3	Pine Ford Rd. Lift Station Upgrade	2010	185,386.63	0.00%	185,386.63
			486,576		**486,576**
354.3	Hollyberry PS & Wetwell	1986	31,840.38	0.00%	31,840.38
			31,840		**31,840**

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
354.3	Regal Oaks Pump Station	2010	387,721.08	0.00%	387,721.08
354.3	Regal Oaks Station Site Work	2010	327,619.87	0.00%	327,619.87
354.3	Cherry Tree Pump Station Site Wc	2010	43,211.97	0.00%	43,211.97
354.3	Transformer Pad	2011	6,004.54	0.00%	6,004.54
354.3	Concrete Pad	2011	4,740.42	0.00%	4,740.42
354.3	Equipment Stand	2011	1,580.14	0.00%	1,580.14
354.3	ATS	2011	9,480.84	0.00%	9,480.84
354.3	Main Circuit Breaker	2011	1,580.14	0.00%	1,580.14
354.3	Light Standard	2011	7,268.64	0.00%	7,268.64
354.3	PVC Pipe	2011	9,480.84	0.00%	9,480.84
354.3	Copper Wire	2011	7,900.70	0.00%	7,900.70
354.3	Copper Wire	2011	11,060.98	0.00%	11,060.98
354.3	Wet Well Work	2011	8,532.76	0.00%	8,532.76
354.3	Metropolitan Edison Utility Work	2011	161,174.28	0.00%	161,174.28
			987,357		**987,357**

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
			1,664,609		**1,664,609**
355	Pine Ford Road PS-Electrical	1998	23,208.00	0.00%	23,208.00
355	Regal Oaks PS	2011	9,094.90	0.00%	9,094.90
			32,303		**32,303**
360	4" and Under Force Collection Sew	1986	45,066.31	0.00%	45,066.31
360	4" and Under Force Collection Sew	1990	29,541.39	0.00%	29,541.39
360	4" and Under Force Collection Sew	2007	35,670.46	0.00%	35,670.46
360	4" and Under Force Collection Sew	2008	6,315.17	0.00%	6,315.17
360	4" and Under Force Collection Sew	2010	102,935.90	0.00%	102,935.90
360	4" and Under Force Collection Sew	2020	11,780.63	0.00%	11,780.63

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
			231,310		**231,310**
360	6" - 8" Force Collection Sewer	1998	121,610.53	0.00%	121,610.53
360	6" - 8" Force Collection Sewer	2007	45,960.18	0.00%	45,960.18
360	6" - 8" Force Collection Sewer	2010	333,311.78	0.00%	333,311.78
			500,882		**500,882**
360.9	Air Release - Force Sewer	2010	11,317.03	0.00%	11,317.03
			11,317		**11,317**
			743,509		**743,509**

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
361.11	6" - 8" Gravity Collection Sewer	1984	299,702.12	0.00%	299,702.12
361.11	6" - 8" Gravity Collection Sewer	1986	630,415.15	0.00%	630,415.15
361.11	6" - 8" Gravity Collection Sewer	1990	96,942.12	0.00%	96,942.12
361.11	6" - 8" Gravity Collection Sewer	1995	314,492.55	0.00%	314,492.55
361.11	6" - 8" Gravity Collection Sewer	1996	61,051.57	0.00%	61,051.57
361.11	6" - 8" Gravity Collection Sewer	1998	350,365.52	0.00%	350,365.52
361.11	6" - 8" Gravity Collection Sewer	1999	237,054.18	0.00%	237,054.18
361.11	6" - 8" Gravity Collection Sewer	2000	107,224.01	0.00%	107,224.01
361.11	6" - 8" Gravity Collection Sewer	2001	129,993.81	0.00%	129,993.81
361.11	6" - 8" Gravity Collection Sewer	2003	226,548.33	0.00%	226,548.33
361.11	6" - 8" Gravity Collection Sewer	2005	162,516.43	0.00%	162,516.43
361.11	6" - 8" Gravity Collection Sewer	2007	892,542.52	0.00%	892,542.52
361.11	6" - 8" Gravity Collection Sewer	2008	684,866.84	0.00%	684,866.84
361.11	6" - 8" Gravity Collection Sewer	2010	568,207.68	0.00%	568,207.68
361.11	6" - 8" Gravity Collection Sewer	2017	194,634.63	0.00%	194,634.63
361.11	6" - 8" Gravity Collection Sewer	2018	295,009.77	0.00%	295,009.77
361.11	6" - 8" Gravity Collection Sewer	2019	45,658.13	0.00%	45,658.13

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
361.11	6" - 8" Gravity Collection Sewer	2020	254,093.54	0.00%	254,093.54
			5,551,319		**5,551,319**
361.12	10" - 12" Gravity Collection Sewer	1995	584,485.58	0.00%	584,485.58
361.12	10" - 12" Gravity Collection Sewer	2007	527,451.65	0.00%	527,451.65
361.12	10" - 12" Gravity Collection Sewer	2010	249,701.50	0.00%	249,701.50
			1,361,639	-	**1,361,639**
361.13	18" and Over - Gravity Collection S	2007	679,394.99	0.00%	679,394.99
361.13	18" and Over - Gravity Collection S	2010	137,411.02	0.00%	137,411.02
			816,806		**816,806**
361.98	Manholes	1984	43,256.78	0.00%	43,256.78
361.98	Manholes	1986	110,416.02	0.00%	110,416.02
361.98	Manholes	1990	66,387.62	0.00%	66,387.62

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Fair Market Value

(36)	(37)	(38)	(39)	(40)	(41)
Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
361.98	Manholes	1995	135,476.85	0.00%	135,476.85
361.98	Manholes	1996	15,703.79	0.00%	15,703.79
361.98	Manholes	1998	23,146.01	0.00%	23,146.01
361.98	Manholes	1999	85,929.48	0.00%	85,929.48
361.98	Manholes	2000	24,622.04	0.00%	24,622.04
361.98	Manholes	2001	28,849.65	0.00%	28,849.65
361.98	Manholes	2003	92,727.66	0.00%	92,727.66
361.98	Manholes	2005	86,988.40	0.00%	86,988.40
361.98	Manholes	2007	179,353.11	0.00%	179,353.11
361.98	Manholes	2008	209,082.90	0.00%	209,082.90
361.98	Manholes	2010	424,482.15	0.00%	424,482.15
361.98	Manholes	2017	28,663.38	0.00%	28,663.38
361.98	Manholes	2018	90,808.94	0.00%	90,808.94
361.98	Manholes	2019	33,658.39	0.00%	33,658.39
361.98	Manholes	2020	82,832.58	0.00%	82,832.58
			1,762,386		**1,762,386**

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
361.99	Miscellaneous	1995	19,504.68	0.00%	19,504.68
361.99	Miscellaneous	2003	88,627.75	0.00%	88,627.75
361.99	Miscellaneous	2008	5,487.41	0.00%	5,487.41
361.99	Miscellaneous	2010	5,371.27	0.00%	5,371.27
361.99	Miscellaneous	2010	94,616.91	0.00%	94,616.91
361.99	Miscellaneous	2010	2,506.02	0.00%	2,506.02
361.99	Miscellaneous	2017	85,405.53	0.00%	85,405.53
361.99	Miscellaneous	2018	3,250.10	0.00%	3,250.10
			304,770		**304,770**
			9,796,919		**9,796,919**
363	Service - Laterals	1986	71,899.18	0.00%	71,899.18
363	Service - Laterals	1990	16,943.68	0.00%	16,943.68
363	Service - Laterals	1995	351,362.10	0.00%	351,362.10

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
363	Service - Laterals	1996	30,727.45	0.00%	30,727.45
363	Service - Laterals	1998	23,515.59	0.00%	23,515.59
363	Service - Laterals	1999	110,406.18	0.00%	110,406.18
363	Service - Laterals	2000	42,451.13	0.00%	42,451.13
363	Service - Laterals	2001	96,373.98	0.00%	96,373.98
363	Service - Laterals	2003	111,962.24	0.00%	111,962.24
363	Service - Laterals	2005	143,757.71	0.00%	143,757.71
363	Service - Laterals	2007	92,047.92	0.00%	92,047.92
363	Service - Laterals	2008	591,213.10	0.00%	591,213.10
363	Service - Laterals	2010	283,066.05	0.00%	283,066.05
363	Service - Laterals	2017	21,954.38	0.00%	21,954.38
363	Service - Laterals	2018	55,421.45	0.00%	55,421.45
363	Service - Laterals	2019	19,082.36	0.00%	19,082.36
363	Service - Laterals	2020	99,767.24	0.00%	99,767.24
			2,161,952		**2,161,952**

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Fair Market Value

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Account	Description	Placement Year	Preliminary Cost Approach	Economic Obsolescence	Fair Market Value
			CORLD $s	% of Preliminary Cost Approach	Appraisal Date Value $s
Input	Input	Input	Calculation	Input	Calculation
Eng Assmnt	Eng Assmnt	Eng Assmnt	Col (31)	AUS Economic Obsolescence Analysis	(39) * [1.00-Col (40)]
Account	Description	Year	Prelim CORLD	EO%	FMV
380	Purchased Treatment Capacity (3	1990	1,298,793.05	0.00%	1,298,793.05
380	Purchased Conveyance thru Lowe	1994	479,841.55	0.00%	479,841.55
380	Purchased Treatment Capacity (1	2005	844,784.88	0.00%	844,784.88
380	Purchased Treatment Capacity (5	2010	273,542.20	0.00%	273,542.20
380	Treatment Plant Expansion (CAPE	2010	587,042.27	0.00%	587,042.27
380	Purchased Treatment Capacity (4,	2011	22,938.80	0.00%	22,938.80
380	Purchased Treatment Capacity (6,	2013	31,730.74	0.00%	31,730.74
380	Purchased Treatment Capacity (6,	2018	34,489.24	0.00%	34,489.24
380	Purchased Treatment Capacity (43	2020	102,960.00	0.00%	102,960.00
380	Purchased Treatment Capacity (1	2020	248,820.00	0.00%	248,820.00
			3,924,943		**3,924,943**
			18,460,028		**18,460,028**

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Original Cost less Depreciation

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

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Determination of the Depreciated Original Cost

(43)	(44)	(46)	(47)	(48)	(49)	(53)	(54)	(55)	(56)	(57)
Account	Description	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost
Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input			Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)
Acct	Descrip	Original Cost	Iowa	Normal Life	age	Rem Life	Total Life	Theo%	Theo Reserve	Net Book
353.00	Land & Land Rights	8,865	ZNonDep	-	18.00	-	-	-	-	8,865
354.00	Stuctures & Improvements - Pumping	1,612,326	R4.0	45.93	12.29	33.86	46.15	0.27	431,160	1,181,166
355.00	Generating Equipment	47,512	R3.0	35.00	18.98	17.77	36.75	0.51	24,391	23,121
360.10	Collection Sewers - Force - Mains - 4" & Under	196,114	R3.0	75.00	15.40	60.48	75.89	0.20	39,560	156,554
360.20	Collection Sewers - Force - Mains - 6"-8"	439,774	R3.0	75.00	12.52	63.11	75.63	0.17	72,715	367,058
360.90	Collection Sewers - Force - Air Release Valve	11,934	R3.0	45.00	10.00	35.43	45.43	0.22	2,627	9,307
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	4,445,706	R2.5	80.00	15.14	66.08	81.21	0.18	821,593	3,624,114
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	1,087,063	R2.5	80.00	16.52	64.87	81.39	0.20	219,876	867,186
361.13	Collection Sewers - Gravity - Mains - 18" & over	740,633	R2.5	80.00	12.48	68.48	80.96	0.15	114,106	626,526
361.98	Collection Sewers - Gravity - Manholes	1,586,684	S2.0	80.00	14.27	65.84	80.11	0.18	281,769	1,304,915
361.99	Collection Sewers - Gravity - Miscellaneous	261,971	R2.5	80.00	10.11	70.47	80.58	0.12	32,711	229,260
363.00	Service Laterals	1,731,294	R3.0	70.00	14.36	56.25	70.61	0.20	351,041	1,380,253
380.00	Treatment and Disposal Equipment Purchased Capacity	3,125,472	R2.0	45.00	17.93	30.26	48.19	0.36	1,133,873	1,991,599
		15,295,347							3,525,422	11,769,925

Appendix A-5.1 (AUS)

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

9 10 11 12 13

(4b) (5) (6a) (6b) (6)

Normal Service Life | Economic Obsolescence | Tax Depreciation | Report Depreciation

years | % | Table | Life

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)	(4a)	(4b)	(5)	(6)	(6a)	(6b)
Account Number	Description		Iowa Survivor / Retirement Curve	Normal Service Life (years)	Economic Obsolescence (% of CORLD)	Tax Depreciation	Table	Life
353.00	Land & Land Rights		ZNonDep	0.00	0.00%	Non-Depr		0.00
354.00	Stuctures & Improvements - Pumping		R4.0	55.00	0.00%	MACRS		25.00
355.00	Generating Equipment		R3.0	35.00	0.00%	MACRS		25.00
360.10	Collection Sewers - Force - Mains - 4" & Under		R3.0	75.00	0.00%	MACRS		25.00
360.20	Collection Sewers - Force - Mains - 6"-8"		R3.0	75.00	0.00%	MACRS		25.00
360.90	Collection Sewers - Force - Air Release Valve		R3.0	45.00	0.00%	MACRS		25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"		R2.5	80.00	0.00%	MACRS		25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"		R2.5	80.00	0.00%	MACRS		25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over		R2.5	80.00	0.00%	MACRS		25.00
361.98	Collection Sewers - Gravity - Manholes		S2.0	80.00	0.00%	MACRS		25.00
361.99	Collection Sewers - Gravity - Miscellaneous		R2.5	80.00	0.00%	MACRS		25.00
363.00	Service Laterals		R3.0	70.00	0.00%	MACRS		25.00
380.00	Treatment and Disposal Equipment Purchased Capacity		R2.0	45.00	0.00%	MACRS		25.00

Pennsylvania American Water Company
Upper Pottsgrove Township
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Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-1(45)+0.5)	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
Account 353.00 - Land and Land Rights																		
353.1	409 Evans Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	256 Mickletz Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1764 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1760 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1637 Kummerer Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1714 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1710 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1702 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1698 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1696 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1693 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1688 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1682 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1674 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1664 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1505 Kummerer Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1717 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1569 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1577 Farmington Ave.	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1387 Chestnut Grove Rd	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1382 Chestnut Grove Rd	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Renovations By Design	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	149 Pine Ford Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.11	Pine Ford Road PS	2002	8,865	ZNonDep	0	18.00	49,250	ZNonDep000	0.00000	0	0	0	-	8,865	159,570	-	-	-
353.1	1371 N. State Street	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1369 N. State Street	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1407 Heather Place	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1413 Heather Place	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1419 Heather Place	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1429 Heather Place	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	120 Primrose Lane	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Pine Ford Rd SG HOA	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Chestnut Grove Rd SG HOA	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Chestnut Grove Rd UPT	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Fallbrook and Cloverhill	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Fallbrook and Heather Place	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Gravity to PFRPS	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	Laura Land UPT	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1804 Joanne Circle	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	1811 Joanne Circle	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	10 Cherrytree Lane	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	18 Cherrytree Lane	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	24 Cherrytree Lane	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	64 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-

Pennsylvania American Water Company
Upper Pottsgrove Township
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Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-[(45)+0.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
353.1	70 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	76 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	80 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	111 Snyder Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	2019 Mimosa Lane	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	2136 Hollyberry Ct	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	2133 Hollyberry Ct	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	221 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	215 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	209 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	203 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	200 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	207 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	188 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	182 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	176 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	170 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	164 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	156 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	140 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	138 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	132 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	124 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	116 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	102 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	145 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	139 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	135 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	127 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	121 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	113 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	109 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	105 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	99 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	95 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	91 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	85 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	82 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	87 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	93 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	101 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	107 Rose Valley Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	63 Maple Leaf	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	2160 Gilbertsville Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1	2146 Gilbertsville Road	2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-

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(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020 5-[(45)+0.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (46) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
353.1 2126 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 94 Maple Leaf		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 98 Maple Leaf		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2019 Mimosa Lane		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2038 Mimosa Lane		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 150 Maple Leaf		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 156 Maple Leaf		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 155 Boxwood Ct		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 161 Boxwood Ct		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2093 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2101 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2115 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 2131 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 256 W. Moyer		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1608 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1614 Gilbertsville Road		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 64 Irwin Place		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 56 Irwin Place		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1275 Whitespire Circle		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1266 N Hanover		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 Glendale Ave		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1537 Meadowview Drive		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1533 Meadowview Drive		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1518 Meadowview Drive		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1522 Meadowview Drive		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1456 Sweetwater Way		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1460 Sweetwater Way		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 1412 Meadwview Drive		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 218 Deerfield Way		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
353.1 220 Deerfield Way		2002	-	ZNonDep	0	18.00	0	ZNonDep000	0.00000	0	0	0	-	-	-	-	-	-
			8,865										-	**8,865**	**159,570**	-	-	-
354 Evan Rd. Chopper Pump Station		2010	83,360	R4.0	55	10.00	18	R4.0018	0.82054	45.13	55.13	0.18139	15,121	68,240	833,603	3,762,049	4,595,652	4,584,815
354 Evan Rd. Lift Station		2010	21,937	R4.0	55	10.00	18	R4.0018	0.82054	45.13	55.13	0.18139	3,979	17,958	219,369	990,013	1,209,382	1,206,530
354 Transducers		2010	2,001	R4.0	55	10.00	18	R4.0018	0.82054	45.13	55.13	0.18139	363	1,638	20,005	90,285	110,290	110,030
354 Power Supply		2011	8,652	R4.0	55	9.00	16	R4.0016	0.84041	46.22	55.22	0.16298	1,410	7,242	77,865	399,881	477,746	475,843
354 Electrical Connections & Appurtenanc		2011	8,273	R4.0	55	9.00	16	R4.0016	0.84041	46.22	55.22	0.16298	1,348	6,925	74,459	382,386	456,845	455,025
354 Pump Level Control		2011	9,733	R4.0	55	9.00	16	R4.0016	0.84041	46.22	55.22	0.16298	1,586	8,147	87,598	449,866	537,464	535,323
354 Auto Dialer		2011	2,163	R4.0	55	9.00	16	R4.0016	0.84041	46.22	55.22	0.16298	353	1,810	19,466	99,970	119,437	118,961
354 PECO Utility Ext		2011	13,249	R4.0	55	9.00	16	R4.0016	0.84041	46.22	55.22	0.16298	2,159	11,090	119,245	612,389	731,634	728,719

43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61

Pennsylvania American Water Company
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Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-[(45)+0.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (48) + (53)	Col (53) / (54)	Col (48) * (55)	Col (48) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
			149,368										**26,319**	**123,049**	**1,451,611**	**6,786,839**	**8,238,450**	**8,215,246**
354.3	Pine Ford PS Complete in Place	1998	157,560	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	76,267	81,293	3,466,315	3,694,776	7,161,091	7,090,189
354.3	Fencing	1998	14,023	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	6,788	7,235	308,502	328,835	637,337	631,027
354.3	15Kv Duct	1998	29,301	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	14,183	15,118	644,617	687,103	1,331,720	1,318,535
354.3	15Kv Cable	1998	11,539	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	5,585	5,953	253,854	270,585	524,438	519,246
354.3	Secondary Service	1998	4,149	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	2,008	2,141	91,273	97,289	188,562	186,695
354.3	Main Breaker & Cabinet	1998	9,335	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	4,518	4,816	205,365	218,900	424,265	420,064
354.3	ATS Panel PP and Cabinet	1998	16,336	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	7,907	8,428	359,388	383,075	742,463	735,112
354.3	Phone Conduit and TVSS	1998	1,037	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	502	535	22,818	24,322	47,141	46,674
354.3	Service Entrance TVSS	1998	1,945	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	941	1,003	42,784	45,604	88,389	87,513
354.3	Connections	1998	2,852	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	1,381	1,472	62,750	66,886	129,636	128,353
354.3	Pump Control Conduit & Cable	1998	4,019	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	1,945	2,074	88,421	94,249	182,670	180,861
354.3	Site Lighting	1998	3,267	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	1,581	1,686	71,878	76,615	148,493	147,022
354.3	Equipment Pads	1998	3,889	R4.0	45	22.00	49	R4.0049	0.52116	23.45	45.45	0.48405	1,883	2,007	85,569	91,208	176,777	175,027
354.3	Demolition of Existing 40 HP Pumps	2011	3,677	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	735	2,942	33,093	132,481	165,574	165,463
354.3	Electric Connections to 50HP Pumps	2011	5,407	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,081	4,327	48,666	194,825	243,491	243,329
354.3	Upgrade of Existing Electric System	2011	1,949	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	390	1,559	17,539	70,215	87,754	87,696
354.3	Pine Ford Rd. Lift Station Upgrade	2010	182,345	R4.0	45	10.00	22	R4.0022	0.78088	35.14	45.14	0.22153	40,395	141,950	1,823,455	6,407,621	8,231,075	8,205,547
			452,630										**168,091**	**284,539**	**7,626,286**	**12,884,590**	**20,510,875**	**20,368,353**
354.3	Hollyberry PS & Wetwell	1986	36,000	R4.0	45	34.00	76	R4.0076	0.29658	13.35	47.35	0.71806	25,850	10,150	1,224,000	480,600	1,704,600	1,620,000
			36,000										**25,850**	**10,150**	**1,224,000**	**480,600**	**1,704,600**	**1,620,000**
354.3	Regal Oaks Pump Station	2010	381,361	R4.0	45	10.00	22	R4.0022	0.78088	35.14	45.14	0.22153	84,483	296,878	3,813,608	13,401,018	17,214,626	17,161,235
354.3	Regal Oaks Station Site Work	2010	322,246	R4.0	45	10.00	22	R4.0022	0.78088	35.14	45.14	0.22153	71,387	250,858	3,222,455	11,323,707	14,546,162	14,501,048
354.3	Cherry Tree Pump Station Site Work	2010	42,503	R4.0	45	10.00	22	R4.0022	0.78088	35.14	45.14	0.22153	9,416	33,087	425,031	1,493,559	1,918,590	1,912,640
354.3	Transformer Pad	2011	5,989	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,197	4,792	53,902	215,789	269,692	269,512
354.3	Concrete Pad	2011	4,728	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	945	3,783	42,555	170,360	212,915	212,773
354.3	Equipment Stand	2011	1,576	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	315	1,261	14,185	56,787	70,972	70,924
354.3	ATS	2011	9,457	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,890	7,566	85,109	340,720	425,829	425,545
354.3	Main Circuit Breaker	2011	1,576	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	315	1,261	14,185	56,787	70,972	70,924
354.3	Light Standard	2011	7,250	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,449	5,801	65,250	261,219	326,469	326,252
354.3	PVC Pipe	2011	9,457	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,890	7,566	85,109	340,720	425,829	425,545
354.3	Copper Wire	2011	7,880	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,575	6,305	70,924	283,933	354,858	354,621
354.3	Copper Wire	2011	11,033	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	2,205	8,828	99,294	397,507	496,801	496,470
354.3	Wet Well Work	2011	8,511	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	1,701	6,810	76,598	306,648	383,246	382,991
354.3	Metropolitan Edison Utility Work	2011	160,762	R4.0	45	9.00	20	R4.0020	0.80069	36.03	45.03	0.19987	32,131	128,630	1,446,855	5,792,241	7,239,096	7,234,273
			974,328										**210,900**	**763,428**	**9,515,060**	**34,440,995**	**43,956,055**	**43,844,753**

43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61

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(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-((43)+0.5)	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (48) * (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
			1,612,326										**431,160**	**1,181,166**	**19,816,956**	**54,593,024**	**74,409,980**	**74,048,352**
355	Pine Ford Road PS-Electrical	1998	36,479	R3.0	35	22.00	63	R3.0063	0.43441	15.2	37.2	0.59140	21,574	14,906	802,548	554,488	1,357,036	1,276,781
355	Regal Oaks PS	2011	11,033	R3.0	35	9.00	26	R3.0026	0.74986	26.25	35.25	0.25532	2,817	8,216	99,294	289,607	388,901	386,143
			47,512										**24,391**	**23,121**	**901,842**	**844,095**	**1,745,937**	**1,662,924**
360	4" and Under Force Collection Sewer	1986	26,880	R3.0	75	34.00	45	R3.0045	0.58001	43.5	77.5	0.43871	11,793	15,087	913,920	1,169,280	2,083,200	2,016,000
360	4" and Under Force Collection Sewer	1990	21,123	R3.0	75	30.00	40	R3.0040	0.62327	46.75	76.75	0.39088	8,257	12,866	633,690	987,501	1,621,191	1,584,226
360	4" and Under Force Collection Sewer	2007	32,560	R3.0	75	13.00	17	R3.0017	0.83474	62.61	75.61	0.17193	5,598	26,962	423,280	2,038,582	2,461,862	2,442,000
360	4" and Under Force Collection Sewer	2008	6,193	R3.0	75	12.00	16	R3.0016	0.8443	63.32	75.32	0.15932	987	5,206	74,315	392,134	466,449	464,467
360	4" and Under Force Collection Sewer	2010	97,577	R3.0	75	10.00	13	R3.0013	0.87314	65.49	75.49	0.13247	12,926	84,651	975,771	6,390,322	7,366,093	7,318,280
360	4" and Under Force Collection Sewer	2020	11,781	R3.0	75	0.00	0	R3.0000	1	75	75	0.00000	-	11,781	-	883,548	883,548	883,548
			196,114										**39,560**	**156,554**	**3,020,976**	**11,861,366**	**14,882,342**	**14,708,521**
360	6" - 8" Force Collection Sewer	1998	81,862	R3.0	75	22.00	29	R3.0029	0.72212	54.16	76.16	0.28887	23,647	58,214	1,800,958	4,433,632	6,234,591	6,139,631
360	6" - 8" Force Collection Sewer	2007	41,952	R3.0	75	13.00	17	R3.0017	0.83474	62.61	75.61	0.17193	7,213	34,740	545,382	2,626,643	3,172,025	3,148,434
360	6" - 8" Force Collection Sewer	2010	315,960	R3.0	75	10.00	13	R3.0013	0.87314	65.49	75.49	0.13247	41,855	274,104	3,159,596	20,692,193	23,851,789	23,696,969
			439,774										**72,715**	**367,058**	**5,505,936**	**27,752,468**	**33,258,404**	**32,983,034**
360.9	Air Release - Force Sewer	2010	11,934	R3.0	45	10.00	22	R3.0022	0.78729	35.43	45.43	0.22012	2,627	9,307	119,336	422,806	542,142	537,010
			11,934										**2,627**	**9,307**	**119,336**	**422,806**	**542,142**	**537,010**
			647,821										**114,902**	**532,919**	**8,646,247**	**40,036,641**	**48,682,888**	**48,228,565**
361.11	6" - 8" Gravity Collection Sewer	1984	170,612	R2.5	80	36.00	45	R2.5045	0.60049	48.04	84.04	0.42837	73,085	97,527	6,142,042	8,196,214	14,338,256	13,648,963
361.11	6" - 8" Gravity Collection Sewer	1986	356,489	R2.5	80	34.00	43	R2.5043	0.61677	49.34	83.34	0.40797	145,437	211,052	12,120,616	17,589,152	29,709,768	28,519,096
361.11	6" - 8" Gravity Collection Sewer	1990	66,276	R2.5	80	30.00	38	R2.5038	0.65821	52.66	82.66	0.36293	24,053	42,222	1,988,275	3,490,085	5,478,360	5,302,066
361.11	6" - 8" Gravity Collection Sewer	1995	203,240	R2.5	80	25.00	31	R2.5031	0.71785	57.43	82.43	0.30329	61,641	141,599	5,080,989	11,672,049	16,753,038	16,259,166
361.11	6" - 8" Gravity Collection Sewer	1996	39,881	R2.5	80	24.00	30	R2.5030	0.72652	58.12	82.12	0.29226	11,656	28,225	957,139	2,317,871	3,275,010	3,190,462
361.11	6" - 8" Gravity Collection Sewer	1998	229,712	R2.5	80	22.00	28	R2.5028	0.74396	59.52	81.52	0.26987	61,992	167,720	5,053,670	13,672,473	18,726,143	18,376,980
361.11	6" - 8" Gravity Collection Sewer	1999	155,044	R2.5	80	21.00	26	R2.5026	0.76153	60.92	81.92	0.25635	39,745	115,298	3,255,921	9,445,271	12,701,192	12,403,508
361.11	6" - 8" Gravity Collection Sewer	2000	72,275	R2.5	80	20.00	25	R2.5025	0.77036	61.63	81.63	0.24501	17,708	54,567	1,445,497	4,454,298	5,899,795	5,781,987

43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61

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As of April 28, 2020

Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-[(45)+0.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (48) * (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
361.11	6" - 8" Gravity Collection Sewer	2001	90,076	R2.5	80	19.00	24	R2.5024	0.77923	62.34	81.34	0.23359	21,041	69,035	1,711,446	5,615,346	7,326,792	7,206,090
361.11	6" - 8" Gravity Collection Sewer	2003	158,427	R2.5	80	17.00	21	R2.5021	0.80602	64.48	81.48	0.20864	33,054	125,373	2,693,256	10,215,361	12,908,617	12,674,145
361.11	6" - 8" Gravity Collection Sewer	2005	127,474	R2.5	80	15.00	19	R2.5019	0.82402	65.92	80.92	0.18537	23,630	103,844	1,912,110	8,403,086	10,315,195	10,197,919
361.11	6" - 8" Gravity Collection Sewer	2007	803,420	R2.5	80	13.00	16	R2.5016	0.85124	68.1	81.1	0.16030	128,788	674,632	10,444,464	54,712,924	65,157,388	64,273,626
361.11	6" - 8" Gravity Collection Sewer	2008	663,041	R2.5	80	12.00	15	R2.5015	0.86036	68.83	80.83	0.14846	98,435	564,606	7,956,488	45,637,087	53,593,574	53,043,250
361.11	6" - 8" Gravity Collection Sewer	2010	533,745	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	66,467	467,278	5,337,449	37,522,267	42,859,716	42,699,593
361.11	6" - 8" Gravity Collection Sewer	2017	188,287	R2.5	80	3.00	4	R2.5004	0.96231	76.98	79.98	0.03751	7,063	181,224	564,860	14,494,300	15,059,159	15,062,925
361.11	6" - 8" Gravity Collection Sewer	2018	288,465	R2.5	80	2.00	3	R2.5003	0.9717	77.74	79.74	0.02508	7,235	281,230	576,929	22,425,242	23,002,172	23,077,172
361.11	6" - 8" Gravity Collection Sewer	2019	45,151	R2.5	80	1.00	1	R2.5001	0.99055	79.24	80.24	0.01246	563	44,588	45,151	3,577,743	3,622,894	3,612,057
361.11	6" - 8" Gravity Collection Sewer	2020	254,094	R2.5	80	0.00	0	R2.5000	1	80	80	0.00000	-	254,094	-	20,327,483	20,327,483	20,327,483
			4,445,706										**821,593**	**3,624,114**	**67,286,301**	**293,768,253**	**361,054,554**	**355,656,508**
361.12	10" - 12" Gravity Collection Sewer	1995	377,722	R2.5	80	25.00	31	R2.5031	0.71785	57.43	82.43	0.30329	114,559	263,162	9,443,038	21,692,547	31,135,585	30,217,722
361.12	10" - 12" Gravity Collection Sewer	2007	474,785	R2.5	80	13.00	16	R2.5016	0.85124	68.1	81.1	0.16030	76,108	398,677	6,172,199	32,332,826	38,505,025	37,982,762
361.12	10" - 12" Gravity Collection Sewer	2010	234,557	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	29,209	205,347	2,345,567	16,489,335	18,834,901	18,764,534
			1,087,063										**219,876**	**867,186**	**17,960,804**	**70,514,707**	**88,475,511**	**86,965,018**
361.13	18" and Over - Gravity Collection Sew	2007	611,556	R2.5	80	13.00	16	R2.5016	0.85124	68.1	81.1	0.16030	98,032	513,524	7,950,228	41,646,964	49,597,192	48,924,481
361.13	18" and Over - Gravity Collection Sew	2010	129,077	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	16,074	113,003	1,290,768	9,074,100	10,364,868	10,326,145
			740,633										**114,106**	**626,526**	**9,240,996**	**50,721,064**	**59,962,060**	**59,250,626**
361.98	Manholes	1984	32,610	S2.0	80	36.00	45	S2.0045	0.57419	45.94	81.94	0.43935	14,327	18,283	1,173,943	1,498,081	2,672,024	2,608,761
361.98	Manholes	1986	84,124	S2.0	80	34.00	43	S2.0043	0.59062	47.25	81.25	0.41846	35,203	48,922	2,860,230	3,974,879	6,835,109	6,729,954
361.98	Manholes	1990	49,462	S2.0	80	30.00	38	S2.0038	0.6332	50.66	80.66	0.37193	18,397	31,066	1,483,873	2,505,768	3,989,641	3,956,996
361.98	Manholes	1995	104,746	S2.0	80	25.00	31	S2.0031	0.69612	55.69	80.69	0.30983	32,454	72,293	2,618,653	5,833,312	8,451,966	8,379,691
361.98	Manholes	1996	12,366	S2.0	80	24.00	30	S2.0030	0.70539	56.43	80.43	0.29840	3,690	8,676	296,787	697,821	994,608	989,291
361.98	Manholes	1998	18,568	S2.0	80	22.00	28	S2.0028	0.72411	57.93	79.93	0.27524	5,111	13,457	408,486	1,075,617	1,484,102	1,485,402
361.98	Manholes	1999	69,014	S2.0	80	21.00	26	S2.0026	0.74306	59.44	80.44	0.26106	18,017	50,997	1,449,288	4,102,176	5,551,465	5,521,099
361.98	Manholes	2000	19,940	S2.0	80	20.00	25	S2.0025	0.75261	60.21	80.21	0.24935	4,972	14,968	398,793	1,200,568	1,599,361	1,595,174
361.98	Manholes	2001	23,964	S2.0	80	19.00	24	S2.0024	0.76221	60.98	79.98	0.23756	5,693	18,271	455,309	1,461,302	1,916,611	1,917,090
361.98	Manholes	2003	79,106	S2.0	80	17.00	21	S2.0021	0.79128	63.3	80.3	0.21171	16,748	62,359	1,344,804	5,007,418	6,352,222	6,326,491
361.98	Manholes	2005	76,013	S2.0	80	15.00	19	S2.0019	0.81084	64.87	79.87	0.18781	14,276	61,737	1,140,201	4,930,989	6,071,190	6,081,071
361.98	Manholes	2007	168,796	S2.0	80	13.00	16	S2.0016	0.8404	67.23	80.23	0.16203	27,350	141,446	2,194,354	11,348,186	13,542,540	13,503,717
361.98	Manholes	2008	201,119	S2.0	80	12.00	15	S2.0015	0.85031	68.02	80.02	0.14996	30,160	170,960	2,413,433	13,680,142	16,093,575	16,089,552
361.98	Manholes	2010	410,713	S2.0	80	10.00	13	S2.0013	0.87016	69.61	79.61	0.12561	51,590	359,123	4,107,125	28,589,698	32,696,823	32,857,001
361.98	Manholes	2017	28,720	S2.0	80	3.00	4	S2.0004	0.96	76.8	79.8	0.03759	1,080	27,641	86,161	2,205,725	2,291,886	2,297,630
361.98	Manholes	2018	90,877	S2.0	80	2.00	3	S2.0003	0.97	77.6	79.6	0.02513	2,284	88,594	181,755	7,052,089	7,233,844	7,270,195
361.98	Manholes	2019	33,713	S2.0	80	1.00	1	S2.0001	0.99	79.2	80.2	0.01247	420	33,292	33,713	2,670,033	2,703,745	2,697,003
361.98	Manholes	2020	82,833	S2.0	80	0.00	0	S2.0000	1	80	80	0.00000	-	82,833	-	6,626,606	6,626,606	6,626,606
			1,586,684										**281,769**	**1,304,915**	**22,646,909**	**104,460,411**	**127,107,320**	**126,934,724**

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
Input	Input	Input	Input	Input	Input	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation	Calculation
AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-[(45)+0.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ col (51)	Col (48) * (52)	Col (48) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
361.99	Miscellaneous	1995	12,605	R2.5	80	25.00	31	R2.5031	0.71785	57.43	82.43	0.30329	3,823	8,782	315,121	723,895	1,039,015	1,008,386
361.99	Miscellaneous	2003	61,978	R2.5	80	17.00	21	R2.5021	0.80602	64.48	81.48	0.20864	12,931	49,047	1,053,626	3,996,341	5,049,967	4,958,240
361.99	Miscellaneous	2008	5,313	R2.5	80	12.00	15	R2.5015	0.86036	68.83	80.83	0.14846	789	4,524	63,750	365,662	429,412	425,003
361.99	Miscellaneous	2010	5,045	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	628	4,417	50,455	354,698	405,153	403,639
361.99	Miscellaneous	2010	88,878	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	11,068	77,810	888,782	6,248,140	7,136,922	7,110,258
361.99	Miscellaneous	2010	2,354	R2.5	80	10.00	13	R2.5013	0.87869	70.3	80.3	0.12453	293	2,061	23,540	165,487	189,028	188,321
361.99	Miscellaneous	2017	82,620	R2.5	80	3.00	4	R2.5004	0.96231	76.98	79.98	0.03751	3,099	79,521	247,860	6,360,088	6,607,948	6,609,600
361.99	Miscellaneous	2018	3,178	R2.5	80	2.00	3	R2.5003	0.9717	77.74	79.74	0.02508	80	3,098	6,356	247,056	253,412	254,239
			261,971										**32,711**	**229,260**	**2,649,490**	**18,461,367**	**21,110,857**	**20,957,686**
			8,122,057										**1,470,055**	**6,652,002**	**119,784,500**	**537,925,802**	**657,710,302**	**649,764,562**
363	Service - Laterals	1986	43,787	R3.0	70	34.00	49	R3.0049	0.54624	38.24	72.24	0.47065	20,608	23,178	1,488,747	1,674,403	3,163,150	3,065,067
363	Service - Laterals	1990	10,876	R3.0	70	30.00	43	R3.0043	0.59718	41.8	71.8	0.41783	4,544	6,332	326,280	454,617	780,898	761,321
363	Service - Laterals	1995	237,347	R3.0	70	25.00	36	R3.0036	0.65866	46.11	71.11	0.35157	83,444	153,903	5,933,686	10,944,091	16,877,777	16,614,321
363	Service - Laterals	1996	21,199	R3.0	70	24.00	34	R3.0034	0.6766	47.36	71.36	0.33632	7,130	14,069	508,778	1,003,989	1,512,767	1,483,936
363	Service - Laterals	1998	16,015	R3.0	70	22.00	31	R3.0031	0.7038	49.27	71.27	0.30869	4,944	11,071	352,329	789,056	1,141,385	1,121,046
363	Service - Laterals	1999	74,731	R3.0	70	21.00	30	R3.0030	0.71294	49.91	70.91	0.29615	22,132	52,599	1,569,351	3,729,825	5,299,176	5,231,171
363	Service - Laterals	2000	29,417	R3.0	70	20.00	29	R3.0029	0.72212	50.55	70.55	0.28349	8,340	21,078	588,350	1,487,054	2,075,404	2,059,224
363	Service - Laterals	2001	57,110	R3.0	70	19.00	27	R3.0027	0.74058	51.84	70.84	0.26821	15,318	41,793	1,085,095	2,960,595	4,045,690	3,997,717
363	Service - Laterals	2003	77,263	R3.0	70	17.00	24	R3.0024	0.76851	53.8	70.8	0.24011	18,552	58,711	1,313,472	4,156,752	5,470,224	5,408,413
363	Service - Laterals	2005	106,618	R3.0	70	15.00	21	R3.0021	0.79673	55.77	70.77	0.21195	22,598	84,020	1,599,267	5,946,074	7,545,341	7,463,246
363	Service - Laterals	2007	78,258	R3.0	70	13.00	19	R3.0019	0.81568	57.1	70.1	0.18545	14,513	63,745	1,017,354	4,468,531	5,485,885	5,478,059
363	Service - Laterals	2008	522,841	R3.0	70	12.00	17	R3.0017	0.83474	58.43	70.43	0.17038	89,082	433,760	6,274,097	30,549,825	36,823,722	36,598,900
363	Service - Laterals	2010	261,405	R3.0	70	10.00	14	R3.0014	0.8635	60.45	70.45	0.14194	37,104	224,301	2,614,045	15,801,904	18,415,949	18,298,317
363	Service - Laterals	2017	21,274	R3.0	70	3.00	4	R3.0004	0.96069	67.25	70.25	0.04270	908	20,366	63,823	1,430,700	1,494,524	1,489,205
363	Service - Laterals	2018	54,388	R3.0	70	2.00	3	R3.0003	0.9705	67.94	69.94	0.02860	1,555	52,832	108,776	3,695,115	3,803,891	3,807,155
363	Service - Laterals	2019	18,997	R3.0	70	1.00	1	R3.0001	0.99015	69.31	70.31	0.01422	270	18,727	18,997	1,316,664	1,335,661	1,329,772
363	Service - Laterals	2020	99,767	R3.0	70	0.00	0	R3.0000	1	70	70	0.00000	-	99,767	-	6,983,707	6,983,707	6,983,707
			1,731,294										**351,041**	**1,380,253**	**24,862,447**	**97,392,704**	**122,255,152**	**121,190,577**
380	Purchased Treatment Capacity (3%)	1990	1,001,717	R2.0	45	30.00	67	R2.0067	0.46519	20.93	50.93	0.58904	590,051	411,666	30,051,510	20,965,937	51,017,447	45,077,265
380	Purchased Conveyance thru Lower(1	1994	350,000	R2.0	45	26.00	58	R2.0058	0.5267	23.7	49.7	0.52314	183,099	166,901	9,100,000	8,295,000	17,395,000	15,750,000
380	Purchased Treatment Capacity (188,/	2005	604,764	R2.0	45	15.00	33	R2.0033	0.71617	32.23	47.23	0.31759	192,067	412,697	9,071,460	19,491,544	28,563,004	27,214,380
380	Purchased Treatment Capacity (53,7	2010	234,132	R2.0	45	10.00	22	R2.0022	0.80704	36.32	46.32	0.21589	50,547	183,585	2,341,320	8,503,674	10,844,994	10,535,940
380	Treatment Plant Expansion (CAPEX)	2010	502,465	R2.0	45	10.00	22	R2.0022	0.80704	36.32	46.32	0.21589	108,477	393,988	5,024,650	18,249,529	23,274,179	22,610,925
380	Purchased Treatment Capacity (4,50	2011	19,755	R2.0	45	9.00	20	R2.0020	0.82399	37.08	46.08	0.19531	3,858	15,897	177,795	732,515	910,310	888,975
380	Purchased Treatment Capacity (6,00	2013	28,267	R2.0	45	7.00	16	R2.0016	0.85828	38.62	45.62	0.15344	4,337	23,930	197,869	1,091,672	1,289,541	1,272,015
380	Purchased Treatment Capacity (6,00	2018	32,592	R2.0	45	2.00	4	R2.0004	0.96393	43.38	45.38	0.04407	1,436	31,156	65,184	1,413,841	1,479,025	1,466,640

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Determination of the Depreciated Original Cost

(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
Account	Description	Placement Year	Original Costs	Retirement Dispersion Iowa-type	Normal Service Life (NSL)	Age at April 28, 2020 Appraisal Date	Age as % of NSL	Iowa Lookup	Iowa Condition Percent of Percent New	Normal Remaining Life	Total Life Expectancy	Theoretical Reserve Percent	Theoretical Reserve	Depreciated Original Cost	OC Weighted Age	OC Weighted Normal Remaining Life	OC Weighted Total Life Expectancy	Normal Service Life (NSL)
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AUS Input	Eng Assmnt	Eng Assmnt	Eng Assmnt	AUS Input	AUS Input	2020.5-[(45)/10.5]	Col (49) / (48)	Col (47) & (50)	Lookup Iowa Curves Life Tables @ Col (51)	Col (48) * (52)	Col (48) + (53)	Col (53) / (54)	Col (46) * (55)	Col (46) - (56)	Col (46) * (49)	Col (46) * (53)	Col (46) * (54)	Col (46) * (48)
Acct	Descrip	Year	Original Cost	Iowa	Normal Life	age	AgeP	IowaLookup	Iowa Condition	Rem Life	Total Life	Theo%	Theo Reserve	Net Book	OC wtd Age	OC wtd Rem Life	OC wtd Total Life	OC wtd Normal Life
380	Purchased Treatment Capacity (43,5	2020	102,960	R2.0	45	0.00	0	R2.0000	1	45	45	0.00000	-	102,960	-	4,633,200	4,633,200	4,633,200
380	Purchased Treatment Capacity (18,0	2020	248,820	R2.0	45	0.00	0	R2.0000	1	45	45	0.00000	-	248,820	-	11,196,900	11,196,900	11,196,900
			3,125,472										**1,133,873**	**1,991,599**	**56,029,788**	**94,573,811**	**150,603,599**	**140,646,240**
			15,295,347										**3,525,422**	**11,769,925**	**230,201,351**	**825,366,078**	**1,055,407,859**	**1,035,541,220**

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach

Discounted Cash Flow Analysis
Period 1 through 19 and 20 to perpetuity

AUS Consultants
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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate 8.09%
Capitalization Rate 6.16%

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Period Present Worth Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
					(3)-(4)	(6)-(5)	(7) *28.89%			(3)-(4)-(8)-(9)-(10)		(11)*(12)	Sum (13)
1	0.5	1,488,089	365,169	595,743	1,122,920	527,177	152,301	191,054	796	778,769	0.962	749,176	749,176
2	1.5	1,726,183	376,124	602,538	1,350,059	747,521	215,959	192,660	12,857	928,583	0.89	826,439	1,575,615
3	2.5	1,743,445	387,408	609,455	1,356,037	746,582	215,688	194,235	932	945,182	0.823	777,885	2,353,500
4	3.5	1,760,879	399,030	616,496	1,361,849	745,353	215,332	195,825	941	949,751	0.762	723,710	3,077,210
5	4.5	1,778,488	411,001	623,664	1,367,487	743,823	214,890	197,427	952	954,218	0.705	672,724	3,749,934
6	5.5	1,974,122	423,331	630,961	1,550,791	919,830	265,739	199,042	10,563	1,075,447	0.652	701,191	4,451,125
7	6.5	1,993,863	436,031	623,251	1,557,832	934,581	270,000	145,622	1,067	1,141,143	0.603	688,109	5,139,234
8	7.5	2,013,802	449,112	628,997	1,564,690	935,693	270,322	146,852	1,077	1,146,439	0.558	639,713	5,778,947
9	8.5	2,154,768	462,585	634,846	1,692,183	1,057,337	305,465	148,092	7,611	1,231,015	0.516	635,204	6,414,151
10	9.5	2,176,316	476,463	640,799	1,699,853	1,059,054	305,961	149,342	1,164	1,243,386	0.478	594,339	7,008,490
11	10.5	2,198,079	490,757	646,857	1,707,322	1,060,465	306,368	150,604	1,175	1,249,175	0.442	552,135	7,560,625
12	11.5	2,351,945	505,480	653,021	1,846,465	1,193,444	344,786	151,875	8,309	1,341,495	0.409	548,671	8,109,296
13	12.5	2,375,464	520,644	659,295	1,854,820	1,195,525	345,387	153,160	1,270	1,355,003	0.378	512,191	8,621,487
14	13.5	2,399,219	536,263	665,679	1,862,956	1,197,277	345,893	154,457	1,283	1,361,323	0.350	476,463	9,097,950
15	14.5	2,567,164	552,351	672,173	2,014,813	1,342,640	387,889	155,763	9,069	1,462,092	0.324	473,718	9,571,668
16	15.5	2,592,836	557,875	575,782	2,034,961	1,459,179	421,557	157,077	1,386	1,454,941	0.299	435,027	10,006,695
17	16.5	2,618,764	563,454	581,310	2,055,310	1,474,000	425,839	158,408	1,400	1,469,663	0.277	407,097	10,413,792
18	17.5	2,802,077	569,089	586,929	2,232,988	1,646,059	475,547	159,746	9,900	1,587,795	0.256	406,476	10,820,268
19	18.5	2,830,098	574,780	592,646	2,255,318	1,662,672	480,346	161,099	1,512	1,612,361	0.237	382,130	11,202,398
20 and beyond	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,698	2.707	4,408,885	15,611,283
								3,324,802					
Age				19.5									
PW(Age) = 1/(1+Discount Rate)^(Age)				0.219				Net Plant		10,732,792			
PW to Perpetuity = 1/Capitalization Rate				12.361				ADIT		(1,762,467)			
PW(20and beyond) = PW to Perpetuity * PW Factor(19.5)				2.707				Rate Base		8,970,325	0.219	1,964,501	13,166,899
								Annual Plant Construction Inflation Rate		0.0422 Input			
								Plant Inflation over 19.5 years		20,503,573	0.219	4,490,282	15,692,680
								PP	13,750,000				
								OCLD	11,769,925				
								PP/OCLD	1.168				
								RCNLD	18,460,028				
								RCNLD/PP		1.342547521			
										12,043,087.31	0.219	2,637,436	13,839,834
								Average					14,577,674

Deferred Tax

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Calculated Rates of Return on Rate Base and Equity
(Years 1 through 20)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Period	Age	Revenues	O&M Expenses	Book Depreciation	Rulemaking Interest Expense	Book Taxable Income (Current + Deferred)	State and Federal Taxes @ 28.89%	Net Operating Income	Net (Equity) Income	Net Plant	Working Capital	Accumulated Deferred Income Taxes (ADIT)	Rate Base	Return on Rate Base	Net Equity	Return on Equity
						(3)-(4)-(5)-(6)	(7) * 28.89%	(7)-(8)=(6)	(9) - (6)				(11)+(12)+(13)	(9)/(14)		(10)/(16)
1	0.5	1,488,089	365,169	304,294	205,739	612,887	177,063	641,563	435,824	13,636,760	80,357	(84,200)	13,632,917	4.71%	14,648,576	2.98%
2	1.5	1,726,183	376,124	306,492	201,296	842,271	243,332	800,235	598,939	13,522,928	93,214	(169,728)	13,446,414	5.95%	15,247,515	3.93%
3	2.5	1,743,445	387,408	309,155	197,590	849,292	245,361	801,521	603,931	13,408,008	94,146	(256,485)	13,245,669	6.05%	15,851,446	3.81%
4	3.5	1,760,879	399,030	309,853	191,003	860,993	248,741	803,255	612,252	13,293,980	95,087	(345,074)	13,043,993	6.16%	16,463,698	3.72%
5	4.5	1,778,488	411,001	311,530	184,636	871,321	251,725	804,232	619,596	13,179,877	96,039	(435,250)	12,840,666	6.26%	17,083,294	3.63%
6	5.5	1,974,122	423,331	313,362	178,482	1,058,947	305,930	931,499	753,017	13,065,557	106,602	(527,005)	12,645,154	7.37%	17,836,311	4.22%
7	6.5	1,993,863	436,031	314,153	172,533	1,071,146	309,454	934,225	761,692	12,896,773	107,669	(616,303)	12,388,139	7.54%	18,598,003	4.10%
8	7.5	2,013,802	449,112	316,510	166,781	1,081,399	312,416	935,764	768,983	12,726,860	108,746	(706,580)	12,129,026	7.72%	19,366,986	3.97%
9	8.5	2,154,768	462,585	318,269	161,222	1,212,692	350,347	1,023,567	862,345	12,556,426	116,357	(798,039)	11,874,744	8.62%	20,229,331	4.26%
10	9.5	2,176,316	476,463	316,996	155,848	1,227,009	354,483	1,028,374	872,526	12,388,513	117,521	(891,586)	11,614,448	8.85%	21,101,857	4.13%
11	10.5	2,198,079	490,757	318,650	150,653	1,238,019	357,664	1,031,008	880,355	12,220,206	118,696	(986,405)	11,352,497	9.08%	21,982,212	4.00%
12	11.5	2,351,945	505,480	319,940	145,631	1,380,894	398,940	1,127,585	981,954	12,051,880	127,005	(1,082,632)	11,096,253	10.16%	22,964,167	4.28%
13	12.5	2,375,464	520,644	321,081	140,777	1,392,962	402,427	1,131,312	990,535	11,883,694	128,275	(1,180,342)	10,831,627	10.44%	23,954,701	4.14%
14	13.5	2,399,219	536,263	320,093	136,084	1,406,779	406,418	1,136,445	1,000,361	11,717,792	129,558	(1,280,181)	10,567,169	10.75%	24,955,062	4.01%
15	14.5	2,567,164	552,351	320,658	131,548	1,562,607	451,437	1,242,718	1,111,170	11,552,628	138,627	(1,381,734)	10,309,521	12.05%	26,066,231	4.26%
16	15.5	2,592,836	557,875	322,941	127,163	1,584,957	457,894	1,254,226	1,127,063	11,386,595	140,013	(1,454,809)	10,071,799	12.45%	27,193,295	4.14%
17	16.5	2,618,764	563,454	322,225	122,924	1,610,161	465,175	1,267,910	1,144,986	11,221,506	141,413	(1,529,658)	9,834,261	12.89%	28,338,281	4.04%
18	17.5	2,802,077	569,089	324,976	118,827	1,789,185	516,896	1,391,116	1,272,289	11,057,001	151,313	(1,605,337)	9,602,977	14.49%	29,610,570	4.30%
19	18.5	2,830,098	574,780	323,288	114,866	1,817,164	524,979	1,407,051	1,292,185	10,894,535	152,825	(1,683,155)	9,364,205	15.03%	30,902,755	4.18%
20	19.5	2,858,399	580,528	323,926	111,037	1,842,908	532,416	1,421,529	1,310,492	10,732,792	154,354	(1,762,467)	9,124,679	15.58%	32,213,247	4.07%
										2,350,481.40						

Deferred Tax

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach

Discounted Cash Flow Analysis
Period 20 through 59 and 60 to perpetuity

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Discounted Cash Flow Analysis

Discount Rate:			8.09%													
Capitalization Rate:			6.16%											Period		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Present Worth				
Period	Age	Revenues	O&M Expenses	Tax Depreciation	Cash Flow from Operations	Taxable Income before State & Federal Taxes	State and Federal Taxes @ 28.89%	Capital Expenditures	Change in Working Capital	Net Cash Flows	Factor (PW)	PW of Cashflow	Accumulated PW of Cashflows
					(3)-(4)	(6)-(5)	(7) * 28.89%			(3)-(4)-(8)-(9)-(10)		(11)*(12)	Sum (13)
20	19.5	2,858,399	580,528	598,458	2,277,871	1,679,413	485,182	162,462	1,529	1,628,698	0.219	356,685	11,559,083
21	20.5	3,058,487	586,333	604,370	2,472,154	1,867,784	539,603	163,837	10,804	1,757,910	0.203	356,856	11,915,939
22	21.5	3,089,072	592,196	610,381	2,496,876	1,886,495	545,008	165,223	1,652	1,784,993	0.188	335,579	12,251,518
23	22.5	3,119,963	598,118	616,492	2,521,845	1,905,353	550,456	166,621	1,668	1,803,100	0.174	313,739	12,565,257
24	23.5	3,338,360	604,099	622,708	2,734,261	2,111,553	610,028	168,032	11,794	1,944,407	0.161	313,050	12,878,307
25	24.5	3,371,744	610,140	629,027	2,761,604	2,132,577	616,102	169,456	1,802	1,974,244	0.149	294,162	13,172,469
26	25.5	3,405,461	616,241	169,727	2,789,220	2,619,493	756,772	170,893	1,821	1,859,734	0.138	256,643	13,429,112
27	26.5	3,643,843	622,403	171,165	3,021,440	2,850,275	823,444	172,339	12,872	2,012,785	0.127	255,624	13,684,736
28	27.5	3,680,281	628,627	172,617	3,051,654	2,879,037	831,754	173,800	1,968	2,044,132	0.118	241,208	13,925,944
29	28.5	3,717,084	634,913	174,081	3,082,171	2,908,090	840,147	175,273	1,988	2,064,763	0.109	225,059	14,151,003
30	29.5	3,754,255	641,262	175,554	3,112,993	2,937,439	848,626	176,755	2,006	2,085,606	0.101	210,646	14,361,649
31	30.5	3,791,798	647,675	177,047	3,144,123	2,967,076	857,188	178,257	2,028	2,106,650	0.093	195,918	14,557,567
32	31.5	3,829,716	654,152	178,547	3,175,564	2,997,017	865,838	179,766	2,047	2,127,913	0.086	183,001	14,740,568
33	32.5	3,868,013	660,694	181,841	3,207,319	3,025,478	874,061	181,291	2,069	2,149,898	0.080	171,992	14,912,560
34	33.5	3,906,693	667,301	185,176	3,239,392	3,054,216	882,363	182,831	2,088	2,172,110	0.074	160,736	15,073,296
35	34.5	3,945,760	673,974	186,743	3,271,786	3,085,043	891,269	184,380	2,110	2,194,027	0.068	149,194	15,222,490
36	35.5	3,985,218	680,714	188,326	3,304,504	3,116,178	900,264	185,945	2,131	2,216,164	0.063	139,618	15,362,108
37	36.5	4,025,070	687,521	189,923	3,337,549	3,147,626	909,349	187,525	2,152	2,238,523	0.058	129,834	15,491,942
38	37.5	4,065,321	694,396	191,533	3,370,925	3,179,392	918,526	189,116	2,173	2,261,110	0.054	122,100	15,614,042
39	38.5	4,105,974	701,340	193,155	3,404,634	3,211,479	927,796	190,721	2,196	2,283,921	0.050	114,196	15,728,238
40	39.5	4,147,034	708,353	194,795	3,438,681	3,243,886	937,159	192,342	2,217	2,306,963	0.046	106,120	15,834,358
41	40.5	4,188,504	715,437	196,445	3,473,067	3,276,622	946,616	193,974	2,239	2,330,238	0.043	100,200	15,934,558
42	41.5	4,230,389	722,591	198,112	3,507,798	3,309,686	956,168	195,622	2,262	2,353,746	0.040	94,150	16,028,708
43	42.5	4,272,693	729,817	206,482	3,542,876	3,336,394	963,884	197,285	2,284	2,379,423	0.037	88,039	16,116,747
44	43.5	4,315,420	737,115	214,979	3,578,305	3,363,326	971,665	198,959	2,308	2,405,373	0.034	81,783	16,198,530
45	44.5	4,358,574	744,486	216,806	3,614,088	3,397,282	981,475	200,650	2,330	2,429,633	0.031	75,319	16,273,849
46	45.5	4,402,160	751,931	218,651	3,650,229	3,431,578	991,383	202,357	2,354	2,454,135	0.029	71,170	16,345,019
47	46.5	4,446,182	759,450	220,508	3,686,732	3,466,224	1,001,392	204,076	2,377	2,478,887	0.027	66,930	16,411,949
48	47.5	4,490,644	767,045	222,385	3,723,599	3,501,214	1,011,501	205,813	2,400	2,503,885	0.025	62,597	16,474,546
49	48.5	4,535,550	774,715	224,275	3,760,835	3,536,560	1,021,712	207,562	2,426	2,529,135	0.023	58,170	16,532,716
50	49.5	4,580,906	782,462	226,183	3,798,444	3,572,261	1,032,026	209,328	2,449	2,554,641	0.021	53,647	16,586,363
51	50.5	4,626,715	790,287	228,106	3,836,428	3,608,322	1,042,444	211,107	2,473	2,580,404	0.020	51,608	16,637,971
52	51.5	4,672,982	798,190	230,048	3,874,792	3,644,744	1,052,967	212,905	2,499	2,606,421	0.018	46,916	16,684,887
53	52.5	4,719,712	806,172	232,005	3,913,540	3,681,535	1,063,595	214,716	2,523	2,632,706	0.017	44,756	16,729,643
54	53.5	4,766,909	814,234	233,981	3,952,675	3,718,694	1,074,331	216,545	2,550	2,658,249	0.016	42,548	16,772,191
55	54.5	4,814,578	822,376	235,973	3,992,202	3,756,229	1,085,175	218,389	2,573	2,686,065	0.014	37,605	16,809,796
56	55.5	4,862,724	830,600	237,983	4,032,124	3,794,141	1,096,127	220,249	2,600	2,713,148	0.013	35,271	16,845,067
57	56.5	4,911,351	838,906	240,008	4,072,445	3,832,437	1,107,191	222,124	2,626	2,740,504	0.012	32,886	16,877,953
58	57.5	4,960,465	847,295	242,051	4,113,170	3,871,119	1,118,366	224,015	2,652	2,768,137	0.011	30,450	16,908,403
59	58.5	5,010,070	855,768	244,114	4,154,302	3,910,188	1,129,653	225,924	2,679	2,796,046	0.011	30,757	16,939,160
60	59.5	5,060,171	864,326	246,194	4,195,845	3,949,651	1,141,054	227,849	2,705	2,824,237	0.124	350,205	17,289,365
								7,926,314					

Age				59.5					Net Plant		5,723,544		
PW(Age) = 1/(1+Discount Rate)^(Age)				0.010					ADIT		(1,059,994)		
PW to Perpetuity = 1/Capitalization Rate				12.361									
PW_(Plant Beyond) = PW to Perpetuity * PW Factor_(59.5)				0.124					Rate Base		4,663,550	0.010	46,635
									Plant Construction Inflation Rate:		0.0422 Input		
									Plant Inflation over 59.5 years		54,551,311	0.010	545,513
									PP	13,750,000			
									RCNLD	18,460,028			
									RCNLD/PP		1.342547521		
											6,261,036.86	0.010	62,610

Deferred Tax

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020
Calculated Rates of Return on Rate Base and Equity
(Years 1 through 20)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Period	Age	Revenues	O&M Expenses	Book Depreciation	Ratemaking Interest Expense	Book Taxable Income (Current + Deferred)	State and Federal Taxes @ 28.89%	Net Operating Income	Net (Equity) Income	Net Plant	Working Capital	Accumulated Deferred Income Taxes (ADIT)	Rate Base	Return on Rate Base	Net Equity	Return on Equity
						(3) (4) (5) (6)	(7) *28.89%	(7)-(8)=(9)	(9) - (6)				(11)=(12)+(13)	(9)/(14)		(10)/(16)
20	19.5	2,858,399	580,528	323,826	111,037	1,842,908	532,416	1,421,529	1,310,492	10,732,792	154,354	(1,762,467)	9,124,679	15.58%	32,213,247	4.07%
20	20.5	3,058,487	586,333	323,707	107,336	2,041,111	589,677	1,558,770	1,451,434	10,572,641	165,158	(1,843,551)	8,894,248	17.53%	33,664,681	4.31%
20	21.5	3,089,072	592,156	324,487	103,758	2,068,631	597,627	1,574,762	1,471,004	10,413,094	166,810	(1,926,145)	8,653,759	18.20%	35,135,685	4.19%
20	22.5	3,119,963	598,118	323,646	100,300	2,097,899	606,083	1,592,116	1,491,816	10,255,784	168,478	(2,010,748)	8,413,514	18.92%	36,627,501	4.07%
20	23.5	3,338,360	604,099	324,842	96,956	2,312,463	668,071	1,741,348	1,644,392	10,098,687	180,272	(2,096,802)	8,182,157	21.28%	38,271,893	4.30%
20	24.5	3,371,744	610,140	323,788	93,724	2,344,092	677,208	1,760,608	1,666,884	9,944,056	182,074	(2,184,985)	7,941,155	22.17%	39,938,777	4.17%
20	25.5	3,405,461	616,241	324,799	90,600	2,373,821	685,797	1,778,624	1,688,024	9,789,869	183,895	(2,140,185)	7,833,579	22.71%	41,626,801	4.06%
20	26.5	3,643,843	622,403	324,272	87,580	2,609,588	753,910	1,943,258	1,855,678	9,637,642	196,767	(2,095,952)	7,738,457	25.11%	43,482,479	4.27%
20	27.5	3,680,281	628,627	327,186	84,661	2,639,807	762,640	1,961,828	1,877,167	9,483,960	198,735	(2,051,297)	7,631,398	25.71%	45,359,646	4.14%
20	28.5	3,717,084	634,913	324,935	81,839	2,675,397	772,922	1,984,314	1,902,475	9,334,000	200,723	(2,007,715)	7,527,008	26.36%	47,262,121	4.03%
20	29.5	3,754,255	641,262	325,254	79,111	2,708,628	782,523	2,005,216	1,926,105	9,185,201	202,729	(1,964,467)	7,423,463	27.01%	49,188,226	3.92%
20	30.5	3,791,798	647,675	323,289	76,474	2,744,360	792,846	2,027,988	1,951,514	9,039,866	204,757	(1,922,218)	7,322,405	27.70%	51,139,740	3.82%
20	31.5	3,829,716	654,152	323,577	73,925	2,778,062	802,582	2,049,405	1,975,480	8,895,750	206,804	(1,880,319)	7,222,235	28.38%	53,115,220	3.72%
20	32.5	3,868,013	660,694	324,948	71,460	2,810,911	812,072	2,070,299	1,998,839	8,751,786	208,873	(1,838,975)	7,121,684	29.07%	55,114,059	3.63%
20	33.5	3,906,693	667,301	322,439	69,078	2,847,875	822,751	2,094,202	2,025,124	8,611,868	210,961	(1,799,320)	7,023,509	29.82%	57,139,182	3.54%
20	34.5	3,945,760	673,974	323,531	66,776	2,881,479	832,459	2,115,796	2,049,020	8,472,406	213,071	(1,759,802)	6,925,675	30.55%	59,188,203	3.46%
20	35.5	3,985,218	680,714	323,771	64,550	2,916,183	842,485	2,138,248	2,073,698	8,334,266	215,202	(1,720,672)	6,828,796	31.31%	61,261,901	3.38%
20	36.5	4,025,070	687,521	322,123	62,398	2,953,028	853,130	2,162,296	2,099,898	8,199,352	217,354	(1,682,480)	6,734,226	32.11%	63,361,799	3.31%
20	37.5	4,065,321	694,396	322,753	60,318	2,987,854	863,191	2,184,981	2,124,663	8,065,396	219,527	(1,644,570)	6,640,353	32.90%	65,486,462	3.24%
20	38.5	4,105,974	701,340	320,243	58,308	3,026,084	874,236	2,210,156	2,151,848	7,935,553	221,723	(1,607,855)	6,549,421	33.75%	67,638,309	3.18%
20	39.5	4,147,034	708,353	322,553	56,364	3,059,764	883,966	2,232,162	2,175,798	7,805,018	223,940	(1,570,946)	6,458,012	34.56%	69,814,107	3.12%
20	40.5	4,188,504	715,437	320,619	54,485	3,097,963	895,001	2,257,447	2,202,962	7,678,047	226,179	(1,535,072)	6,369,154	35.44%	72,017,069	3.06%
20	41.5	4,230,389	722,591	320,777	52,669	3,134,352	905,514	2,281,507	2,228,838	7,552,565	228,441	(1,499,634)	6,281,372	36.32%	74,245,908	3.00%
20	42.5	4,272,693	729,817	318,651	50,913	3,173,312	916,770	2,307,455	2,256,542	7,430,867	230,725	(1,467,229)	6,194,363	37.25%	76,502,449	2.95%
20	43.5	4,315,420	737,115	318,128	49,216	3,210,961	927,647	2,332,530	2,283,314	7,311,365	233,033	(1,437,430)	6,106,968	38.19%	78,785,763	2.90%
20	44.5	4,358,574	744,486	316,594	47,576	3,249,919	938,901	2,358,594	2,311,018	7,195,085	235,363	(1,408,601)	6,021,847	39.17%	81,096,780	2.85%
20	45.5	4,402,160	751,931	315,922	45,990	3,288,317	949,995	2,384,312	2,338,322	7,081,182	237,717	(1,380,500)	5,938,399	40.15%	83,435,102	2.80%
20	46.5	4,446,182	759,450	317,119	44,457	3,325,156	960,638	2,408,975	2,364,518	6,967,798	240,094	(1,352,590)	5,855,302	41.14%	85,799,620	2.76%
20	47.5	4,490,644	767,045	315,634	42,975	3,364,990	972,146	2,435,819	2,392,844	6,857,633	242,494	(1,325,651)	5,774,476	42.18%	88,192,464	2.71%
20	48.5	4,535,550	774,715	314,988	41,543	3,404,304	983,504	2,462,343	2,420,800	6,749,862	244,920	(1,299,445)	5,695,337	43.23%	90,613,265	2.67%
20	49.5	4,580,906	782,462	313,464	40,158	3,444,822	995,209	2,489,771	2,449,613	6,645,376	247,369	(1,274,229)	5,618,516	44.31%	93,062,877	2.63%
20	50.5	4,626,715	790,287	312,674	38,819	3,484,935	1,006,798	2,516,956	2,478,137	6,543,458	249,842	(1,249,797)	5,543,503	45.40%	95,541,014	2.59%
20	51.5	4,672,982	798,190	314,940	37,525	3,522,327	1,017,600	2,542,252	2,504,727	6,441,069	252,341	(1,225,271)	5,468,139	46.49%	98,045,741	2.55%
20	52.5	4,719,712	806,172	312,506	36,274	3,564,760	1,029,859	2,571,175	2,534,901	6,342,922	254,864	(1,202,014)	5,395,772	47.65%	100,580,642	2.52%
20	53.5	4,766,909	814,234	311,516	35,065	3,606,094	1,041,801	2,599,358	2,564,293	6,247,592	257,414	(1,179,615)	5,325,391	48.81%	103,144,935	2.49%
20	54.5	4,814,578	822,376	311,529	33,896	3,646,777	1,053,554	2,627,119	2,593,223	6,154,090	259,987	(1,157,787)	5,256,290	49.98%	105,738,158	2.45%
20	55.5	4,862,724	830,600	309,505	32,767	3,689,852	1,065,998	2,656,621	2,623,854	6,064,469	262,587	(1,137,124)	5,189,932	51.19%	108,362,012	2.42%
20	56.5	4,911,351	838,906	310,891	31,674	3,729,880	1,077,562	2,683,992	2,652,318	5,975,335	265,213	(1,116,646)	5,123,902	52.38%	111,014,330	2.39%
20	57.5	4,960,465	847,295	310,051	30,619	3,772,500	1,089,875	2,713,244	2,682,625	5,888,929	267,865	(1,097,001)	5,059,793	53.62%	113,696,955	2.36%
20	58.5	5,010,070	855,768	309,045	29,598	3,815,659	1,102,344	2,742,913	2,713,315	5,805,435	270,544	(1,078,243)	4,997,736	54.88%	116,410,270	2.33%
20	59.5	5,060,171	864,326	309,364	28,611	3,857,870	1,114,539	2,771,942	2,743,331	5,723,544	273,249	(1,059,994)	4,936,799	56.15%	119,153,601	2.30%

Deferred Tax

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach
Forecast Results from Operation
Income Statement, Balance Statement, & Equity
Periods 1 through 60

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	20-26	27-33	34-40	41-46	47-53	54-60	0	1	2	3	4	5	6	7	8	9
Income Statement																				
Revenues																				
Annual Revenue Growth rate:																				
Subscriber Growth Rate (Annually)		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Periodic Subscriber Growth																				
Growth	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%						0.0%				
Period for Periodic Growth	5																			
Rate Case Activities																				
Periodic Rate Case (years)	typically 3 years																			
Required Rate Increase	Calculated in DCF										44.92%	45.18%	24.60%	22.84%	20.92%	19.08%	6.71%	6.82%	3.05%	-4.36%
Proposed Rate Increase	Calculated in DCF										0.0%	0.0%	15.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	6.0%
Total Revenue Adjustments	Calculated										1.0%	1.0%	16.0%	1.0%	1.0%	1.0%	11.0%	1.0%	1.0%	7.0%
Base and Forecast	1,473,355										1,488,089	1,488,089	1,726,183	1,743,445	1,760,879	1,778,488	1,974,122	1,993,863	2,013,802	2,154,768
Operating Expenses											24%	25%	22%	22%	23%	23%	21%	22%	22%	21%
Expense Level 1. Operations & Maintenance	354,533										354,533	365,169	376,124	387,408	399,030	411,001	423,331	436,031	449,112	462,585
Expense Level 1. Operations & Maintenance Rate of Change		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Expense Level 2. Not Used	-																			
Expense Level 2. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 4. Not Used	-																			
Expense Level 4. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 5. Not Used	-																			
Expense Level 5. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Property Taxes	19,206,421										13,750,000	13,750,000	13,636,760	13,522,928	13,408,008	13,293,080	13,179,877	13,065,557	12,896,771	12,726,866
Begin Plant											0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
PT Rate % of beginning net plant	0.000%																			
Book Depreciation (based on Beginning Year Property Plant & Equipment)											304,294	304,294	306,492	309,155	309,853	312,530	313,362	314,153	316,510	318,269
Total Operating Expenses											658,827	669,463	682,616	696,563	708,883	723,531	736,693	750,184	765,622	780,854
Cost of Operation as % of Revenues (Calculation)											44.3%	45.0%	39.5%	40.0%	40.3%	40.6%	37.3%	37.6%	38.0%	36.2%
Operating Expenses less Depreciation											354,533	365,169	376,124	387,408	399,030	411,001	423,331	436,031	449,112	462,585
Operating Income											829,262	818,626	1,043,567	1,046,882	1,051,996	1,055,957	1,237,429	1,243,679	1,248,280	1,373,914
Nonoperating Revenues (Expenses)																				
Interest Income																				
Interest Expense																				
Interest Exp as % of Debt	4.12%										205,739	205,739	201,296	197,590	191,003	184,636	178,482	172,533	166,781	161,222
Total nonoperating revenues (expenses)											4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
											205,739.00	205,739.00	201,296.00	197,590.00	191,003.00	184,636.00	178,482.00	172,533.00	166,781.00	161,222.00
Income (loss) before State and Federal Taxes											623,523	612,887	842,271	849,292	860,993	871,321	1,058,947	1,071,146	1,081,499	1,212,692
State and Federal Taxes																				
State and Federal Tax Rate	28.89%										180,136	177,063	243,332	245,361	248,741	251,725	305,930	309,454	312,416	350,347
											28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income After Taxes											443,387	435,824	598,939	603,931	612,252	619,596	753,017	761,692	768,983	862,345
Income After Taxes plus Interest											649,126	641,563	800,235	801,521	803,255	804,232	931,499	934,225	935,764	1,023,567
Earnings before Interest, Taxes, Depreciation, & Amortization											773,284	768,794	863,395	865,315	864,367	864,037	938,931	938,924	939,858	991,489
												768,794								
Income (loss) before State and Federal Taxes											623,523	612,887	842,271	849,292	860,993	871,321	1,058,947	1,071,146	1,081,499	1,212,692
Book Depreciation											(304,294)	(304,294)	(306,492)	(309,155)	(309,853)	(312,530)	(313,362)	(314,153)	(316,510)	(318,269)
Tax Depreciation												(595,743)	(662,588)	(609,455)	(616,496)	(623,664)	(630,961)	(623,253)	(628,997)	(634,846)
Difference Tax over Book Depreciation											304,294	(291,449)	(296,046)	(300,300)	(306,643)	(312,135)	(317,599)	(309,098)	(312,487)	(316,576)
Income Adjusted for Tax Depreciation											927,817	321,438	546,225	548,992	554,350	559,187	741,348	762,048	768,912	896,115
Income Tax Rate											28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income Taxes											268,046	92,863	157,804	158,604	160,152	161,549	214,175	220,156	222,139	258,868
Income After Tax											659,771	228,575	388,421	390,388	394,198	397,634	527,173	541,892	546,773	637,247
Deferred Income Taxes											67,910	(64,200)	(85,528)	(86,757)	(86,589)	(85,176)	(91,755)	(89,298)	(90,277)	(91,459)
Accumulated Deferred Income Taxes											4,710	(64,200)	(149,728)	(256,485)	(343,074)	(428,250)	(527,005)	(616,303)	(706,580)	(798,039)
Income After Taxes (Book Depreciation)											443,387	435,824	598,939	603,931	612,252	619,596	753,017	761,692	768,983	862,345
Plus Deferred Taxes											67,910	(64,200)	(85,528)	(86,757)	(86,589)	(90,176)	(91,755)	(89,298)	(90,277)	(91,459)
Plus Interest											205,739	205,739	201,296	197,590	191,003	184,636	178,482	172,533	166,781	161,222
After Tax Income Debt Free											561,216	725,763	885,763	888,278	891,844	894,408	1,023,254	1,023,523	1,026,045	1,115,026
Balance Statement																				
Assets																				
Current Assets																				
Current Asset Balance	412,539										416,665	416,665	863,331	488,165	493,046	497,977	552,754	558,282	563,865	603,135
CA as % of Revenues	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Balance Statement																				
Property Plant & Equipment																				
Total PP&E																				
Begin Balance												19,206,421.00	19,867,096.00	19,524,674.00	19,683,563.00	19,843,777.00	20,005,326.00	20,168,221.00	20,291,188.00	20,415,214.00
Additions												191,054.00	192,660.00	194,235.00	195,825.00	197,427.00	199,042.00	145,622.00	146,852.00	148,092.00
Retirements												(30,379.00)	(35,082.00)	(35,346.00)	(35,611.00)	(35,878.00)	(36,147.00)	(22,655.00)	(22,826.00)	(22,998.00)
End Balance	19,206,421.00											19,867,096.00	19,524,674.00	19,683,563.00	19,843,777.00	20,005,326.00	20,168,221.00	20,291,188.00	20,415,214.00	20,540,308.00
End Balance Check												19,867,096.00	19,524,674.00	19,683,563.00	19,843,777.00	20,005,326.00	20,168,221.00	20,291,188.00	20,415,214.00	20,540,308.00
Book Depreciation of Property, Plant, & Equipment																				
Total Book Depreciation																				
Begin Balance											-	(5,456,421.00)	(5,730,336.11)	(6,001,745.97)	(6,279,554.72)	(6,549,797.02)	(6,825,448.78)	(7,102,663.61)	(7,394,414.69)	(7,688,354.12)
Depreciation												(304,294.11)	(306,491.86)	(309,154.75)	(309,853.30)	(311,529.76)	(313,361.83)	(314,153.08)	(316,510.43)	(318,269.35)
Retirements												30,379.00	35,082.00	35,346.00	35,611.00	35,878.00	36,147.00	22,402.00	22,571.00	22,741.00

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser, Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	20-26	27-33	34-40	41-46	47-53	54-60	0	1	2	3	4	5	6	7	8	9
Accumulated PW of Cashflows	15,624,668										1,638,366	723,847	1,522,319	2,270,290	2,961,212	3,599,711	4,264,345	4,916,545	5,519,517	6,117,328
CASH FLOW																				
Income from Operations											659,771	228,575	388,421	390,388	394,198	397,638	527,173	541,892	546,773	637,227
Depreciation											-	(595,743)	(602,538)	(609,455)	(616,496)	(623,664)	(630,961)	(639,751)	(628,997)	(634,846)
Capital Expenditures												191,054	192,660	194,235	195,825	197,427	199,042	145,622	146,852	148,092
Change in Working Capital											796	796	12,857	932	941	952	10,563	1,067	1,077	7,611
Net Cash Flows											658,975	632,488	785,642	804,676	813,928	822,923	948,529	1,028,454	1,027,841	1,116,370
Period											0.5	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5
PW Factor																				
Discount Rate with growth	8.40%										8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	6.46%										6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%
Period Present Worth Factor (PW)											0.96	0.96	0.886	0.817	0.754	0.696	0.642	0.592	0.546	0.504
PW of Cashflow											637,616	607,169	695,902	657,420	613,702	572,754	608,956	607,925	561,201	562,650
Accumulated PW of Cashflows	14,731,588										1,239,785	607,169	1,303,071	1,960,491	2,574,193	3,146,947	3,755,903	4,363,828	4,920,029	5,482,679

Rate Case Forecasts																				
Rate Base																				
Plant in Service											19,467,096.00	19,467,096.00	19,524,674.00	19,584,563.00	19,843,777.00	20,005,326.00	20,168,221.00	20,291,188.00	20,416,214.00	20,540,308.00
Accumulated Book Depreciation											(5,730,336.11)	(6,730,336.11)	(6,001,745.97)	(6,275,554.72)	(6,549,797.02)	(6,825,468.78)	(7,102,663.81)	(7,394,414.69)	(7,688,454.17)	(7,983,882.47)
Working Capital											80,357.00	80,357.00	93,214.00	94,146.00	95,087.00	96,039.00	106,602.00	107,669.00	108,746.00	116,357.00
Accumulated Deferred Income Tax											3,710	(84,200)	(169,728)	(256,485)	(345,074)	(435,290)	(527,065)	(615,203)	(705,589)	(798,035)
Rate Base											13,720,826.89	13,832,916.89	13,446,414.03	13,245,669.28	13,043,992.98	12,840,666.22	12,645,154.39	12,468,739.31	12,329,025.83	11,874,743.53
Authorized Return on Rate Base	7.31%										1,002,992.00	996,566.00	982,933.00	968,258.00	953,516.00	938,653.00	924,361.00	905,573.00	886,632.00	868,044.00
O&M Expenses											354,333.00	365,169.00	376,124.00	387,408.00	399,030.00	411,001.00	423,331.00	436,031.00	449,112.00	462,585.00
Book Depreciation											304,294.11	304,294.11	306,491.86	309,154.75	309,853.35	311,529.76	313,361.83	314,153.08	316,510.43	318,269.35
Refinancing Interest Expense											205,739.00	205,739.00	201,296.00	197,590.00	193,003.00	184,636.00	178,482.00	172,583.00	166,781.00	161,222.00
Revenue Requirement											1,867,358.11	1,871,768.11	1,866,844.86	1,862,410.75	1,855,402.35	1,845,819.76	1,839,535.83	1,828,290.08	1,819,035.43	1,810,120.35
O&M Expenses											354,333.00	365,169.00	376,124.00	387,408.00	399,030.00	411,001.00	423,331.00	436,031.00	449,112.00	462,585.00
Depreciation Expense											304,294.11	304,294.11	306,491.86	309,154.75	309,853.35	311,529.76	313,361.83	314,153.08	316,510.43	318,269.35
Interest											205,739.00	205,739.00	201,296.00	197,590.00	193,003.00	184,636.00	178,482.00	172,583.00	166,781.00	161,222.00
Pretax Income											1,002,992.00	996,566.00	982,933.00	968,258.00	953,516.00	938,653.00	924,361.00	905,573.00	886,632.00	868,044.00
State & Federal Taxes @ 28.89%											289,764.00	287,908.00	283,969.00	279,730.00	275,471.00	271,177.00	267,048.00	261,620.00	256,148.00	250,778.00
After Tax Income											713,228.00	708,658.00	698,964.00	688,528.00	678,045.00	667,476.00	657,313.00	643,953.00	630,484.00	617,266.00
Current Revenue											1,488,089.00	1,488,089.00	1,726,183.00	1,743,445.00	1,760,879.00	1,778,488.00	1,974,122.00	1,993,863.00	2,013,802.00	2,154,768.00
Revenue Requirement											2,157,322.11	2,159,676.11	2,150,813.86	2,142,140.75	2,128,873.35	2,116,996.76	2,108,583.83	2,089,910.08	2,073,183.43	2,060,898.35
Required Revenue Increase											45%	45%	25%	23%	21%	19%	7%	5%	3%	4%
Income from Operations											649,126	641,363	801,235	801,521	803,255	804,737	931,499	934,225	935,764	1,023,567
Return on Rate Base											4.73%	4.71%	5.95%	6.05%	6.16%	6.26%	7.37%	7.54%	7.72%	8.62%
Required Return	7.31%										7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%
Authorized Return											1,002,992	996,566	982,933	968,258	953,516	938,653	924,361	905,573	886,632	868,044
After Tax Net Income											443,387	435,824	598,939	601,931	612,252	619,596	753,017	761,697	768,986	862,345
Taxes											180,136	177,063	243,332	245,361	248,741	251,725	305,930	309,624	312,416	350,347
Pre tax Net Income											623,523	612,887	842,271	849,292	860,994	871,321	1,058,947	1,071,146	1,081,399	1,212,692
Interest Expense											(205,739)	(205,739)	(201,296)	197,590	193,003	184,636	178,482	172,583	166,781	161,222
Operating Income											879,262	818,626	1,043,567	1,046,882	1,053,996	1,056,957	1,237,429	1,243,679	1,248,180	1,373,914
Operating Expenses											658,827	669,463	682,616	696,563	708,883	722,531	736,693	750,184	765,622	780,854
Revenue Requirement											1,488,089	1,488,089	1,726,183	1,743,445	1,760,879	1,778,488	1,974,122	1,993,863	2,013,802	2,154,768
Required Return											1,002,992	996,566	982,933	968,258	953,516	938,653	924,361	905,573	886,632	868,044
Operating Expenses											658,827	669,463	682,616	696,563	708,883	722,531	736,693	750,184	765,622	780,854
Revenue Requirement											1,661,819	1,666,029	1,665,549	1,664,821	1,662,399	1,661,184	1,661,054	1,655,757	1,652,254	1,648,898
Required Rate Increase											44.97%	45.13%	24.60%	22.87%	20.90%	19.03%	6.71%	4.42%	3.05%	4.36%
											0	1	2	3	4	5	6	7	8	9
Proposed Rate Increase																				
Rate Increase Scenario	6										0%	0%	15%	0%	0%	0%	10%	0%	0%	6%
	0										0	1	2	3	4	5	6	7	8	9
No. Increases (Input 2)	2										0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
No Rate Increases (Input 2)	3																			
Modest Rate Increases 6% every 5 year period starting in period 3 (Input 4)	4										0.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%
Modest Rate Increases (Input 4)	5																			
Required Rate Increases 15% period 2, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 5)	6									15,621,283.00	0.0%	0.0%	15.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	6.0%
Required Rate Increases (Input 6)	7										100.0%	100.0%	115.0%	115.0%	115.0%	115.0%	126.5%	126.5%	126.5%	134.1%
	4										0.0%	0.0%	0.0%	0.0%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Changes in Balance Sheet Accounts																				
Assets																				
Change in Current Assets (Source negative / Use positive)												4,126	66,bbb	4,834	4,881	4,931	54,777	5,528	5,583	39,470
Plant & Equipment																				
Additions (Source negative / Use positive)												191,054	192,660	194,235	195,825	197,427	199,042	145,622	146,852	148,092
Liabilities																				
Change in Current Liabilities (Source Positive / Use negative)												3,330	53,809	3,902	3,940	3,979	44,214	4,461	4,506	31,859
Long Term Debt																				
Additional Long Term Debt Source Positive / Use Negative												(58,621.00)	(72,890.00)							
Principal Paid Long term Debt (Source positive / Use negative)												166,456	167,861	169,862	154,533	149,887	144,403	139,589	134,936	130,439

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

S Water industry (AIA Americas - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4 28 2020 Created 10 14 2020

	Base	1-5	Periods 6-15	16 - 19	20 Yrs	21 33	34 40	41 46	47 53	54 60	0	1	2	3	4	5	6	7	8	9
Equity																				
Additions to Equity (Source Positive / Use Negative)																				
Dividends (Source negative / Use Positive)																				
Funds Provided from Operations																				
Sources of Funds:																				
Net Income (Use Negative / Source Positive)												435,824	599,939	683,961	617,762	619,596	653,017	701,869	748,984	802,486
Depreciation (Source, assumed negative)												805,294	806,492	809,155	859,863	911,530	964,214	4,461	416,250	318,269
Current Liabilities (Source Positive)												3,130	53,829	3,902	3,960	3,979	68,214	4,461	6,586	31,859
Sources and Uses of Funds:												743,648	959,240	916,988	926,045	936,105	1,330,993	1,060,305	1,089,999	1,717,473
Sources of Funds:																				
Current Liabilities (Source Positive)																				
Uses of Funds:																				
Current Assets - Increase (Use)												4,126	66,666	6,834	6,963	6,931	54,717	5,578	5,583	39,670
Fixed Assets - Assets Received (Use)												191,054	179,660	194,235	196,825	197,477	199,042	145,677	146,852	148,092
Total Uses of Funds:												195,180	246,326	199,069	203,788	204,408	253,759	151,256	152,435	187,762
Funds from Financing Activities																				
Changes in Debt																				
Increase in Long Term Debt												(96,627,100)	(72,890,100)							
Repayment of Long Term Debt												(166,436)	(162,861)	(159,862)	(154,233)	(149,382)	(144,403)	(139,569)	(134,936)	(130,439)
Funds from Equity																				
Dividends Paid (Use)												0	0	0	0	0	0	0	0	0
Additional Paid-in Capital (Source)																				
Total Funds from Financing Activities												(225,077,100)	(235,753,100)	(159,862,020)	(154,233,100)	(149,382,100)	(144,403,100)	(139,569,100)	(134,936,100)	(130,439,100)
Total Funds Needed												42,139,100	464,163,100	564,826,100	570,806,100	383,386,100	172,471,100	780,567,100	802,628,100	894,472,100
Financing																				
Debt			25%									(84,630,100)	(170,467,100)	(145,095,100)	(148,410,100)	(151,675,100)	(185,216,100)	(205,787,100)	(208,683,100)	(232,364,100)
Equity			75%									(239,161,100)	(443,483,100)	(417,962,100)	(422,396,100)	(431,640,100)	(527,155,100)	(584,780,100)	(593,945,100)	(662,109,100)
Funds Provided by Financing												(323,791,100)	(614,150,100)	(563,057,100)	(570,806,100)	(583,315,100)	(712,371,100)	(790,567,100)	(802,628,100)	(894,473,100)
												58,691,100	(1,891,100)							
												166,883,100	207,455,100							

DCF Investor Owned

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	1-5	Periods 6-15	16 - 19	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Income Statement																				
Revenues																				
Annual Revenue Growth rate																				
Subscriber Growth Rate (Annually)		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Periodic Subscriber Growth																				
Growth	0.0%	0.0%	0.0%	0.0%	0.0%					0.0%					0.0%					0.0%
Period to Periodic Growth	5																			
Rate Case Activities																				
Periodic Rate Case (years)	Typically 3 years																			
Required Rate Increase	Calculated in DCF				6.10%	7.66%	14.26%	15.68%	17.19%	23.03%	24.53%	26.10%	31.56%	33.03%	38.40%	39.86%	40.57%	41.83%	46.36%	47.83%
Proposed Rate Increase	Calculated in DCF				0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%
Total Revenue Adjustments	Calculated				1.0%	1.0%	7.0%	1.0%	1.0%	7.0%	1.0%	1.0%	7.0%	1.0%	1.0%	7.0%	1.0%	1.0%	7.0%	1.0%
Base and Forecast	1,473,355				2,178,319	2,198,079	2,351,945	2,375,464	2,399,219	2,567,164	2,592,836	2,618,764	2,802,077	2,830,098	2,858,399	3,058,687	3,089,272	3,119,965	3,338,360	3,371,744
Operating Expenses																				
Expense Level 1. Operations & Maintenance	354,533				22%	22%	21%	22%	22%	22%	22%	22%	20%	20%	20%	19%	19%	19%	18%	18%
Expense Level 1. Operations & Maintenance Rate of Change		3.0%	3.0%	3.0%	476,463	490,757	505,480	520,644	536,263	552,351	557,875	563,454	569,089	574,780	580,528	586,333	592,196	598,118	604,099	610,140
Expense Level 2. Not Used					3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Expense Level 2. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 4. Not Used	-																			
Expense Level 4. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 5. Not Used	-																			
Expense Level 5. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Property Taxes	19,206,421																			
Begin Plant					17,566,426	17,988,513	18,220,206	18,051,880	17,884,694	17,717,792	17,552,628	17,388,595	17,225,686	17,063,892	16,894,585	16,732,792	16,572,641	16,413,099	16,255,784	16,098,687
PT Rate % of beginning net plant	0.000%				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Book Depreciation (based on Beginning Year Property Plant & Equipment)					816,996	818,650	819,946	821,081	820,093	820,658	822,841	822,225	824,976	823,288	823,926	823,707	824,087	823,646	824,842	824,784
Total Operating Expenses					1,293,459	1,309,407	1,325,426	1,341,725	1,356,356	1,373,009	1,380,716	1,385,679	1,394,065	1,398,068	1,404,454	1,410,040	1,416,283	1,421,764	1,428,941	1,434,924
Cost of Operation as % of Revenues (Calculation)					36.5%	35.8%	35.1%	35.0%	35.7%	34.0%	34.0%	33.8%	31.9%	31.7%	31.6%	29.8%	29.7%	29.5%	27.8%	27.7%
Operating Expenses exs Depreciation					476,463	490,757	505,480	520,644	536,263	552,351	557,875	563,454	569,089	574,780	580,528	586,333	592,196	598,118	604,099	610,140
Operating Income					1,382,857	1,388,672	1,526,525	1,533,739	1,542,863	1,694,155	1,712,120	1,733,085	1,908,012	1,932,004	1,954,945	2,148,647	2,172,989	2,198,199	2,409,419	2,437,819
Nonoperating Revenues (Expenses)																				
Interest Income																				
Interest Expense					155,848	150,651	145,631	140,777	136,084	131,548	127,163	122,924	118,827	114,866	111,037	107,336	103,758	100,300	96,956	93,724
Interest Exp as % of Debt	4.12%				4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
Total nonoperating revenues (expenses)					155,848.00	150,651.00	145,631.00	140,777.00	136,084.00	131,548.00	127,163.00	122,924.00	118,827.00	114,866.00	111,037.00	107,336.00	103,758.00	100,300.00	96,956.00	93,724.00
Income (loss) before State and Federal Taxes					1,227,009	1,238,019	1,380,894	1,392,962	1,406,779	1,562,607	1,584,957	1,610,161	1,789,185	1,817,138	1,843,908	2,041,311	2,068,231	2,097,899	2,312,463	2,344,092
State and Federal Taxes																				
State and Federal Tax Rate	28.89%				28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income After Taxes					872,526	880,355	981,954	990,535	1,000,361	1,111,170	1,127,063	1,144,986	1,272,289	1,292,185	1,310,892	1,451,434	1,471,034	1,491,816	1,644,392	1,666,884
Income After Taxes plus Interest					1,028,374	1,031,008	1,127,585	1,131,312	1,136,445	1,242,718	1,254,226	1,267,910	1,391,116	1,407,051	1,422,929	1,558,770	1,574,792	1,592,116	1,741,348	1,760,608
Earnings before Interest, Taxes, Depreciation, & Amortization					990,847	991,994	1,048,545	1,049,966	1,050,120	1,111,939	1,119,173	1,124,960	1,199,196	1,205,360	1,213,039	1,292,800	1,301,622	1,309,679	1,398,119	1,407,168
Income (loss) before State and Federal Taxes					1,227,009	1,238,019	1,380,894	1,392,962	1,406,779	1,562,607	1,584,957	1,610,161	1,789,185	1,817,164	1,843,908	2,041,311	2,068,637	2,097,899	2,312,463	2,344,092
Book Depreciation					(316,996)	(318,650)	(319,946)	(321,081)	(320,093)	(320,658)	(322,225)	(324,946)	(324,288)	(323,926)	(323,707)	(324,487)	(323,646)	(324,842)	(323,788)	
Tax Depreciation					(640,799)	(646,807)	(653,021)	(659,295)	(663,679)	(672,170)	(575,082)	(583,410)	(588,928)	(592,646)	(598,458)	(604,170)	(610,381)	(616,492)	(622,708)	(629,027)
Difference Tax over Book Depreciation					(323,803)	(328,707)	(333,075)	(338,214)	(343,586)	(351,513)	(252,942)	(259,085)	(264,959)	(268,720)	(274,547)	(279,683)	(286,894)	(291,651)	(297,866)	(301,239)
Income Adjusted for Tax Depreciation					903,206	909,312	1,047,813	1,054,748	1,063,193	1,211,092	1,332,016	1,351,076	1,527,232	1,547,806	1,568,376	1,760,648	1,782,737	1,805,053	2,014,597	2,038,853
Income Tax Rate					28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income Taxes					260,936	262,665	302,713	304,717	306,579	349,886	384,859	390,326	441,217	447,361	453,534	508,593	515,033	521,460	582,017	589,025
Income After Tax					642,270	646,967	745,100	750,031	754,614	861,208	947,197	960,750	1,086,071	1,100,645	1,115,272	1,251,855	1,267,704	1,283,573	1,432,560	1,449,828
Deferred Income Taxes					(93,547)	(94,859)	(96,227)	(97,716)	(99,839)	(101,553)	(73,075)	(74,849)	(75,679)	(77,312)	(85,084)	(82,594)	(84,603)	(86,054)	(86,054)	(88,183)
Accumulated Deferred Income Taxes					(991,546)	(986,405)	(1,082,632)	(1,180,347)	(1,280,185)	(1,381,738)	(1,454,809)	(1,529,658)	(1,605,337)	(1,683,155)	(1,768,467)	(1,843,591)	(1,928,193)	(2,010,148)	(2,096,202)	(2,184,385)
Income After Taxes (Book Depreciation)					872,526	880,355	981,954	990,535	1,000,361	1,111,170	1,127,063	1,144,986	1,272,289	1,292,185	1,310,892	1,451,434	1,471,034	1,491,816	1,644,392	1,666,884
Plus Deferred Taxes					(93,547)	(94,859)	(96,227)	(97,716)	(99,839)	(101,553)	(73,075)	(74,849)	(75,679)	(77,312)	(85,084)	(82,594)	(84,603)	(86,054)	(86,054)	(88,183)
Plus Interest					155,848	150,651	145,631	140,777	136,084	131,548	127,163	122,924	118,827	114,866	111,037	107,336	103,758	100,300	96,956	93,724
After Tax Income Excl Fins					1,121,921	1,125,827	1,223,812	1,229,027	1,236,284	1,344,271	1,327,301	1,342,759	1,466,795	1,484,363	1,507,013	1,641,364	1,659,396	1,678,170	1,827,402	1,848,791
Balance Statement																				
Assets																				
Current Assets																				
Current Asset Balance	412,539				609,368	615,462	658,545	665,131	671,781	738,806	725,994	733,254	784,582	792,427	800,352	896,376	864,940	873,590	938,741	948,088
CA as % of Revenues	28.00%	28.00%	28.00%	28.00%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Balance Statement																				
Property Plant & Equipment																				
Total PP&E																				
Begin Balance					20,540,368.00	20,666,460.00	20,793,739.00	20,922,096.00	21,051,560.00	21,182,143.00	21,313,853.00	21,446,697.00	21,580,692.00	21,715,840.00	21,852,157.00	21,989,651.00	22,128,333.00	22,268,211.00	22,409,299.00	22,551,606.00
Additions					149,342.00	150,604.00	152,875.00	153,760.00	154,457.00	155,763.00	157,077.00	158,428.00	161,099.00	162,462.00	163,837.00	165,223.00	166,621.00	168,032.00	169,456.00	
Retirements					(23,170.00)	(23,345.00)	(23,518.00)	(23,696.00)	(23,874.00)	(24,053.00)	(24,233.00)	(24,414.00)	(24,598.00)	(24,782.00)	(24,968.00)	(25,155.00)	(25,345.00)	(25,533.00)	(25,725.00)	(25,917.00)
End Balance	(9,206,421.00)				20,666,480.00	20,793,739.00	20,922,096.00	21,051,560.00	21,182,143.00	21,313,853.00	21,446,697.00	21,580,692.00	21,715,840.00	21,852,157.00	21,989,651.00	22,128,333.00	22,268,211.00	22,409,299.00	22,551,606.00	22,695,145.00
End Balance Check					20,666,480.00	20,793,739.00	20,922,096.00	21,051,560.00	21,182,143.00	21,313,853.00	21,446,697.00	21,580,692.00	21,715,840.00	21,852,157.00	21,989,651.00	22,128,333.00	22,268,211.00	22,409,299.00	22,551,606.00	22,695,145.00
Book Depreciation of Property, Plant, & Equipment																				
Total Book Depreciation																				
Begin Balance					(7,983,682.47)	(8,277,967.30)	(8,573,592.87)	(8,870,216.45)	(9,167,860.81)	(9,466,351.21)	(9,761,224.54)	(10,060,102.11)	(10,358,186.22)	(10,658,879.26)	(10,957,622.30)	(11,256,859.21)	(11,555,692.17)	(11,855,117.50)	(12,153,525.27)	(12,452,919.38)
Depreciation					(316,995.83)	(318,649.57)	(319,919.58)	(321,081.36)	(320,093.40)	(320,658.33)	(322,225.13)	(324,926.04)	(323,288.04)	(323,925.91)	(323,706.96)	(324,487.33)	(323,645.77)	(324,842.11)	(324,784.11)	(323,787.83)
Retirements					22,911.00	23,084.00	23,256.00	23,432.00	23,608.00	23,785.00	23,963.00	24,141.00	24,323.00	24,505.00	24,689.00	24,874.00	25,062.00	25,248.00	25,438.00	25,628.00

L:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Basis	1-5	Periods 6-15	16 - 19	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
End Balance					(8,277,967.80)	(8,573,532.87)	(8,870,216.45)	(9,167,865.81)	(9,464,351.23)	(9,761,224.54)	(10,060,102.11)	(10,358,186.22)	(10,658,819.26)	(10,957,622.30)	(11,256,809.21)	(11,555,692.17)	(11,855,117.50)	(12,153,515.27)	(12,452,919.38)	(12,751,079.21)
End Balance Check					(8,277,967.80)	(8,573,532.87)	(8,870,216.45)	(9,167,865.81)	(9,464,351.23)	(9,761,224.54)	(10,060,102.11)	(10,358,186.22)	(10,658,819.26)	(10,957,622.30)	(11,256,809.21)	(11,555,692.17)	(11,855,117.50)	(12,153,515.27)	(12,452,919.38)	(12,751,079.21)
Net Plant																				
Begin Balance					12,566,625.53	12,368,512.70	12,220,206.13	12,051,879.55	11,883,694.19	11,717,791.79	11,552,628.46	11,386,594.89	11,222,505.78	11,057,000.74	10,894,534.70	10,732,791.79	10,572,640.83	10,413,093.50	10,255,783.73	10,098,686.62
End Balance					12,368,512.70	12,220,206.13	12,051,879.55	11,883,694.19	11,717,791.79	11,552,628.46	11,386,594.89	11,222,505.78	11,057,000.74	10,894,534.70	10,732,791.79	10,572,640.83	10,413,093.50	10,255,783.73	10,098,686.62	9,944,065.79
Total Assest					12,997,480.70	12,835,668.13	12,710,424.55	12,548,824.19	12,389,572.79	12,271,434.46	12,112,589.89	11,955,759.78	11,841,582.74	11,686,961.70	11,533,143.79	11,429,016.83	11,278,033.50	11,129,374.73	11,013,427.62	10,868,153.49
Tax Depreciation of Property, Plant, & Equipment																				
Total MACRS Depreciation																				
Begin Balance																				
Depreciation					(640,798.53)	(646,856.64)	(653,020.99)	(659,294.88)	(665,678.96)	(672,173.33)	(679,782.40)	(687,309.88)	(686,928.56)	(692,645.88)	(698,458.32)	(604,370.32)	(610,881.24)	(616,492.36)	(622,707.68)	(629,026.60)
Retirements					23,170.00	23,345.00	23,518.00	23,696.00	23,874.00	24,053.00	24,233.00	24,413.00	24,598.00	24,782.00	24,968.00	25,156.00	25,345.00	25,533.00	25,725.00	25,917.00
End Balance					(617,628.53)	(623,511.64)	(629,502.99)	(635,598.88)	(641,804.96)	(648,120.33)	(655,549.40)	(662,896.88)	(662,330.56)	(667,863.88)	(673,490.32)	(579,215.32)	(585,536.24)	(590,959.36)	(596,982.68)	(603,109.60)
End Balance Check					(617,628.53)	(623,511.64)	(629,502.99)	(635,598.88)	(641,804.96)	(648,120.33)	(655,549.40)	(662,896.88)	(662,330.56)	(667,863.88)	(673,490.32)	(579,215.32)	(585,536.24)	(590,959.36)	(596,982.68)	(603,109.60)
Net Plant																				
Begin Balance					20,540,308.00	20,666,486.00	20,793,739.00	20,922,096.00	21,051,560.00	21,182,143.00	21,313,853.00	21,446,697.00	21,580,692.00	21,715,840.00	21,852,157.00	21,989,651.00	22,128,333.00	22,268,211.00	22,409,299.00	22,551,606.00
End Balance					20,048,851.47	20,170,227.36	20,292,593.01	20,415,961.12	20,540,338.04	20,665,732.69	20,899,147.64	21,023,795.12	21,153,509.44	21,284,293.12	21,416,160.68	21,549,117.68	21,683,174.76	21,818,339.64	21,954,623.32	22,092,035.40
Tax					(640,798.53)	(646,856.64)	(653,020.99)	(659,294.88)	(665,678.96)	(672,173.33)	(679,782.40)	(687,309.88)	(686,928.56)	(692,645.88)	(698,458.32)	(604,370.32)	(610,881.24)	(616,492.36)	(622,707.68)	(629,026.60)
Book					(316,999.83)	(318,649.57)	(319,999.58)	(321,081.36)	(320,093.40)	(320,614.33)	(322,840.57)	(322,225.12)	(324,978.04)	(323,268.04)	(323,925.91)	(323,706.96)	(324,487.33)	(323,645.77)	(324,842.11)	(323,787.83)
					(323,802.70)	(328,207.07)	(333,021.41)	(338,213.52)	(345,585.56)	(351,559.00)	(356,941.83)	(365,084.77)	(361,950.52)	(369,377.84)	(374,532.41)	(280,663.36)	(286,393.91)	(292,846.59)	(297,865.57)	(305,238.77)

Balance Statement

Liabilities																				
Current Liabilities																				
Current Liabilities	332,978				592,847	896,766	5,312,540	530,855	542,223	580,179	585,981	591,841	633,269	639,602	645,998	691,218	698,130	705,112	754,469	762,014
CL as % of Revenues	22.60%	22.60%		22.60%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%
Noncurrent Liabilities																				
Long Term Debt, Notes payable, net of current portion Beg	9,993,569.00				2,782,719.00	3,456,628.00	3,534,740.00	3,416,915.00	3,303,018.00	3,192,917.00	3,086,486.00	2,983,603.00	2,884,150.00	2,788,012.00	2,695,078.00	2,605,242.00	2,518,401.00	2,434,454.00	2,353,306.00	2,274,862.00
Additional Debt																				
Debt Repayment					(126,091)	(121,888)	(117,825)	(113,897)	(110,101)	(106,431)	(102,883)	(99,453)	(96,138)	(92,937)	(89,836)	(86,841)	(83,947)	(81,148)	(78,444)	(75,829)
Debt Repayment years	30.00				30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
End Long Term Dept, Notes payable, net of current portion End					3,656,628.00	3,534,740.00	3,416,915.00	3,303,018.00	3,192,917.00	3,086,486.00	2,983,603.00	2,884,150.00	2,788,012.00	2,695,078.00	2,605,242.00	2,518,401.00	2,434,454.00	2,353,306.00	2,274,862.00	2,199,033.00
Total noncurrent liabilities																				
Deferred Tax Liabilities																				
Begin Balance					798,019	891,566	966,405	1,082,632	1,180,342	1,280,181	1,381,734	1,454,809	1,529,658	1,605,337	1,683,013	1,762,867	1,843,551	1,926,145	2,010,748	2,096,802
Additions to Deferred Asset					93,547	74,839	116,227	97,710	99,839	101,553	73,075	74,849	75,679	77,676	79,852	81,684	82,594	84,603	86,054	88,184
Total Deferred Tax Liability					891,566	966,405	1,082,632	1,180,342	1,280,181	1,381,734	1,454,809	1,529,658	1,605,337	1,683,013	1,762,867	1,843,551	1,926,145	2,010,748	2,096,802	2,184,986
Total Liabilities					5,080,041.60	5,017,911.00	5,031,687.60	5,020,215.00	5,015,721.00	5,048,399.00	5,024,393.00	5,005,649.00	5,026,618.00	5,017,835.00	5,053,107.00	5,053,170.00	5,058,729.00	5,069,166.00	5,126,183.00	5,146,232.00
Equity																				
Preserfence Capital	0%																			
Beginning Equity Capital	19,213,753				20,229,331	21,101,857	21,982,212	22,964,167	23,954,701	24,955,062	26,066,231	27,193,295	28,338,281	29,610,570	30,902,756	32,213,247	33,664,681	35,135,685	36,627,501	38,271,893
Additions to Equity (Retained Earnings)					872,526	880,355	981,954	990,535	1,000,361	1,111,170	1,127,063	1,144,986	1,272,289	1,292,186	1,310,492	1,451,434	1,471,004	1,491,816	1,644,392	1,666,888
Deductions form Equity Dividends	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Paid In Capital					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ending Equity Capital					21,101,857	21,982,212	22,964,167	23,954,701	24,955,062	26,066,231	27,193,295	28,338,281	29,610,570	30,902,756	32,213,247	33,664,681	35,135,685	36,627,501	38,271,893	39,938,777
Operating Income					1,382,857	1,388,872	1,526,525	1,533,739	1,542,861	1,684,155	1,712,120	1,733,086	1,908,012	1,932,030	1,953,943	2,148,447	2,172,389	2,196,199	2,409,419	2,437,816
Return On Equity					6.55%	6.32%	6.65%	6.40%	6.18%	6.46%	6.30%	6.12%	6.44%	6.25%	6.07%	6.38%	6.18%	6.00%	6.30%	6.10%
Total Liabilities & Stockholders Equity					26,181,898	27,000,123	27,995,854	28,974,916	29,970,783	31,114,630	32,217,688	33,343,930	34,637,188	35,920,590	37,226,954	38,717,851	40,194,414	41,696,667	43,898,076	45,084,809
Assets					12,997,481	12,835,668	12,710,425	12,548,824	12,389,573	12,271,434	12,112,589	11,955,760	11,841,583	11,686,962	11,533,144	11,429,017	11,278,034	11,129,374	11,013,428	10,868,154
Liabilities & Stockholders Equity less Assets					13,144,017	14,164,455	15,284,829	16,426,092	17,580,810	18,843,196	20,105,099	21,388,170	22,795,605	24,233,628	25,693,810	27,288,834	28,916,380	30,567,293	32,884,648	34,216,655
Dividend					13,144,017	14,164,455	15,284,829	16,426,092	17,580,810	18,843,196	20,105,099	21,388,170	22,795,605	24,233,628	25,693,810	27,288,834	28,916,380	30,567,293	32,884,648	34,196,655
Final Stockholder Equity					12,997,881	12,835,668	12,710,425	12,548,824	12,389,573	12,271,434	12,112,589	11,955,760	11,841,583	11,686,962	11,533,144	11,429,017	11,278,034	11,129,374	11,013,428	10,868,154
Capital Expenditures and Changes in Working Capital																				
Capital Expenditures					149,142.00	150,604.00	151,875.00	153,166.00	154,457.00	155,763.00	157,077.00	158,408.00	159,746.00	161,099.00	162,462.00	163,847.00	165,228.00	166,621.00	168,032.00	169,456.00
Changes in Working Capital																				
Current Assets	413,139				409,968	415,462	458,545	463,180	471,781	718,626	725,994	733,254	784,587	792,427	800,352	858,376	864,940	873,490	934,741	944,088
Current Liabilities	332,978				592,847	896,766	5,312,540	530,855	542,223	580,179	585,981	591,841	633,269	639,602	645,998	691,218	698,130	705,112	754,469	762,014
Working Capital	80,161				183,121	518,696	127,005	328,325	329,558	138,447	140,013	141,413	151,318	152,825	154,354	165,158	166,810	168,378	180,272	182,074
Changes in Working Capital					1,164	1,375	8,309	1,270	1,233	9,069	1,386	1,400	9,906	1,512	1,529	10,804	1,653	1,568	11,794	1,802
CASH FLOW																				
Income from Operations					1,028,373	1,031,008	1,127,585	1,131,872	1,138,496	1,242,728	1,254,226	1,267,910	1,391,116	1,407,255	1,423,529	1,558,770	1,574,762	1,592,116	1,741,368	1,760,608
Non Cash Expense (depreciation)					326,996	318,650	319,940	321,081	320,093	320,608	322,841	322,225	324,976	323,268	323,926	323,707	324,487	323,645	324,842	323,788
Capital Expenditures					149,142	150,604	151,875	153,166	154,457	155,763	157,077	158,408	159,746	161,099	162,462	163,847	165,228	166,621	168,032	169,456
Change in Working Capital					1,164	1,375	8,309	1,270	1,233	9,069	1,386	1,400	9,906	1,512	1,529	10,804	1,653	1,568	11,794	1,802
Net Cash Flows					1,194,864	1,197,879	1,287,341	1,297,963	1,302,798	1,398,584	1,418,604	1,430,327	1,546,446	1,567,726	1,585,464	1,707,816	1,732,374	1,747,473	1,886,384	1,911,138
Period					9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5
PW Factor																				
Discount Rate with growth	8.40%				8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	6.86%				6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%	6.86%
															15.480	15.480	15.480	15.480	15.480	15.480
Annual Present Worth Factor (PW)					0.460	0.429	0.396	0.365	0.337	0.311	0.286	0.263	0.244	0.225	0.207	0.191	0.177	0.163	0.15	0.139
PW of Cashflow					555,632	513,890	509,767	473,756	438,369	434,947	405,721	377,600	377,331	352,739	328,680	326,525	306,525	284,923	283,257	265,517

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base Periods 1-5	6-15	16 - 19	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Accumulated PW of Cashflows	15,674,668			6,672,940	7,186,830	7,696,617	8,170,373	8,608,740	9,043,689	9,449,410	9,827,016	10,204,349	10,557,088	15,624,668	20,674,194	25,420,828	29,830,122	34,210,259	38,326,796
CASH FLOW																			
Income from Operations				642,270	646,967	745,100	750,031	754,614	861,208	947,197	960,750	1,086,035	1,100,645	1,115,272	1,251,855	1,267,704	1,283,573	1,432,580	1,449,878
Depreciation				(640,799)	(646,857)	(653,021)	(659,295)	(665,679)	(672,173)	(575,782)	(581,310)	(586,979)	(592,646)	(598,458)	(604,370)	(610,381)	(616,492)	(622,708)	(629,027)
Capital Expenditures				169,362	150,604	151,875	153,160	154,457	155,763	157,077	158,408	159,746	161,099	162,467	163,837	165,223	166,621	168,032	169,456
Change in Working Capital				1,164	1,175	1,187	1,199	1,211	1,223	1,235	1,247	1,259	1,272	1,285	1,298	1,311	1,324	1,337	1,350
Net Cash Flows				1,132,563	1,142,085	1,237,937	1,254,896	1,264,553	1,368,949	1,364,516	1,382,252	1,503,298	1,530,680	1,549,799	1,681,564	1,711,210	1,741,776	1,875,462	1,907,597
Period				9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5
PW Factor																			
Discount Rate with growth	8.40%			8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	6.46%			6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%
Period Present Worth Factor (PW)				0.465	0.429	0.396	0.365	0.337	0.311	0.286	0.264	0.244	0.225	0.207	0.191	0.177	0.163	0.151	0.139
PW of Cashflow				526,642	489,937	490,223	458,047	426,154	425,819	390,252	364,915	366,805	344,403	4,983,922	4,971,901	4,688,647	4,869,846	4,394,823	4,106,615
Accumulated PW of Cashflows	14,731,588			6,009,321	6,499,258	6,989,481	7,447,528	7,873,672	8,299,491	8,689,743	9,054,658	9,421,463	9,765,866	14,731,588	19,703,494	24,392,141	28,761,827	33,156,650	37,221,265

Rate Case Forecasts																			
Rate Base																			
Plant In Service				20,666,480.00	20,793,739.00	20,922,096.00	21,051,560.00	21,182,143.00	21,313,853.00	21,446,697.00	21,580,692.00	21,715,840.00	21,852,157.00	21,989,653.00	22,128,333.00	22,268,211.00	22,409,299.00	22,551,606.00	22,695,145.00
Accumulated Book Depreciation				(8,277,967.00)	(8,543,567.87)	(8,870,215.45)	(9,167,865.81)	(9,464,351.21)	(9,761,224.54)	(10,060,102.11)	(10,358,386.27)	(10,658,839.26)	(10,957,622.30)	(11,256,859.21)	(11,555,692.17)	(11,855,317.50)	(12,158,515.27)	(12,452,939.38)	(12,751,079.21)
Working Capital				117,571.00	118,696.00	122,005.00	126,275.00	129,558.00	130,627.00	140,013.00	141,413.00	151,333.00	152,825.00	154,354.00	165,158.00	166,810.00	168,478.00	180,272.00	182,074.00
Accumulated Deferred Income Tax				(891,386)	(986,405)	(1,082,622)	(1,180,342)	(1,280,181)	(1,381,736)	(1,454,809)	(1,529,658)	(1,605,837)	(1,683,150)	(1,762,467)	(1,843,551)	(1,926,145)	(2,010,748)	(2,096,802)	(2,184,985)
Rate Base				11,614,447.70	11,352,497.13	11,098,252.55	10,831,627.19	10,567,168.79	10,309,521.46	10,071,798.89	9,834,260.78	9,602,976.74	9,364,204.70	9,124,678.79	8,894,247.83	8,653,754.50	8,413,513.73	8,182,156.62	7,941,154.79
Authorized Return on Rate Base	7.31%			849,016.00	829,868.00	811,136.00	791,792.00	772,460.00	753,626.00	736,248.00	718,884.00	701,978.00	684,523.00	667,014.00	650,170.00	632,590.00	615,028.00	598,116.00	580,498.00
O&M Expenses				476,463.00	490,757.00	505,480.00	520,644.00	536,263.00	552,351.00	557,875.00	563,454.00	569,089.00	574,780.00	580,528.00	586,333.00	592,196.00	598,118.00	604,099.00	610,140.00
Book Depreciation				316,995.83	318,649.57	319,939.58	321,081.36	320,093.40	320,658.33	322,840.57	322,225.11	324,976.04	323,288.04	323,925.91	323,706.96	324,487.33	323,645.77	324,842.11	323,787.83
Remaining Interest Expense				155,848.00	150,653.00	145,631.00	140,777.00	136,084.00	131,548.00	127,163.00	122,924.00	118,827.00	114,866.00	111,037.00	107,336.00	103,758.00	100,300.00	96,956.00	93,724.00
Revenue Requirement				1,798,322.83	1,789,927.57	1,782,186.58	1,774,294.36	1,764,900.40	1,758,183.33	1,744,126.57	1,727,487.11	1,714,870.04	1,697,457.04	1,682,504.91	1,667,545.96	1,653,031.33	1,637,091.77	1,624,013.11	1,608,149.83
O&M Expenses				476,463.00	490,757.00	505,480.00	520,644.00	536,263.00	552,351.00	557,875.00	563,454.00	569,089.00	574,780.00	580,528.00	586,333.00	592,196.00	598,118.00	604,099.00	610,140.00
Depreciation Expense				316,995.83	318,649.57	319,939.58	321,081.36	320,093.40	320,658.33	322,840.57	322,225.11	324,976.04	323,288.04	323,925.91	323,706.96	324,487.33	323,645.77	324,842.11	323,787.83
Interest				155,848.00	150,653.00	145,631.00	140,777.00	136,084.00	131,548.00	127,163.00	122,924.00	118,827.00	114,866.00	111,037.00	107,336.00	103,758.00	100,300.00	96,956.00	93,724.00
Pretax Income				849,016.00	829,868.00	811,136.00	791,792.00	772,460.00	753,626.00	736,248.00	718,884.00	701,978.00	684,523.00	667,014.00	650,170.00	632,590.00	615,028.00	598,116.00	580,498.00
State & Federal Taxes @ 28.89%				245,281.00	239,749.00	234,337.00	228,749.00	223,164.00	217,723.00	212,707.00	207,686.00	202,801.00	197,759.00	192,700.00	187,834.00	182,755.00	177,682.00	172,796.00	167,706.00
After Tax Income				603,735.00	590,119.00	576,799.00	563,043.00	549,296.00	535,903.00	523,540.00	511,198.00	499,177.00	486,764.00	474,314.00	462,336.00	449,835.00	437,346.00	425,320.00	412,792.00
Current Revenue				2,176,316.00	2,198,079.00	2,251,945.00	2,315,464.00	2,399,219.00	2,567,164.00	2,592,836.00	2,618,764.00	2,802,077.00	2,830,098.00	2,858,399.00	3,058,487.00	3,089,072.00	3,119,963.00	3,338,360.00	3,371,744.00
Revenue Requirement				2,043,603.83	2,029,676.57	2,016,324.58	2,003,043.36	1,988,064.40	1,975,906.33	1,956,828.57	1,935,278.11	1,917,671.04	1,895,218.04	1,875,204.91	1,855,379.96	1,835,786.33	1,814,773.77	1,796,809.11	1,779,855.83
Required Revenue Increase				6%	8%	14%	16%	17%	23%	25%	26%	47%	49%	49%	49%	41%	42%	46%	47%
Income from Operations				1,026,374	1,031,008	1,127,585	1,131,317	1,136,645	1,242,718	1,254,226	1,267,910	1,391,116	1,407,051	1,423,529	1,558,770	1,574,767	1,592,116	1,741,348	1,760,608
Return on Rate Base				8.85%	9.08%	10.16%	10.46%	10.75%	12.05%	12.45%	12.89%	14.49%	15.03%	15.58%	17.53%	18.20%	18.92%	21.28%	22.17%
Required Return	7.31%			7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%
Authorized Return				849,016	829,868	811,136	791,792	772,460	753,626	736,248	718,884	701,978	684,523	667,014	650,170	632,590	615,028	598,116	580,498
After Tax Net Income				872,576	880,355	981,954	990,535	1,000,361	1,111,170	1,127,063	1,144,986	1,272,289	1,292,185	1,310,492	1,451,434	1,471,004	1,491,816	1,646,992	1,666,884
Taxes				354,481	357,664	398,940	402,427	406,418	451,437	457,896	465,175	516,896	524,979	532,411	589,677	597,627	606,083	668,871	677,208
Pre tax Net Income				1,227,009	1,238,019	1,380,894	1,392,962	1,406,779	1,562,607	1,584,957	1,610,161	1,789,185	1,817,164	1,842,903	2,041,111	2,068,631	2,097,899	2,315,863	2,344,092
Interest Expense				155,848	150,653	145,631	140,777	136,084	131,548	127,163	122,924	118,827	114,866	111,037	107,336	103,758	100,300	96,956	93,724
Operating Income				1,382,857	1,388,672	1,526,525	1,533,739	1,542,863	1,694,155	1,712,120	1,733,085	1,908,012	1,932,030	1,953,940	2,148,447	2,172,389	2,198,199	2,409,419	2,437,816
Operating Expenses				793,459	809,407	825,420	841,725	858,336	873,009	880,716	885,679	894,065	898,068	904,454	910,040	916,683	921,784	928,941	933,928
Revenue Requirement				2,176,316	2,198,079	2,251,945	2,275,464	2,299,219	2,567,164	2,592,836	2,618,764	2,802,077	2,830,098	2,858,399	3,058,487	3,089,072	3,119,963	3,338,360	3,371,744
Required Return				869,016	829,868	811,136	791,792	772,460	753,626	736,248	718,884	701,978	684,523	667,014	650,170	632,590	615,028	598,116	580,498
Operating Expenses				793,459	809,407	825,420	841,725	858,336	873,009	880,716	885,679	894,065	898,068	904,454	910,040	916,683	921,784	928,941	933,928
Revenue Requirement				1,662,475	1,639,275	1,636,556	1,633,517	1,628,816	1,626,635	1,616,964	1,604,563	1,596,043	1,582,591	1,571,468	1,560,210	1,549,273	1,536,792	1,527,057	1,514,426
Required Rate Increase				6.10%	7.66%	14.26%	15.88%	17.14%	23.03%	24.34%	26.10%	33.56%	33.03%	34.40%	39.14%	40.57%	41.83%	46.18%	47.33%
				10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Proposed Rate Increase																			
Rate Increase Scenario	b			0%	0%	6%	0%	0%	6%	0%	0%	6%	0%	0%	6%	0%	0%	6%	0%
	0			10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
No Increases (Input 2)	2			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
No Rate Increases (Input 2)	3																		
Modest Rate Increases 6% every 3 year period starting in period 1 (Input 4)	4			0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%
Modest Rate Increases (Input 4)	5																		
Required Rate Increases 15% period 1, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)	6			0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%
Required Rate Increases (Input 6)	7			134.1%	134.1%	142.1%	142.1%	142.1%	150.7%	150.7%	150.7%	159.7%	159.7%	159.7%	169.3%	169.3%	169.4%	179.4%	179.4%
	8			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Changes in Balance Sheet Accounts																			
Assets																			
Change in Current Assets (Source negative / Use positive)				6,033	6,094	43,083	6,585	6,651	47,025	7,188	7,260	51,378	7,845	7,925	56,024	8,564	8,650	61,151	9,367
Plant & Equipment																			
Additions (Source negative / Use positive)				149,362	150,604	151,875	153,160	154,457	155,763	157,077	158,408	159,746	161,099	162,467	163,837	165,223	166,621	168,032	169,456
Liabilities																			
Change in Current Liabilities (Source Positive / Use negative)				4,869	4,919	34,774	5,315	5,368	37,956	5,802	5,860	41,428	6,333	6,396	45,220	6,912	6,982	49,357	7,555
Long Term Debt																			
Additional Long Term Debt Source Positive / Use Negative																			
Principal Paid Long term Debt (Source positive / Use negative)				126,091	121,888	117,825	113,897	110,101	106,431	102,881	99,450	96,138	92,938	89,846	86,861	83,967	81,168	78,444	75,829

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchase: Investor-Owned Utility
As of April 28, 2020

S Sewer Industry/PA American - Upper Pottsgrove/Upper Pottsgrove Wastewater System Valuation as of 4.28.2020 - Created 10.14.2020

	Base		Periods																			
	1.5		6.25																			
				16.19	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
Equity																						
Additions to Equity (Source Positive / Use Negative)																						
Dividend (Source Negative / Use Positive)																						
Funds Provided from Operations																						
Sources of Funds:					872,526	880,455	981,954	990,935	1,000,361	1,111,170	1,127,084	1,146,986	1,272,089	1,292,185	1,310,492	1,421,934	1,471,006	1,491,416	1,666,492	1,668,888		
Net Income (Use Negative / Source Positive)					316,996	318,650	419,940	321,081	320,093	320,658	322,845	322,255	324,976	324,784	323,705	324,487	324,646	324,492	324,492	324,492		
Depreciation (Source positive / use negative)					8,869	4,919	34,774	5,315	5,384	17,966	5,862	5,860	41,428	6,333	6,386	45,220	6,917	6,982	49,357	7,345		
Current Liabilities (Source Positive)					1,194,991	1,203,924	1,336,668	1,316,931	1,325,842	1,469,784	1,455,706	1,473,071	1,638,693	1,621,806	1,640,814	1,820,361	1,802,484	1,822,466	2,038,341	1,998,217		
Sources and Uses of Funds																						
Sources of Funds:																						
(Current Liabilities (Source Positive)																						
Uses of Funds																						
(Current Assets - Increase (Use)					6,033	6,959	43,083	6,585	6,651	47,025	7,388	7,261	51,328	7,945	7,925	56,024	8,560	8,606	61,351	9,347		
Fixed Assets - Additions - Increase (Use)					169,342	190,644	254,875	263,196	194,457	155,763	157,077	158,408	159,746	161,099	162,462	163,837	165,223	166,621	168,032	169,456		
Total Uses of Funds					175,375	196,603	298,958	269,781	201,108	202,788	164,465	165,668	211,074	168,044	170,387	219,861	173,783	175,227	229,383	178,803		
Funds from Financing Activities																						
Changes in Debt																						
Increase in Long Term Debt					(126,695)	(171,888)	(117,854)	(111,899)	(110,101)	(110,431)	(102,888)	(99,453)	(96,138)	(92,934)	(89,836)	(86,845)	(84,047)	(81,439)	(78,844)	(76,879)		
Repayment of Long Term Debt																						
Funds from Equity					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Dividends Paid (Use)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Additional Paid in Capital (source)																						
Total Funds from Financing Activities					(126,695)	(171,888)	(117,854)	(111,899)	(110,101)	(110,431)	(102,888)	(99,453)	(96,138)	(92,934)	(89,836)	(86,845)	(84,047)	(81,439)	(78,844)	(76,879)		
Total Funds Needed					917,929	929,338	1,023,889	1,043,289	1,054,623	1,160,565	1,186,534	1,207,990	1,333,483	1,359,928	1,386,991	1,514,669	1,545,669	1,566,605	1,710,964	1,743,585		
Financing																						
Debt				25%	(237,361)	(240,568)	(266,210)	(271,255)	(274,199)	(301,747)	(309,025)	(314,057)	(346,185)	(353,461)	(358,994)	(393,551)	(401,624)	(407,216)	(444,851)	(453,132)		
Equity				75%	(675,568)	(684,750)	(757,679)	(772,034)	(780,424)	(858,818)	(879,510)	(893,933)	(985,298)	(1,006,467)	(1,022,997)	(1,121,118)	(1,144,045)	(1,159,389)	(1,266,113)	(1,290,453)		
Funds Provided by Financing					(913,929)	(925,318)	(1,023,889)	(1,043,289)	(1,054,623)	(1,160,565)	(1,188,536)	(1,207,990)	(1,331,483)	(1,360,928)	(1,381,991)	(1,514,669)	(1,545,669)	(1,566,605)	(1,710,964)	(1,743,585)		

DCI Investor Owned

S:\water industry\PA Americas - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 8-28-2020- Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Income Statement																				
Revenues																				
Annual Revenue Growth rate																				
Subscriber Growth Rate (Annually)		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Periodic Subscriber Growth																				
Growth	0.0%	0.0%	0.0%	0.0%					0.0%					0.0%					0.0%	
Period to Periodic Growth	1																			
Rate Case Activities																				
Periodic Rate Case (years)	typically 3 years																			
Required Rate Increase	Calculated in DCF				68.03%	61.61%	52.19%	52.90%	53.52%	54.18%	54.77%	55.32%	55.96%	56.49%	57.04%	57.66%	58.11%	58.67%	59.13%	59.64%
Proposed Rate Increase	Calculated in DCF				0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Revenue Adjustments	Calculated				1.0%	7.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Base and Forecast	1,473,355				3,405,461	3,643,843	3,680,281	3,717,084	3,754,255	3,791,798	3,829,716	3,868,013	3,906,693	3,945,760	3,985,218	4,025,070	4,065,321	4,105,974	4,147,034	4,188,504
Operating Expenses					18%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Expense Level 1. Operations & Maintenance	354,533				616,241	622,404	628,627	634,913	641,262	647,675	654,152	660,694	667,301	673,974	680,714	687,521	694,396	701,340	708,353	715,437
Expense Level 1. Operations & Maintenance Rate of Change		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Expense Level 2. Not Used	-																			
Expense Level 2. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 4. Not Used	-																			
Expense Level 4. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 5. Not Used	-																			
Expense Level 5. Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Property Taxes	19,206,421																			
Begin Plant					9,944,666	9,989,869	9,637,642	9,683,960	9,334,000	9,185,205	9,039,886	8,895,750	8,751,786	8,611,868	8,472,466	8,334,266	8,199,352	8,063,396	7,930,553	7,805,018
PT Rate % of beginning net plant	0.000%				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Book Depreciation (based on Beginning Year Property Plant & Equipment)					324,799	324,272	327,186	324,933	325,254	323,289	323,577	324,948	322,439	323,531	323,771	322,123	322,753	320,243	322,553	320,629
Total Operating Expenses					941,040	946,675	955,813	959,846	966,516	970,964	977,729	985,642	989,740	997,505	1,004,486	1,009,644	1,017,149	1,021,583	1,030,906	1,036,066
Cost of Operation as % of Revenues (Calculation)					27.6%	26.0%	26.0%	25.8%	25.7%	25.6%	25.5%	25.5%	25.3%	25.3%	25.2%	25.1%	25.0%	24.9%	24.9%	24.7%
Operating Expenses less Depreciation					616,241	622,403	628,627	634,913	641,262	647,675	654,152	660,694	667,301	673,974	680,714	687,521	694,396	701,340	708,353	715,437
Operating Income					2,464,421	2,697,168	2,724,468	2,757,238	2,787,739	2,820,834	2,851,987	2,882,371	2,916,953	2,948,255	2,980,733	3,015,426	3,048,172	3,084,392	3,119,128	3,152,448
Nonoperating Revenues (Expenses)																				
Interest Income																				
Interest Expense																				
Interest Exp as % of Debt	4.12%				90,600	87,580	84,661	81,839	79,111	76,474	73,925	71,460	69,078	66,776	64,550	62,398	60,318	58,308	56,364	54,485
Total nonoperating revenues (expenses)					4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
					90,600.00	87,580.00	84,661.00	81,839.00	79,111.00	76,474.00	73,925.00	71,460.00	69,078.00	66,776.00	64,550.00	62,398.00	60,318.00	58,308.00	56,364.00	54,485.00
Income (loss) before State and Federal Taxes					2,373,821	2,609,588	2,639,807	2,675,399	2,708,628	2,744,360	2,778,062	2,810,911	2,847,875	2,881,479	2,916,183	2,953,028	2,987,854	3,026,084	3,062,764	3,097,963
State and Federal Taxes																				
State and Federal Tax Rate	28.89%				685,797	753,910	762,640	772,922	782,523	792,846	802,582	812,072	822,751	832,459	842,486	853,130	863,191	874,236	884,966	895,001
					28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income After Taxes					1,688,024	1,855,678	1,877,167	1,902,475	1,926,105	1,951,514	1,975,480	1,998,839	2,025,124	2,049,020	2,073,698	2,099,898	2,124,663	2,151,848	2,175,798	2,202,962
Income After Taxes plus Interest					1,778,624	1,943,258	1,961,828	1,984,314	2,005,216	2,027,988	2,049,405	2,070,299	2,094,202	2,115,796	2,138,248	2,162,296	2,184,981	2,210,156	2,232,162	2,257,447
Earnings before Interest, Taxes, Depreciation, & Amortization					1,417,626	1,513,620	1,526,374	1,536,327	1,547,947	1,558,431	1,570,400	1,583,175	1,593,890	1,606,868	1,619,534	1,631,289	1,644,543	1,656,162	1,670,749	1,683,065
Income (loss) before State and Federal Taxes					2,373,821	2,609,588	2,639,807	2,675,397	2,708,628	2,744,360	2,778,062	2,810,911	2,847,875	2,881,479	2,916,183	2,953,028	2,987,854	3,026,084	3,062,764	3,097,963
Book Depreciation					(324,799)	(324,272)	(327,186)	(324,933)	(325,254)	(323,289)	(323,577)	(324,948)	(322,439)	(323,531)	(323,771)	(322,123)	(322,753)	(320,243)	(322,553)	(320,629)
Tax Depreciation					(169,727)	(171,166)	(172,617)	(174,081)	(175,554)	(177,047)	(178,547)	(181,841)	(185,176)	(186,743)	(188,326)	(189,923)	(191,533)	(193,155)	(194,795)	(196,445)
Difference Tax over Book Depreciation					155,072	153,107	154,569	150,852	149,700	146,242	145,030	143,107	137,263	136,788	135,445	132,200	131,220	127,087	127,758	124,174
Income Adjusted for Tax Depreciation					2,528,893	2,762,695	2,794,376	2,826,251	2,858,328	2,890,602	2,923,092	2,954,018	2,985,138	3,018,267	3,051,628	3,085,728	3,119,074	3,153,171	3,187,522	3,222,137
Income Tax Rate					28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income Taxes					730,597	798,143	807,295	816,504	825,771	835,095	844,481	853,916	862,406	871,977	881,615	891,322	901,101	910,951	920,875	930,875
Income After Tax					1,778,296	1,964,552	1,987,081	2,009,747	2,032,557	2,055,507	2,078,611	2,101,907	2,122,731	2,146,276	2,170,013	2,193,908	2,217,918	2,242,220	2,266,647	2,291,262
Deferred Income Taxes					94,800	44,233	44,655	43,582	43,268	42,249	41,899	41,844	39,655	39,538	39,130	38,192	37,910	36,715	36,909	35,874
Accumulated Deferred Income Taxes					(2,140,185)	(2,095,952)	(2,051,297)	(2,007,715)	(1,964,447)	(1,922,218)	(1,880,319)	(1,838,975)	(1,799,320)	(1,759,802)	(1,720,672)	(1,682,480)	(1,644,570)	(1,607,855)	(1,570,946)	(1,535,072)
Income After Taxes (Book Depreciation)					1,688,024	1,855,678	1,877,167	1,902,475	1,926,105	1,951,514	1,975,480	1,998,839	2,025,124	2,049,020	2,073,698	2,099,898	2,124,663	2,151,848	2,175,798	2,202,962
Plus Deferred Taxes					44,800	44,233	44,655	43,582	43,268	42,249	41,899	41,844	39,655	39,538	39,130	38,192	37,910	36,715	36,909	35,874
Plus Interest					90,600	87,580	84,661	81,839	79,111	76,474	73,925	71,460	69,078	66,776	64,550	62,398	60,318	58,308	56,364	54,485
After Tax Income Debt Free					1,823,424	1,899,025	1,921,173	1,940,732	1,961,968	1,985,739	2,007,504	2,028,955	2,054,547	2,076,278	2,099,318	2,124,104	2,147,071	2,173,441	2,195,253	2,221,573
Balance Statement																				
Assets																				
Current Assets																				
Current Asset Balance	412,539				954,529	1,020,276	1,030,479	1,040,384	1,051,191	1,061,701	1,072,320	1,083,044	1,093,874	1,104,813	1,115,861	1,127,020	1,138,290	1,149,673	1,161,170	1,172,781
CA as % of Revenues	28.00%	28.00%	28.00%	28.00%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Balance Statement																				
Property Plant & Equipment																				
Total PP&E																				
Begin Balance					22,695,145.00	22,839,926.00	22,985,956.00	23,133,251.00	23,281,820.00	23,431,669.00	23,582,818.00	23,735,273.00	23,889,050.00	24,044,162.00	24,200,611.00	24,358,418.00	24,517,594.00	24,678,147.00	24,840,090.00	25,003,439.00
Additions					170,893.00	172,339.00	173,800.00	175,273.00	176,755.00	178,257.00	179,766.00	181,291.00	182,831.00	184,380.00	185,945.00	187,525.00	189,116.00	190,721.00	192,342.00	193,974.00
Retirements					(26,112.00)	(26,309.00)	(26,505.00)	(26,704.00)	(26,906.00)	(27,108.00)	(27,311.00)	(27,514.00)	(27,719.00)	(27,931.00)	(28,138.00)	(28,349.00)	(28,563.00)	(28,778.00)	(28,993.00)	(29,209.00)
End Balance	19,206,421.00				22,839,926.00	22,985,956.00	23,133,251.00	23,281,820.00	23,431,669.00	23,582,818.00	23,735,273.00	23,889,050.00	24,044,162.00	24,200,611.00	24,358,418.00	24,517,594.00	24,678,147.00	24,840,090.00	25,003,439.00	25,168,204.00
End Balance Check					22,839,926.00	22,985,956.00	23,133,251.00	23,281,820.00	23,431,669.00	23,582,818.00	23,735,273.00	23,889,050.00	24,044,162.00	24,200,611.00	24,358,418.00	24,517,594.00	24,678,147.00	24,840,090.00	25,003,439.00	25,168,204.00
Book Depreciation of Property, Plant, & Equipment																				
Total Book Depreciation																				
Begin Balance					(12,751,079.71)	(13,050,056.78)	(13,348,113.92)	(13,649,291.32)	(13,947,819.95)	(14,246,466.38)	(14,542,952.60)	(14,839,523.12)	(15,137,264.22)	(15,432,293.63)	(15,728,205.44)	(16,024,152.04)	(16,318,242.22)	(16,612,751.13)	(16,908,536.61)	(17,198,620.75)
Depreciation					(324,798.57)	(324,272.14)	(327,186.40)	(324,934.63)	(325,254.43)	(323,288.62)	(323,577.12)	(324,948.10)	(322,439.41)	(323,530.81)	(323,770.62)	(322,123.16)	(322,752.91)	(320,242.50)	(322,553.12)	(320,619.17)
Retirements					25,871.00	26,013.00	26,299.00	26,406.00	26,626.00	26,803.00	27,006.00	27,207.00	27,410.00	27,619.00	27,824.00	28,033.00	28,244.00	28,457.00	28,669.00	28,883.00

DCF Investor Owned

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Accumulated PW of Cashflows	15,624,668				42,152,380	45,936,027	49,521,749	52,822,066	55,919,752	58,776,343	61,455,967	63,955,488	66,270,141	68,432,324	70,438,760	72,321,458	74,078,528	75,706,817	77,204,761	78,605,862
CASH FLOW																				
Income from Operations					1,798,296	1,964,552	1,987,081	2,009,747	2,032,557	2,055,507	2,078,611	2,100,602	2,122,732	2,146,290	2,170,013	2,193,906	2,217,973	2,242,220	2,266,647	2,291,267
Depreciation					(169,727)	(171,165)	(172,617)	(174,081)	(175,556)	(177,047)	(178,547)	(181,841)	(185,176)	(186,743)	(188,326)	(189,923)	(191,533)	(193,156)	(194,795)	(196,445)
Capital Expenditures					170,893	172,339	173,800	175,273	176,755	178,257	179,766	181,291	182,831	184,380	185,945	187,525	189,116	190,721	192,342	193,974
Change in Working Capital					1,821	12,872	1,988	1,988	2,006	2,026	2,047	2,069	2,088	2,110	2,131	2,152	2,173	2,196	2,217	2,239
Net Cash Flows					1,799,309	1,950,508	1,983,930	2,006,967	2,029,350	2,052,269	2,075,345	2,099,083	2,122,989	2,146,543	2,170,263	2,196,152	2,218,217	2,242,458	2,266,883	2,291,494
Period					25.5	26.5	27.5	28.5	29.5	30.5	31.5	32.5	33.5	34.5	35.5	36.5	37.5	38.5	39.5	40.5
PW Factor																				
Discount Rate with growth	8.40%				8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	6.46%				6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%
					15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480
Period Present Worth Factor (PW)					0.228	0.218	0.169	0.1	0.093	0.085	0.079	0.073	0.067	0.062	0.057	0.053	0.049	0.045	0.041	0.038
PW of Cashflow					1,367,797	1,362,872	1,347,525	1,106,166	2,921,533	2,700,376	2,537,981	2,377,094	2,201,879	2,060,166	1,914,951	1,800,170	1,687,562	1,562,096	1,438,765	1,347,998
Accumulated PW of Cashflows	14,731,588				40,778,582	44,341,454	47,688,979	50,795,125	53,716,658	56,417,034	58,955,015	61,327,063	63,528,942	65,589,108	67,504,061	69,304,231	70,991,793	72,548,889	73,987,654	75,335,652

Rate Case Forecast																				
Rate Base																				
Plant in Service					22,839,926.00	22,985,956.00	23,133,251.00	23,281,820.00	23,431,669.00	23,582,838.00	23,735,273.00	23,889,050.00	24,044,162.00	24,200,611.00	24,358,418.00	24,517,594.00	24,678,147.00	24,840,090.00	25,003,439.00	25,168,204.00
Accumulated Book Depreciation					(14,050,056.78)	(13,368,313.92)	(13,649,291.32)	(13,947,819.95)	(14,246,468.38)	(14,542,952.00)	(14,839,523.12)	(15,137,264.22)	(15,432,293.63)	(15,728,205.44)	(16,024,157.06)	(16,318,242.22)	(16,612,751.13)	(16,904,536.63)	(17,194,420.75)	(17,490,156.92)
Working Capital					183,895.00	196,767.00	198,755.00	200,723.00	202,729.00	204,757.00	206,804.00	208,873.00	210,961.00	213,071.00	215,202.00	217,354.00	219,527.00	221,723.00	223,940.00	226,179.00
Accumulated Deferred Income Tax					(2,140,180)	(2,035,952)	(2,051,797)	(2,067,715)	(1,964,467)	(1,922,218)	(1,880,159)	(1,838,975)	(1,799,320)	(1,759,802)	(1,720,672)	(1,682,480)	(1,644,570)	(1,607,855)	(1,570,946)	(1,535,072)
Rate Base					7,833,579.22	7,738,457.08	7,631,397.68	7,527,008.05	7,423,462.62	7,322,405.00	7,222,234.88	7,121,683.78	7,024,509.37	6,925,674.56	6,828,795.94	6,734,225.78	6,640,352.87	6,549,421.37	6,458,012.25	6,369,154.08
Authorized Return on Rate Base	7.31%				572,635.00	565,681.00	557,855.00	550,224.00	542,655.00	535,268.00	527,945.00	520,595.00	513,419.00	506,267.00	499,185.00	492,272.00	485,410.00	478,763.00	472,081	465,585.00
O&M Expenses					616,241.00	622,403.00	628,627.00	634,913.00	641,262.00	647,675.00	654,152.00	660,694.00	667,301.00	673,974.00	680,714.00	687,521.00	694,396.00	701,340.00	708,353.00	715,437.00
Book Depreciation					324,798.57	324,272.14	327,186.40	324,934.63	325,254.43	323,288.62	323,577.12	324,948.10	322,439.41	323,530.81	323,770.62	322,123.16	322,752.91	320,242.50	322,553.12	320,619.17
Ratemaking Interest Expense					90,600.00	87,580.00	84,661.00	81,839.00	79,111.00	76,474.00	73,925.00	71,460.00	69,078.00	66,776.00	64,550.00	62,398.00	60,318.00	58,308.00	56,364.00	54,485.00
Revenue Requirement					1,604,274.57	1,599,936.14	1,598,329.40	1,591,910.63	1,588,282.43	1,582,705.62	1,579,599.12	1,577,697.10	1,572,237.41	1,570,547.81	1,568,219.62	1,564,314.16	1,562,876.91	1,558,653.50	1,559,353.12	1,556,126.17
O&M Expenses					616,241.00	622,403.00	628,627.00	634,913.00	641,262.00	647,675.00	654,152.00	660,694.00	667,301.00	673,974.00	680,714.00	687,521.00	694,396.00	701,340.00	708,353.00	715,437.00
Depreciation Expense					324,798.57	324,272.14	327,186.40	324,934.63	325,254.43	323,288.62	323,577.12	324,948.10	322,439.41	323,530.81	323,770.62	322,123.16	322,752.91	320,242.50	322,553.12	320,619.17
Interest					90,600.00	87,580.00	84,661.00	81,839.00	79,111.00	76,474.00	73,925.00	71,460.00	69,078.00	66,776.00	64,550.00	62,398.00	60,318.00	58,308.00	56,364.00	54,485.00
Pretax Income					572,635.00	565,681.00	557,855.00	550,224.00	542,655.00	535,268.00	527,945.00	520,595.00	513,419.00	506,267.00	499,185.00	492,272.00	485,410.00	478,763.00	472,081.00	465,585.00
State & Federal Taxes @ 28.80%					165,434.00	163,425.00	163,164.00	158,960.00	156,773.00	154,639.00	152,523.00	150,400.00	148,327.00	146,261.00	144,215.00	142,217.00	140,235.00	138,315.00	136,364.00	134,508.00
After Tax Income					407,201.00	402,256.00	396,691.00	391,264.00	385,882.00	380,629.00	375,422.00	370,195.00	365,092.00	360,006.00	354,970.00	350,055.00	345,175.00	340,448.00	335,697.00	331,077.00
Current Revenue					3,405,461.00	3,643,843.00	3,680,261.00	3,717,084.00	3,754,255.00	3,791,798.00	3,829,716.00	3,868,013.00	3,906,693.00	3,945,760.00	3,985,218.00	4,025,070.00	4,065,321.00	4,105,974.00	4,147,034.00	4,188,504.00
Revenue Requirement					1,769,708.57	1,763,361.14	1,759,493.40	1,750,870.63	1,745,055.43	1,737,344.62	1,732,122.12	1,728,097.10	1,720,564.41	1,716,808.81	1,712,434.62	1,706,531.16	1,703,111.91	1,696,968.50	1,695,745.12	1,690,634.17
Required Revenue Increase					48%	52%	52%	53%	54%	54%	55%	55%	56%	56%	57%	58%	58%	59%	59%	60%
Income from Operations					1,798,296	1,964,552	1,987,081	2,009,747	2,032,557	2,055,507	2,078,611	2,100,602	2,122,732	2,146,290	2,170,013	2,193,906	2,217,973	2,242,220	2,266,647	2,291,267
Return on Rate Base					22.71%	25.11%	25.71%	26.36%	27.01%	27.70%	28.38%	29.07%	29.82%	30.55%	31.31%	32.12%	32.90%	33.75%	34.56%	35.44%
Required Return	7.31%				7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%
Authorized Return					572,635	565,681	557,855	550,224	542,655	535,268	527,945	520,595	513,419	506,267	499,185	492,272	485,410	478,763	472,081	465,585
After Tax Net Income					1,668,024	1,850,678	1,877,167	1,902,475	1,926,105	1,951,514	1,975,680	1,998,839	2,025,174	2,049,020	2,073,698	2,099,898	2,124,663	2,151,848	2,176,798	2,202,962
Taxes					665,797	753,910	762,640	772,922	782,523	792,846	802,582	812,072	822,751	832,499	842,486	853,130	863,191	874,236	883,966	895,021
Pre-tax Net Income					2,333,821	2,604,588	2,639,807	2,675,397	2,708,628	2,744,360	2,778,262	2,810,911	2,847,925	2,881,479	2,916,183	2,953,028	2,987,854	3,026,084	3,059,764	3,097,983
Interest Expense					90,600	87,580	84,661	81,839	79,111	76,474	73,925	71,460	69,078	66,776	64,550	62,398	60,318	58,308	56,364	54,485
Operating Income					2,464,421	2,692,168	2,724,468	2,757,236	2,787,739	2,820,834	2,851,987	2,882,371	2,916,953	2,948,255	2,980,733	3,015,426	3,048,172	3,084,392	3,116,128	3,152,468
Operating Expenses					941,040	946,675	955,813	959,848	966,516	970,964	977,729	985,642	989,740	997,505	1,004,485	1,009,644	1,017,149	1,021,583	1,030,906	1,038,056
Revenue Requirement					3,405,461	3,643,843	3,680,281	3,717,084	3,754,255	3,791,798	3,829,716	3,868,013	3,906,693	3,945,760	3,985,218	4,025,070	4,065,321	4,105,974	4,147,034	4,188,504
Required Return					572,635	565,681	557,855	550,224	542,655	535,268	527,945	520,595	513,419	506,267	499,185	492,272	485,410	478,763	472,081	465,585
Operating Expenses					941,040	946,675	955,813	959,848	966,516	970,964	977,729	985,642	989,740	997,505	1,004,485	1,009,644	1,017,149	1,021,583	1,030,906	1,038,056
Revenue Requirement					1,513,675	1,512,356	1,513,668	1,510,072	1,509,171	1,506,232	1,505,674	1,506,237	1,503,159	1,503,772	1,503,670	1,501,916	1,502,559	1,500,346	1,502,987	1,503,641
Required Rate Increase					48.03%	51.61%	52.15%	52.90%	53.52%	54.16%	54.77%	55.32%	55.96%	56.49%	57.03%	57.60%	58.11%	58.67%	59.11%	59.64%
					26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Proposed Rate Increase																				
Rate Increase Scenario	0				0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	0				26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
No Increases (Input 2)	2				0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
No Rate Increases (Input 2)	3																			
Modest Rate Increases: 6% every 3 year period starting in period 3 (Input 4)	4				0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%
Modest Rate Increases (Input 4)	5																			
Required Rate Increases: 15% period 3, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)	6				0.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Required Rate Increases (Input 6)	7				179.4%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%
	4				0.0%	0.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%
Changes in Balance Sheet Accounts																				
Assets																				
Change in Current Assets (Source negative / Use positive)					9,441	66,747	10,203	10,805	10,407	10,512	10,617	10,724	10,830	10,939	11,048	11,159	11,270	11,383	11,497	11,611
Plant & Equipment																				
Additions (Source negative / Use positive)					170,893	172,339	173,800	175,273	176,755	178,257	179,766	181,291	182,831	184,380	185,945	187,525	189,116	190,721	192,342	193,974
Liabilities																				
Change in Current Liabilities (Source Positive / Use negative)					7,620	53,875	8,235	8,317	8,401	8,484	8,570	8,655	8,742	8,829	8,917	9,007	9,097	9,187	9,280	9,372
Long Term Debt																				
Additional Long Term Debt Source Positive / Use Negative																				
Principal Paid Long term Debt (Source positive / Use negative)					73,301	70,858	68,496	66,213	64,008	61,872	59,810	57,816	55,889	54,026	52,225	50,484	48,801	47,175	45,602	44,082

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28.xlsx, Created 10/14/2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base		Period:																		
	1-5		6-15	16 - 19	20	21	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Equity																				
Additions to Equity (Source Positive / Use Negative)																				
Dividend (Source negative / Use Positive)																				
Funds Provided from Operations																				
Sources of Funds																				
Net Income (Use Negative / Source Positive)					1,688,024	1,855,678	1,877,367	1,902,676	1,926,110	1,951,514	1,976,480	1,998,839	2,025,174	2,049,026	2,073,698	2,099,895	2,126,663	2,152,464	2,176,796	2,202,962
Depreciation (Source positive/ Use negative)					326,799	324,274	322,386	324,936	326,254	325,289	323,577	324,968	322,439	323,531	323,773	322,223	321,753	320,243	322,554	320,419
Current Liabilities (Source Positive)					7,620	53,875	8,235	14,317	8,401	8,484	6,570	8,655	8,742	8,829	8,917	9,007	9,097	9,187	9,286	9,377
Total Sources of Funds					2,020,443	2,233,825	2,207,988	2,241,929	2,260,764	2,285,287	2,306,627	2,332,462	2,356,355	2,381,386	2,406,388	2,431,078	2,456,513	2,481,777	2,507,631	2,530,758
Uses of Funds																				
Current Liabilities (Source Positive)																				
Uses of Funds																				
Current Assets, Increase (Use)					9,443	66,747	10,203	10,325	10,407	10,512	10,617	10,724	10,830	10,939	11,048	11,159	11,270	11,384	11,497	11,611
Fixed Assets, Additions (Use)					170,893	172,139	172,600	175,273	176,755	178,257	179,766	181,291	182,831	184,390	185,965	187,575	189,116	190,721	192,341	193,976
Total Uses of Funds					180,336	238,886	182,803	185,598	187,162	188,769	190,383	192,015	193,661	195,329	196,993	198,734	200,386	202,104	203,839	205,585
Funds from Financing Activities																				
Change in Cash																				
Increase in Long Term Debt					(73,301)	(70,858)	(68,496)	(66,213)	(64,006)	(61,872)	(59,810)	(57,816)	(55,889)	(54,026)	(52,225)	(50,484)	(48,801)	(47,176)	(45,602)	(44,080)
Repayment of Long Term Debt																				
Funds from Equity																				
Dividends Paid (Use)					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Paid in Capital (Issuance)																				
Total Funds from Financing Activities					(73,301.00)	(70,858.00)	(68,496.00)	(66,213.00)	(64,006.00)	(61,872.00)	(59,810.00)	(57,816.00)	(55,889.00)	(54,026.00)	(52,225.00)	(50,484.00)	(48,801.00)	(47,176.00)	(45,602.00)	(44,080.00)
Total Funds, Needed					1,766,828.05	1,924,861.80	1,962,289.00	1,987,936.00	2,008,599.00	2,032,645.00	2,057,434.00	2,082,631.00	2,106,752.00	2,132,035.00	2,157,168.00	2,181,860.00	2,207,326.00	2,231,998.00	2,258,190.00	2,283,286.00
Financing																				
Debt			70%		(959,370.00)	(560,209.00)	(509,674.00)	(515,823.00)	(522,234.00)	(526,688.00)	(534,933.00)	(541,479.00)	(547,756.00)	(554,329.00)	(560,864.00)	(567,286.00)	(573,905.00)	(580,319.00)	(587,129.00)	(594,654.00)
Equity			30%		(1,387,438.00)	(1,423,672.00)	(1,450,466.00)	(1,468,113.00)	(1,485,358.00)	(1,505,958.00)	(1,522,501.00)	(1,541,152.00)	(1,558,996.00)	(1,577,706.00)	(1,596,304.00)	(1,614,574.00)	(1,633,421.00)	(1,651,679.00)	(1,671,061.00)	(1,689,632.00)
Funds Provided by Financing					(1,766,808.00)	(1,983,881.00)	(1,960,140.00)	(1,983,936.00)	(2,007,592.00)	(2,032,646.00)	(2,057,434.00)	(2,082,631.00)	(2,106,752.00)	(2,132,035.00)	(2,157,168.00)	(2,181,860.00)	(2,207,326.00)	(2,231,998.00)	(2,258,190.00)	(2,283,286.00)

DCF Investor Owned

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Income Statement																				
Revenues																				
Annual Revenue Growth rate																				
Subscriber Growth Rate (Annually)		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Periodic Subscriber Growth																				
Growth	0.0%	0.0%	0.0%	0.0%				0.0%					0.0%							
Period for Periodic Growth	5																	0.0%		
Rate Case Activities																				
Periodic Rate Case (years)	typically 3 years																			
Required Rate Increase	Calculated in DCF				60.10%	60.61%	61.09%	61.55%	61.99%	62.38%	62.75%	63.10%	63.44%	64.01%	64.35%	64.76%	65.12%	65.46%	65.87%	66.21%
Proposed Rate Increase	Calculated in DCF				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Revenue Adjustments	Calculated				1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Base and Forecast	1,473,855				4,232,389	4,272,893	4,315,420	4,358,574	4,402,160	4,446,182	4,490,644	4,535,550	4,580,906	4,626,715	4,672,982	4,719,712	4,766,909	4,814,578	4,862,724	4,911,351
Operating Expenses					17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Expense Level 1: Operations & Maintenance	854,533				722,391	729,617	737,113	744,486	751,931	759,450	767,045	774,715	782,462	790,287	798,190	806,172	814,234	822,376	830,600	838,906
Expense Level 1: Operations & Maintenance Rate of Change		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Expense Level 2: Not Used	-																			
Expense Level 2: Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 4: Not Used	-																			
Expense Level 4: Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Expense Level 5: Not Used	-																			
Expense Level 5: Not Used Rate of Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Property Taxes	19,206,421																			
Begin Plant					7,678,047	7,592,566	7,492,867	7,311,365	7,199,085	7,081,182	6,967,798	6,857,633	6,749,882	6,645,375	6,543,458	6,444,089	6,342,922	6,247,592	6,154,090	6,064,469
PT Rate % of beginning net plant	0.000%				0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Book Depreciation (based on Beginning Year Property, Plant & Equipment)					670,771	818,651	818,228	816,594	715,922	717,119	715,634	714,988	713,466	712,674	714,940	712,526	711,516	711,579	709,565	710,890
Total Operating Expenses					1,043,868	1,048,068	1,055,241	1,061,086	1,067,853	1,076,069	1,082,679	1,089,701	1,096,976	1,102,963	1,113,130	1,118,678	1,125,750	1,133,905	1,140,105	1,149,797
Cost of Operation as % of Revenues (Calculation)					24.7%	24.5%	24.5%	24.4%	24.3%	24.2%	24.1%	24.0%	23.9%	23.8%	23.8%	23.7%	23.6%	23.5%	23.5%	23.4%
Operating Expenses less Depreciation					372,591	729,617	737,115	744,486	751,931	759,450	767,045	774,715	782,462	790,287	798,190	806,172	814,234	822,376	830,600	838,906
Operating Income					4,167,021	4,224,225	4,260,177	4,297,488	4,334,307	4,369,113	4,407,965	4,445,847	4,484,980	4,523,754	4,559,852	4,601,034	4,641,159	4,680,673	4,722,619	4,761,554
Nonoperating Revenues (Expenses)																				
Interest Income																				
Interest Expense					52,669	50,913	49,216	47,576	45,990	44,457	42,975	41,543	40,158	38,819	37,525	36,274	35,065	33,896	32,767	31,674
Interest Exp as % of Debt	4.12%				4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
Total nonoperating revenues (expenses)					52,669.00	50,913.00	49,216.00	47,576.00	45,990.00	44,457.00	42,975.00	41,543.00	40,158.00	38,819.00	37,525.00	36,274.00	35,065.00	33,896.00	32,767.00	31,674.00
Income (loss) before State and Federal Taxes					4,114,352	4,173,312	4,210,961	4,249,919	4,288,317	4,325,156	4,364,990	4,404,304	4,444,822	4,484,935	4,522,327	4,564,760	4,606,094	4,646,777	4,689,852	4,729,880
State and Federal Taxes																				
State and Federal Tax Rate	28.89%				905,514	916,770	927,647	938,902	949,995	960,638	972,146	983,504	995,209	1,006,298	1,017,660	1,029,859	1,041,801	1,053,558	1,065,998	1,077,562
					28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income After Taxes					2,228,838	2,256,542	2,283,314	2,311,018	2,338,322	2,364,518	2,392,844	2,420,800	2,449,613	2,478,637	2,504,667	2,534,901	2,564,293	2,593,219	2,623,854	2,652,318
Income After Taxes plus Interest					2,281,507	2,307,455	2,332,530	2,358,594	2,384,312	2,408,975	2,435,819	2,462,343	2,489,771	2,516,956	2,542,192	2,571,175	2,599,358	2,627,115	2,656,621	2,683,992
Earnings before Interest, Taxes, Depreciation, & Amortization					1,696,770	1,709,336	1,723,011	1,736,286	1,750,239	1,765,456	1,779,307	1,793,827	1,808,026	1,822,832	1,839,592	1,853,822	1,869,078	1,885,094	1,900,128	1,917,321
Income (loss) before State and Federal Taxes					4,114,352	4,173,312	4,210,961	4,249,919	4,288,317	4,325,156	4,364,990	4,404,304	4,444,822	4,484,935	4,522,327	4,564,760	4,606,094	4,646,777	4,689,852	4,729,880
Book Depreciation					(670,771)	(818,651)	(818,228)	(816,594)	(715,922)	(717,119)	(715,634)	(714,988)	(713,466)	(712,674)	(714,940)	(712,526)	(711,516)	(711,579)	(709,565)	(710,890)
Tax Depreciation					(198,113)	(206,482)	(214,979)	(216,806)	(218,651)	(220,508)	(222,385)	(224,275)	(226,183)	(228,108)	(230,068)	(232,003)	(233,981)	(235,973)	(237,980)	(240,008)
Difference Tax over Book Depreciation					122,460	112,169	103,249	99,787	97,271	96,611	93,248	90,712	87,281	84,566	84,872	80,523	77,535	75,394	71,577	70,883
Income Adjusted for Tax Depreciation					3,251,017	3,280,681	3,314,110	3,349,706	3,385,588	3,421,767	3,458,239	3,495,017	3,532,103	3,569,503	3,607,259	3,645,261	3,683,629	3,722,333	3,761,374	3,800,763
Income Tax Rate					28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%	28.89%
Income Taxes					940,952	949,175	957,446	967,736	978,096	988,548	999,085	1,009,710	1,020,423	1,031,230	1,042,126	1,053,115	1,064,200	1,075,382	1,086,661	1,098,040
Income After Tax					2,336,065	2,336,306	2,356,664	2,382,970	2,407,492	2,433,219	2,459,154	2,485,307	2,511,678	2,538,273	2,565,093	2,592,145	2,619,429	2,646,951	2,674,713	2,702,721
Deferred Income Taxes					35,438	32,405	29,799	28,829	28,101	27,910	26,939	26,206	25,216	24,432	24,526	23,257	22,399	21,829	20,663	20,478
Accumulated Deferred Income Taxes					(1,499,634)	(1,467,229)	(1,437,430)	(1,408,601)	(1,380,500)	(1,352,590)	(1,325,651)	(1,299,445)	(1,274,229)	(1,249,797)	(1,225,271)	(1,202,014)	(1,179,615)	(1,157,787)	(1,137,124)	(1,116,646)
Income After Taxes (Book Depreciation)					2,228,838	2,256,542	2,283,314	2,311,018	2,338,322	2,364,518	2,392,844	2,420,800	2,449,613	2,478,637	2,504,727	2,534,901	2,564,293	2,593,223	2,623,854	2,652,318
Plus Deferred Taxes					35,438	32,405	29,799	28,829	28,101	27,910	26,939	26,206	25,216	24,432	24,526	23,257	22,399	21,829	20,663	20,478
Plus Interest					52,669	50,913	49,216	47,576	45,990	44,457	42,975	41,543	40,158	38,819	37,525	36,274	35,065	33,896	32,767	31,674
After Tax Income Debt Free					2,246,069	2,275,050	2,302,731	2,329,765	2,356,213	2,381,865	2,408,886	2,436,137	2,464,555	2,492,526	2,517,726	2,547,918	2,576,959	2,605,291	2,635,958	2,663,514
Balance Statement																				
Assets																				
Current Assets																				
Current Asset Balance	412,539				1,184,569	1,196,364	1,208,318	1,220,401	1,232,605	1,244,931	1,257,380	1,269,954	1,282,654	1,295,481	1,308,436	1,321,519	1,334,735	1,348,082	1,361,563	1,375,178
CA as % of Revenues	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%
Balance Statement																				
Property Plant & Equipment																				
Total PP&E																				
Begin Balance					26,168,204.00	25,394,398.00	25,502,833.00	25,671,120.00	25,841,672.00	26,013,705.00	26,187,231.00	26,362,264.00	26,538,816.00	26,716,903.00	26,896,535.00	27,077,727.00	27,260,492.00	27,444,848.00	27,630,807.00	27,818,381.00
Additions					196,622.00	197,285.00	198,959.00	200,650.00	202,357.00	204,076.00	205,814.00	207,562.00	209,328.00	211,107.00	212,905.00	214,716.00	216,545.00	218,389.00	220,249.00	222,124.00
Retirements					(29,428.00)	(29,650.00)	(29,872.00)	(30,098.00)	(30,324.00)	(30,550.00)	(30,780.00)	(31,010.00)	(31,241.00)	(31,475.00)	(31,711.00)	(31,951.00)	(32,189.00)	(32,430.00)	(32,675.00)	(32,918.00)
End Balance	19,206,421.00				25,335,398.00	25,502,033.00	25,671,120.00	25,841,672.00	26,013,705.00	26,187,231.00	26,362,264.00	26,538,816.00	26,716,903.00	26,896,535.00	27,077,727.00	27,260,492.00	27,444,848.00	27,630,807.00	27,818,381.00	28,007,587.00
End Balance Check					25,394,398.00	25,502,033.00	25,671,120.00	25,841,672.00	26,013,705.00	26,187,231.00	26,362,264.00	26,538,816.00	26,716,903.00	26,896,535.00	27,077,727.00	27,260,492.00	27,444,848.00	27,630,807.00	27,818,381.00	28,007,587.00
Book Depreciation of Property, Plant & Equipment																				
Total Book Depreciation																				
Begin Balance					(17,490,156.92)	(17,781,633.47)	(18,071,166.92)	(18,359,755.17)	(18,646,586.67)	(18,932,522.95)	(19,219,412.92)	(19,504,630.60)	(19,788,954.32)	(20,071,526.34)	(20,353,078.82)	(20,636,657.82)	(20,917,570.18)	(21,197,254.19)	(21,476,716.98)	(21,754,911.95)
Depreciation					(320,776.55)	(318,651.45)	(318,128.25)	(316,593.50)	(315,922.28)	(317,178.97)	(315,613.68)	(314,987.72)	(313,464.24)	(312,674.26)	(314,940.00)	(312,526.32)	(311,516.01)	(311,526.77)	(309,504.99)	(310,891.13)
Retirements					29,550.00	29,319.00	29,539.00	29,762.00	29,986.00	30,209.00	30,436.00	30,664.00	30,892.00	31,124.00	31,359.00	31,596.00	31,833.00	32,068.00	32,310.00	32,551.00

DCF Investor Owned

S:\water industry\PA Americas - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation.xlsx] 4-28-2020 Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	1-5	Periods 6-15	16-19	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
End Balance					(17,781,833.47)	(18,071,166.92)	(18,359,755.17)	(18,648,586.67)	(18,932,522.95)	(19,219,432.92)	(19,504,630.60)	(19,788,954.32)	(20,071,526.56)	(20,353,076.62)	(20,636,657.82)	(20,917,570.14)	(21,197,256.19)	(21,476,716.96)	(21,753,911.95)	(22,032,252.08)
End Balance Check					(17,781,833.47)	(18,071,166.92)	(18,359,755.17)	(18,648,586.67)	(18,932,522.95)	(19,219,432.92)	(19,504,630.60)	(19,788,954.32)	(20,071,526.56)	(20,353,076.62)	(20,636,657.82)	(20,917,570.14)	(21,197,256.19)	(21,476,716.96)	(21,753,911.95)	(22,032,252.08)
Net Plant																				
Begin Balance					7,678,047.08	7,552,564.53	7,430,867.08	7,311,364.83	7,195,085.33	7,081,182.05	6,967,798.08	6,857,633.40	6,749,861.68	6,645,376.44	6,543,458.18	6,441,089.18	6,342,921.86	6,247,591.81	6,154,090.04	6,064,469.05
End Balance					7,552,564.53	7,430,867.08	7,311,364.83	7,195,085.33	7,081,182.05	6,967,798.08	6,857,633.40	6,749,861.68	6,645,376.44	6,543,458.18	6,441,089.18	6,342,921.86	6,247,591.81	6,154,090.04	6,064,469.05	5,975,334.92
Total Asset					8,737,973.53	8,627,221.08	8,519,682.83	8,415,486.33	8,313,787.05	8,212,729.08	8,115,013.40	8,019,815.68	7,928,030.44	7,838,938.18	7,749,504.18	7,664,440.86	7,582,326.81	7,502,172.88	7,426,032.05	7,350,512.92
Tax Depreciation of Property, Plant, & Equipment																				
Total MACRS Depreciation																				
Begin Balance																				
Depreciation					(198,111.87)	(206,482.12)	(214,979.43)	(216,808.46)	(214,650.92)	(220,508.43)	(222,385.43)	(224,275.49)	(226,182.89)	(228,105.52)	(230,047.69)	(232,005.09)	(233,980.91)	(235,973.03)	(237,982.53)	(240,008.29)
Retirements					29,428.00	29,650.00	29,872.00	30,098.00	30,324.00	30,550.00	30,780.00	31,010.00	31,241.00	31,475.00	31,711.00	31,951.00	32,189.00	32,430.00	32,675.00	32,918.00
End Balance					(156,683.87)	(176,832.12)	(185,107.43)	(186,708.46)	(184,326.92)	(189,958.43)	(191,605.43)	(193,265.49)	(194,941.89)	(196,630.52)	(198,336.69)	(200,054.09)	(201,791.91)	(203,543.03)	(205,307.53)	(207,090.29)
End Balance Check					(156,683.87)	(176,832.12)	(185,107.43)	(186,708.46)	(184,326.92)	(189,958.43)	(191,605.43)	(193,265.49)	(194,941.89)	(196,630.52)	(198,336.69)	(200,054.09)	(201,791.91)	(203,543.03)	(205,307.53)	(207,090.29)
Net Plant																				
Begin Balance					25,168,204.00	25,334,998.00	25,502,631.00	25,671,170.00	25,841,672.00	26,013,705.00	26,187,231.00	26,362,264.00	26,538,816.00	26,716,903.00	26,896,535.00	27,077,727.00	27,260,492.00	27,444,846.00	27,630,807.00	27,818,387.00
End Balance					25,166,714.13	25,325,200.88	25,486,012.57	25,654,961.52	25,825,378.08	25,997,272.57	26,170,658.57	26,345,550.51	26,521,961.11	26,699,904.48	26,879,392.31	27,060,437.91	27,243,056.09	27,427,263.91	27,613,079.47	27,800,496.71
Tax					(198,111.87)	(206,482.12)	(214,979.43)	(216,808.46)	(214,650.92)	(220,508.43)	(222,385.43)	(224,275.49)	(226,182.89)	(228,105.52)	(230,047.69)	(232,005.09)	(233,980.91)	(235,973.03)	(237,982.53)	(240,008.29)
Book					(320,776.56)	(318,661.45)	(318,128.25)	(316,593.50)	(315,922.28)	(317,118.97)	(315,843.68)	(314,987.72)	(313,454.24)	(312,674.26)	(314,940.02)	(312,506.32)	(311,516.05)	(311,528.77)	(309,504.96)	(310,891.15)
					122,664.69	112,179.33	103,148.82	99,787.02	99,271.36	96,610.54	93,458.25	89,287.77	87,271.35	84,568.74	84,892.33	80,501.23	77,535.14	75,555.74	71,521.46	70,882.86
Balance Statement																				
Liabilities																				
Current Liabilities																				
Current Liabilities	332,978				916,068	966,629	975,285	985,098	994,868	1,004,837	1,014,886	1,025,034	1,035,285	1,045,638	1,056,094	1,066,655	1,077,321	1,088,095	1,098,976	1,109,965
CL as % of Revenues	22.60%	22.60%	22.60%	22.60%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%	22.6%
Noncurrent Liabilities																				
Long Term Debt, Notes payable, net of current portion Bal	4,993,669.00				1,278,377.00	1,235,764.00	1,194,572.00	1,154,753.00	1,116,261.00	1,079,052.00	1,043,084.00	1,008,315.00	974,704.00	942,214.00	910,807.00	880,447.00	851,099.00	822,729.00	795,305.00	768,795.00
Additional Debt																				
Debt Repayment					(42,613)	(41,192)	(39,819)	(38,492)	(37,209)	(35,968)	(34,769)	(33,611)	(32,490)	(31,407)	(30,360)	(29,348)	(28,370)	(27,424)	(26,510)	(25,627)
Debt Repayment years	30.00				30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
End Long Term Debt, Notes payable, net of current portion End					1,235,764.00	1,194,572.00	1,154,753.00	1,116,261.00	1,079,052.00	1,043,084.00	1,008,315.00	974,704.00	942,214.00	910,807.00	880,447.00	851,099.00	822,729.00	795,305.00	768,795.00	743,168.00
Total noncurrent liabilities																				
Deferred Tax Liabilities																				
Begin Balance					1,535,072	1,499,634	1,467,229	1,437,430	1,408,601	1,380,580	1,352,590	1,325,651	1,299,645	1,274,229	1,249,797	1,225,271	1,202,014	1,179,615	1,157,787	1,137,124
Additions to Deferred Asset					(35,438)	(32,405)	(29,799)	(28,829)	(28,021)	(27,990)	(26,939)	(26,006)	(25,216)	(24,432)	(24,526)	(23,257)	(22,399)	(21,828)	(20,663)	(20,478)
Total Deferred Tax Liability					1,499,634	1,467,229	1,437,430	1,408,601	1,380,580	1,352,590	1,325,651	1,299,645	1,274,229	1,249,797	1,225,271	1,202,014	1,179,615	1,157,787	1,137,124	1,116,646
Total Liabilities					3,651,466.00	3,627,430.00	3,567,468.00	3,509,900.00	3,454,440.00	3,400,511.00	3,348,852.00	3,299,184.00	3,251,728.00	3,206,242.00	3,161,827.00	3,119,768.00	3,079,065.00	3,041,187.00	3,004,895.00	2,969,779.00
Equity																				
Proportion of Capital	74%																			
Beginning Equity Capital	14,212,757				72,017,069	74,245,908	76,502,449	78,785,763	81,096,780	83,435,102	85,799,620	88,192,464	90,613,265	93,062,877	95,541,014	98,045,741	100,580,642	103,144,935	105,738,158	108,362,012
Additions to Equity (Retained Earnings)					2,228,838	2,256,542	2,283,314	2,310,818	2,338,322	2,364,518	2,392,844	2,420,800	2,449,611	2,478,137	2,504,727	2,534,901	2,564,293	2,593,223	2,623,854	2,652,318
Deductions form Equity Dividends	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional Paid In Capital					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ending Equity Capital					74,245,908	76,502,449	78,785,763	81,096,780	83,435,102	85,799,620	88,192,464	90,613,265	93,062,877	95,541,014	98,045,741	100,580,642	103,144,935	105,738,158	108,362,012	111,014,330
Operating Income					3,187,021	3,274,225	3,260,177	3,297,495	3,334,407	3,369,613	3,407,965	3,445,847	3,484,980	3,523,754	3,559,852	3,601,184	3,641,159	3,680,673	3,722,619	3,761,554
Return On Equity					4.29%	4.29%	4.14%	4.07%	4.00%	3.93%	3.86%	3.80%	3.74%	3.69%	3.63%	3.58%	3.53%	3.48%	3.44%	3.39%
Total Liabilities & Stockholders Equity					77,937,374	80,129,879	82,353,231	84,606,680	86,889,542	89,200,131	91,541,316	93,912,448	96,314,605	98,747,256	101,207,553	103,700,410	106,224,600	108,779,345	111,366,907	113,984,109
Assets	8,737,074	8,627,221	8,519,683	8,415,486	8,313,787	8,212,729	8,115,013	8,019,816	7,928,030	7,838,938	7,749,504	7,664,441	7,582,327	7,502,172	7,426,032	7,350,513				
Liabilities & Stockholders Equity was Assets	69,200,300	71,502,658	73,833,548	76,191,194	78,575,755	80,987,402	83,426,303	85,892,632	88,386,575	90,908,318	93,458,049	96,035,969	98,642,273	101,277,173	103,940,875	106,633,596				
Dividend	69,200,300	71,502,658	71,833,548	76,191,194	78,575,755	80,987,402	83,426,303	85,892,632	88,386,575	90,908,318	93,458,049	96,035,969	98,642,273	101,277,173	103,940,875	106,633,596				
Free Stockholder Equity	8,737,074	8,627,221	8,519,683	8,415,486	8,313,787	8,212,729	8,115,013	8,019,816	7,928,030	7,838,938	7,749,504	7,664,441	7,582,327	7,502,172	7,426,032	7,350,513				
Capital Expenditures and Changes in Working Capital																				
Capital Expenditures					195,622.00	197,285.00	198,959.00	200,650.00	202,357.00	204,076.00	205,813.00	207,562.00	209,324.00	211,107.00	212,905.00	214,716.00	216,545.00	218,389.00	220,249.00	222,124.00
Changes to Working Capital																				
Current Assets	412,339				1,184,589	1,196,354	1,208,318	1,220,607	1,232,665	1,244,931	1,257,380	1,269,994	1,282,694	1,295,486	1,308,430	1,321,519	1,334,735	1,348,080	1,361,563	1,375,178
Current Liabilities	332,978				916,068	966,629	975,285	985,098	994,868	1,004,837	1,014,886	1,025,034	1,035,285	1,045,638	1,056,094	1,066,655	1,077,321	1,088,095	1,098,976	1,109,965
Working Capital	79,361				268,521	229,725	233,033	235,509	237,797	240,094	242,494	244,960	247,409	249,848	252,336	254,864	257,414	259,985	262,587	265,213
Changes to Working Capital					2,262	2,286	2,308	2,330	2,354	2,377	2,400	2,426	2,449	2,473	2,499	2,523	2,550	2,573	2,601	2,626
CASH FLOW																				
Income from Operations					2,281,501	2,307,915	2,332,530	2,358,599	2,384,312	2,408,975	2,435,819	2,462,343	2,489,771	2,516,956	2,542,252	2,571,175	2,599,358	2,627,119	2,656,621	2,683,992
Non Cash Expense (depreciation)					320,771	318,661	318,128	316,594	315,922	317,119	315,844	314,988	313,454	312,674	314,940	312,506	311,516	311,529	309,505	310,891
Capital Expenditures					195,622	197,285	198,959	200,650	202,357	204,076	205,813	207,562	209,324	211,107	212,905	214,716	216,545	218,389	220,249	222,124
Change in Working Capital					2,262	2,286	2,308	2,330	2,354	2,377	2,400	2,426	2,449	2,473	2,499	2,523	2,550	2,573	2,600	2,626
Net Cash Flows					2,404,408	2,426,543	2,449,391	2,472,207	2,495,523	2,519,641	2,543,240	2,567,343	2,591,452	2,616,050	2,641,788	2,666,442	2,691,779	2,717,686	2,743,277	2,770,183
Period					41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5
PW Factor																				
Discount Rate with growth	8.40%				8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	8.40%				8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
					15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480
Period Present Worth Factor (PW)					0.035	0.032	0.03	0.028	0.025	0.024	0.022	0.02	0.019	0.017	0.016	0.014	0.013	0.012	0.011	0.01
PW of Cashflow					1,307,704	1,202,009	1,117,997	1,071,553	965,767	936,997	866,128	794,849	722,084	688,440	654,318	571,871	541,694	504,837	467,125	428,817

OCI Investor Owned

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser, Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1-5	6-15	16 - 19	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Accumulated PW of Cashflows	15,624,668				79,908,566	81,110,575	82,248,072	83,319,625	84,285,352	85,221,489	86,087,615	86,882,464	87,604,548	88,292,988	88,947,306	89,525,177	90,066,871	90,571,708	91,038,833	91,467,650
CASH FLOW																				
Income from Operations					2,316,085	2,338,306	2,356,664	2,381,976	2,407,492	2,433,219	2,459,154	2,485,307	2,511,678	2,538,273	2,565,093	2,592,145	2,619,429	2,646,951	2,674,713	2,702,723
Depreciation					(198,112)	(206,482)	(214,979)	(216,806)	(218,651)	(220,508)	(222,385)	(224,275)	(226,183)	(228,106)	(230,048)	(232,005)	(233,981)	(235,974)	(237,983)	(240,008)
Capital Expenditures					195,622	197,786	198,959	200,650	202,357	204,076	205,813	207,562	209,328	211,107	212,905	214,716	216,545	218,389	220,249	222,124
Change in Working Capital					2,262	2,284	2,308	2,330	2,354	2,377	2,400	2,426	2,449	2,473	2,499	2,523	2,550	2,573	2,600	2,626
Net Cash Flows					2,316,293	2,348,219	2,370,376	2,395,802	2,421,432	2,447,274	2,473,326	2,499,594	2,526,084	2,552,799	2,579,737	2,606,911	2,634,315	2,661,962	2,689,847	2,717,981
Period					41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5	53.5	54.5	55.5	56.5
PW Factor																				
Discount Rate with growth	8.40%				8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
Discount Rate without growth	6.46%				6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%	6.46%
					15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480	15.480
Period Present Worth Factor (PW)					0.035	0.032	0.03	0.028	0.026	0.024	0.022	0.02	0.018	0.017	0.016	0.014	0.013	0.012	0.011	0.01
PW of Cashflow					1,254,968	1,160,737	1,100,803	1,038,436	937,094	909,211	842,335	773,874	703,888	671,795	638,959	564,970	530,130	494,446	458,027	420,743
Accumulated PW of Cashflows	14,741,588				76,590,550	77,751,287	78,852,090	79,890,526	80,827,620	81,736,831	82,579,167	83,353,041	84,056,889	84,728,684	85,367,643	85,932,603	86,462,733	86,957,179	87,415,206	87,835,949

Rate Case Forecasts																				
Rate Base																				
Plant in Service					25,436,398.00	25,502,033.00	25,671,170.00	25,841,672.00	26,013,705.00	26,187,231.00	26,362,264.00	26,538,816.00	26,716,903.00	26,896,535.00	27,077,727.00	27,260,499.00	27,444,848.00	27,630,807.00	27,818,381.00	28,007,587.00
Accumulated Book Depreciation					(17,783,833.47)	(18,071,166.92)	(18,359,755.17)	(18,646,586.67)	(18,932,522.95)	(19,219,432.92)	(19,504,630.60)	(19,788,954.32)	(20,071,526.56)	(20,353,076.82)	(20,633,657.82)	(20,917,570.14)	(21,197,256.19)	(21,476,716.96)	(21,754,911.95)	(22,032,252.08)
Working Capital					229,441.00	230,725.00	233,033.00	235,363.00	237,717.00	240,094.00	242,494.00	244,920.00	247,369.00	249,842.00	252,341.00	254,864.00	257,414.00	259,988.00	262,587.00	265,214.00
Accumulated Deferred Income Tax					(1,499,634)	(1,467,229)	(1,417,430)	(1,408,601)	(1,380,560)	(1,352,596)	(1,325,651)	(1,299,445)	(1,274,229)	(1,249,793)	(1,225,271)	(1,202,014)	(1,179,615)	(1,157,784)	(1,137,124)	(1,116,646)
Rate Base					6,281,371.53	6,194,363.08	6,106,967.83	6,021,847.33	5,938,299.05	5,855,302.08	5,774,476.40	5,693,336.68	5,618,516.44	5,543,503.18	5,468,139.18	5,395,771.86	5,325,390.81	5,256,290.04	5,189,932.05	5,124,902.92
Authorized Return on Rate Base	7.31%				459,168.00	452,808.00	446,419.00	440,197.00	434,097.00	428,023.00	422,114.00	416,329.00	410,714.00	405,230.00	399,721.00	394,431.00	389,286.00	384,235.00	379,384.00	374,557.00
O&M Expenses					722,593.00	729,817.00	737,115.00	744,486.00	751,931.00	759,450.00	767,045.00	774,715.00	782,462.00	790,287.00	798,190.00	806,172.00	814,234.00	822,376.00	830,600.00	838,906.00
Book Depreciation					320,776.55	318,651.45	318,128.25	316,593.50	315,922.28	317,118.97	315,633.68	314,987.72	313,464.24	312,674.26	314,940.00	312,508.32	311,516.05	311,528.77	309,504.99	310,891.13
Ratemaking Interest Expense					52,669.00	50,913.00	49,216.00	47,576.00	45,990.00	44,457.00	42,975.00	41,543.00	40,158.00	38,819.00	37,525.00	36,274.00	35,065.00	33,896.00	32,767.00	31,674.00
Revenue Requirement					1,555,204.55	1,552,189.45	1,550,878.25	1,548,852.50	1,547,940.28	1,549,048.97	1,547,767.68	1,547,574.72	1,546,798.24	1,547,010.26	1,550,376.00	1,549,383.32	1,550,101.05	1,552,036.77	1,552,255.99	1,556,028.13
O&M Expenses					722,593.00	729,817.00	737,115.00	744,486.00	751,931.00	759,450.00	767,045.00	774,715.00	782,462.00	790,287.00	798,190.00	806,172.00	814,234.00	822,376.00	830,600.00	838,906.00
Depreciation Expense					320,776.55	318,651.45	318,128.25	316,593.50	315,922.28	317,118.97	315,633.68	314,987.72	313,464.24	312,674.26	314,940.00	312,508.32	311,516.05	311,528.77	309,504.99	310,891.13
Interest					52,669.00	50,913.00	49,216.00	47,576.00	45,990.00	44,457.00	42,975.00	41,543.00	40,158.00	38,819.00	37,525.00	36,274.00	35,065.00	33,896.00	32,767.00	31,674.00
Pretax Income					459,168.00	452,808.00	446,419.00	440,197.00	434,097.00	428,023.00	422,114.00	416,329.00	410,714.00	405,230.00	399,721.00	394,431.00	389,286.00	384,235.00	379,384.00	374,557.00
State & Federal Taxes @ 28.89%					132,654.00	130,816.00	128,970.00	127,173.00	125,411.00	123,656.00	121,949.00	120,277.00	118,655.00	117,071.00	115,479.00	113,951.00	112,465.00	111,005.00	109,604.00	108,210.00
After Tax Income					326,514.00	321,992.00	317,449.00	313,024.00	308,686.00	304,367.00	300,166.00	296,052.00	292,059.00	288,159.00	284,242.00	280,480.00	276,821.00	273,230.00	269,780.00	266,347.00
Current Revenue					4,230,389.00	4,272,693.00	4,315,420.00	4,358,574.00	4,402,160.00	4,446,182.00	4,490,644.00	4,535,550.00	4,580,906.00	4,626,715.00	4,672,982.00	4,719,712.00	4,766,909.00	4,814,578.00	4,862,724.00	4,911,351.00
Revenue Requirement					1,687,858.55	1,683,005.45	1,679,848.25	1,676,025.50	1,673,351.28	1,672,704.97	1,669,716.68	1,667,851.72	1,665,453.24	1,664,081.26	1,665,855.00	1,663,334.32	1,662,586.05	1,663,040.77	1,661,859.99	1,664,238.13
Required Revenue Increase					60%	61%	61%	62%	62%	62%	63%	63%	64%	64%	64%	65%	65%	65%	65%	66%
Income from Operations					2,281,507	2,307,455	2,332,530	2,358,594	2,384,312	2,408,975	2,435,819	2,462,343	2,489,771	2,516,956	2,542,252	2,571,175	2,599,354	2,627,119	2,656,623	2,683,992
Return on Rate Base:					36.32%	37.25%	38.19%	39.17%	40.15%	41.14%	42.18%	43.23%	44.31%	45.40%	46.49%	47.65%	48.81%	49.98%	51.19%	52.38%
Required Return	7.31%				7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%	7.31%
Authorized Return					459,168	452,808	446,419	440,197	434,097	428,023	422,114	416,329	410,714	405,230	399,721	394,431	389,286	384,235	379,384	374,557
After tax Net Income					2,228,838	2,256,647	2,284,114	2,311,078	2,338,327	2,364,518	2,392,844	2,420,660	2,449,613	2,478,137	2,504,727	2,534,901	2,564,294	2,593,223	2,623,854	2,652,318
Taxes					905,514	916,770	927,647	938,903	949,995	960,648	972,146	983,504	995,209	1,006,798	1,017,600	1,029,859	1,041,820	1,053,554	1,065,998	1,077,567
Pre tax Net Income					3,134,352	3,173,312	3,210,961	3,249,919	3,288,317	3,325,166	3,364,990	3,404,164	3,444,822	3,484,935	3,522,327	3,564,760	3,606,094	3,646,777	3,689,852	3,729,886
Interest Expense					52,669	50,913	49,216	47,576	45,990	44,457	42,975	41,543	40,158	38,819	37,525	36,274	35,065	33,896	32,767	31,674
Operating Income					3,187,021	3,224,225	3,260,177	3,297,495	3,334,307	3,369,623	3,407,965	3,445,847	3,484,980	3,523,754	3,559,852	3,601,034	3,641,159	3,680,673	3,722,619	3,761,560
Operating Expenses					1,043,368	1,048,468	1,055,243	1,061,080	1,067,853	1,076,569	1,082,679	1,089,703	1,095,926	1,102,961	1,113,130	1,118,678	1,125,750	1,133,905	1,140,105	1,149,797
Revenue Requirement					4,230,389	4,272,693	4,315,420	4,358,574	4,402,160	4,446,192	4,490,644	4,535,550	4,580,906	4,626,715	4,672,982	4,719,712	4,766,909	4,814,578	4,862,724	4,911,351
Required Return					459,168	452,808	446,419	440,197	434,097	428,023	422,114	416,329	410,714	405,230	399,721	394,431	389,286	384,235	379,384	374,557
Operating Expenses					1,043,368	1,048,468	1,055,243	1,061,080	1,067,853	1,076,569	1,082,679	1,089,703	1,095,926	1,102,961	1,113,130	1,118,678	1,125,750	1,133,905	1,140,105	1,149,797
Revenue Requirement					1,502,536	1,501,276	1,501,662	1,501,277	1,501,950	1,504,592	1,504,793	1,506,032	1,506,640	1,508,191	1,512,851	1,513,109	1,515,036	1,518,140	1,519,489	1,524,354
Required Rate Increase:					60.10%	60.61%	61.07%	62.55%	61.99%	62.38%	62.67%	63.23%	63.64%	64.08%	64.85%	64.76%	65.12%	65.46%	65.82%	66.11%
					42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Proposed Rate Increase:																				
Rate Increase Scenario	0				0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	0				42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
No increases (Input 2)	2				0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
No Rate Increases (Input 2)	3																			
Modest Rate Increases: 6% every 3 year period starting in period 3 (Input 4)	4				6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%
Modest Rate Increases (Input 4)	5																			
Required Rate Increases: 3% period 1, 10% period 6, and 6% every 3rd year beginning in period 9 (Input 6)	6				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Required Rate Increases (Input 6)	7				190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%	190.2%
	4				6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%	0.0%	0.0%	6.0%
Changes in Balance Sheet Accounts																				
Assets																				
Change in Current Assets (Source negative / Use positive)					11,728	11,845	11,964	12,083	12,204	12,326	12,449	12,574	12,700	12,826	12,955	13,084	13,216	13,347	13,481	13,615
Plant & Equipment																				
Additions (Source negative / Use positive)					195,622	197,786	198,959	200,650	202,357	204,076	205,813	207,562	209,328	211,107	212,905	214,716	216,545	218,389	220,249	222,124
Liabilities																				
Change in Current Liabilities (Source Positive / Use negative)					9,466	9,561	9,656	9,754	9,850	9,949	10,049	10,148	10,251	10,353	10,456	10,561	10,666	10,774	10,881	10,989
Long Term Debt																				
Additional Long Term Debt Source Positive / Use Negative																				
Principal Paid Long term Debt (Source positive / Use negative)					42,613	41,197	39,819	38,492	37,209	35,968	34,769	33,611	32,490	31,407	30,360	29,348	28,370	27,424	26,510	25,627

S:\water\industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater\System Valuation as of 8 28 2020 - Created 10 26 2020\

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	15	Periods 6-15	16	19	47	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
Equity																					
Additions to Equity (Source Positive) / Use Negative)																					
Dividend (Source negative) / Use Positive)																					
Funds Provided from Operations																					
Sources of Funds:																					
Net Income (Use Negative) / Source Positive)						2,728,838	2,256,542	2,283,316	2,311,018	2,338,727	2,366,518	2,394,464	2,420,820	2,449,613	2,478,111	2,506,727	2,536,957	2,568,793	2,593,273	2,622,854	2,652,458
Depreciation (Source, positive / Use negative)						320,777	318,651	316,528	314,594	315,972	317,139	315,644	315,988	313,464	312,046	314,040	312,306	311,216	311,249	309,505	310,893
Current Liabilities (Source Positive)						9,466	9,461	9,456	9,753	9,850	9,969	10,049	10,348	10,251	10,353	10,455	10,563	10,669	10,774	10,881	10,989
Sources and Uses of Funds						2,559,086	2,584,764	2,611,098	2,637,864	2,664,094	2,691,586	2,718,527	2,745,936	2,773,326	2,801,164	2,830,123	2,857,964	2,886,475	2,915,576	2,944,240	2,974,298
Sources of Funds:																					
Current Liabilities (Source Positive)																					
Uses of Funds:																					
Current Assets: Increase (Use)						11,778	11,895	11,964	12,083	12,204	12,326	12,449	12,574	12,700	12,826	12,955	13,084	13,216	13,347	13,481	13,615
Fixed Assets: Additions / Retirement (Use)						196,627	197,785	198,959	200,150	201,357	202,579	203,817	205,071	206,340	207,626	208,927	210,246	211,581	212,933	214,302	215,688
Total Uses of Funds						208,404	209,680	210,923	212,233	213,561	214,905	216,266	217,645	219,040	220,452	221,882	223,330	224,797	226,280	227,783	229,303
Funds from Financing Activities																					
Changes in Debt																					
Increase in Long Term Debt						(47,613)	(41,392)	(39,819)	(38,492)	(37,209)	(35,968)	(34,769)	(33,611)	(32,490)	(31,407)	(30,360)	(29,348)	(28,370)	(27,424)	(26,510)	(25,627)
Repayment of Long Term Debt																					
Funds from Equity						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dividends Paid (Use)																					
Additional Paid in Capital (Source)						(42,613,100)	(41,392,100)	(39,819,100)	(38,492,100)	(37,209,100)	(35,968,100)	(34,769,100)	(33,611,100)	(32,490,100)	(31,407,100)	(30,360,100)	(29,348,100)	(28,370,100)	(27,424,100)	(26,510,100)	(25,627,100)
Total Funds from Financing Activities																					
Total Funds Needed						2,309,138,100	2,348,437,100	2,380,568,100	2,386,189,100	2,413,224,100	2,439,216,100	2,465,496,900	2,492,189,900	2,518,850,100	2,545,824,900	2,573,953,100	2,602,830,200	2,631,844,300	2,661,932,400	2,691,772,900	2,721,842,100
Financing																					
Debt	26%					(600,373,100)	(608,756,700)	(613,893,100)	(620,396,100)	(627,265,100)	(634,196,100)	(641,029,100)	(647,969,100)	(654,991,100)	(661,954,100)	(669,215,100)	(676,213,100)	(683,369,100)	(690,655,100)	(697,490,100)	(705,218,100)
Equity	74%					(1,728,741,000)	(1,737,680,400)	(1,746,663,100)	(1,765,792,900)	(1,785,720,000)	(1,805,020,000)	(1,825,467,800)	(1,844,220,900)	(1,863,859,000)	(1,883,910,000)	(1,905,688,000)	(1,924,869,100)	(1,947,975,000)	(1,970,655,000)	(1,993,160,100)	(2,017,496,000)
Funds Provided by Financing						(2,329,114,100)	(2,346,437,100)	(2,360,556,100)	(2,386,189,100)	(2,412,985,100)	(2,439,216,100)	(2,466,496,900)	(2,492,189,900)	(2,518,850,100)	(2,545,864,100)	(2,574,903,100)	(2,601,082,200)	(2,631,844,100)	(2,661,145,100)	(2,690,650,100)	(2,722,714,100)

IOU Investor Owned

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4 28 2020 - Created 10 14 2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchase: Investor-Owned Utility
As of April 28, 2020

	Base	Periods 1 to 5	Periods 6 to 15	Periods 16 to 19	59	59	60
Accumulated PW of Cashflows	15,829,868			91,950,568	92,298,978	92,565,965	
CASH FLOW							
Income from Operations				2,710,980	2,709,486	2,788,532	
Depreciation				(242,051)	(244,134)	(246,194)	
Capital Expenditures				224,025	226,324	227,469	
Change in Working Capital				2,243	2,305	2,326	
Net Cash Flows				2,476,364	2,774,981	2,865,993	
Period		5 / 5		5 / 5	59 / 5		
PW Factor							
Discount Rate with growth	8.45%	8.45%		8.45%	8.45%	8.45%	
Discount Rate without growth	5.45%	5.45%		5.45%	5.45%	5.45%	
Period Present Worth Factor (PWF)	1.0000	1.0000		1.0000	1.0000	1.0000	
PW of Cashflow	425,137			386,823		347,246	
Accumulated PW of Cashflows	15,753,368			86,567,739	86,904,913		

Rate Case Forecast:							
Rate Base							
Plant In Service				28,298,437.00	28,590,986.00	28,595,128.00	
Accumulated Book Depreciation				(27,409,506.44)	(27,665,511.80)	(27,861,544.47)	
Net Plant In Service				888,930.56	925,474.20	733,583.53	
Accumulated Deferred Income Tax				(1,097,101)	(1,108,274)	(1,119,457)	
Rate Base				5,059,795.56	4,991,735.70	4,916,798.53	
Authorized Return on Rate Base	7.15%			369,871.00	365,330.00	360,880.00	
O&M Expenses				847,795.00	857,768.00	865,376.00	
Book Depreciation				310,051.36	309,004.86	309,394.17	
Maintaining Interest Expense				30,619.00	29,508.00	28,611.00	
O&M Income Requirement				1,157,846.36	1,166,772.86	1,174,770.17	
Depreciation Expense				310,051.36	309,004.86	309,394.17	
Interest				150,052.46	109,044.86	109,394.17	
Pretax Income				80,619.00	29,508.00	28,611.00	
State & Federal Taxes @ 28.89%				109,871.00	365,330.00	360,880.00	
After Tax Income				106,858.00	105,565.00	104,258.00	
Current Revenue				263,015.00	259,109.00	256,622.00	
Revenue Requirement				4,960,465.00	5,010,070.00	5,066,171.00	
Required Revenue Increase				1,564,691.36	1,565,788.86	1,565,549.17	
Income from Operations				2,713,264	2,742,913	2,771,942	
Return on Rate Base				53.62%	54.88%	56.35%	
Required Return	7.15%			7.15%	7.15%	7.15%	
Authorized Return				369,871	365,330	360,880	
After Tax Net Income				2,683,625	2,713,215	2,743,441	
Taxes				1,089,675	1,102,244	1,115,549	
Pretax Net Income				3,773,300	3,815,459	3,857,870	
Interest Expense				30,619	29,508	28,611	
Operating Income				3,803,119	3,845,257	3,886,481	
Operating Expenses				1,157,846	1,166,813	1,173,690	
Revenue Requirement				4,960,965	5,010,070	5,060,171	
Required Return				369,871	365,330	360,880	
Operating Expenses				1,157,846	1,166,813	1,173,690	
Revenue Requirement				1,527,717	1,532,143	1,534,570	
Required Rate Increase				68.46%	67.06%	67.05%	
Proposed Rate Increase				68.46%	67.06%	67.05%	
Rate Increase (Decrease)	n			68	67	67	
	o			0%	0%	0%	
				68	99	68	
No increases (Input 2)	r						
No Rate Increases (Input 2)	s				0%	0%	
Modest Rate Increases, 5% every 3 years starting in period 3 (Input 4)	q			0.00%	0.00%	0.00%	
Modest Rate Increases (Input 4)	t						
Required Rate Increase: 10% period 1, 10% period 2, and 8% every 3 years beginning in period 3 (Input 6)	u			0.00%	0.00%	0.00%	
Required Rate Increases (Input 6)	v			190.2%	190.2%	190.2%	
	q			0.00%	0.00%	0.00%	
Changes in Balance Sheet Accounts							
Assets:							
Change in Current Assets (Source: negative / Use: positive)				11,752	13,890	14,028	
Plant & Equipment							
Additions (Source: negative / Use: positive)				224,025	226,324	227,469	
Liabilities:							
Change in Current Liabilities (Source: Positive / Use: negative)				11,100	11,211	11,323	
Change in Long Term Debt							
Additional Long Term Debt (Source: positive / Use: Negative)				24,112	24,354	24,598	
Principal Paid Long Term Debt (Source: positive / Use: negative)							

DCF Investor Owned

S:\water-industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4.28.2020 Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Potential Purchaser: Investor-Owned Utility
As of April 28, 2020

	Base	1.5	Periods 6.5	16 - 79	58	59	60	
Equity								
Additions to Equity (Source Positive / Use Negative)								
Dividend (Source negative / Use Positive)								
Funds Provided from Operations								
Sources of Funds								
Net Income (Use Negative / Source Positive)					2,582,625	2,113,353	2,163,333	
Depreciation (Source, assume zero negative)					330,053	690,045	409,864	
Current Liabilities (Source Positive)					11,100	11,211	11,323	
Sources and Uses of Funds					3,003,776	3,033,571	3,064,518	
Sources of Funds								
Current Liabilities (Source Positive)								
Uses of Funds								
Current Assets, Increase (Use)					13,752	13,890	14,028	
Fixed Assets, Assets, Increase (Use)					224,015	226,974	227,809	
Total Uses of Funds					237,767	240,864	241,837	
Funds from Financing Activities								
Changes in Debt								
Net Increase / (-) Long Term Debt					(24,372)	(23,947)	(23,548)	
Repayment of Long Term Debt								
Funds from Equity								
Dividends Paid (Use)					0	0	0	
Additional Paid in Capital (source)								
Total Funds from Financing Activities					(24,372.00)	(23,947.00)	(23,548.00)	
Total Funds Needed					2,741,237.00	2,769,850.00	2,798,993.00	
Financing								
Debt			45%		(712,722.00)	(720,151.00)	(727,738.00)	
Equity			55%		(2,028,515.00)	(2,049,699.00)	(2,071,255.00)	
Funds Provided by Financing					(2,741,237.00)	(2,769,850.00)	(2,798,993.00)	

DCF Investor Owned

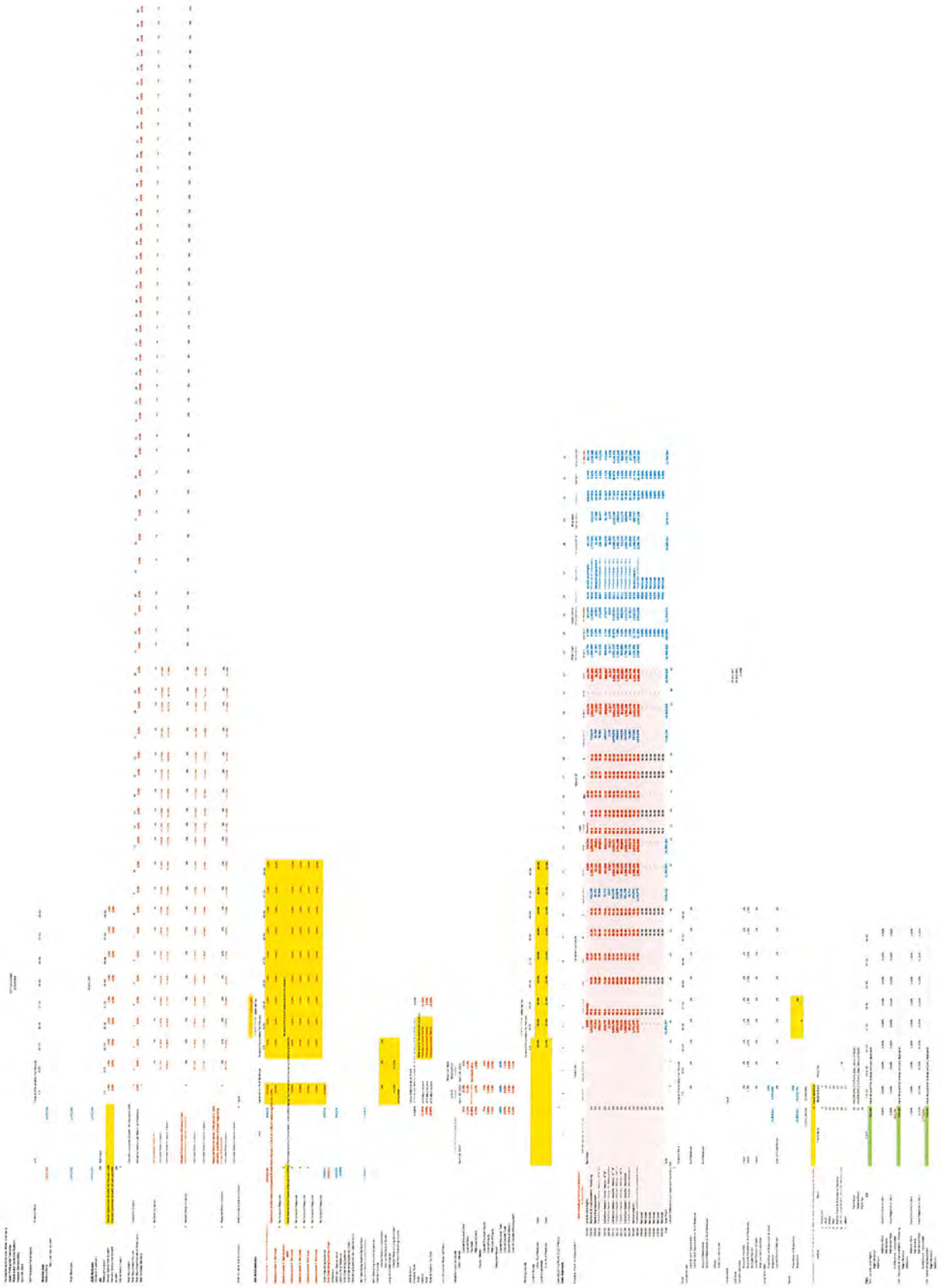
Pennsylvania American Water Company

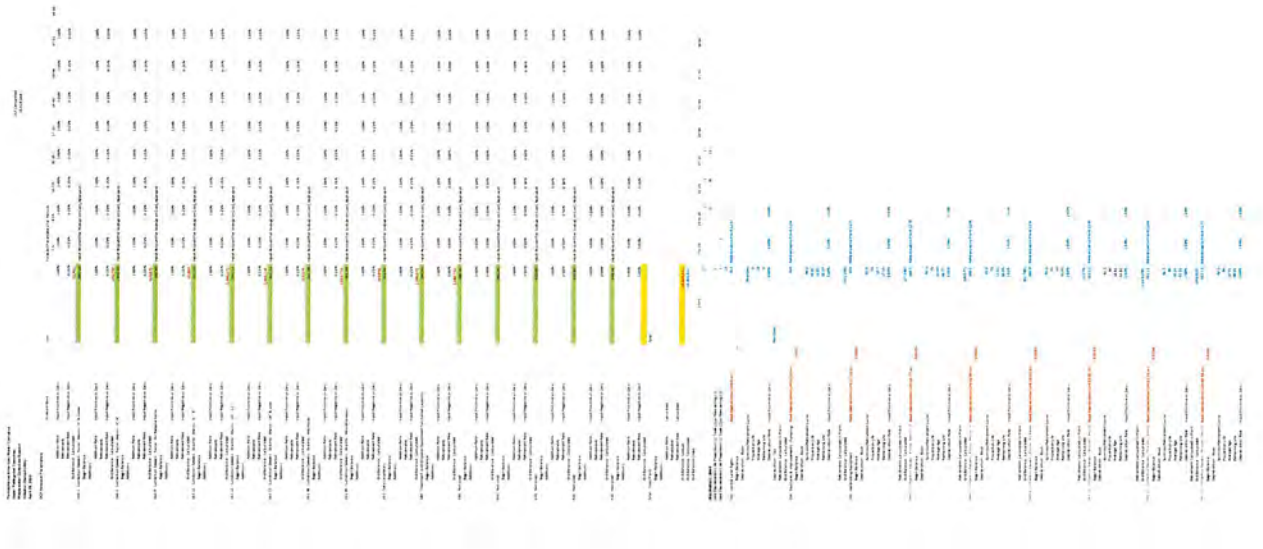
Upper Pottsgrove Township's Wastewater System

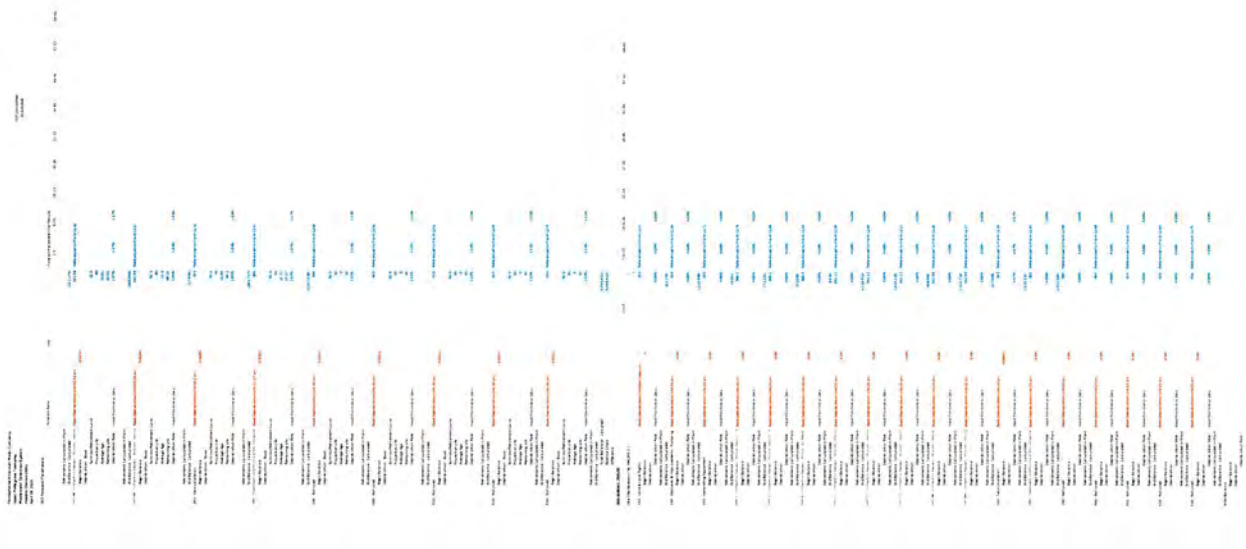
Appraisal Work Papers
As of April 28, 2020

Income Approach
DCF Forecast Parameters
Periods 1 through 60

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net







Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Income Approach
Upper Pottsgrove Township Financials
Income Analysis 2013 through 2019

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Montgomery County, PA
Wastewater Collection System
Financial Projections
April 28, 2020

2020

Upper Pottsgrove Wastewater System Valuation as of 4.28.2020 - Created 10.14.2020

Description	2014	2014	2015	2016	2017	2018	2019	Forecast Base
Operating Revenues								
Charges for Services, Sewer Charges	1,555,675	1,342,942	1,313,298	1,315,318	1,332,039	1,362,072	1,374,115	
Connection Fees	15,907	4,104	24,735	4,408	86,705	26,512	99,113	
Refund of Prior Year Expenses							6,127	
Total Operating Revenues	**1,571,582**	**1,347,046**	**1,338,033**	**1,321,725**	**1,398,744**	**1,388,584**	**1,473,355**	1,473,355
		6.4%	7.3%	-5.5%	5.7%	-0.7%	6.1%	6.0%
Operating Expenditures								Expense Level 1: Operations & Maintenance
Wastewater Collections and Treatment	1,112,873	246,557	230,134	347,690	595,022	425,021	354,533	Operations & Maintenance Expense Growth Rate: Periods 1-5 & 6-10: 3.0% all remaining Periods 3.0%
Debt Service	1,626,759							Expense Level 2: Not Used
Principal	1,381,431							
Interest	245,328							Expense Level 3: Depreciation
Debt Issuance Costs	99,500							Based on Historical Assets Based on COR&D, Plant Depreciation Parameters, and COR&D Alpha; Tax Depreciation based on COR&D and AMACRS
Total Operating Expenditures	**3,043,371**	**246,557**	**230,134**	**347,690**	**595,022**	**425,021**	**354,533**	354,533
Operating Loss	**(1,471,679)**	**1,100,489**	**1,107,899**	**976,126**	**803,742**	**963,563**	**1,118,822**	Expense Level 4: Not Used
Nonoperating Revenues								Expense Level 5: Not Used
Investment Income		77	642	2,328	9,477	10,727	11,076	
						94,810		Expense Level 6: Not Used
Miscellaneous Income				11,000	11,000			Expense Level 7: Not Used
Debt Service Income		325,353	247,764	(640,080)	(564,084)	(564,084)	(610,884)	
Interest Expense	500	(325,764)	(247,976)	(290,491)	(277,935)	(153,225)	(145,774)	
Interest Income	11,027							
Refund of Prior Year Expenditures	(1,027)							
Total Nonoperating Revenues	**12,527**	**(731,001)**	**(715,098)**	**(729,245)**	**(734,156)**	**(668,157)**	**(739,063)**	
Income Before Interfund Transfers		**369,488**	**392,851**	**246,991**	**69,586**	**295,406**	**379,759**	
Other Financing Sources (Uses)								
Proceeds from Bond Issuance and Bond Premium	1,193,282							
Transfer In	9,512							
Transfer Out	(196,953)	(137,000)	(137,000)	-	-	(210,000)	(125,000)	
Total Other Financing Sources (Uses)	**1,005,841**	**(137,000)**	**(137,000)**	**-**	**-**	**(210,000)**	**(125,000)**	
Change in Net Position	**854,571**	**132,488**	**255,851**	**246,991**	**69,586**	**85,406**	**254,759**	
Net Position at Beginning of Year	**997,123**	**142,552**	**275,440**	**531,251**	**778,242**	**847,828**	**873,234**	
Net Position at End of Year	**142,552**	**275,440**	**531,251**	**778,242**	**847,828**	**873,234**	**1,027,993**	
SEWER FUND								
Assets								
Current Assets								
Cash		612,765	868,576	955,567	985,153	881,403	1,027,993	
Due from Capital Fund		475	375	375	375			
Total Current Assets		**613,240**	**868,951**	**955,942**	**985,528**	**881,403**	**1,027,993**	
Liabilities								
Due to Other Funds		137,700	137,700	137,700	137,700	8,169		
Net Position								
Unrestricted		**275,440**	**531,251**	**778,242**	**847,828**	**873,234**	**1,027,993**	

Projections	Forecast Parameters for Periods														
	1-5	6-15	16-19	20-26	27-33	34-40	40-46	47-53	54-60	54-60					
	Sen Rate Increase Schedule on Sur. DCF Investor Owned Cents: 1263 #6263														
1,473,355	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
1,473,355															
6.0%															
354,533	3.0%	3.0%	3.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%					
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
354,533	Expense Level 4: Not Used														
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
	Expense Level 5: Not Used														
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
	Expense Level 6: Not Used														
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
	Expense Level 7: Not Used														
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Market Approach

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

Central Tendancy and Reliability Analysis

Market Sales Analysis - PP/OCLD

	Simple	Weighted	
Mean	2.082	1.9992	
Standard Deviation	0.8607	0.6008	
Median	1.608	1.5597	
Mode	Not Applicable	1.5601	
Conclusion		2.0000	AUS Input
Upper Pottsgrove Township OCLD		11,769,925	Cost Approach - OCLD
Market Value Indication		**23,539,850**	

Market Sales Analysis - PP/CORLD

	Simple	Weighted	
Mean	0.813	0.9285	
Standard Deviation	0.1852	0.1086	
Median	0.8908	0.9637	
Mode	Not Applicable	0.9919	
Conclusion		0.93	AUS Input
Upper Pottsgrove Township CORLD		18,460,028	Cost Approach - CORLD
Market Value Indication		**17,167,826**	

Market Sales Analysis - PP/Customer

	Simple	Weighted	
Mean	7441	9,157	
Standard Deviation	4031	3,158	
Median	8221	6,322	
Mode	Not Applicable	7,825	
Forecast	7,251		
Conclusion		8,679	Valley Wastewater Info
Upper Pottsgrove Township Customers		1,428	AUS Input
Market Value Indication		**12,393,612**	

Financial Basis[1]

Financial Markets	Market Value per Share to Book Value per Share	
Market to Book (equity and debt)	2.77	
Use (equity and debt)	2.77	AUS Input
Upper Pottsgrove Township OCLD	11,769,925	Cost Approach - OCLD
Market Value Indication	**32,602,692**	

Market Sales Analysis - PP/Cash Flows (EBITDA)

	Simple	Weighted	
Mean	22.38	21.58	
Standard Deviation	11.60	8.02	
Median	20.93	13.52	
Mode	Not Applicable	Not Applicable	
Forecast			
Conclusion		22.00	AUS Input
Upper Pottsgrove Township Cash Flows		768,794	Income Approach
Market Value Indication		**16,913,468**	

Summary of Market Analyses

Indicators		
OCLD	23,539,850	
CORLD	17,167,826	Use
Customers	12,393,612	Use
Cash Flows	16,913,468	Use
Value Line	32,602,692	
Mean	20,523,490	15,491,635
Median	17,167,826	16,913,468
Conclusion	**17,167,826**	15,491,635

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Market Approach
Market Transaction

AUS Consultants
Suite 201
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Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Data

RowID	Approximate Date	Buyer	Seller	County	Type of Facility	Initial Purchase Price	Final Purchase Price[1]	Number of Total Customers	OCA Market Value per customer	Relationship to the passage of Section 1329	Average Purchase Price per Customer	AUS Market Value per customer	Engineers Assessment	Original Cost	OCLD Depreciation	Original Cost less Depreciation (OCLD)	Purchase Price to OCLD	COR Translation	Cost New	Replacement Cost less Depreciation (CORLD)	Cost New less Depreciation (RCNLD)	Purchase Price to RCNLD	Rate Base Determination By PA PUC
20	6/1/2016	PA American Water	City of McKeesport	Allegheny	Wastewater Collection and Treatment	160,000,000	159,000,000	23,953	7,197	Post	7,242.75	7,241	KLH Engineers, Inc.	108,233,570	74.0%	80,085,602	1.9854		323,139,630	48.4%	156,524,909	1.0158	154,000,000
21	8/1/2016	Aqua PA	New Garden Twp. SA	Chester	Wastewater Collection and Paid for and Owned Treatment	29,500,000	29,500,000	2,106	14,008	Post	14,007.60	14,008	AUS Consultants	27,146,852	68.4%	18,567,728	1.5888	2.219	60,212,053.00	50.8%	30,615,410	0.9635	29,500,000
22	12/1/2017	Aqua PA	Limerick Township	Montgomery	Wastewater Collection and paid for treatment	64,373,000	64,373,000	5,414	11,846	Post	9,264	11,846				44,816,934	1.4364				73,068,177	0.8810	64,373,000
23	12/10/2017	Aqua PA	East Bradford Township	Chester	Gravity	5,000,000	5,000,000	1,248	4,006	Post	4,006.41	4,006		8,294,930	64.9%	5,383,591	0.9287	1.817	35,073,739	61.3%	9,236,581	0.5414	5,000,000
24		SUEZ	Valhorning	Carbon	Water Treatment and Distribution System	4,734,800	4,734,800	2,806		Post		1,687									8,899,330	0.5320	
25		SUEZ	Mahoning	Carbon	Wastewater Collection and Treatment	4,765,200	4,765,200	2,806		Post		1,698									7,991,234	0.5963	
26	6/1/2018	Aqua PA	Cheltenham	Montgomery	Wastewater Collection	50,250,000	50,250,000	10,500		Post	4,785.71	4,786	Boucher & James, Inc.	19,818,218	79.6%	15,784,461	3.1835	7.342	145,511,461	34.5%	49,940,486	1.0062	
27	11/14/2018	PA American Water	Steelton	Dauphin	Water Distribution and Treatment	22,500,000	21,750,000	2,325		Post	9,354.84	9,355	Herbert, Rowland & Grubic, Inc (HRG)	19,739,906	73.1%	14,433,435	1.5069	2.626	51,836,769	46.1%	23,923,473	0.9092	
28		PA American Water	Sudsbury	Chester	Wastewater Collection	9,250,000	8,600,000	998		Post	8,617.23	8,617	Herbert, Rowland & Grubic, Inc (HRG)	7,480,601	81.9%	6,128,876	1.40	1.424	10,652,193	80.0%	8,517,587	1.0097	
29	5/28/2018	PA American Water	Exeter	Berks	Wastewater Collection and Treatment	96,000,000	96,000,000	9,000		Post	10,666.67	10,667	Gannett Fleming	68,404,345	58.6%	40,057,634	2.3965	3.065	209,693,218	47.5%	99,589,819	0.9640	
30	10/29/2018	Aqua PA	East Norriton	Montgomery	Wastewater Collection	21,000,000	21,000,000	4,950		Post	4,242.42		Carroll Engineering corporation	16,246,828	51.7%	8,407,087	2.4979	4.359	70,770,233	38.8%	27,461,356	0.7647	
31	9/30/2018	PA American	Kane	McKean	Wastewater Collection and Treatment	17,560,000	17,560,000	2,006		Post	8,753.74		Gannett Fleming	21,023,527	57.4%	12,010,455	1.4548	2.642	55,539,558	52.2%	29,015,055	0.6052	
32	12/10/2019	PA American	Royersford	Montgomery	Wastewater Collection and Treatment	13,000,000	13,000,000	1,556		Post	8,345.36		PennoniAssociates, Inc.	7,666,492	67.5%	5,173,559	2.5128	5.325	40,821,536	32.8%	13,376,309	0.9719	
33	12/17/2019	PA American	Valley	Chester	Water Treatment and Distribution System	7,325,000	7,325,000	1,459		Post	5,020.56		PennoniAssociates, Inc.	6,843,616	78.5%	5,370,438	1.3639	2.239	35,320,978	76.1%	11,664,026	0.6280	
34	12/17/2019	PA American	Valley	Chester	Wastewater Collection System	13,950,000	13,950,000	1,844		Post	8,485.40		PennoniAssociates, Inc.	13,389,110	68.8%	9,214,738	1.5139	2.370	31,729,237	60.7%	19,252,333	0.7246	

Notes:

1. Final Purchase Price reflects the agreed upon purchase price achieved to settled the acquisition application

Source:
OCA Exhibit AFE-3
Pennsylvania-American Water Company
Acquisition of Sudsbury Township Wastewater
Docket No. A-2018-3002437
Adjustment to HRG Market Approach

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Market Approach
Market Analysis: Purchase Price (PP) Comparison to:
Original Cost Less Depreciation (PP/OCLD)
Replacement Cost Less Depreciation (PP/CORLD)
Customers (PP/Customers)
Cash Flow (PP/EBITDA)

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Appendix A-5.1 (AUS)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/OCLD

Property Acquired		Purchase Price (PP)	Proportion of Purchase Price to Total	Depreciated Original Cost (OCLD) (AUS Consultants Determination	Purchase Price to (PP/OCLD)	Variance to Simple Mean	Variance to Wtd Mean	Variance Squared
New Garden Wastewater System	Wastewater	29,500,000	6%	18,567,728	1.5888	-0.4932	-0.4104	0.1684
McKeesport Wastewater System	Wastewater	159,000,000	32%	101,915,080	1.5601	-0.5219	-0.4391	0.1928
Limerick Wastewater System	Wastewater	75,100,000	15%	46,153,867	1.6272	-0.4548	-0.372	0.1384
Mahoning Water System	Water	4,734,800	1%	1,194,489	3.9639	1.8819	1.9647	3.86
Mahoning Wastewater System	Wastewater	4,765,200	1%	1,658,678	2.8729	0.7909	0.8737	0.7634
East Bradford Wastewater Collection System	Wastewater	5,000,000	1%	5,383,591	0.9287	-1.1533	-1.0705	1.146
Sadsbury Wastewater Collection System	Wastewater	8,600,000	2%	6,128,876	1.4032	-0.6788	-0.596	0.3552
Exeter Wastwater Collection System	Wastewater	96,000,000	19%	40,057,634	2.3965	0.3145	0.3973	0.1578
Steelton Water System	Water	21,750,000	4%	14,433,435	1.5069	-0.5751	-0.4923	0.2424
Cheltenham Wastewarer Collection System	Wastewater-collection	50,250,000	10%	15,784,463	3.1835	1.1015	1.1843	1.4026
East Norriton Wastewater	Wastewater-collection	21,000,000	4%	8,407,007	2.4979	0.4159	0.4987	0.2487
Kane Wastewater	Wastewater	17,560,000	4%	12,070,455	1.4548	-0.6272	-0.5444	0.2964
Royersford Wastewater	Wastewater	13,000,000	3%	5,173,559	2.5128	0.4308	0.5136	0.2638
Valley Water	Water	7,325,000	1%	5,370,438	1.3639	-0.7181	-0.6353	0.4036
Valley Wastewater	Wastewater	13,950,000	3%	9,214,738	1.5139	-0.5681	-0.4853	0.2355
		493,260,000	100%	271,755,303	1.8151			8.9721

Simple Mean	2.082
Standard Deviation	0.8607
SimpleMedian	1.608
Simple Mode	Not Applicable

		2.995346
		12
		0.249612

Weighted Mean	1.999
Standard Deviation	0.6008
Wtd Median	1.5597
Wtd Mode	1.5601

Property Acquired		Depreciated Original Cost (OCLD) (AUS Consultants Determination	Purchase Price to (PP/OCLD)	Accummulated OCLD
East Bradford Wastewater Collection System		5,383,591	0.9287	5,383,591
Valley Water	Water	5,370,438	1.3639	10,754,029
Kane Wastewater		12,070,455	1.4548	22,824,484
Sadsbury Wastewater Collection System		6,128,876	1.5092	28,953,360
Valley Wastewater	Wastewater	9,214,738	1.5139	38,168,098
Steelton Water System		14,433,435	1.5589	52,601,533
McKeesport Wastewater System		101,915,080	1.5601	154,516,613
New Garden Wastewater System		18,567,728	1.5888	173,084,341
Limerick Wastewater System		46,153,867	1.6272	219,238,208
Exeter Wastwater Collection System		40,057,634	2.3965	259,295,842
East Norriton Wastewater		8,407,007	2.4979	267,702,849
Royersford Wastewater	Wastewater	5,173,559	2.5128	272,876,408
Mahoning Wastewater System		1,658,678	2.8729	274,535,086
Cheltenham Wastewarer Collection System		15,784,463	3.1835	290,319,549
Mahoning Water System		1,194,489	3.9639	291,514,038
		291,514,038		

Middle OCLD			145,757,019
Bottomvalue of the range containng the Middle Value		1.5589	52,601,533
Top value of the range containing the Middle Value		1.5601	154,516,613
Range containng the middle value		0.0012	101,915,080
Range from bottom value to middle value		0.0008	93,155,486
Median Value		1.5597	

Simple Mean		
	Water	2.7354
	Wastewater	1.7290
	Wastewater-Collection	2.8407
Median		
	Water	
	Wastewater	1.7290
	Wastewater-Collection	2.8407

Appendix A-5.1 (AUS)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/CORLD

Property Acquired		Purchase Price (PP)	Proportion of Purchase Price to Total	Replacement Cost New less Depreciation (CORLD)	Purchase Price to CORLD	Variance to Simple Mean	Variance to Wtd Mean	Variance Squared
New Garden Wastewater System	Wastewater	29,500,000	6%	30,615,410	0.9636	0.1506	0.0351	0.0012
McKeesport Wastewater System	Wastewater	159,000,000	32%	160,301,491	0.9919	0.1789	0.0634	0.004
Limerick Wastewater System	Wastewater	75,100,000	15%	86,086,756	0.8724	0.0594	-0.0561	0.0031
Mahoning Water System	Water	4,734,800	1%	8,899,336	0.532	-0.2810	-0.3965	0.1572
Mahoning Wastewater System	Wastewater	4,765,200	1%	7,991,234	0.5963	-0.2167	-0.3322	0.1104
East Bradford Wastewater Collection System	Wastewater	5,000,000	1%	9,236,581	0.5413	-0.2717	-0.3872	0.1499
Sadsbury Wastewater Collection System	Wastewater	8,600,000	2%	8,517,587	1.0097	0.1967	0.0812	0.0066
Exeter Wastwater Collection System	Wastewater	96,000,000	19%	99,589,819	0.964	0.1510	0.0355	0.0013
Steelton Water System	Water	21,750,000	4%	23,921,473	0.9092	0.0962	-0.0193	0.0004
Cheltenham Wastewarer Collection System	Wastewater-collection	50,250,000	10%	49,940,486	1.0062	0.1932	0.0777	0.006
East Norriton Wastewater	Wastewater-collection	21,000,000	4%	27,461,356	0.7647	-0.0483	-0.1638	0.0268
Kane Wastewater	Wastewater	17,560,000	4%	29,015,055	0.6052	-0.2078	-0.3233	0.1045
Royersford Wastewater	Wastewater	13,000,000	3%	13,376,109	0.9719	0.1589	0.0434	0.0019
Valley Water	Water	7,325,000	1%	11,664,026	0.628	-0.1850	-0.3005	0.0903
Valley Wastewater	Wastewater	13,950,000	3%	19,252,333	0.7246	-0.0884	-0.2039	0.0416
		493,260,000	100%	541,576,584	0.9108			
	Simple Mean				0.8130			
	Standard Deviation				0.1852			
	SimpleMedian				0.8908			
	Simple Mode				Not Applicable			
	Weighted Mean				0.9285			
	Standard Deviation				0.1086			
	Wtd Median				0.9637			
	Wtd Mode				0.9919			

Property Acquired				Replacement Cost New less Depreciation (CORLD)	Purchase Price to CORLD	Accummulated CORLD
Mahoning Water System	Water	4734800	0.009598994	8,899,336	0.532	8,899,336
East Bradford Wastewater Collection System	Wastewater	5000000	0.010136642	9,236,581	0.5413	18,135,917
Mahoning Wastewater System	Wastewater	4765200	0.009660625	7,991,234	0.5963	26,127,151
Kane Wastewater	Wastewater	17560000	0.035599886	29,015,055	0.6052	55,142,206
Valley Water	Water	7325000	0.01485018	11,664,026	0.628	66,806,232
Valley Wastewater	Wastewater	13950000	0.028281231	19,252,333	0.7246	86,058,565
East Norriton Wastewater	Wastewater-collection	21000000	0.042573896	27,461,356	0.7647	113,519,921
Limerick Wastewater System	Wastewater	75100000	0.152252362	86,086,756	0.8724	199,606,677
Steelton Water System	Water	21750000	0.044094392	23,921,473	0.9092	223,528,150
New Garden Wastewater System	Wastewater	29500000	0.059806187	30,615,410	0.9636	254,143,560
Exeter Wastwater Collection System	Wastewater	96000000	0.194623525	99,589,819	0.964	353,733,379
Royersford Wastewater	Wastewater	13000000	0.026355269	13,376,109	0.9719	367,109,488
McKeesport Wastewater System	Wastewater	159000000	0.322345213	160,301,491	0.9919	527,410,979
Cheltenham Wastewarer Collection System	Wastewater-collection	50250000	0.101873251	49,940,486	1.0062	577,351,465
Sadsbury Wastewater Collection System	Wastewater	8600000	0.017435024	8,517,587	1.0097	585,869,052
				585,869,052		
Middle OCLD						292,934,526
Bottomvalue of the range containng the Middle Value					0.9636	254,143,560
Top value of the range containing the Middle Value					0.9640	353,733,379
Range containng the middle value					0.0004	99,589,819
Range from bottom value to middle value					0.0001	38,790,966
Median Value					0.9637	

Simple Mean				
	Water			0.7206
	Wastewater			0.8181
	Wastewater-Collection			0.8855
Wtd Mean				
	Water	26,484,800	32,820,809	0.806951468
	Wastewater	395,525,200	431,353,933	0.916938898
	Wastewater-Collection	71,250,000	77,401,842	0.920520729
		493,260,000	541,576,584	0.910785316

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/Customer

Property Acquired		Asset Purchase Agreement (APA) Date	Purchase Price (PP)	Proportion of Purchase Price to Total	SCustomers	Purchase Price to Customers	Variance to Simple Mean	Variance to Wtd Mean	Variance Squared	
New Garden Wastewater System	Wastewater	2016.59	29,500,000	6%	2,100	14,048	6,607	4,891	23,921,881	840.16
McKeesport Wastewater System	Wastewater	2016.67	159,000,000	32%	20,320	7,825	384	(1,332)	1,774,224	2,522.35
Limerick Wastewater System	Wastewater	2018.57	75,100,000	15%	5,434	13,820	6,379	4,663	21,743,569	2,104.13
Mahoning Water System	Water	2017.79	4,734,800	1%	2,806	1,687	(5,754)	(7,470)	55,800,900	16.19
Mahoning Wastewater System	Wastewater	2017.79	4,765,200	1%	2,806	1,698	(5,743)	(7,459)	55,636,681	16.40
East Bradford Wastewater Collection System	Wastewater	2017.97	5,000,000	1%	1,248	4,006	(3,435)	(5,151)	26,532,801	40.61
Sadsbury Wastewater Collection System	Wastewater	2019.19	8,600,000	2%	998	8,617	1,176	(540)	291,600	150.24
Exeter Wastwater Collection System	Wastewater	2018.41	96,000,000	19%	9,000	10,667	3,226	1,510	2,280,100	2,076.05
Steelton Water System	Water	2018.87	21,750,000	4%	2,412	9,017	1,576	(140)	19,600	397.60
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.42	50,250,000	10%	10,219	4,917	(2,524)	(4,240)	17,977,600	500.91
East Norriton Wastewater	Wastewater-collection	2018.76	21,000,000	4%	4,952	4,241	(3,200)	(4,916)	24,167,056	180.56
Kane Wastewater	Wastewater	2019.75	17,560,000	4%	2,006	8,754	1,313	(403)	162,409	311.64
Royersford Wastewater	Wastewater	2019.94	13,000,000	3%	1,596	8,145	704	(1,012)	1,024,144	214.66
Valley Water	Water	2019.96	7,325,000	1%	1,459	5,021	(2,420)	(4,136)	17,106,496	74.56
Valley Wastewater	Wastewater	2019.96	13,950,000	3%	1,644	8,485	1,044	(672)	451,584	239.97
			493,260,000	100%	64,301	7,671				9,156.83

Simple Mean	7441
Standard Deviation	4031
SimpleMedian	8,221
Simple Mode	Not Applicable

Weighted Mean	9157
Standard Deviation	3158
Wtd Median	6,322
Wtd Mode	7825

Forecast	2019.944064	7,251
	2021	7,139

Property Acquired					Customers	Purchase Price to Customers	Accummulated Customers
Mahoning Water System	Water	2017.793836	4734800	0.009598994	2,806	1687	2,806
Mahoning Wastewater System	Wastewater	2017.793836	4765200	0.009660625	2,806	1698	5,612
East Bradford Wastewater Collection System	Wastewater	2017.971461	5000000	0.010136642	1,248	4006	6,860
East Norriton Wastewater	Wastewater-collection	2018.755479	21000000	0.042573896	4,952	4241	11,812
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.419406	50250000	0.101873251	10,219	4917	22,031
Valley Water	Water	2019.963242	7325000	0.01485018	1,459	5021	23,490
McKeesport Wastewater System	Wastewater	2016.669406	159000000	0.322345213	20,320	7825	43,810
Royersford Wastewater	Wastewater	2019.944064	13000000	0.026355269	1,596	8145	45,406
Valley Wastewater	Wastewater	2019.963242	13950000	0.028281231	1,644	8485	47,050
Sadsbury Wastewater Collection System	Wastewater-collection	2019.185845	8600000	0.017435024	998	8617	48,048
Kane Wastewater	Wastewater	2019.748858	17560000	0.035599886	2,006	8754	50,054
Steelton Water System	Water	2018.871689	21750000	0.044094392	2,412	9017	52,466
Exeter Wastwater Collection System	Wastewater	2018.412785	96000000	0.194623525	9,000	10667	61,466
Limerick Wastewater System	Wastewater	2018.568493	75100000	0.152252362	5,434	13820	66,900
New Garden Wastewater System	Wastewater	2016.586073	29500000	0.059806187	2,100	14048	69,000
					69,000		

Middle OCLD		34,500
Bottomvalue of the range containg the Middle Value	5,021	23,490
Top value of the range containing the Middle Value	7,825	43,810
Range containg the middle value	2,804	20,320
Range from bottom value to middle value	1,301	11,010
Median Value	6,322	

Simple Mean	
Water	5,352
Wastewater	8,679
Wastewater-Collection	4,579

Appendix A-5.1 (AUS)

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
As of April 28, 2020

Comparable Sales Approach

Market Sales Analysis - PP/Cash Flow (EBITDA)

Property Acquired		Asset Purchase Agreement (APA) Date	Purchase Price (PP)	Proportion of Purchase Price to Total	Cash Flows (EBITDA)	Purchase Price to Cash Flow	Variance to Simple Mean	Variance to Wtd Mean	Variance Squared	
New Garden Wastewater System	Wastewater	2016.59	29,500,000	7%	1,409,768	20.93	(1.45)	(0.65)	0.42	1.51
McKeesport Wastewater System	Wastewater	2016.67	159,000,000	39%	5,247,843	30.30	7.92	8.72	76.04	11.79
Limerick Wastewater System	Wastewater	2018.57	75,100,000							
Mahoning Water System	Water	2017.79	4,734,800							
Mahoning Wastewater System	Wastewater	2017.79	4,765,200							
East Bradford Wastewater Collection System	Wastewater	2017.97	5,000,000	1%	100,053	49.97	27.59	28.39	805.99	0.61
Sadsbury Wastewater Collection System	Wastewater	2019.19	8,600,000	2%	580,238	14.82	(7.56)	(6.76)	45.70	0.31
Exeter Wastwater Collection System	Wastewater	2018.41	96,000,000	23%	7,099,396	13.52	(8.86)	(8.06)	64.96	3.18
Steelton Water System	Water	2018.87	21,750,000	5%	1,568,999	13.86	(8.52)	(7.72)	59.60	0.74
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.42	50,250,000	12%	5,270,576	9.53	(12.85)	(12.05)	145.20	1.17
East Norriton Wastewater	Wastewater-collection	2018.76	21,000,000	5%	925,477	22.69	0.31	1.11	1.23	1.17
Kane Wastewater	Wastewater	2019.75	17,560,000	4%	680,463	25.81	3.43	4.23	17.89	1.11
Royersford Wastewater	Wastewater	2019.94	13,000,000	3%	692,724	18.77	(3.61)	(2.81)	7.90	0.60
Valley Water	Water	2019.96	7,325,000	2%	520,405	14.08	(8.30)	(7.50)	56.25	0.25
Valley Wastewater	Wastewater	2019.96	13,950,000	3%	685,766	20.34	(2.04)	(1.24)	1.54	0.69
			408,660,000	100%	22,882,813	17.86				21.58

Simple Mean	22.38
Standard Deviation	11.60
SimpleMedian	20.93
Simple Mode	Not Applicable

Weighted Mean	21.58
Standard Deviation	8.02
Wtd Median	13.52
Wtd Mode	Not Applicable

Forecast	2019.944064	17.24
	2021	13.95

Property Acquired		Asset Purchase Agreement (APA) Date	Purchase Price (PP)	Proportion of Purchase Price to Total	Cash Flows (EBITDA)	Purchase Price to Cash Flow	Accummulated Customers
Cheltenham Wastewarer Collection System	Wastewater-collection	2018.419406	50,250,000	0.1134478	5,270,576	9.53	5,270,576
Exeter Wastwater Collection System	Wastewater	2018.412785	96,000,000	0.21673609	7,099,396	13.52	12,369,972
Steelton Water System	Water	2018.871689	21,750,000	0.04910427	1,568,999	13.86	13,938,971
Valley Water	Water	2019.963242	7,325,000	0.01653742	520,405	14.08	14,459,376
Sadsbury Wastewater Collection System	Wastewater	2019.185845	8,600,000	0.01941594	580,238	14.82	15,039,614
Royersford Wastewater	Wastewater	2019.944064	13,000,000	0.02934968	692,724	18.77	15,732,338
Valley Wastewater	Wastewater	2019.963242	13,950,000	0.03149446	685,766	20.34	16,418,104
New Garden Wastewater System	Wastewater	2016.586073	29,500,000	0.06660119	1,409,768	20.93	17,827,872
East Norriton Wastewater	Wastewater-collection	2018.755479	21,000,000	0.04741102	925,477	22.69	18,753,349
Kane Wastewater	Wastewater	2019.748858	17,560,000	0.03964464	680,463	25.81	19,433,812
McKeesport Wastewater System	Wastewater	2016.669406	159,000,000	0.35896915	5,247,843	30.3	24,681,655
East Bradford Wastewater Collection System	Wastewater	2017.971461	5,000,000	0.01128834	100,053	49.97	24,781,708
			442,935,000	100.0%	24,781,708	17.87	

Middle Cash Flow		12,390,854
Bottomvalue of the range containng the Middle Value	13.52	12,369,972
Top value of the range containing the Middle Value	13.86	13,938,971
Range containng the middle value	0.34	1,568,999
Range from bottom value to middle value	0.00	20,882
Median Value	13.52	

Simple Mean

Water	13.86
Wastewater	25.89
Wastewater-Collection	16.11

Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

Pennsylvania American Water Company
Upper Pottsgrove Township
Montgomery County, PA
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

	Customers	EDUs
Commerical	22	40
Mixed Use	7	26
Public	3	32
Residential	1390	1429
Commerical	6	46
Total	1428	1573

Year	Population			
1990	3315	15.40%	10	1.5%
2000	4102	23.70%	10	2.4%
2010	5315	29.60%	10	3.0%
Est. 2016	5567	4.70%	6	0.8%
Forecast				1.0%

Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Market Approach
Value Line Investment Surveys
Water Industry
Market and Financial Ratios

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

S:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Pennsylvania American Water Company															
Upper Pottsgrove Township															
Montgomery County, PA															
Comparable Sales Approach															
04/01/2020															
Financial Basis[1]															
Company	Exchange	Ticker	Value Line No.	Value Line Issue Date	Market Price per share	Book Value per share	Market to Book Equity Ratio	Debt (Total) $millions	Outstanding Shares millions	Debt per share	Market Value per share (Debt + Equity)	Book Value per share (Debt + Equity)	Market to Book Value Ratio	Market Value Wtd Market to Book Ratio	
Value Line Information															
American States Water	NYSE	AWR	1785	4/10/2020	84.6	17.15	4.93	286.3	36.859505	7.77	92.37	24.92	3.71	342.69	
American Water	NYSE	AWK	1786	4/10/2020	126.72	35.35	3.58	9453	180.974719	52.23	178.95	87.58	2.04	365.06	
California Water	NYSE	CWT	1787	4/10/2020	52.32	15.7	3.33	983.8	48.532	20.27	72.59	35.97	2.02	146.63	
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	15.93	11.2	1.42	0.1	15.078499	0.01	15.94	11.21	1.42	22.63	
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	43.05	17.35	2.48	3074.1	222.781536	13.8	56.85	31.15	1.83	104.04	
Middlesex Water	NDQ	MSEX	1790	4/10/2020	61.47	16.15	3.81	258	17.434	14.8	76.27	30.95	2.46	187.62	
SJW Corporation	NYSE	SJW	1791	4/10/2020	59.78	33.3	1.8	1305.9	28.456508	45.89	105.67	79.19	1.33	140.54	
York Water	NDQ	YORW	1792	4/10/2020	46.77	11.2	4.18	101	13.014898	7.76	54.53	18.96	2.88	157.05	
											653.17			1466.26	
Essential Utilities, Inc. formerly Aqua America															
Analysis Summary															
Minimum													1.33		
Mean													2.21		
Standard Deviation													0.74		
Wtd Mean													2.24		
Median													2.03		
Maximum													3.71		
American Water & Essential Utilities Averages													2.77		
Conclusion (AUS Input)													**2.77**		

Water and Wastewater Industry

Cost Indices

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net
ail: weinertj@auswest.net

Water and Wastewater Industry

Cost Indices

Handy Whitman Index of Public System Construction Costs
Water Industry – Northeastern United States

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Bulletin No. 191

1912 to January 1, 2020

The Handy-Whitman Index® of Public Utility Construction Costs™

Trends of Construction Costs

COMPILED & PUBLISHED BY
Whitman, Requardt & Associates, LLP
Engineers, Architects and Planners
801 South Caroline Street
Baltimore, Maryland 21231
410-235-3450

FOREWORD

Tradition of Quality

The Handy-Whitman Index of Public Utility Construction Costs has been published continuously since 1924. Formerly the Handy Index, Bulletin Nos. 1 through 15 were developed by William W. Handy of Baltimore who had wide valuation experience in public utilities. *He believed that valuation studies should not be confined to rate cases but should be kept alive to the benefit of the utility industry.* He began publishing index numbers for electric and gas construction cost trends. Carrying on with the *tradition of quality,* after Mr. Handy's death, we continued publication for his estate beginning with Bulletin 16. Then, January 1, 1950, Whitman, Requardt and Associates, LLP purchased rights to the publication and have since been the sole publishers.

The name Handy-Whitman Index was adopted for Bulletin No. 53 and succeeding issues to combine the names of Mr. Handy and Ezra B. Whitman, a well-known valuation engineer. In 1957 an index of water utility construction costs was added. Mr. Whitman was a consultant on the publication of the Index until his death in 1963.

Whitman, Requardt and Associates, LLP

Ezra B. Whitman, a well-known valuation engineer was one of the founders of our firm. Major Whitman, as he was known from his World War I service, had already made a name for himself. Prior to the founding of the firm in 1915, Major Whitman had been President and Chief Engineer of the Water Board of the City of Baltimore. He designed the first rapid sand filtration plant serving a major city while he was the Baltimore Water Engineer. He was also president of the American Society of Civil Engineers and of the American Institute of Consulting Engineers and a chairman of the Public Service Commission of Maryland.

The Handy-Whitman Index is prepared especially for electric, gas and water utilities and is the only known publication of its kind available to the public. The list of subscribers is international and includes operating utilities, regulatory bodies, valuation engineers, equipment industries, insurance companies and reference libraries.

Tradition of Quality Continued

Since 1915, Whitman, Requardt and Associates, LLP, has been an independent consulting engineering firm organized to serve government, industry and private enterprise.

The firm has steadily expanded its engineering capabilities, providing complete services for civil, sanitary, structural, mechanical and electrical engineering and architectural projects from job inception through construction management. Construction cost data from utility projects of all types are available from design and valuation assignments. The staff is composed of specialists in these and related disciplines who bring a diverse professional and academic expertise to each assignment. A full-time staff is maintained specifically for preparing the Handy-Whitman Index.

Methods of Preparation of Indexes

An index number is a percentage ratio between the cost of an item at any stated time and its cost at a base period, or:

$$\text{Index Number} = \frac{\text{cost at stated time}}{\text{cost at base period}} \times 100$$

Index numbers have been prepared for many items, including wage rates, cost-of-living, material and equipment costs, and financial transactions. In the Handy-Whitman Index, index numbers have been developed for Building Construction, Electric Utility Construction, Gas Utility Construction and Water Utility Construction. Prices of basic materials such as cement, sand, gravel, cast iron pipe, wire, etc., are obtained from publications such as Engineering News-Record and checked against prices actually being paid for such materials. Labor cost trends are computed from labor rates obtained from sources such as the Construction Labor Research Council. Prices and cost trends of equipment are obtained from nationally recognized manufacturers, and operating utilities.

Handy-Whitman Index numbers are developed from wage rates and prices prevailing on January 1 and July 1 each year. The index numbers are generally based on 1973 = 100, although those items of recent origin are based on a later year.

The proportions of basic materials, labor, equipment and other cost components used in the Handy-Whitman Index are based on analyses developed during valuation and design assignments and on data furnished by utilities and industrial sources willing to assist with the Index. These data are reviewed continuously, and weightings and components are revised as required. This review assures that the indexes published reflect current construction practice.

FOREWORD

Geographic Regions

To reflect differing cost trends throughout the 48 contiguous states, the index has been divided into six geographical regions of similar characteristics. They are shown on the accompanying map.

Use of Index Numbers

Handy-Whitman Index numbers have been widely used to trend earlier valuations and original cost records to estimate reproduction cost at prices prevailing at a certain date. The use of indexes for an appropriate property item or group will provide a reliable guide to changes in cost. Cost trends are given for all the important items of property. The electric and gas groups are arranged by the Federal Energy Regulatory Commission Uniform System of Accounts. The water property accounts are arranged to follow the classification of the National Association of Regulatory Utility Commissioners and the American Water Works Association.

The Handy-Whitman Index will furnish a yardstick for the fluctuations in value of property which will be satisfactory for many purposes. In rate cases, when a more exact determination of value is desired, however, the Index must be used carefully. Average prices and cost trends are used to develop the Index, and any direct application of cost trends without checking with actual local experience may not be accepted without controversy. When local experience is compared with the index and the correlation between the two trends is determined, the result is satisfactory. Costs trended by such a method are used to assist in establishing a rate base.

Indexes in these bulletins are used to trend earlier valuations or original cost records for insurance purposes.

The Handy-Whitman Index has a general application in valuations of all types of property. The building construction cost trends may be used wherever similar items of property are to be compared. Many of the other trends may be used for related items in other industries because of their similarity.

State-of-the-art changes often affect costs independently of inflation. New regulatory and environmental requirements, changes in work rules and improved design standards, for instance, increase construction costs even though the price of wages, materials and equipment may be static. Trended construction costs will not reflect such changes. However, trended costs are a reasonably accurate measure of the cost of reproducing actual plant.

Although every effort is made to maintain accuracy, Whitman, Requardt and Associates, LLP disclaim any responsibility for the use of these indexes, because local conditions may vary.

No guarantee or warranty of any kind is made in the sale of the Handy-Whitman Index. Published numbers are occasionally subject to change based upon receipt of new or different information. These numbers will be bolded.

Further inquiries on electric, gas and water indexes should be addressed to Whitman, Requardt and Associates, LLP.

Total Electric Plant and Function

Three indexes are provided for total plant. The first is for all steam generation and the other two for weighted combinations of steam and nuclear, and steam and hydro generation. Indexes are also provided for each function.

Indexes are not maintained for plant accounts 323,324,325,341,345 and 346. We believe that indexes for comparable accounts in other functions are sufficiently accurate for these accounts.

The indexes for total nuclear production and total other production incorporate comparable indexes from the steam production function for the accounts not listed.

Value of Index Numbers

We believe that present-day reproduction cost of any property can be calculated more accurately using index numbers than by repricing a complete inventory.

Trending the controlling items of property in any utility by the index method saves time and effort in arriving at a valuation. Analyzing and determining cost trends for all of the great numbers of articles of plant that represent only a very small proportion of the value of the utility is not necessary. They may be assumed to follow in general the trend of the controlling items, and the fluctuations in value above or below the trends of the controlling items will tend to offset each other and have a very slight effect on the total value.

Comments on Bulletin No. 191

During the twelve-month period ending January 1, 2020, the average index of all geographical regions for Total Gas Plant increased 7.0%. and the comparable index for Electric Plant-All Steam Generation increased 1.1%.

May 2020
Whitman, Requardt and Associates, LLP

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BY

WHITMAN, REQUARDT AND ASSOCIATES, LLP

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North Atlantic Region	E-1	E-1-1
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North Central Region	E-3	E-3-1
South Central Region	E-4	E-4-1
Plateau Region	E-5	E-5-1
Pacific Region	E-6	E-6-1

COST TRENDS OF GAS UTILITY CONSTRUCTION

Cost Trend Tables - 1912 to January 1, 2020		
North Atlantic Region	G-1	G-1-1
South Atlantic Region	G-2	G-2-1
North Central Region	G-3	G-3-1
South Central Region	G-4	G-4-1
Plateau Region	G-5	G-5-1
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COST TRENDS OF WATER UTILITY CONSTRUCTION

Cost Trend Tables - 1912 to January 1, 2020		
North Atlantic Region	W-1	W-1-1
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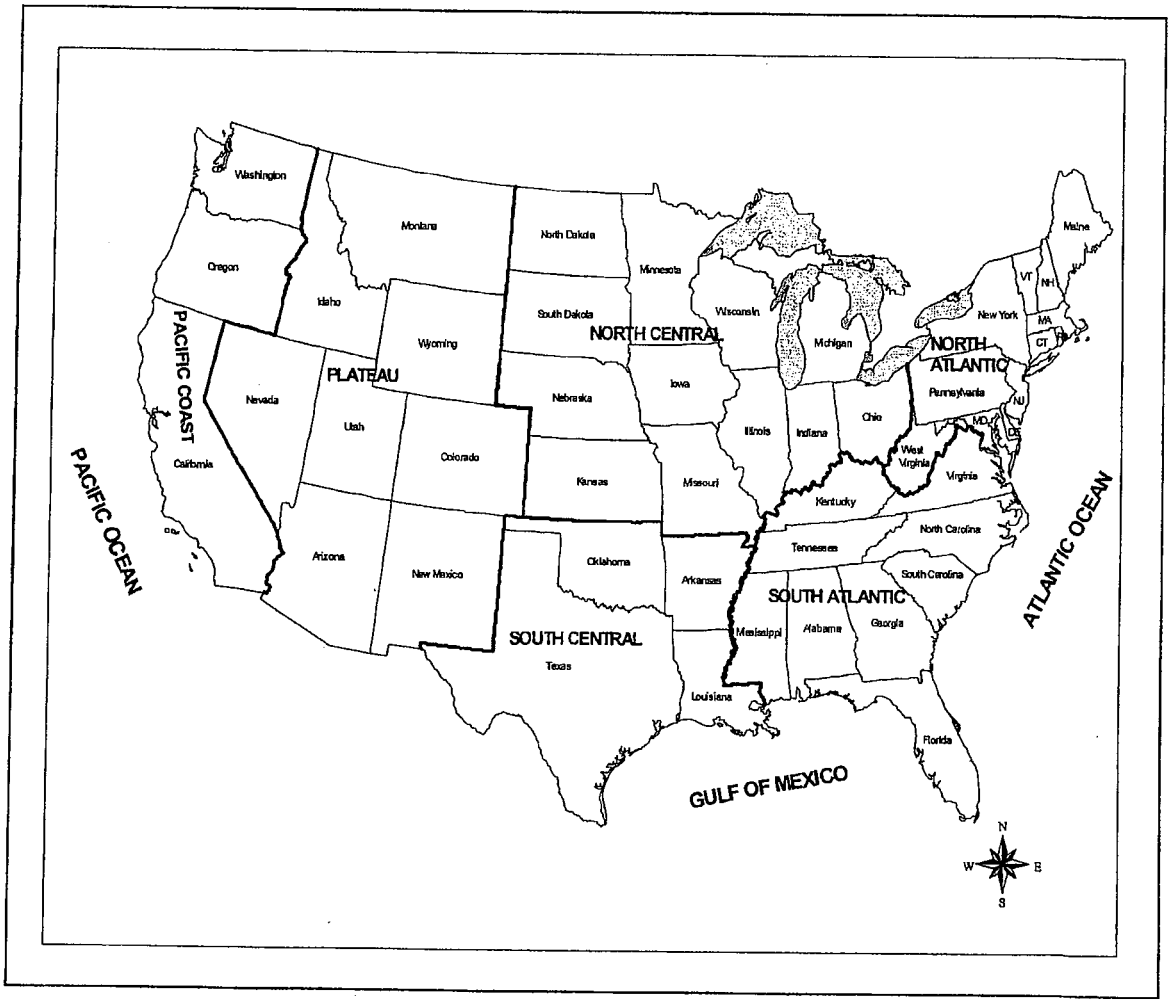
North Central Region	W-3	W-3-1
South Central Region	W-4	W-4-1
Plateau Region	W-5	W-5-1
Pacific Region	W-6	W-6-1

TRENDS OF PUBLIC UTILITY CONSTRUCTION COSTS

GEOGRAPHIC REGIONS



Cost Trends Of

Water Utility Construction

COST TREND TABLES
1912 to January 1, 2020

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	7	7	7	7	9	13	15	15	17	16	16	16	16	16
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	8	8	8	9	11	16	17	18	20	18	18	18	19	18
9	Electric Pumping Equipment	311	-	-	15	15	17	20	22	24	24	23	21	22	23	23
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	8	8	8	9	11	16	17	18	20	18	18	18	19	18
16	Large Treatment Plant Equip.	320	9	9	9	9	11	14	16	17	20	19	18	18	20	20
17	Small Treatment Plant Equip.	320	10	10	10	10	13	17	19	19	22	20	20	20	21	20
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	4	4	4	12	15	17	19	20	15	13	12	13	13	13
24	Elevated Steel Tanks	330	4	4	4	11	14	16	18	19	16	13	11	12	11	10
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	9	10	8	9	11	16	19	20	22	22	20	21	22	21
35	Cast Iron Mains	331	9	10	9	9	12	18	20	22	25	24	22	23	24	23
36	Cement-Asbestos Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	Steel Mains	331	6	7	6	7	8	11	13	13	14	15	14	14	14	15
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	6	6	5	6	6	9	10	11	12	13	12	12	13	13
40	Meters	334	23	23	23	23	26	29	35	37	37	37	37	37	37	37
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		14	16	13	14	26	38	31	29	29	24	25	26	24	23
47	Clarifier Equipment-Installed		-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	Filter Gallery Piping-Installed		8	8	8	8	10	14	16	18	20	18	17	18	19	19
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	17	17	17	17	17	16	14	14	15	15	15	17	17	17
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	19	18	18	18	17	16	15	15	16	16	16	18	18	18
9	Electric Pumping Equipment	311	23	23	23	22	22	22	22	23	24	24	25	26	26	26
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	19	18	18	18	17	16	15	15	16	16	16	18	18	18
16	Large Treatment Plant Equip.	320	20	20	20	20	20	19	17	17	18	18	18	20	20	20
17	Small Treatment Plant Equip.	320	20	20	20	20	20	19	17	17	19	19	19	21	21	21
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	12	12	12	12	11	10	9	9	12	11	12	14	14	14
24	Elevated Steel Tanks	330	11	10	10	10	10	9	8	8	10	10	11	12	13	13
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	21	21	20	20	20	20	18	18	19	19	20	21	22	22
35	Cast Iron Mains	331	23	21	20	21	21	20	18	18	20	20	21	23	24	24
36	Cement-Asbestos Mains	331	-	-	-	-	-	-	-	-	-	-	31	32	32	33
37	Steel Mains	331	15	15	15	16	16	16	14	13	14	14	14	16	16	16
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	13	13	13	14	14	14	13	11	12	13	13	14	14	14
40	Meters	334	37	37	37	37	37	37	37	35	26	26	26	31	32	32
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		23	22	22	22	21	20	20	20	21	21	23	26	25	25
47	Clarifier Equipment-Installed		-	-	-	-	-	-	-	-	-	-	-	17	23	24
48	Filter Gallery Piping-Installed		19	18	18	18	18	18	15	16	18	18	18	19	20	20
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	17	18	20	20	20	21	23	27	31	32	33	35	36	38
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	18	19	20	21	21	22	24	28	32	35	36	38	38	39
9	Electric Pumping Equipment	311	26	27	27	27	27	27	31	39	43	45	49	55	55	55
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	18	19	20	21	21	22	24	28	32	35	36	38	38	39
16	Large Treatment Plant Equip.	320	21	22	23	24	24	25	28	32	35	36	38	40	41	42
17	Small Treatment Plant Equip.	320	21	22	24	24	24	25	28	33	37	39	41	43	43	44
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	14	16	16	13	14	16	20	26	29	27	28	30	31	32
24	Elevated Steel Tanks	330	12	15	15	14	15	14	17	23	26	25	26	28	29	31
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	-	-	-	-	-	-	-	-	-	-	-	42	43	45
28	Steel Mains	331	-	-	-	-	-	-	-	-	-	-	-	40	40	43
29	Concrete Cylinder Mains	331	-	-	-	-	-	-	-	-	-	-	-	44	45	47
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	23	23	24	25	25	26	29	35	41	42	43	45	47	48
35	Cast Iron Mains	331	24	25	27	27	28	28	32	39	46	46	48	50	51	53
36	Cement-Asbestos Mains	331	33	34	36	36	37	37	44	49	59	61	62	64	65	67
37	Steel Mains	331	16	17	18	18	18	19	21	24	28	29	31	32	34	36
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	14	15	16	16	17	17	19	22	25	27	28	29	31	33
40	Meters	334	33	35	37	37	37	37	40	42	48	52	59	61	61	65
41	Meter Installations	334	-	-	-	-	-	-	-	-	-	29	31	34	35	36
42	Hydrants Installed	335	-	-	-	-	-	-	-	-	-	35	37	41	41	43
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		25	27	28	28	28	30	33	38	44	45	45	49	49	50
47	Clarifier Equipment-Installed		25	26	27	27	27	29	32	37	43	43	44	46	46	49
48	Filter Gallery Piping-Installed		21	21	22	22	22	23	25	30	35	37	37	39	40	41
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	39	41	44	47	49	51	52	53	55	56	57	59	61	64
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	41	43	46	49	50	52	53	53	54	55	56	57	59	61
9	Electric Pumping Equipment	311	55	56	63	69	73	74	74	71	71	71	73	74	78	81
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	41	43	46	49	50	52	53	53	54	55	56	57	59	61
16	Large Treatment Plant Equip.	320	44	45	48	50	52	54	55	56	58	59	60	62	64	67
17	Small Treatment Plant Equip.	320	46	47	50	53	54	56	58	58	60	60	62	63	66	68
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	32	33	38	42	37	36	35	35	35	41	44	45	46	47
24	Elevated Steel Tanks	330	31	33	35	38	38	38	38	37	36	37	38	38	41	44
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	47	50	52	56	57	61	62	63	64	65	66	67	69	71
28	Steel Mains	331	44	46	49	52	55	57	57	58	59	60	61	63	65	67
29	Concrete Cylinder Mains	331	48	50	52	54	56	59	60	60	61	62	62	64	66	70
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	51	53	57	60	63	65	68	69	71	72	73	74	75	76
35	Cast Iron Mains	331	56	59	62	66	68	72	73	75	77	79	79	80	80	81
36	Cement-Asbestos Mains	331	68	70	75	78	81	84	86	86	87	89	88	81	82	82
37	Steel Mains	331	38	40	43	46	48	51	53	55	56	58	60	63	65	66
38	PVC Mains	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Services Installed	333	35	36	39	41	44	46	48	50	51	53	55	58	60	63
40	Meters	334	67	70	77	78	78	78	78	78	84	87	87	93	101	101
41	Meter Installations	334	38	40	44	45	46	48	51	52	54	55	57	59	62	65
42	Hydrants Installed	335	44	44	48	50	51	53	54	55	56	57	58	58	61	64
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		52	53	57	58	58	59	60	61	61	62	65	66	67	68
47	Clarifier Equipment-Installed		50	49	53	55	57	58	58	59	60	60	63	65	66	67
48	Filter Gallery Piping-Installed		44	46	48	50	53	54	56	57	58	59	60	61	63	65
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	67	72	78	86	94	100	115	127	133	139	148	164	179	189
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	64	69	75	84	92	100	117	127	130	137	148	163	181	191
9	Electric Pumping Equipment	311	81	84	89	93	96	100	122	155	174	184	192	205	222	245
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	64	69	75	84	92	100	117	127	130	137	148	163	181	191
16	Large Treatment Plant Equip.	320	69	73	79	89	96	100	118	134	144	152	162	175	191	208
17	Small Treatment Plant Equip.	320	70	74	80	90	96	100	120	139	150	160	172	186	204	223
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	49	53	75	82	85	100	140	159	171	172	173	178	191	208
24	Elevated Steel Tanks	330	48	55	71	80	86	100	152	183	182	183	195	206	228	250
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	74	78	84	91	96	100	129	137	142	150	158	166	180	196
28	Steel Mains	331	69	74	80	88	96	100	113	125	133	141	152	166	180	199
29	Concrete Cylinder Mains	331	72	78	80	88	95	100	113	134	138	140	148	162	176	189
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	77	80	84	94	98	100	110	146	154	162	173	185	202	219
35	Cast Iron Mains	331	82	83	88	97	99	100	143	158	163	167	178	185	202	218
36	Cement-Asbestos Mains	331	82	85	88	97	98	100	127	148	159	167	176	202	212	234
37	Steel Mains	331	68	72	78	88	97	100	115	128	139	151	164	179	197	212
38	PVC Mains	331	-	-	-	-	-	-	25	100	104	108	113	122	132	138
39	Services Installed	333	66	72	79	89	96	100	115	123	130	139	145	160	175	184
40	Meters	334	101	106	108	108	106	100	93	93	98	101	105	108	122	127
41	Meter Installations	334	68	73	79	89	97	100	113	120	131	147	152	162	177	189
42	Hydrants Installed	335	68	72	80	90	96	100	123	143	157	167	182	194	207	222
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		69	74	82	93	98	100	139	174	195	218	246	290	350	406
47	Clarifier Equipment-Installed		68	72	82	93	98	100	140	167	181	199	210	232	272	310
48	Filter Gallery Piping-Installed		68	72	78	90	97	100	119	130	136	144	151	158	171	185
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	197	206	217	227	234	238	248	255	258	262	270	282	295	302
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	198	206	218	225	233	239	251	265	271	274	281	294	308	316
9	Electric Pumping Equipment	311	260	271	277	282	284	299	311	330	349	355	368	386	428	442
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	198	206	218	225	233	239	251	265	271	274	281	294	308	316
16	Large Treatment Plant Equip.	320	227	242	251	262	269	276	286	301	313	322	332	342	348	357
17	Small Treatment Plant Equip.	320	243	259	268	279	286	293	303	317	328	334	343	354	360	366
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	210	182	184	181	184	196	220	216	229	253	261	248	246	250
24	Elevated Steel Tanks	330	244	197	200	198	207	219	260	268	278	285	277	249	242	252
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	208	222	225	236	235	242	253	266	273	279	284	295	305	305
28	Steel Mains	331	215	223	230	234	232	241	255	272	279	287	293	302	316	324
29	Concrete Cylinder Mains	331	203	213	218	232	239	243	258	269	277	288	295	303	311	317
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	231	239	244	254	255	263	280	295	301	307	311	321	327	332
35	Cast Iron Mains	331	223	245	253	264	263	269	282	296	304	313	320	329	339	341
36	Cement-Asbestos Mains	331	253	244	249	255	259	275	315	340	338	332	319	335	338	354
37	Steel Mains	331	233	228	231	237	242	248	265	277	281	288	295	302	304	311
38	PVC Mains	331	137	151	149	151	150	160	197	217	211	200	183	193	191	204
39	Services Installed	333	198	207	215	221	226	230	245	258	262	272	283	292	300	307
40	Meters	334	128	141	148	135	135	137	140	150	159	162	196	195	175	200
41	Meter Installations	334	207	230	239	247	255	259	269	282	294	310	320	337	347	358
42	Hydrants Installed	335	245	264	270	285	296	307	320	343	363	372	378	385	391	398
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		458	496	506	540	560	575	579	580	565	528	539	555	562	566
47	Clarifier Equipment-Installed		356	389	398	431	442	446	451	455	442	416	435	458	492	514
48	Filter Gallery Piping-Installed		201	217	223	234	237	243	251	266	279	289	297	309	319	321
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS									2005		2006		2007	
			1996	1997	1998	1999	2000	2001	2002	2003	2004	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	**Source of Supply Plant**																
2	Collecting & Impounding Res.	305	309	317	318	318	326	336	344	350	373	388	394	400	405	413	439
3																	
4																	
5																	
6																	
7	**Pumping Plant**																
8	Structures & Improvements	304	321	331	337	343	362	378	389	394	421	442	447	456	464	481	494
9	Electric Pumping Equipment	311	450	473	489	505	530	527	529	543	572	604	611	620	619	639	628
10																	
11																	
12																	
13																	
14	**Water Treatment Plant**																
15	Structures & Improvements	304	321	331	337	343	362	378	389	394	421	442	447	456	464	481	494
16	Large Treatment Plant Equip.	320	367	380	391	401	413	428	443	452	466	480	482	499	500	516	533
17	Small Treatment Plant Equip.	320	375	389	401	410	424	439	452	460	480	498	502	520	518	539	559
18																	
19																	
20																	
21																	
22	**Transmission Plant**																
23	Steel Reservoirs	330	251	255	268	268	270	274	275	276	308	329	338	348	375	494	537
24	Elevated Steel Tanks	330	268	273	283	288	299	341	429	431	481	524	524	524	596	657	657
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																	
27	Cast Iron Mains	331	311	320	323	328	348	363	383	385	393	411	415	442	451	480	484
28	Steel Mains	331	329	337	342	351	377	391	400	404	451	509	508	530	539	528	527
29	Concrete Cylinder Mains	331	324	331	338	345	372	404	415	415	425	436	440	454	459	460	462
30																	
31																	
32																	
33	**Distribution Plant**																
34	Mains-Average All Types	331	339	347	355	361	377	391	404	407	432	462	464	485	494	524	523
35	Cast Iron Mains	331	348	358	364	370	390	404	421	425	436	457	460	483	492	525	528
36	Cement-Asbestos Mains	331	364	372	375	382	405	423	444	446	460	480	483	538	546	599	597
37	Steel Mains	331	316	322	334	339	346	358	363	367	416	459	460	467	477	494	487
38	PVC Mains	331	211	216	216	219	231	242	253	254	263	277	278	321	321	365	361
39	Services Installed	333	321	323	330	334	348	354	360	368	388	404	407	421	459	478	481
40	Meters	334	207	197	197	198	205	206	207	207	207	207	207	235	248	260	262
41	Meter Installations	334	375	381	387	392	406	417	428	440	456	466	467	482	530	549	552
42	Hydrants Installed	335	418	475	493	508	526	551	565	570	585	597	597	613	647	663	669
43																	
44																	
45	**Miscellaneous Items**																
46	Flocculating Equipment-Installed		579	603	622	642	652	671	683	697	758	801	801	852	852	869	983
47	Clarifier Equipment-Installed		540	562	572	579	593	603	617	630	663	709	709	729	729	760	892
48	Filter Gallery Piping-Installed		328	337	344	349	363	378	398	408	421	438	438	468	470	500	501
49																	
50																	
51																	
52																	
53																	
54																	
55																	
56																	

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			2008		2009		2010		2011		2012		2013		2014	
			Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	457	466	470	465	475	478	492	495	501	502	507	505	515	517
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	516	543	551	536	552	558	571	583	597	600	618	608	621	630
9	Electric Pumping Equipment	311	640	666	679	688	707	701	708	760	780	785	800	844	856	900
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	516	543	551	536	552	558	571	583	597	600	618	608	621	630
16	Large Treatment Plant Equip.	320	566	582	614	616	631	638	642	653	669	680	689	697	713	725
17	Small Treatment Plant Equip.	320	602	624	666	669	686	693	706	712	740	754	764	779	800	813
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	537	722	722	722	722	722	771	771	795	810	778	780	715	742
24	Elevated Steel Tanks	330	680	866	866	866	866	867	1079	1079	1059	1082	1089	1099	1131	1131
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26																
27	Cast Iron Mains	331	510	534	578	576	601	601	602	610	634	669	691	684	712	743
28	Steel Mains	331	543	606	605	585	593	609	644	658.5	711	708	724	704	694	708
29	Concrete Cylinder Mains	331	468	475	502	502	494	495	510	517	523	526	547	534	535	547
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	550	588	624	608	617	623	633	644	669	690	698	693	720	733
35	Cast Iron Mains	331	556	579	625	624	647	648	654	660	681	716	733	730	759	781
36	Cement-Asbestos Mains	331	621	632	691	678	638	649	658	683	716	721	712	707	704	721
37	Steel Mains	331	514	582	595	559	565	575	593	606	633	637	638	631	665	665
38	PVC Mains	331	372	374	419	408	353	363	369	389	412	412	391	392	383	383
39	Services Installed	333	501	511	534	534	545	554	568	574	589	600	602	602	603	605
40	Meters	334	373	373	373	373	374	376	379	379	379	379	380	381	381	381
41	Meter Installations	334	572	573	597	598	612	623	635	635	646	673	677	677	688	688
42	Hydrants Installed	335	693	699	732	731	740	721	730	731	757	758	774	784	807	849
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		1187	1373	1645	1645	1699	1744	1823	1848	1904	1973	1978	2015	2041	2078
47	Clarifier Equipment-Installed		920	944	997	997	991	1001	1056	1060	1077	1102	1105	1136	1154	1162
48	Filter Gallery Piping-Installed		530	543	589	590	613	614	620	620	641	666	677	680	713	728
49																
50																
51																
52																
53																
54																
55																
56																

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COST TRENDS OF WATER UTILITY CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	NARUC	COST INDEX NUMBERS													
			2015		2016		2017		2018		2019		2020		2021	
			Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	**Source of Supply Plant**															
2	Collecting & Impounding Res.	305	526	521	526	532	543	549	559	570	576	575	584			
3																
4																
5																
6																
7	**Pumping Plant**															
8	Structures & Improvements	304	642	646	655	659	672	671	687	706	717	713	719			
9	Electric Pumping Equipment	311	928	931	990	1013	1052	1135	1146	1216	1261	1346	1374			
10																
11																
12																
13																
14	**Water Treatment Plant**															
15	Structures & Improvements	304	642	646	655	659	672	671	687	706	717	713	719			
16	Large Treatment Plant Equip.	320	736	737	755	758	774	785	797	812	832	842	871			
17	Small Treatment Plant Equip.	320	832	840	861	864	881	897	911	934	960	975	1012			
18																
19																
20																
21																
22	**Transmission Plant**															
23	Steel Reservoirs	330	742	742	742	774	784	784	801	820	832	832	836			
24	Elevated Steel Tanks	330	1131	1131	1131	1143	1161	1161	1181	1200	1244	1244	1244			
25	Concrete Reservoirs	330	-	-	-	-	-	-	-	-	-	-	-			
26																
27	Cast Iron Mains	331	733	744	754	759	793	785	810	825	844	858	884			
28	Steel Mains	331	712	713	697	705	723	726	733	770	792	785	824			
29	Concrete Cylinder Mains	331	562	575	591	592	601	592	620	626	639	641	638			
30																
31																
32																
33	**Distribution Plant**															
34	Mains-Average All Types	331	736	738	747	750	774	772	790	801	819	826	847			
35	Cast Iron Mains	331	780	785	795	797	832	826	855	864	883	894	920			
36	Cement-Asbestos Mains	331	724	731	741	743	751	746	763	770	784	793	820			
37	Steel Mains	331	673	670	678	681	697	701	704	717	734	736	748			
38	PVC Mains	331	387	387	388	388	387	387	397	397	401	401	417			
39	Services Installed	333	617	616	622	617	638	651	661	667	677	684	706			
40	Meters	334	400	400	403	403	404	418	434	434	443	443	459			
41	Meter Installations	334	702	702	709	708.5	722	733	750	750	765	772	790			
42	Hydrants Installed	335	877	930	971	972	980	981	1012	1024	1049	1063	1101			
43																
44																
45	**Miscellaneous Items**															
46	Flocculating Equipment-Installed		2167	2177	2192	2192	2198	2213	2223	2264	2360	2360	2470			
47	Clarifier Equipment-Installed		1184	1188	1229	1272	1311	1315	1369	1401	1462	1462	1523			
48	Filter Gallery Piping-Installed		727	728	735	738	772	772	801	808	825	834	868			
49																
50																
51																
52																
53																
54																
55																
56																

Cost Trends Of

Building Construction

COST TREND TABLES
1912 to January 1, 2020

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COST TRENDS OF BUILDING CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION, MATERIAL, AND LABOR	COST INDEX NUMBERS															
		1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	8	8	8	8	12	18	19	19	20	15	14	17	17	17	17	16
3	Brick Building Construction	8	8	8	9	11	15	17	19	21	17	16	18	19	18	18	18
4	Structural Steel Erected	9	9	9	8	16	29	26	22	22	16	15	19	19	17	17	16
5	Reinf. Concrete (Ready-Mix)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7																	
8	**Building Material**																
9	Ready-Mix Concrete	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Lumber for Reinf. Concrete	7	7	7	7	9	13	19	19	20	14	13	15	19	19	15	15
11	Steel Bars for Reinf. Concrete	15	15	15	17	34	47	37	35	37	24	22	28	29	27	25	24
12	Common Brick	10	10	10	14	16	19	20	27	34	31	30	33	30	28	28	28
13	Concrete Block	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14																	
15	**Labor**																
16	Building Trades Labor	6	6	6	6	6	7	8	10	11	11	11	12	13	14	15	15
17	Heavy Constr. Trades Labor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Labor for Reinf. Concrete	5	5	5	5	5	6	8	10	11	9	9	10	11	11	11	11
19	Common Labor	4	4	4	4	5	5	8	10	11	9	8	9	9	9	9	9
20	Electricians	5	5	5	6	6	6	8	9	10	11	11	11	12	13	14	14
21	Pipefitters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Plumbers	6	6	6	6	6	7	8	9	9	11	11	12	12	13	14	14
23																	

Line	CONSTRUCTION, MATERIAL, AND LABOR	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	16	16	15	14	12	13	15	15	15	16	16	16	17	18	20	20
3	Brick Building Construction	18	17	17	16	14	14	16	16	16	17	17	17	17	19	20	20
4	Structural Steel Erected	16	16	15	13	11	12	14	15	15	17	15	15	15	19	20	20
5	Reinf. Concrete (Ready-Mix)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Reinf. Concrete (Plant-Mix)	16	16	15	14	12	13	15	15	15	17	17	17	17	18	19	19
7																	
8	**Building Material**																
9	Ready-Mix Concrete	-	-	-	-	-	-	32	32	32	33	33	32	31	31	32	33
10	Lumber for Reinf. Concrete	15	15	14	12	10	12	16	13	13	15	15	15	16	19	21	22
11	Steel Bars for Reinf. Concrete	24	25	22	20	20	21	24	23	25	31	29	28	27	28	28	28
12	Common Brick	25	23	20	20	19	19	22	20	20	20	20	20	20	21	22	22
13	Concrete Block	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14																	
15	**Labor**																
16	Building Trades Labor	15	15	15	15	14	12	13	13	13	15	15	15	16	17	18	18
17	Heavy Constr. Trades Labor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Labor for Reinf. Concrete	11	11	10	10	9	9	11	11	11	12	13	13	14	14	14	15
19	Common Labor	9	9	9	9	8	6	8	9	9	10	10	11	11	12	12	13
20	Electricians	14	15	15	16	16	14	14	14	15	16	16	17	17	18	19	19
21	Pipefitters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Plumbers	14	15	15	15	13	13	14	14	14	15	16	16	17	17	18	18
23																	

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COST TRENDS OF BUILDING CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION, MATERIAL, AND LABOR	COST INDEX NUMBERS															
		1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	20	20	24	28	32	34	35	37	38	40	42	44	48	52	53	55
3	Brick Building Construction	21	21	24	28	32	34	35	37	38	39	41	42	46	49	50	52
4	Structural Steel Erected	20	20	24	30	37	39	41	43	43	47	48	50	59	66	67	67
5	Reinf. Concrete (Ready-Mix)	-	-	-	-	-	-	-	-	35	37	39	41	43	46	48	50
7																	
8	**Building Material**																
9	Ready-Mix Concrete	33	33	35	39	44	45	46	47	49	50	54	57	60	63	66	66
10	Lumber for Reinf. Concrete	23	23	29	33	38	34	37	37	38	36	39	42	44	45	44	47
11	Steel Bars for Reinf. Concrete	28	28	30	34	37	43	45	47	48	51	53	56	61	68	70	72
12	Common Brick	23	27	31	33	38	42	43	47	47	48	50	51	52	53	54	54
13	Concrete Block	-	-	-	-	-	56	58	62	63	63	62	67	69	70	69	73
14																	
15	**Labor**																
16	Building Trades Labor	18	19	21	23	26	27	28	31	31	33	34	36	37	39	41	43
17	Heavy Constr. Trades Labor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Labor for Reinf. Concrete	15	16	18	22	24	25	26	27	29	30	32	33	35	37	39	41
19	Common Labor	13	14	17	19	21	23	24	25	27	28	30	31	33	35	37	40
20	Electricians	19	19	20	23	25	27	28	30	32	33	34	35	37	38	41	42
21	Pipefitters	-	-	-	-	-	26	27	28	29	31	32	33	35	35	39	41
22	Plumbers	18	18	19	22	25	27	28	29	30	32	34	35	37	38	40	41
23																	

Line	CONSTRUCTION, MATERIAL, AND LABOR	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	55	54	55	55	57	58	59	62	65	70	75	84	91	100	121	134
3	Brick Building Construction	53	52	53	54	56	57	59	61	64	68	74	84	91	100	118	127
4	Structural Steel Erected	66	62	62	62	63	63	65	66	69	74	77	83	89	100	140	161
5	Reinf. Concrete (Ready-Mix)	51	52	53	54	55	57	59	61	64	69	77	88	94	100	111	119
6	Reinf. Concrete (Plant-Mix)	49	48	50	51	52	53	56	58	61	66	73	83	91	100	108	115
7																	
8	**Building Material**																
9	Ready-Mix Concrete	66	66	66	65	64	64	65	65	68	73	82	91	94	100	112	123
10	Lumber for Reinf. Concrete	47	39	41	40	39	38	41	42	46	53	53	63	75	100	93	91
11	Steel Bars for Reinf. Concrete	72	72	72	72	74	81	82	81	81	81	84	91	91	100	157	156
12	Common Brick	56	56	56	57	58	58	60	62	65	65	68	78	84	100	123	126
13	Concrete Block	68	70	70	70	70	67	70	72	75	77	81	90	98	100	109	113
14																	
15	**Labor**																
16	Building Trades Labor	45	46	48	50	52	54	56	59	62	68	76	87	96	100	108	115
17	Heavy Constr. Trades Labor	-	45	47	48	50	53	56	58	61	67	76	86	96	100	107	116
18	Labor for Reinf. Concrete	43	45	47	49	51	53	56	58	62	67	77	88	96	100	108	116
19	Common Labor	42	44	45	47	49	52	55	58	61	66	75	88	97	100	109	117
20	Electricians	43	45	48	49	51	53	55	57	60	64	72	82	91	100	108	117
21	Pipefitters	41	44	45	45	48	50	52	55	57	62	70	85	97	100	107	114
22	Plumbers	43	44	46	48	49	51	53	56	58	64	71	86	96	100	107	114
23																	

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COST TRENDS OF BUILDING CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION, MATERIAL, AND LABOR	COST INDEX NUMBERS															
		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	134	139	150	167	184	190	189	196	211	222	229	234	246	258	262	257
3	Brick Building Construction	130	136	148	164	183	192	197	206	217	225	233	239	252	265	271	272
4	Structural Steel Erected	153	154	170	193	225	227	202	202	225	240	249	255	272	286	286	261
5	Reinf. Concrete (Ready-Mix)	124	131	140	154	166	176	191	201	210	220	225	229	238	244	251	260
7																	
8	**Building Material**																
9	Ready-Mix Concrete	126	133	143	163	185	207	226	227	235	248	245	252	254	244	250	255
10	Lumber for Reinf. Concrete	106	118	130	148	139	138	135	143	144	140	140	146	143	148	147	145
11	Steel Bars for Reinf. Concrete	145	147	166	206	215	216	203	190	198	202	205	205	227	232	222	199
12	Common Brick	130	136	159	190	232	247	255	257	256	246	258	270	292	320	320	316
13	Concrete Block	116	120	139	185	210	228	260	260	262	278	285	287	285	301	288	288
14																	
15	**Labor**																
16	Building Trades Labor	122	129	135	143	152	164	184	199	212	221	229	234	245	256	268	285
17	Heavy Constr. Trades Labor	123	131	137	146	155	165	184	199	210	220	229	233	244	255	264	279
18	Labor for Reinf. Concrete	122	130	137	147	157	166	184	198	210	220	227	232	242	253	262	277
19	Common Labor	124	133	141	152	163	172	190	204	214	223	231	234	243	254	265	280
20	Electricians	124	129	135	143	150	164	186	207	224	234	239	244	261	271	280	298
21	Pipefitters	122	131	135	143	154	170	192	207	219	228	236	242	248	263	276	290
22	Plumbers	122	131	136	141	152	168	191	205	217	226	235	241	242	257	279	294
23																	

Line	CONSTRUCTION, MATERIAL, AND LABOR	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 Jan. 1	2005 Jul. 1
1	**Building Construction**															
2	Reinf. Conc. Bldg. Construction	262	279	298	305	311	322	324	330	342	347	363	371	403	415	422
3	Brick Building Construction	278	290	304	310	315	328	337	345	359	366	383	391	414	425	431
4	Structural Steel Erected	260	278	305	317	325	334	336	344	360	366	375	385	433	443	452
5	Reinf. Concrete (Ready-Mix)	268	279	291	296	304	312	320	327	336	343	364	372	389	402	409
6	Reinf. Concrete (Plant-Mix)	247	265	281	279	286	298	296	299	304	307	324	328	351	364	373
7																
8	**Building Material**															
9	Ready-Mix Concrete	257	262	270	281	295	286	301	307	315	327	350	356	344	351	371
10	Lumber for Reinf. Concrete	150	193	227	196	206	218	186	182	168	161	164	153	182	182	215
11	Steel Bars for Reinf. Concrete	194	212	234	236	236	250	246	229	225	220	221	243	296	348	360
12	Common Brick	315	310	313	315	311	335	369	384	412	422	426	427	429	429	439
13	Concrete Block	288	263	262	258	258	285	306	332	354	363	381	384	394	406	406
14																
15	**Labor**															
16	Building Trades Labor	296	307	318	326	331	344	353	362	376	386	412	424	442	458	458
17	Heavy Constr. Trades Labor	291	300	311	319	325	337	348	358	372	380	402	411	430	446	446
18	Labor for Reinf. Concrete	289	297	308	314	320	333	343	354	366	376	400	407	426	439	439
19	Common Labor	293	303	315	315	327	338	349	359	376	382	400	407	421	428	428
20	Electricians	309	324	336	343	353	365	377	390	401	411	441	454	475	497	497
21	Pipefitters	305	317	323	335	342	352	361	374	388	401	423	435	470	488	488
22	Plumbers	305	320	330	339	348	355	363	368	385	397	425	438	455	469	469
23																

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COST TRENDS OF BUILDING CONSTRUCTION

NORTH ATLANTIC REGION (1973=100)

Line	CONSTRUCTION, MATERIAL, AND LABOR	COST INDEX NUMBERS															
		2006		2007		2008		2009		2010		2011		2012		2013	
		Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	431	436	446	472	493	501	505	486	497	498	515	515	524	527	537	534
3	Brick Building Construction	441	443	457	472	492	497	506	494	506	507	521	518	530	532	542	539
4	Structural Steel Erected	462	471	480	534	550	563	555	509	511	511	531	532	538	542	558	553
5	Reinf. Concrete (Ready-Mix)	414	418	434	446	469	476	484	484	500	506	516	517	525	526	527	527
7																	
8	**Building Material**																
9	Ready-Mix Concrete	371	379	382	425	425	425	429	430	430	437	431	439	441	441	436	436
10	Lumber for Reinf. Concrete	195	195	150	164	157	162	162	159	158	149	147	152	150	165	170	168
11	Steel Bars for Reinf. Concrete	324	361	380	420	398	490	334	326	358	416	417	406	393	391	365	356
12	Common Brick	439	439	457	457	460	460	460	453	453	453	453	434	448	451	458	452
13	Concrete Block	428	450	460	386	390	390	390	390	443	432	430	432	428	428	445	445
14																	
15	**Labor**																
16	Building Trades Labor	478	478	499	499	527	527	550	550	572	572	590	590	607	607	619	619
17	Heavy Constr. Trades Labor	459	459	483	483	517	517	542	542	564	564	584	584	596	596	605	605
18	Labor for Reinf. Concrete	452	452	476	476	512	512	541	541	562	562	579	579	591	591	598	598
19	Common Labor	436	436	475	475	510	510	550	550	572	572	590	590	604	604	604	604
20	Electricians	512	512	543	543	564	564	582	582	615	615	632	632	665	665	674	674
21	Pipefitters	514	514	526	526	566	566	590	590	607	607	642	642	658	658	668	668
22	Plumbers	502	502	520	520	545	545	580	580	597	597	610	610	623	623	634	634
23																	

Line	CONSTRUCTION, MATERIAL, AND LABOR	2014		2015		2016		2017		2018		2019		2020		2021	
		Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	**Building Construction**																
2	Reinf. Conc. Bldg. Construction	546	549	557	549	552	558	569	576	589	611	611	605	617			
3	Brick Building Construction	550	552	585	580	586	589	604	608	633	647	647	643	664			
4	Structural Steel Erected	561	567	568	555	549	556	561	569	579	617	618	604	609			
5	Reinf. Concrete (Ready-Mix)	541	543	556	554	564	567	581	585	602	609	611	608	625			
6	Reinf. Concrete (Plant-Mix)	482	482	497	490	497	505	519	527	541	561	553	551	565			
7																	
8	**Building Material**																
9	Ready-Mix Concrete	441	452	455	461	471	471	481	485	488	488	489	488	492			
10	Lumber for Reinf. Concrete	174	170	188	182	178	204	222	240	244	309	255	249	243			
11	Steel Bars for Reinf. Concrete	363	373	368	326	288	307	316	349	342	393	413	381	333			
12	Common Brick	449	449	617	617	618	618	636	637	725	725	709	709	757			
13	Concrete Block	444	499	505	485	483	429	427	411	411	443	429	461	462			
14																	
15	**Labor**																
16	Building Trades Labor	636	636	646	646	660	660	678	678	696	696	707	707	732			
17	Heavy Constr. Trades Labor	620	620	640	640	659	659	673	673	696	696	705	705	732			
18	Labor for Reinf. Concrete	616	616	633	633	651	651	666	666	690	690	693	693	723			
19	Common Labor	620	620	644	644	661	661	674	674	705	705	712	712	750			
20	Electricians	691	691	702	702	724	724	731	731	753	753	775	775	787			
21	Pipefitters	694	694	704	704	717	717	738	738	755	755	768	768	780			
22	Plumbers	655	655	668	668	674	674	696	696	716	716	734	734	751			
23																	

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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
1	Boilers	6	6	6	7	8	13	17	15	16	14	12	14	15	15
2	Coal & Ash Handling Equipment	12	12	12	12	19	31	29	20	28	24	21	23	23	21
3	Pumps	9	9	9	12	14	16	18	18	18	17	16	16	16	17
4	Steam Pipe	17	17	17	12	18	39	44	35	37	35	34	36	37	37
5	Cranes	6	6	6	7	7	7	7	8	8	9	9	9	9	10
6	Regulators	32	32	32	32	32	39	47	45	49	50	49	50	53	52
7	Switchboards	20	20	20	20	21	23	26	35	44	49	43	40	43	43
8	Power Transformers	23	23	23	23	23	32	41	41	49	48	42	43	46	46
9	Oil Switches	27	27	27	27	27	30	38	45	49	53	50	50	51	51
10	Motors	21	21	21	21	21	28	31	37	42	43	34	29	29	29
11	Line Transformers	48	48	48	48	48	51	69	72	77	79	69	67	69	68
12	Meters-Electric	37	37	37	37	37	41	46	51	53	57	53	50	50	48
13	Treated Pine Poles	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Standard Cross Arms	7	7	7	7	7	9	10	12	12	11	12	12	12	13
15	Standard Galv. Steel Guy Wire	12	12	12	14	15	19	22	23	22	22	21	21	20	20
16	Fibre Conduit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Plastic Conduit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Mercury Luminaires w/Standard	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Power Wire & Control Cable	-	-	-	-	-	-	-	-	-	-	-	-	27	26
20	Overhead Conductor-Transmission	23	23	23	30	36	42	48	51	49	37	29	33	31	34
21	Underground Conductor-Transmission	28	26	23	25	45	49	54	53	51	31	28	32	31	32
22	Overhead Conductor-Distribution	15	13	12	12	19	22	25	27	26	21	21	26	23	23
23	Underground Conductor-Distribution	25	23	20	23	40	43	48	47	45	28	25	28	28	29
24	Service Cable	16	15	14	14	22	25	28	30	29	22	22	28	25	25
25	Condensers & Tubes	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	Turbo-Generators	7	7	7	7	11	13	20	21	21	20	17	17	18	18
27		9	9	9	9	13	13	17	18	21	23	20	19	19	19
28	Gas Compressors														
29	Gas Transmission Line Pipe	18	18	18	18	18	19	25	25	27	26	25	25	25	25
30	Steel Distribution Pipe	23	24	23	24	34	44	44	45	44	43	40	41	43	43
31	Plastic Pipe	15	16	16	17	24	36	40	36	34	32	28	30	31	31
32	Meters-Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	House Regulators	17	18	18	18	19	23	33	33	32	33	30	30	28	27
34		24	25	25	25	26	31	47	46	45	45	41	41	39	37
35	Cast Iron Pipe														
36	Cast Iron Fittings	16	17	16	17	23	40	44	48	53	44	39	45	47	40
37	Ductile Iron Pipe	10	10	10	13	13	24	27	25	34	29	25	25	25	27
38	Chemical Feeders-Small	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	Chemical Feeders-Large	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	Gate Valves	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	Meter Yokes	15	15	15	17	17	17	24	24	30	28	25	29	29	27
42	Corporation Stops	24	24	24	24	24	24	29	29	31	31	29	29	29	29
43	Curb Stops	27	27	27	27	27	27	25	25	25	25	25	25	24	24
44	Hydrants	20	20	20	20	20	20	22	22	22	22	22	22	21	21
45	Meters-Water	23	23	23	23	23	23	23	24	27	27	23	26	27	26
46		23	23	23	23	26	29	35	37	37	37	37	37	37	37
47															
48															
49															
50	Construction Equipment	-	-	-	11	15	19	26	28	30	22	19	23	21	22
51															
52															
53															
54															
55															
56															

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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
1	Boilers	15	15	14	14	14	14	12	12	15	15	16	18	19	20
2	Coal & Ash Handling Equipment	21	20	20	20	19	17	16	17	20	20	20	21	20	20
3	Pumps	19	19	19	20	20	19	18	18	19	19	19	21	22	22
4	Steam Pipe	37	37	37	36	36	36	35	32	31	31	32	36	35	35
5	Cranes	10	10	11	11	11	11	10	10	10	10	10	10	10	11
6	Regulators	42	41	40	41	42	43	42	43	48	48	48	52	53	53
7	Switchboards	44	44	45	48	48	47	43	43	48	48	48	52	53	53
8	Power Transformers	46	43	41	42	40	40	39	40	46	47	47	50	52	52
9	Oil Switches	51	49	49	51	53	52	51	55	59	59	59	63	65	65
10	Motors	29	28	28	29	29	29	29	30	33	32	32	32	32	32
11	Line Transformers	63	59	58	62	61	59	57	59	61	62	62	66	67	67
12	Meters-Electric	48	48	48	48	48	48	48	50	54	55	55	55	55	55
13	Treated Pine Poles	28	27	26	25	24	23	21	22	23	24	23	24	23	23
14	Standard Cross Arms	10	9	9	9	9	8	8	9	10	11	11	12	12	12
15	Standard Galv. Steel Guy Wire	18	17	16	16	15	14	14	15	17	17	17	18	19	18
16	Fibre Conduit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Plastic Conduit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Mercury Luminaires w/Standard	26	23	26	27	28	29	29	29	30	30	30	30	30	30
19	Power Wire & Control Cable	33	30	27	29	26	21	19	23	26	27	29	35	29	26
20	Overhead Conductor-Transmission	29	27	32	38	26	22	19	23	28	27	29	32	27	27
21	Underground Conductor-Transmission	22	21	23	27	20	19	19	21	23	23	25	27	24	24
22	Overhead Conductor-Distribution	26	24	28	34	23	19	17	20	25	24	26	28	24	24
23	Underground Conductor-Distribution	24	22	25	29	22	21	20	22	25	25	27	29	26	26
24	Service Cable	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Condensers & Tubes	18	16	15	19	20	19	18	19	21	24	24	27	27	27
26	Turbo-Generators	19	19	20	21	22	22	21	22	25	25	26	29	30	30
27															
28	Gas Compressors	24	23	24	24	24	24	24	24	24	24	23	23	23	23
29	Gas Transmission Line Pipe	43	43	43	43	43	43	42	35	35	35	34	35	34	34
30	Steel Distribution Pipe	31	31	31	31	30	29	29	26	29	29	26	28	26	25
31	Plastic Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	Meters-Gas	27	27	27	27	27	26	25	25	25	25	25	26	26	26
33	House Regulators	37	38	38	38	37	36	34	34	34	34	34	35	37	40
34															
35	Cast Iron Pipe	40	34	29	30	30	28	25	30	34	35	36	39	39	38
36	Cast Iron Fittings	27	25	25	25	24	21	19	20	22	23	23	23	24	24
37	Ductile Iron Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	Chemical Feeders-Small	18	19	22	22	20	15	17	17	17	17	17	17	17	17
39	Chemical Feeders-Large	-	-	-	-	-	-	-	-	-	12	12	13	13	13
40	Gate Valves	26	26	28	28	28	24	23	23	22	22	23	25	26	26
41	Meter Yokes	29	29	29	29	29	29	28	28	28	28	28	28	29	29
42	Corporation Stops	24	24	24	24	24	24	24	22	21	21	21	21	21	21
43	Curb Stops	21	21	21	21	21	21	21	21	21	21	21	21	21	21
44	Hydrants	24	24	25	25	25	23	23	23	20	22	22	24	25	25
45	Meters-Water	37	37	37	37	37	37	37	35	26	26	26	31	32	32
46															
47															
48															
49															
50	Construction Equipment	21	22	21	22	22	20	19	19	20	21	21	23	23	23
51															
52															
53															
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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	Boilers	20	21	21	21	21	21	22	25	31	36	37	41	41	43
2	Coal & Ash Handling Equipment	20	23	25	25	24	24	29	35	42	44	47	50	51	55
3	Pumps	22	23	24	24	24	24	26	32	35	37	40	47	47	48
4	Steam Pipe	35	35	35	35	35	35	37	42	45	50	52	53	53	55
5	Cranes	11	11	11	11	12	17	20	23	26	29	31	33	35	38
6	Regulators	53	53	53	53	52	51	57	63	65	69	70	74	74	81
7	Switchboards	53	53	51	50	45	44	50	58	59	59	62	72	72	77
8	Power Transformers	52	52	51	49	46	45	50	60	62	67	70	78	78	83
9	Oil Switches	65	65	65	65	59	58	67	78	79	79	89	102	102	110
10	Motors	31	32	33	33	31	32	37	45	46	49	53	63	63	66
11	Line Transformers	67	69	68	64	64	64	72	90	93	96	100	113	113	121
12	Meters-Electric	55	55	55	55	55	55	61	69	74	80	80	80	78	81
13	Treated Pine Poles	23	24	27	28	33	39	37	41	43	43	42	44	46	49
14	Standard Cross Arms	13	16	17	19	22	23	25	35	37	34	36	41	42	42
15	Standard Galv. Steel Guy Wire	17	17	17	18	18	18	19	29	35	38	40	42	43	51
16	Fibre Conduit	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Plastic Conduit	-	-	-	-	-	-	-	-	-	-	-	-	179	170
18	Mercury Luminaires w/Standard	30	30	31	31	31	31	32	40	44	48	47	53	52	51
19	Power Wire & Control Cable	31	39	40	40	40	40	48	56	65	66	66	75	77	74
20	Overhead Conductor-Transmission	29	28	31	32	32	32	40	48	52	48	52	59	63	69
21	Underground Conductor-Transmission	25	29	30	29	28	28	34	41	50	56	56	59	61	59
22	Overhead Conductor-Distribution	26	25	27	28	28	28	35	43	46	43	46	52	56	61
23	Underground Conductor-Distribution	27	31	32	32	31	31	36	44	54	59	59	63	64	64
24	Service Cable	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Condensers & Tubes	27	27	27	27	26	27	30	32	33	36	37	40	40	43
26	Turbo-Generators	30	30	30	30	30	31	36	44	47	49	49	54	54	58
27															
28	Gas Compressors	24	25	27	27	26	28	31	31	35	40	40	41	42	43
29	Gas Transmission Line Pipe	34	34	34	34	34	34	36	41	44	48	50	51	52	54
30	Steel Distribution Pipe	25	25	25	25	25	25	28	33	37	41	43	46	47	52
31	Plastic Pipe	-	-	-	-	-	-	-	-	-	-	-	-	175	175
32	Meters-Gas	26	26	26	26	26	26	33	41	42	45	48	55	55	55
33	House Regulators	48	48	48	48	48	48	53	63	64	68	69	74	74	74
34															
35	Cast Iron Pipe	39	39	40	39	39	40	45	58	69	68	67	73	73	73
36	Cast Iron Fittings	24	26	27	27	27	28	33	42	49	48	48	54	56	59
37	Ductile Iron Pipe	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	Chemical Feeders-Small	17	17	17	17	17	18	22	26	31	34	38	40	40	40
39	Chemical Feeders-Large	13	14	15	15	16	19	20	24	29	35	40	42	42	42
40	Gate Valves	26	28	29	29	29	29	34	39	42	45	52	57	57	57
41	Meter Yokes	29	29	30	30	30	31	37	39	40	39	41	48	48	48
42	Corporation Stops	22	22	23	23	23	24	31	36	37	37	37	45	45	45
43	Curb Stops	22	23	23	23	23	25	31	36	38	37	38	45	45	45
44	Hydrants	25	27	27	27	27	27	32	36	39	43	50	55	55	55
45	Meters-Water	33	35	37	37	37	37	40	42	48	52	59	61	61	65
46															
47															
48															
49															
50	Construction Equipment	24	25	28	29	29	29	34	37	39	40	42	45	46	49
51															
52															
53															
54															
55															
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M UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1	Boilers	45	47	54	61	63	65	65	66	66	66	68	70	71	74
2	Coal & Ash Handling Equipment	56	58	68	76	77	79	77	72	72	72	73	73	74	76
3	Pumps	49	50	55	56	56	62	68	68	69	69	70	70	74	77
4	Steam Pipe	56	57	61	67	69	71	71	71	71	71	73	73	73	74
5	Cranes	40	43	45	47	49	52	54	55	55	55	56	56	58	64
6	Regulators	83	85	98	105	108	108	108	96	96	90	87	84	83	84
7	Switchboards	79	81	96	105	108	106	98	81	78	77	77	78	82	90
8	Power Transformers	85	87	100	103	107	103	95	88	84	76	81	84	87	91
9	Oil Switches	112	110	115	131	136	132	109	75	74	64	70	82	80	88
10	Motors	67	68	79	89	93	96	92	87	86	85	85	87	87	88
11	Line Transformers	123	123	127	135	130	125	122	118	107	100	100	101	101	105
12	Meters-Electric	83	79	82	87	89	92	92	91	90	89	89	88	88	89
13	Treated Pine Poles	51	51	55	59	60	57	57	56	56	56	56	56	58	61
14	Standard Cross Arms	42	42	49	50	47	46	46	44	44	44	44	45	47	46
15	Standard Galv. Steel Guy Wire	54	55	58	62	63	63	63	63	63	63	63	63	63	63
16	Fibre Conduit	-	-	-	-	-	-	82	86	86	86	86	84	76	71
17	Plastic Conduit	170	157	159	159	154	154	154	150	146	146	143	139	141	136
18	Mercury Luminaires w/Standard	59	59	60	66	68	68	68	67	67	66	67	66	72	82
19	Power Wire & Control Cable	71	68	72	65	50	50	40	38	40	40	44	55	67	72
20	Overhead Conductor-Transmission	67	73	80	81	79	72	73	73	74	63	69	73	76	78
21	Underground Conductor-Transmission	60	65	72	65	63	65	66	64	63	63	69	77	77	79
22	Overhead Conductor-Distribution	59	67	72	63	58	63	64	62	62	62	64	71	75	78
23	Underground Conductor-Distribution	64	71	78	69	67	70	71	69	67	68	74	82	83	85
24	Service Cable	-	-	93	89	74	69	68	69	67	62	66	68	71	74
25	Condensers & Tubes	44	45	48	53	56	56	56	56	56	57	61	65	71	75
26	Turbo-Generators	59	61	72	80	84	84	78	72	70	70	70	71	72	73
27															
28	Gas Compressors	44	46	49	54	58	61	61	61	61	64	68	73	74	78
29	Gas Transmission Line Pipe	55	56	59	65	67	69	69	69	69	69	71	71	71	72
30	Steel Distribution Pipe	54	56	60	68	69	71	71	71	71	71	71	71	71	73
31	Plastic Pipe	154	147	146	142	140	139	137	133	132	132	128	123	126	126
32	Meters-Gas	55	56	63	66	71	71	71	73	79	79	79	79	86	88
33	House Regulators	74	74	74	76	80	80	80	81	82	82	82	80	80	80
34															
35	Cast Iron Pipe	79	80	86	91	95	95	95	95	95	95	95	95	95	95
36	Cast Iron Fittings	62	64	67	69	72	74	74	74	73	72	72	72	72	75
37	Ductile Iron Pipe	-	-	-	-	-	-	-	96	96	96	96	96	96	96
38	Chemical Feeders-Small	40	41	45	48	49	54	60	60	63	63	64	69	73	77
39	Chemical Feeders-Large	42	44	54	61	68	68	68	68	71	72	71	70	72	79
40	Gate Valves	55	51	57	59	58	58	58	59	62	63	62	62	68	72
41	Meter Yokes	51	57	64	61	59	59	62	63	65	65	66	70	75	77
42	Corporation Stops	46	54	59	59	59	60	62	62	65	65	66	71	79	81
43	Curb Stops	46	54	59	59	59	60	62	63	65	65	67	71	79	82
44	Hydrants	55	52	58	59	59	59	59	59	59	59	59	59	61	66
45	Meters-Water	67	70	77	78	78	78	78	78	84	87	87	93	101	101
46															
47															
48															
49															
50	Construction Equipment	49	51	55	59	62	64	65	67	67	68	70	71	73	76
51															
52															
53															
54															
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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1	Boilers	76	78	83	89	94	100	119	143	159	172	186	203	221	245
2	Coal & Ash Handling Equipment	79	84	88	93	95	100	124	150	154	162	175	192	213	225
3	Pumps	78	80	85	89	93	100	127	154	177	183	195	212	235	259
4	Steam Pipe	78	82	86	92	98	100	112	131	143	155	178	206	223	236
5	Cranes	68	72	78	82	88	100	122	139	147	171	186	215	237	267
6	Regulators	84	87	90	92	97	100	128	150	165	170	174	179	189	206
7	Switchboards	92	93	94	96	97	100	131	196	212	222	234	238	261	295
8	Power Transformers	93	95	97	95	93	100	129	157	162	172	182	193	210	223
9	Oil Switches	96	92	93	93	95	100	123	140	143	174	186	195	203	229
10	Motors	89	94	100	104	100	100	110	155	167	186	186	188	195	210
11	Line Transformers	109	106	105	104	100	100	110	133	136	147	158	166	165	194
12	Meters-Electric	92	95	98	101	101	100	107	126	135	140	144	148	144	160
13	Treated Pine Poles	62	66	69	73	77	100	150	205	192	190	206	234	265	289
14	Standard Cross Arms	44	50	65	60	58	100	162	157	146	155	161	223	244	252
15	Standard Galv. Steel Guy Wire	63	64	72	86	97	100	133	153	151	162	178	205	214	244
16	Fibre Conduit	72	78	83	82	85	100	119	130	133	149	173	203	218	235
17	Plastic Conduit	116	105	100	98	100	100	118	133	129	144	161	187	199	190
18	Mercury Luminaires w/Standard	74	78	94	101	102	100	125	173	194	211	234	263	288	314
19	Power Wire & Control Cable	81	86	84	74	86	100	115	95	97	95	101	109	135	142
20	Overhead Conductor-Transmission	75	84	97	107	103	100	121	167	204	220	189	201	232	250
21	Underground Conductor-Transmission	76	82	86	83	89	100	149	142	142	154	148	188	238	259
22	Overhead Conductor-Distribution	75	84	97	107	102	100	121	166	203	220	192	210	246	257
23	Underground Conductor-Distribution	76	86	94	92	100	100	135	130	132	140	148	196	231	222
24	Service Cable	71	77	92	98	99	100	105	124	126	131	149	183	221	217
25	Condensers & Tubes	80	84	89	94	99	100	109	128	142	157	171	189	209	229
26	Turbo-Generators	72	75	81	89	96	100	111	131	144	158	170	188	206	230
27															
28	Gas Compressors	84	88	91	91	90	100	120	150	161	172	188	213	237	265
29	Gas Transmission Line Pipe	75	80	83	89	98	100	122	145	172	187	212	225	253	290
30	Steel Distribution Pipe	73	76	82	89	97	100	127	142	155	170	194	213	225	254
31	Plastic Pipe	123	111	98	96	100	100	112	116	120	125	129	142	152	142
32	Meters-Gas	88	89	94	100	100	100	111	128	131	136	139	143	149	158
33	House Regulators	81	83	92	98	100	100	106	125	132	136	144	171	201	210
34															
35	Cast Iron Pipe	95	95	96	100	100	100	153	178	180	183	195	201	217	235
36	Cast Iron Fittings	77	80	87	99	99	100	144	142	148	152	163	173	194	209
37	Ductile Iron Pipe	96	96	97	100	100	100	153	182	186	189	201	207	215	228
38	Chemical Feeders-Small	81	81	86	90	92	100	126	180	209	230	249	257	287	316
39	Chemical Feeders-Large	80	81	87	92	94	100	125	177	194	195	201	212	232	249
40	Gate Valves	74	74	79	91	96	100	127	160	191	197	220	252	270	289
41	Meter Yokes	79	87	93	95	95	100	132	139	160	227	246	262	296	320
42	Corporation Stops	85	90	96	99	99	100	126	133	133	136	139	154	168	178
43	Curb Stops	86	90	96	99	99	100	126	133	135	140	146	161	177	187
44	Hydrants	71	76	84	94	95	100	143	185	214	229	261	279	293	315
45	Meters-Water	101	107	108	108	106	100	93	93	98	101	105	108	122	127
46															
47															
48															
49															
50	Construction Equipment	80	84	88	93	95	100	117	141	153	164	178	197	222	246
51															
52															
53															
54															
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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	Boilers	264	273	283	292	298	307	330	344	364	380	385	404	413	425
2	Coal & Ash Handling Equipment	224	229	240	246	250	255	270	289	296	300	302	308	318	325
3	Pumps	276	281	284	292	296	300	310	327	342	353	361	391	406	419
4	Steam Pipe	254	226	215	215	215	231	271	264	241	229	222	199	199	216
5	Cranes	302	328	344	384	411	423	442	458	474	482	490	537	598	615
6	Regulators	216	225	227	229	231	236	239	248	253	257	257	256	260	241
7	Switchboards	318	317	319	333	338	343	366	398	429	439	449	499	496	572
8	Power Transformers	231	226	229	237	242	253	264	291	327	337	343	360	371	388
9	Oil Switches	279	280	275	271	268	273	336	380	402	411	399	358	369	395
10	Motors	224	250	260	261	257	266	285	339	365	357	348	376	478	495
11	Line Transformers	208	210	211	212	213	211	212	221	224	222	223	226	230	225
12	Meters-Electric	188	201	200	202	207	205	187	175	174	186	190	189	174	169
13	Treated Pine Poles	291	280	276	283	289	284	289	300	310	323	332	367	416	445
14	Standard Cross Arms	249	240	243	230	228	226	250	291	333	366	381	419	441	464
15	Standard Galv. Steel Guy Wire	254	236	227	233	233	235	249	253	252	252	251	253	254	255
16	Fibre Conduit	175	210	231	225	221	225	301	470	379	260	230	198	222	228
17	Plastic Conduit	158	183	197	189	188	199	280	409	366	316	289	237	251	260
18	Mercury Luminaires w/Standard	333	326	343	358	352	321	321	334	345	353	361	389	408	430
19	Power Wire & Control Cable	132	131	123	107	110	123	137	139	136	130	126	119	121	127
20	Overhead Conductor-Transmission	247	271	246	242	242	218	359	366	355	372	379	334	352	399
21	Underground Conductor-Transmission	270	268	256	242	277	281	298	328	405	461	469	477	477	485
22	Overhead Conductor-Distribution	252	266	259	249	244	229	349	366	354	363	366	322	341	386
23	Underground Conductor-Distribution	206	201	196	202	216	222	223	243	254	258	259	254	253	263
24	Service Cable	207	198	229	209	194	201	250	285	271	264	258	227	240	271
25	Condensers & Tubes	247	256	257	247	222	239	263	268	268	270	270	275	288	308
26	Turbo-Generators	242	256	266	270	270	274	292	302	306	312	315	325	333	343
27															
28	Gas Compressors	280	284	295	301	303	307	325	354	371	388	405	438	446	455
29	Gas Transmission Line Pipe	315	271	262	254	265	272	301	298	269	257	250	233	235	243
30	Steel Distribution Pipe	268	270	282	272	237	250	291	316	318	323	323	327	370	381
31	Plastic Pipe	132	149	157	146	146	159	218	283	285	290	275	230	235	244
32	Meters-Gas	158	146	147	158	166	165	170	177	185	190	190	191	189	190
33	House Regulators	217	221	230	237	236	243	247	253	269	280	283	297	303	302
34															
35	Cast Iron Pipe	234	254	247	265	244	244	266	282	278	275	275	275	278	266
36	Cast Iron Fittings	216	232	229	240	259	289	296	317	324	324	324	350	377	370
37	Ductile Iron Pipe	228	262	249	281	246	246	275	278	271	271	271	271	273	250
38	Chemical Feeders-Small	341	353	358	366	373	379	398	410	424	430	432	444	453	453
39	Chemical Feeders-Large	273	286	294	306	324	341	353	379	402	418	423	438	437	477
40	Gate Valves	321	358	375	395	417	441	468	517	530	540	548	561	524	540
41	Meter Yokes	336	389	389	383	394	399	445	470	478	507	516	551	566	603
42	Corporation Stops	189	200	207	212	220	220	240	254	257	273	279	303	308	318
43	Curb Stops	198	210	220	225	233	233	254	270	273	289	296	321	330	348
44	Hydrants	352	384	385	414	439	456	480	521	558	560	560	559	561	577
45	Meters-Water	128	141	148	135	135	137	140	143	152	160	173	195	175	200
46															
47															
48															
49															
50	Construction Equipment	263	269	273	276	280	286	295	281	298	320	316	324	331	333
51															
52															
53															
54															
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UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS															
											2005		2006		2007	
		1996	1997	1998	1999	2000	2001	2002	2003	2004	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	Boilers	433	443	452	460	467	474	481	489	517	535	550	565	578	590	604
2	Coal & Ash Handling Equipment	328	333	344	351	353	357	359	362	397	426	426	425.4	431	441	453
3	Pumps	440	476	496	510	528	524	525	544	557	567	575	592.3	602	620	640
4	Steam Pipe	215	204	190	183	178	170	167	160	194	270	286	292	299	307	304
5	Cranes	615	656	689	728	747	749	749	749	800	817	817	816.8	817	817	817
6	Regulators	234	232	234	237	242	240	243	255	261	271	276	290.3	343	360	375
7	Switchboards	620	656	662	689	749	813	892	983	1066	1111	1173	1227	1340	1447	1596
8	Power Transformers	370	371	400	400	400	400	383	375	486	540	545	583.7	591	648	671
9	Oil Switches	399	409	415	415	409	408	399	391	382	379	389	412	420	429	436
10	Motors	475	467	476	497	533	535	541	543	610	691	695	685.7	658	683	601
11	Line Transformers	219	206	210	210	209	217	223	225	237	250	258	298.8	345	397	405
12	Meters-Electric	172	187	193	181	176	206	241	263	290	276	276	276	283	283	291
13	Treated Pine Poles	463	473	471	473	471	489	505	515	534	541	554	562.3	601	600	604
14	Standard Cross Arms	466	477	443	413	417	437	433	411	394	440	435	451.1	456	487	471
15	Standard Galv. Steel Guy Wire	261	280	314	313	318	249	220	227	271	302	302	300.7	280	323	323
16	Fibre Conduit	204	209	199	225	246	226	275	252	250	284	284	432.2	432	460	390
17	Plastic Conduit	252	256	251	266	281	291	319	311	323	354	354	447.3	447	527	495
18	Mercury Luminaires w/Standard	460	471	469	472	479	492	529	571	583	601	615	637.4	774	808	826
19	Power Wire & Control Cable	121	121	119	112	110	108	103	99.8	112	132	137	159.5	187	263	265
20	Overhead Conductor-Transmission	402	405	420	354	398	426	409	404	457	491	540	633.3	698	742	770
21	Underground Conductor-Transmission	487	487	487	493	485	468	461	462	519	536	559	614.6	615	615	615
22	Overhead Conductor-Distribution	386	387	399	345	381	403	388	387	437	467	515	600.3	648	692	715
23	Underground Conductor-Distribution	266	263	265	268	270	257	245	239	264	295	308	342.2	343	457	459
24	Service Cable	267	264	264	249	260	265	259	266	297	313	347	396	396	432	439
25	Condensers & Tubes	305	306	309	290	284	287	291	304	388	439	433	447.3	465	466	506
26	Turbo-Generators	348	364	369	371	387	372	380	395	397	411	400	401.8	424	440	452
27																
28	Gas Compressors	461	470	478	480	483	487	495	497	503	506	586	535.3	544	557	574
29	Gas Transmission Line Pipe	269	272	273	267	263	258	256	257	377	449	452	440.4	460	525	482
30	Steel Distribution Pipe	376	388	389	399	428	424	421	448	637	875	855	924.4	954	829	839
31	Plastic Pipe	249	251	252	255	265	295	304	308	325	351	351	393	393	509	509
32	Meters-Gas	192	196	196	191	202	209	202	193	183	185	184	187.6	197	205	231
33	House Regulators	303	303	307	306	305	312	319	318	323	336	339	343.8	356	377	377
34																
35	Cast Iron Pipe	268	279	281	285	291	297	299	301	306	341	341	345.9	346	402	402
36	Cast Iron Fittings	368	379	379	378	378	384	476	500	514	520	520	660.6	690	706	720
37	Ductile Iron Pipe	251	268	270	279	290	292	292	292	276	274	274	283.2	283	327	327
38	Chemical Feeders-Small	462	476	514	522	546	561	563	566	606	640	661	669.4	596	640	676
39	Chemical Feeders-Large	493	506	537	569	562	581	612	612	597	576	576	586.2	544	531	570
40	Gate Valves	553	592	611	630	651	685	691	691	704	718	718	718.4	720	720	720
41	Meter Yokes	670	673	677	679	699	708	713	737	762	769	794	793.6	1111	1111	1169
42	Corporation Stops	329	329	329	329	338	341	344	353	364	367	367	367.2	527	527	527
43	Curb Stops	361	361	361	361	371	374	377	387	399	403	403	402.7	577	577	577
44	Hydrants	625	795	840	874	909	961	970	970	980	989	989	989.2	1097	1097	1116
45	Meters-Water	207	197	197	198	205	206	207	207	207	207	207	234.7	248	260	262
46																
47																
48																
49																
50	Construction Equipment	336	351	380	385	389	391	396	402	414	427	443	448.3	461	463	470.6
51																
52																
53																
54																
55																
56																

M

UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		2008		2009		2010		2011		2012		2013		2014	
		Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	Boilers	596	616	620	599	608	620	624	634	649	649	669	653	661	665
2	Coal & Ash Handling Equipment	478	537	543	513	499	503	522	536	550	559	562	563	580	581
3	Pumps	643	663	673	675	703	704	706	756	781	787	799	846	859	922
4	Steam Pipe	324	400	454	413	376	417	419	448	438	455	439	425	429	431
5	Cranes	817	899	899	899	899	899	899	899	899	899	899	965	965	1007
6	Regulators	401	427	389	390	402	408	410	418	415	428	422	428	441	425
7	Switchboards	1791	1954	2077	2218	2373	2504	2616	2757	2879	3034	3173	3319	3471	3594
8	Power Transformers	694	725	746	745	780	788	804	814	818	826	815	814	813	816
9	Oil Switches	437	455	460	461	469	475	480	483	483	485	485	488	498	500
10	Motors	635	674	696	719	717	695	713	770	777	782	804	837	849	851
11	Line Transformers	615	505	534	560	588	617	630	650	673	690	737	756	799	819
12	Meters-Electric	292	293	295	295	307	307	295	294	288	291	295	298	303	305
13	Treated Pine Poles	611	643	653	665	672	686	664	678	687	697	700	700	675	675
14	Standard Cross Arms	464	486	518	501	482	465	446	446	452	453	464	466	440	434
15	Standard Galv. Steel Guy Wire	351	381	548	536	550	405	405	405	404	423	423	488	458	486
16	Fibre Conduit	411	420	468	468	380	380	390	390	419	419	417	417	497	497
17	Plastic Conduit	522	526	609	609	463	463	468	468	521	521	477	477	478	478
18	Mercury Luminaires w/Standard	839	899	1024	1053	1087	972	990	1034	1052	1079	1061	1077	990	993
19	Power Wire & Control Cable	242	250	228	234	213	220	245	251	268	270	271	270	267	254
20	Overhead Conductor-Transmission	860	985	985	553	700	714	675	782	650	659	701	729	729	740
21	Underground Conductor-Transmission	877	927	919	929	906	885	973	971	977	1016	1026	1052	1083	1093
22	Overhead Conductor-Distribution	793	898	898	539	661	682	672	772	647	656	686	710	716	735
23	Underground Conductor-Distribution	499	541	631	609	515	518	563	577	621	647	617	654	631	645
24	Service Cable	472	510	511	390	430	460	516	579	497	505	502	512	530	562
25	Condensers & Tubes	496	603	516	462	473	525	527	575	580	566	567	528	536	549
26	Turbo-Generators	457	538	468	417	439	488	474	501	498	487	564	480	478	483
27															
28	Gas Compressors	581	603	621	626	625	631	633	656	662	677	674	692	693	707
29	Gas Transmission Line Pipe	502	604	600	510	444	506	510	525	586	616	542	535	626	627
30	Steel Distribution Pipe	833	1122	1019	929	911	987	1081	1123	1350	1327	1305	1276	1253	1266
31	Plastic Pipe	541	541	644	644	464	464	470	470	535	535	464	464	403	403
32	Meters-Gas	241	250	261	252	257	252	252	256	261	271	271	272	341	342
33	House Regulators	387	392	412	400	406	414	425	430	432	438	443	443	454	454
34															
35	Cast Iron Pipe	421	468	541	541	563	563	550	550	565	676	688	697	770	779
36	Cast Iron Fittings	783	837	897	909	986	987	961	961	1091	1120	1148	1168	1230	1395
37	Ductile Iron Pipe	363	363	485	485	521	521	500	500	524	524	545	545	575	575
38	Chemical Feeders-Small	817	819	831	880	880	880	907	908	1068	1086	1092	1203	1249	1249
39	Chemical Feeders-Large	676	683	654	700	700	700	633	715	753	770	774	803	805	805
40	Gate Valves	736	736	759	759	736	778	762	762	755	755	770	790	803	824
41	Meter Yokes	1169	1169	1202	1202	1202	1241	1241	1241	1323	1594	1594	1594	1594	1594
42	Corporation Stops	527	527	527	527	527	542	542	542	542	723	723	723	723	723
43	Curb Stops	577	577	577	577	577	582	582	582	582	739	739	739	739	739
44	Hydrants	1133	1133	1155	1155	1150	1081	1089	1089	1132	1132	1166	1189	1221	1339
45	Meters-Water	373	373	373	373	374	376	379	379	379	379	380	381	381	381
46															
47															
48															
49															
50	Construction Equipment	474	483	499	502	502	501	505	516	527	539	547	552	554	562
51															
52															
53															
54															
55															
56															

M

UTILITY PLANT MATERIALS

ALL REGIONS (1973=100)

Line	CONSTRUCTION AND EQUIPMENT	COST INDEX NUMBERS													
		2015		2016		2017		2018		2019		2020		2021	
		Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1
1	Boilers	669	691	697	698	700	681	683	707	710	739	738			
2	Coal & Ash Handling Equipment	584	583	582	584	589	595	596	608	620	630	640			
3	Pumps	958	963	1043	1076	1120	1244	1248	1345	1401	1492	1526			
4	Steam Pipe	417	416	404	411	421	415	407	462	483	468	481			
5	Cranes	1007	1007	1007	1007	1007	1007	1041	1083	1108	1108	1141			
6	Regulators	416	406	396	403	412	416	420	430	436	437	442			
7	Switchboards	3757	3760	3931	3930	4109	4300	4461	4629	4847	4852	5080			
8	Power Transformers	812	801	795	798	822	827	868	879	901	901	902			
9	Oil Switches	500	502	502	501	501	503	505	507	511	521	530			
10	Motors	859	857	869	869	893	883	910	917	937	1006	1023			
11	Line Transformers	854	856	884	882	918	946	982	1008	1048	1048	1086			
12	Meters-Electrric	307	307	307	298	298	298	304	304	306	306	323			
13	Treated Pine Poles	670	658	676	678	670	730	665	668	687	693	799			
14	Standard Cross Arms	458	448	457	458	456	451	450	450	456	456	508			
15	Standard Galv. Steel Guy Wire	486	486	486	486	515	515	515	515	541	541	623			
16	Fibre Conduit	475	475	430	430	412	412	511	511	523	523	525			
17	Plastic Conduit	479	479	468	468	452	452	514	514	521	521	549			
18	Mercury Luminaires w/Standard	981	1018	986	981	998	942	964	1008	1130	1085	1188			
19	Power Wire & Control Cable	258	253	224	221	225	228	246	253	255	257	261			
20	Overhead Conductor-Transmission	743	743	777	777	740	740	838	838	885	885	919			
21	Underground Conductor-Transmission	1095	1103	1108	1108	1113	1180	1252	1271	1329	1329	1339			
22	Overhead Conductor-Distribution	747	750	768	768	741	745	785	801	818	834	868			
23	Underground Conductor-Distribution	622	637	589	589	539	562	561	572	605	605	622			
24	Service Cable	592	600	580	578	580	593	496	544	490	540	567			
25	Condensers & Tubes	547	551	520	535	536	510	516	569	583	574	509			
26	Turbo-Generators	485	551	538	561	579	506	507	537	560	548	462			
27															
28	Gas Compressors	713	720	722	727	728	735	747	759	779	783	787			
29	Gas Transmission Line Pipe	616	589	535	544	570	601	615	693	716	689	680			
30	Steel Distribution Pipe	1243	1189	1088	1116	1175	1247	1218	1382	1432	1394	1590			
31	Plastic Pipe	403	403	403	403	394	394	410	410	413	413	447			
32	Meters-Gas	372	372	388	388	442	442	475	477	511	511	489			
33	House Regulators	469	469	481	481	487	487	533	533	558	565	559			
34															
35	Cast Iron Pipe	758	748	731	731	809	808	867	868	878	881	912			
36	Cast Iron Fittings	1278	1322	1380	1418	1478	1478	1481	1565	1627	1736	1883			
37	Ductile Iron Pipe	579	579	600	600	622	622	715	715	721	721	768			
38	Chemical Feeders-Small	1316	1404	1471	1471	1496	1589	1618	1738	1792	1871	2019			
39	Chemical Feeders-Large	805	805	842	842	863	891	900	939	965	990	1080			
40	Gate Valves	814	814	868	868	825	825	771	789	812	832	863			
41	Meter Yokes	1594	1594	1594	1594	1594	1706	1706	1706	1706	1768	1768			
42	Corporation Stops	723	723	723	723	723	723	723	723	773	861	861			
43	Curb Stops	780	780	780	780	780	780	780	780	835	929	929			
44	Hydrants	1418	1591	1694	1694	1681	1681	1735	1759	1803	1830	1886			
45	Meters-Water	400	400	403	403	404	418	434	434	443	443	459			
46															
47															
48															
49															
50	Construction Equipment	564	568	570	574	575	579	580	575	600	609	613			
51															
52															
53															
54															
55															
56															

BULLETIN NO. 192
1912 to July 1, 2020

THE

HANDY-WHITMAN INDEX
Of
Public Utility Construction Costs©

TRENDS OF CONSTRUCTION COSTS

Preliminaries

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Whitman, Requardt and Associates, LLP
801 South Caroline Street
Baltimore, Maryland 21231
(410) 235-3450

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

PRELIMINARY NUMBERS BULLETIN 192

WATER INDEXES 7/1/20

LINE	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
2	585	498	566	485	530	593
8	731	617	696	596	681	737
9	1453	1453	1453	1453	1453	1453
15	731	617	696	596	681	737
16	890	812	853	799	816	915
17	1035	976	1009	970	985	1067
23	836	836	836	836	836	836
24	1244	1244	1244	1244	1244	1244
27	895	864	877	864	875	918
28	830	766	793	785	771	829
29	653	595	625	587	600	654
34	850	801	819	760	781	844
35	924	918	928	878	897	935
36	831	688	733	655	687	711
37	748	659	699	632	649	751
38	418	369	395	357	365	404
39	701	578	628	554	555	677
40	459	459	459	459	459	459
41	797	681	731	666	676	787
42	1104	1056	1058	1040	1043	1122
46	2481	2469	2473	2503	2484	2543
47	1557	1456	1539	1465	1516	1579
48	866	736	815	741	794	911

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

PRELIMINARY NUMBERS BULLETIN 192

BUILDING INDEXES 7/1/20

LINE	REGION 1	REGION 2	REGION 3	REGION 4	REGION 5	REGION 6
2	617	489	571	469	509	605
3	664	553	636	556	629	665
4	606	536	573	516	542	577
5	629	510	593	460	493	638
6	568	447	536	412	463	587
9	514	626	613	587	594	667
10	259	329	313	326	343	354
11	325	328	324	320	322	330
12	757	1118	914	1083	1528	800
13	461	483	458	609	397	446
16	732	492	637	470	506	713
17	732	536	642	476	503	692
18	723	520	638	451	498	689
19	750	561	647	455	500	692
20	787	492	659	509	514	786
21	780	583	674	519	576	794
22	751	555	648	521	577	808

HANDY-WHITMAN INDEX OF PUBLIC UTILITY CONSTRUCTION COSTS

PRELIMINARY NUMBERS BULLETIN 192

MATERIAL INDEXES 7/1/20

LINE	INDEX
1	743
2	664
3	1639
4	469
5	1175
6	436
7	5367
8	895
9	533
10	1022
11	1129
12	323
13	799
14	512
15	623
16	525
17	549
18	1206
19	259
20	919
21	1385
22	868
23	650
24	564
25	566
26	562
28	795
29	639
30	1555
31	447
32	490
33	559
35	877
36	1955
37	768
38	2106
39	1140
40	863
41	1821
42	887
43	957
44	1886
45	459
50	620

Water and Wastewater Industry

Cost Indices

AUS Consultants Index of General Support Assets

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

AUS Telephone Plant Index

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AUS Telephone Plant Index

Cost Trend Tables from 1946 to July 1, 2020

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For information contact:

AUS Consultants
3601 N. Progress Ave., Suite 202
Harrisburg PA 17110
717.763.9890

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AUS Telephone Plant Index

155 Gaither Drive
Suite A
Mount Laurel, NJ 08054
856.234.9200

3601 N. Progress Ave.
Suite 202
Harrisburg, PA 17110
717.763.9890

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To July 1, 2020

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FOREWORD

The AUS Telephone Plant Index, which follows this foreword was first introduced in 1977 by Associated Utility Services, Inc., and published as part of the Handy-Whitman Index of Public Utility Construction Costs through 1989. In 1990 AUS Consultants, the successor company to Associated Utility Services, Inc., decided to publish the Telephone Plant Index under the name C.A. Turner Utility Reports publication division. In 2005 the index changed its name from C.A. Turner Telephone Plant Index to AUS Telephone Plant Index.

The 1990 AUS Telephone Plant Index (TPI) was the first nationally available TPI based on the Federal Communication Commission (FCC) Uniform System of Accounts (USOA) Part 32. The prior published TPI, also prepared by AUS staff, was based on the earlier USOA Part 31 Standards.

Telephone Plant Index Description

The TPI consists of a separate cost index series for each of six geographic regions shown on the map at page iv. These regions are designated: North Atlantic, South Atlantic, North Central, South Central, Plateau, and Pacific Coast. The regional designation are the same as those used in the prior issues of the cost index and are based on similarity of characteristics among the contiguous 48 states.

Each cost index series within a region consists of one index labeled "Total Plant Account" and up to 31 individual cost index series for the individual plant account identified in the left hand columns.

The Base Year for each cost index is 1973=100. Some plant accounts will not show an index number of 100 at year 1973 due to a subsequent adjustment for FCC Part 31 to Part 32, changes explained later in this foreword. In a few accounts the item described in the account was not included in the index series until after 1973 and the base year is considered the first year of entry.

The index for most plant accounts begins with a single entry in year 1946 and continues with a single number for each year through 1973. Beginning in 1974 there are two index numbers for each year; one for January 1 and one for July 1. These numbers represent the prevailing wages and material prices and weightings at that point in time.

Index History

An index is a tool for identifying the relative price change of an item, or group of items over an identified period of time. Price indexes have been in use for many years for a variety of reasons. One example is an index developed in the eighteenth century by an Italian named Carli to determine the effect of the discovery of America upon the level of prices in Italy of three commodities between the years 1500 and 1750. In the current century, numerous organizations, including the United States Bureau of Statistic, have developed a variety of indexes ranging from the cost of basic commodities to manufactured goods and building construction cost.

Interest in telephone utility cost indexes has varied over time depending on the need to develop reproduction cost values for utility properties. Previous uses of cost indexes included such things as the determination trended original cost in fair value rate jurisdictions and current cost pricing for FASB-33 financial accounting disclosures. Due to changes in rate regulation proceedings and financial disclosure requirements, the need in these two specific areas has declined. Other areas in which reproduction cost indexes were utilized included insurance valuations, property tax valuations, retirement accounting and cost forecasting, etc.

Most recently, interest in cost indexes for the telecommunication industry has increased due to the possible implementation of price cap regulation. This form of regulation incorporates the use of changes in price levels by regulators to set rates. Under one proposal, customer tariff prices are adjusted to give consideration to productivity improvements, therefore, the development of the construction cost indexes will have an indirect bearing on the level of the company revenue requirements.

Index Design

The telephone plant index was designed as a product which could be utilized by any of the various telephone operating companies to develop the reproduction cost of the company's property at the selected test year date. Due to the variation of many design construction specifics from one company to another, it is impossible to produce an index which will exactly mirror the construction cost changes for each company. In circumstances where companies desire a more specific reproduction cost of their property, a custom index should be prepared or, alternately, the company's property should be inventoried and unit priced. Such unit cost work efforts, of course, will be significantly more expensive and time consuming to complete.

As indicated, the telephone plant index is a standard index which is published on a semi-annual basis. The yearly average index is calculated via a 1-2-1 weighting process which is the sum of 25% of the January index, 50 of the July index, and 25% of the succeeding year's January index.

In general terms, the telephone plant index was constructed around the FCC Part 32 system of accounts to aid companies in ease of application of the published index. Each embedded property account was reviewed to determine the components which comprise the large segment of the property investment in each account. In this manner, the resulting telephone plant index was a reasonable proxy for determining the reproduction cost of the embedded investment of the independent telephone industry.

With the exception of the General Support Asset Group, the FCC Part 32 based indexes were adjusted for all index years 1987 and prior to compensate for the change in overhead capitalization policies effective with the new regulations. That is, under FCC Part 31 regulation, a greater level of overheads were previously incorporated in the plant in service investments contained on the company's books and records. The adjusted indexes for the years 1946 through 1987, when applied to the company's original costs, will produce the applicable reproduction cost under FCC Part 32 accounting treatment. The index adjustment for Part 31 to Part 32 accounting results in the plant accounts not having an index number of 100 at the 1973 base year.

The AUS Telephone Plant Index was designed around thirty-six component indexes representing the basic components of material and labor which make up the construction of the various telephone plant accounts. The components include such items as Buildings, Switching Equipment, Circuit Equipment, Poles, Cable, Wire Vehicles, Tools, Furniture, Installer Labor and Lineman Labor, etc. The components were composited together into account level indexes based upon material and labor weights derived from a study of independent telephone construction cost experience.

Introduction of new technologies into a reproduction cost index required the review of composite weight included in development of the account level index to reflex the new mix of property.

The goal of the telephone plant index was to produce a product which when utilized together with each companies' books and records would produce a reproduction cost value.

The AUS Telephone Plant Index does not reflect replacement cost inasmuch as it was designed to produce the reproduction cost (the cost in today's dollars to reproduce the company's embedded plant in service).

Index Functions

The AUS Telephone Plant Index series was initially prepared to address a very specific function. That is, it was designed to enable companies to produce trended original cost values to the historical original cost of plant in service on the companies' books and records. This trended original cost is a general representation of the cost to reconstruct the property in question at the price level of the selected period. If a company desires a more specific estimate of reconstruction, the property specific indexes can be developed giving consideration to the actual history of the company's wages and material cost in comparison to the labor and material costs. For an even more specific cost estimated to rebuild the plant in serve, engineering estimated can be completed based upon the property inventory and the current unit costs for constructing the various plant categories.

In summary, the index was designed to be applied on a vintage and account level basis to determine the reproduction cost of local distribution companies' plant in service, as of the selected price level.

A tool can be utilized correctly only within the boundaries for which the product was originally designed. Uses above and beyond the scope of the original design may or may not produce reliable results. That is, the use of a generalized index to prepare a reproduction cost will provide general results within the range of reasonableness. If more specific or exact results are required, alternative methods or procedures (i.e., custom indexes or specific detail pricing) should be employed.

An effort has been made to carefully construct an index which produces a reasonable proxy of reproduction cost for the telephone plant or local distribution companies giving consideration to the fact that there are variances in material and labor costs, as well as, construction methods and practices from one company to another. Nevertheless, we believe that there is sufficient similarity in the cost trends to make the AUS Telephone Plant Index a useful tool when carefully applied to a company's historical cost base.

North Atlantic

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBER																LINE NO
			1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	
1	Total Plant		85	89	91	91	92	95	96	96	94	94	97	97	96	96	97	96	1
2																			2
3																			3
4	Motor Vehicles	2112	57	57	63	67	67	70	74	74	74	77	81	84	87	89	88	87	4
5	Aircraft	2113	56	56	62	66	66	69	73	73	73	75	80	83	86	88	86	86	5
6	Special Purpose Vehicles	2114	30	34	38	41	42	46	47	48	49	51	56	60	62	65	66	67	6
7	Gargare Work Equipment	2115	36	38	42	44	46	51	51	52	53	56	61	65	67	69	70	70	7
8	Other Work Equipment	2116	50	50	52	54	55	59	59	61	62	64	67	70	71	74	75	77	9
9																			10
10																			11
11	Buildings	2121	24	28	32	34	35	37	38	39	41	42	46	49	50	52	53	52	12
12	Furniture	2122	43	43	46	47	50	56	56	57	57	60	64	68	70	70	71	71	12
13	Office Equipment	2123	67	67	69	69	70	75	74	76	77	79	82	85	87	88	88	89	13
14	General Purpose Computer	2124	67	67	69	69	70	75	74	76	77	79	82	85	87	88	88	89	14
15																			15
16																			16
17	Analog Electronic Switching	2211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
18	Ditgital Electronic Switching	2212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
19																			19
20																			20
21	Electro Mechanical Switching	2215	36	48	49	57	62	64	67	66	64	65	68	70	69	72	70	72	21
22																			22
23	Operator Systems	2220	37	50	51	59	64	67	69	68	66	67	70	72	71	73	71	74	23
24																			24
25																			25
26																			26
27	Radio System-Analog	22311	51	57	62	63	63	66	64	60	58	58	49	49	46	47	36	36	27
28	Radio System-Digital	22312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
29	Circuit Equipment-Analog	22321	347	392	417	411	410	423	410	401	348	311	319	317	303	299	312	297	29
30	Circuit Equipment-Digital	22322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
31																			31
32	Public Telephone Term Eq	2351	148	151	145	145	148	154	143	144	146	158	159	164	164	164	165	165	32
33																			33
34																			34
35	Poles	2411	33	37	39	41	42	45	47	49	51	50	54	58	59	59	60	61	35
36	Aerial Cable-Metallic	24211	44	47	49	49	51	58	61	64	64	68	74	72	70	71	72	70	36
37	Aerial Cable-Fiber	24212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38	Underground Cable-Metallic	24221	48	52	54	53	55	64	67	71	69	75	82	78	75	76	78	75	38
39	Underground Cable-Fiber	24222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
40	Buried Cable-Metallic	24231	50	54	56	55	57	66	70	74	72	78	85	81	77	78	80	76	40
41	Buried Cable-Fiber	24232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
42	Submarine Cable-Metallic	24241	43	45	48	48	50	56	59	62	61	65	71	69	68	69	71	70	42
43	Submarine Cable-Fiber	24241	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
44	Intra Building Cable-Metallic	24261	43	47	49	48	50	58	61	64	63	68	74	71	69	70	72	70	44
45	Intra Building Cable-Fiber	24262	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
46	Aerial Wire	2431	33	36	38	38	40	45	47	50	50	55	58	57	57	59	61	62	46
47	Conduit Systems	2441	54	55	57	59	60	63	64	64	65	65	67	69	71	72	73	74	47
48																			48
49	Aerial Cable-FTTP (Distribution)	24213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	Underground Cable-FTTP (Dist.)	24223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	Buried Cable-FTTP (Distribution)	24233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	Submarine Cable-FTTP (Dist.)	24243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	Intra Building Cable-FTTP (Dist.)	24263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																			54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	COST INDEX NUMBER																							LINE NO
	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974		1975		1976		1977		1978		1979	
													Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	
1	95	94	94	94	95	96	96	97	101	101	102	105	108	113	116	116	117	120	122	123	125	128	131	135	1
2																									2
3																									3
4	87	86	86	85	85	86	88	89	92	97	99	100	102	105	116	116	123	124	131	132	140	143	149	155	4
5	85	85	84	84	84	84	86	88	91	96	99	100	102	109	119	123	128	131	136	140	146	151	157	163	5
6	67	68	70	72	74	77	81	85	89	93	96	100	103	114	130	141	147	151	158	162	171	177	187	195	6
7	71	71	72	73	76	79	82	85	90	94	96	100	114	118	134	139	143	147	153	159	165	172	180	189	7
8	78	79	79	79	81	85	88	93	98	100	100	100	100	111	118	122	119	122	124	130	131	137	141	147	8
9																									9
10																									10
11	53	54	56	57	59	61	64	68	74	84	91	100	107	119	125	128	126	131	132	136	140	148	154	163	11
12	71	71	72	72	73	77	80	83	89	91	93	100	103	114	130	128	129	135	136	144	149	155	160	171	12
13	89	90	90	90	91	92	93	93	96	97	99	100	101	105	109	111	110	112	111	113	114	118	119	123	13
14	89	90	90	90	91	92	93	93	96	97	99	100	100	100	102	103	100	100	98	90	90	90	90	90	14
15																									15
16																									16
17	0	0	0	0	0	0	0	0	0	0	0	104	103	106	110	111	111	113	113	113	115	119	122	125	17
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	105	100	95	95	95	96	96	18
19																									19
20																									20
21	71	76	78	75	72	71	75	81	84	88	98	104	106	110	115	120	124	127	132	136	140	145	151	156	21
22																									22
23	73	77	79	76	72	71	76	81	85	89	98	104	106	108	111	114	117	119	121	122	125	128	132	136	23
24																									24
25																									25
26																									26
27	46	49	52	60	58	63	62	66	78	97	102	104	102	102	102	102	97	98	103	104	106	106	103	103	27
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
29	273	234	228	214	224	210	173	159	163	128	108	104	105	108	111	112	111	111	115	118	118	119	120	122	29
30	0	0	0	0	0	0	0	0	0	0	0	104	104	104	105	105	110	116	121	126	126	127	123	120	30
31																									31
32	165	165	166	130	122	123	120	118	108	107	108	107	106	107	110	109	109	111	112	114	116	119	123	127	32
33																									33
34																									34
35	62	63	65	66	68	71	76	79	83	88	97	107	119	131	144	157	158	160	164	169	176	183	196	208	35
36	70	70	70	73	77	81	84	88	96	97	100	107	114	125	129	126	130	135	140	144	148	152	158	170	36
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38	74	73	72	75	80	84	87	91	100	99	100	107	114	127	130	125	129	134	138	143	145	149	155	168	38
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
40	76	74	73	77	81	85	88	91	101	99	100	107	114	128	131	124	128	133	138	142	144	147	153	167	40
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
42	70	70	71	73	77	81	84	88	95	96	101	107	113	123	128	126	131	136	141	145	150	154	160	171	42
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
44	70	70	70	73	77	81	84	88	96	96	100	107	114	125	129	126	130	136	140	145	148	152	158	170	44
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
46	63	65	66	70	73	75	78	84	91	93	100	107	114	125	130	131	134	139	142	146	145	150	158	172	46
47	74	77	78	79	82	84	84	87	89	94	102	107	111	117	127	130	135	139	144	150	159	163	169	180	47
48																									48
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																									54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBERS																LINE NO
			1980		1981		1982		1983		1984		1985		1986		1987		
			Jan. 1	Jul 1	Jan. 1	Jul 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	
1	Total Plant		140	146	146	149	150	152	156	159	156	154	156	158	156	154	154	155	1
2																			2
3																			3
4	Motor Vehicles	2112	162	167	178	186	195	195	201	199	203	204	206	210	215	215	227	220	4
5	Aircraft	2113	170	180	195	205	215	217	224	223	227	228	230	234	238	237	233	231	5
6	Special Purpose Vehicles	2114	206	220	231	245	254	263	266	270	271	274	274	277	278	281	283	287	6
7	Gargare Work Equipment	2115	200	213	223	234	241	248	250	251	253	257	260	263	264	267	268	270	7
8	Other Work Equipment	2116	153	165	170	181	183	189	189	189	189	190	192	197	199	202	204	205	8
9																			9
10																			10
11	Buildings	2121	176	183	188	193	192	198	200	206	210	218	223	224	228	234	234	239	11
12	Furniture	2122	174	182	187	199	210	213	215	222	224	229	232	238	242	245	248	252	12
13	Office Equipment	2123	125	130	132	136	137	140	140	143	142	142	140	142	143	143	143	146	13
14	General Purpose Computer	2124	90	90	90	90	87	83	76	69	59	48	48	48	48	47	47	47	14
15																			15
16																			16
17	Analog Electronic Switching	2211	130	140	149	163	168	175	183	188	193	199	202	204	205	208	210	210	17
18	Ditgital Electronic Switching	2212	96	96	97	97	94	90	84	77	67	57	57	57	57	56	56	56	18
19																			19
20																			20
21	Electro Mechanical Switching	2215	167	188	199	213	219	226	232	248	268	277	282	281	283	286	287	287	21
22																			22
23	Operator Systems	2220	146	157	166	176	180	185	191	197	204	211	213	215	216	218	219	219	23
24																			24
25																			25
26																			26
27	Radio System-Analog	22311	100	100	101	102	90	91	94	94	79	80	80	81	77	78	82	82	27
28	Radio System-Digital	22312	0	0	0	0	0	0	115	115	115	117	119	121	122	124	126	124	28
29	Circuit Equipment-Analog	22321	125	130	129	128	130	132	121	154	153	152	153	152	147	144	145	146	29
30	Circuit Equipment-Digital	22322	114	107	100	93	93	94	95	96	89	82	80	78	68	59	49	39	30
31																			31
32	Public Telephone Term Eq	2351	132	141	145	150	158	167	190	196	201	206	210	212	213	217	219	218	32
33																			33
34																			34
35	Poles	2411	220	232	240	249	254	259	263	268	272	273	280	283	287	292	295	297	35
36	Aerial Cable-Metallic	24211	182	193	191	197	202	204	208	213	211	209	219	231	227	223	225	228	36
37	Aerial Cable-Fiber	24212	0	0	0	0	0	0	136	138	132	127	119	111	108	105	108	110	37
38	Underground Cable-Metallic	24221	181	192	187	191	195	196	199	203	197	193	204	217	212	205	206	209	38
39	Underground Cable-Fiber	24222	0	0	0	0	0	0	130	131	125	119	110	101	98	94	97	100	39
40	Buried Cable-Metallic	24231	180	192	186	189	192	193	195	199	192	187	198	212	205	198	198	201	40
41	Buried Cable-Fiber	24232	0	0	0	0	0	0	129	131	124	118	109	100	97	93	96	98	41
42	Submarine Cable-Metallic	24241	181	192	193	199	205	209	214	219	219	218	227	238	237	235	238	240	42
43	Submarine Cable-Fiber	24241	0	0	0	0	0	0	147	149	145	141	134	128	126	124	127	130	43
44	Intra Building Cable-Metallic	24261	182	193	191	197	202	205	209	214	211	210	220	231	228	224	226	230	44
45	Intra Building Cable-Fiber	24262	0	0	0	0	0	0	136	138	132	127	119	111	108	105	108	111	45
46	Aerial Wire	2431	182	191	198	206	210	214	219	225	232	239	243	248	250	252	253	253	46
47	Conduit Systems	2441	188	196	203	211	219	220	228	240	246	253	257	262	267	271	276	278	47
48																			48
49	Aerial Cable-FTTP (Distribution)	24213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	Underground Cable-FTTP (Dist.)	24223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	Buried Cable-FTTP (Distribution)	24233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	Submarine Cable-FTTP (Dist.)	24243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	Intra Building Cable-FTTP (Dist.)	24263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																			54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	COST INDEX NUMBERS																								LINE NO
	1988		1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		
	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	
1	150	153	158	165	164	165	167	165	165	165	167	168	169	170	174	178	182	182	184	185	186	184	184	181	1
2																									2
3																									3
4	221	222	231	229	236	232	244	241	254	251	258	261	267	271	275	270	279	276	277	271	270	263	273	266	4
5	234	234	234	240	246	254	261	271	274	284	285	291	297	300	304	312	318	322	326	328	327	328	329	330	5
6	289	293	298	309	312	319	325	328	333	337	343	348	348	351	353	360	362	368	370	374	377	382	383	388	6
7	273	279	286	294	298	305	309	316	318	322	324	328	332	336	338	345	349	354	356	359	361	364	366	368	7
8	206	210	215	218	221	228	230	234	235	240	240	243	244	250	250	254	254	258	258	260	260	262	263	265	8
9																									9
10																									10
11	242	254	257	268	268	272	272	274	270	279	283	290	295	306	310	310	311	312	323	329	331	338	341	343	11
12	255	263	269	274	278	284	287	290	291	294	296	299	302	309	309	315	320	322	326	328	330	330	330	333	12
13	147	149	151	153	154	154	152	153	153	156	154	155	155	155	154	156	155	156	155	157	156	157	156	157	13
14	45	43	37	31	30	29	26	24	23	21	21	21	21	21	21	20	17	15	14	14	14	14	13	13	14
15																									15
16																									16
17	204	207	210	212	214	211	212	214	213	213	213	216	215	216	213	212	211	204	204	200	196	194	193	192	17
18	52	50	45	40	39	38	36	33	32	31	31	31	32	32	32	31	28	27	26	26	26	26	25	25	18
19																									19
20																									20
21	278	284	289	291	291	292	296	302	303	304	309	317	316	324	329	327	334	333	336	339	331	336	338	342	21
22																									22
23	213	216	217	218	218	218	220	223	224	224	227	231	231	236	238	236	239	240	239	239	234	237	237	239	23
24																									24
25																									25
26																									26
27	80	80	81	81	81	82	81	82	84	85	86	87	87	87	89	89	91	91	91	93	94	95	95	96	27
28	117	117	117	118	118	118	116	116	117	118	119	120	119	120	120	121	121	122	123	125	125	123	123	124	28
29	140	141	142	144	145	144	145	146	147	147	147	149	150	150	152	149	149	146	146	145	143	143	142	143	29
30	36	35	35	35	35	34	34	34	37	38	39	39	39	39	37	37	37	38	35	36	36	36	36	35	30
31																									31
32	205	209	212	214	216	213	213	215	214	214	213	216	215	216	213	212	211	204	204	200	196	195	194	192	32
33																									33
34																									34
35	278	285	291	295	300	304	310	315	319	327	331	338	352	365	368	369	379	385	400	402	406	413	418	421	35
36	226	237	257	275	273	277	282	277	279	275	281	282	283	282	294	310	319	323	325	328	333	324	322	314	36
37	94	87	85	89	89	89	90	90	89	90	89	89	88	87	88	89	90	91	91	92	93	94	94	95	37
38	210	221	244	265	261	265	270	261	263	256	262	260	260	257	270	289	299	304	305	308	312	299	297	285	38
39	84	75	73	77	76	76	77	77	76	76	75	74	73	72	72	73	74	75	75	76	76	77	77	77	39
40	204	215	240	262	257	261	265	256	257	249	256	253	252	249	262	283	293	298	298	301	306	291	288	275	40
41	82	73	71	75	74	74	75	75	74	74	73	72	71	69	70	71	72	73	73	73	74	74	75	75	41
42	235	244	260	274	274	277	283	278	282	279	285	286	287	288	298	310	319	324	324	327	332	325	325	319	42
43	114	107	106	111	111	111	113	113	113	114	113	114	113	113	114	115	118	119	119	120	121	122	123	123	43
44	227	238	257	275	273	277	282	277	279	275	281	282	282	282	293	309	318	323	324	328	333	324	322	314	44
45	95	87	85	90	89	89	90	91	90	90	89	89	88	87	88	89	91	92	92	93	94	94	95	95	45
46	249	261	270	278	279	283	290	291	293	298	302	305	307	312	320	324	329	332	334	337	341	344	342	342	46
47	269	277	301	309	311	309	316	308	307	310	314	320	325	331	336	340	345	347	350	353	355	358	362	366	47
48																									48
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
54																									54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBERS																LINE NO
			2000		2001		2002		2003		2004		2005		2006		2007		
			Jan. 1	Jul. 1	Jan. 1	Jul 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	
1	Total Plant		182	185	188	190	191	193	194	197	201	206	210	213	227	244	244	249	1
2																			2
3																			3
4	Motor Vehicles	2112	275	269	276	266	270	263	264	257	268	266	272	261	262	258	264	257	4
5	Aircraft	2113	334	343	351	359	362	364	369	377	387	393	408	417	424	438	447	450	5
6	Special Purpose Vehicles	2114	388	392	392	392	392	398	400	404	404	413	428	445	449	462	465	472	6
7	Gargare Work Equipment	2115	369	372	373	377	376	376	377	378	379	387	393	403	408	416	422	430	7
8	Other Work Equipment	2116	266	267	268	273	271	272	271	273	273	275	276	278	278	275	278	279	8
9																			9
10																			10
11	Buildings	2121	353	359	364	374	377	384	385	385	407	412	425	431	441	443	457	472	11
12	Furniture	2122	335	337	338	341	341	341	344	346	346	350	360	368	372	376	380	386	12
13	Office Equipment	2123	156	157	157	158	159	158	158	157	159	160	158	162	161	161	160	161	13
14	General Purpose Computer	2124	12	11	9	9	7	7	6	4.8	3.4	3.4	3.3	3.3	3.0	2.8	2.6	2.7	14
15																			15
16																			16
17	Analog Electronic Switching	2211	193	193	193	190	189	190	189	190	189	190	190	189	187	193	196	186	17
18	Ditgital Electronic Switching	2212	25	24	22	23	23	23	21	22	22	22	22	22	22	22	23	23	18
19																			19
20																			20
21	Electro Mechanical Switching	2215	344	348	350	358	366	376	379	386	391	395	403	405	414	421	430	432	21
22																			22
23	Operator Systems	2220	241	242	243	247	251	257	258	261	264	266	271	272	276	282	287	287	23
24																			24
25																			25
26																			26
27	Radio System-Analog	22311	96	96	96	95	95	95	95	95	95	96	95	95	94	97	98	94	27
28	Radio System-Digital	22312	125	125	126	127	128	127	125	125	125	126	127	127	128	129	130	130	28
29	Circuit Equipment-Analog	22321	143	144	144	142	143	143	143	144	143	145	145	145	144	148	150	144	29
30	Circuit Equipment-Digital	22322	36	36	36	37	37	38	38	39	38	38	39	39	39	40	40	41	30
31																			31
32	Public Telephone Term Eq	2351	193	193	193	191	190	190	190	191	190	191	190	189	187	193	195	186	32
33																			33
34																			34
35	Poles	2411	421	429	434	446	451	459	463	472	477	490	495	503	502	521	526	529	35
36	Aerial Cable-Metallic	24211	313	322	328	333	335	338	340	349	357	371	379	386	430	486	477	492	36
37	Aerial Cable-Fiber	24212	96	98	100	102	104	105	105	108	110	112	114	116	118	119	121	122	37
38	Underground Cable-Metallic	24221	281	289	295	299	298	299	299	307	314	326	334	340	394	461	448	466	38
39	Underground Cable-Fiber	24222	78	80	82	83	84	86	85	87	89	91	92	94	95	96	98	98	39
40	Buried Cable-Metallic	24231	271	278	284	287	285	289	286	293	300	312	320	326	383	456	441	460	40
41	Buried Cable-Fiber	24232	76	77	79	80	81	83	82	84	85	87	89	90	91	92	93	94	41
42	Submarine Cable-Metallic	24241	320	327	334	338	341	343	346	353	362	372	379	384	417	459	454	466	42
43	Submarine Cable-Fiber	24241	125	127	130	132	134	136	136	138	141	144	146	148	149	150	153	154	43
44	Intra Building Cable-Metallic	24261	313	322	328	333	335	338	340	349	357	370	378	385	429	483	474	489	44
45	Intra Building Cable-Fiber	24262	97	99	101	103	104	106	106	108	110	113	115	117	118	120	121	122	45
46	Aerial Wire	2431	348	355	362	368	372	377	381	391	399	412	419	427	446	466	465	472	46
47	Conduit Systems	2441	375	380	391	395	403	412	418	422	432	442	453	458	474	478	495	493	47
48																			48
49	Aerial Cable-FTTP (Distribution)	24213	0	0	0	0	0	0	0	0	0	100	97	95	92	89	88	87	49
50	Underground Cable-FTTP (Dist.)	24223	0	0	0	0	0	0	0	0	0	100	99	98	98	97	96	96	50
51	Buried Cable-FTTP (Distribution)	24233	0	0	0	0	0	0	0	0	0	100	102	105	104	103	103	102	51
52	Submarine Cable-FTTP (Dist.)	24243	0	0	0	0	0	0	0	0	0	100	99	98	98	97	96	96	52
53	Intra Building Cable-FTTP (Dist.)	24263	0	0	0	0	0	0	0	0	0	100	100	100	100	100	101	103	53
54																			54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	COST INDEX NUMBERS																						LINE NO
	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		
	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	
1	251	256	245	248	258	260	279	282	282	282	285	283	284	285	289	287	283	282	288	290	298	304	1
2																							2
3																							3
4	263	257	272	273	274	269	272	273	280	279	286	282	291	287	291	295	299	298	305	301	307	304	4
5	461	471	495	480	485	490	497	502	514	520	523	528	532	537	541	543	543	547	548	553	557	562	5
6	476	485	499	504	503	503	507	518	529	541	548	555	557	564	566	570	572	576	577	581	583	578	6
7	435	445	457	457	456	458	462	474	479	485	489	494	497	503	505	509	510	513	514	519	522	533	7
8	281	286	290	286	286	288	288	290	291	294	295	296	304	307	309	315	318	322	322	324	327	330	8
9																							9
10																							10
11	492	497	506	494	506	507	521	518	530	532	542	539	550	552	585	580	586	589	604	608	633	647	11
12	389	402	417	415	418	420	415	429	433	437	433	437	439	450	449	454	454	455	457	461	464	482	12
13	162	171	184	171	169	169	170	171	173	173	164	165	166	166	171	172	172	172	173	171	171	169	13
14	2.7	2.6	2.6	2.1	2.01	1.98	1.97	1.49	0.82	0.66	0.67	0.50	0.57	0.60	0.55	0.63	0.64	0.65	0.73	0.71	0.67	0.64	14
15																							15
16																							16
17	180	179	178	178	177	177	174	175	174	174	174	175	176	176	176	176	177	177	177	179	177	179	17
18	24	24	25	25	25	25	25	25	26	26	26	27	27	27	27	28	28	28	28	29	29	29	18
19																							19
20																							20
21	439	445	456	458	460	469	474	481	486	478	484	491	497	495	499	499	496	497	502	502	509	506	21
22																							22
23	288	292	297	299	300	305	307	311	313	309	312	317	320	319	322	322	320	321	324	325	328	327	23
24																							24
25																							25
26																							26
27	91	90	90	90	89	89	88	89	88	88	88	88	89	89	89	89	89	89	89	90	90	90	27
28	131	132	134	134	135	137	138	138	137	138	138	138	138	138	139	140	140	140	140	141	141	142	28
29	140	139	139	139	138	138	137	138	137	137	137	138	139	139	140	140	141	141	141	142	142	143	29
30	41	41	41	41	40	40	40	41	41	42	42	42	43	43	44	44	44	45	45	45	46	46	30
31																							31
32	180	179	177	178	177	177	174	175	173	174	173	174	175	175	176	176	177	177	177	179	177	179	32
33																							33
34																							34
35	537	547	554	563	570	578	576	587	594	600	603	607	605	616	620	621	629	633	634	652	643	652	35
36	494	507	461	473	506	509	573	582	577	576	582	572	573	573	578	570	555	551	566	568	590	604	36
37	123	124	126	127	128	130	131	133	135	136	137	138	140	142	143	144	146	148	149	151	153	155	37
38	465	481	421	435	475	476	555	562	554	552	556	544	542	540	544	533	513	506	523	524	548	563	38
39	100	100	102	103	103	105	106	108	109	110	111	112	113	114	116	116	118	119	120	122	123	125	39
40	459	475	410	425	467	467	553	560	550	547	552	538	536	533	537	524	501	493	511	511	537	552	40
41	95	96	97	98	99	100	101	103	104	105	106	107	108	109	111	111	113	114	115	116	118	120	41
42	468	479	447	458	484	486	535	541	539	540	545	539	541	542	547	544	534	532	546	548	566	578	42
43	155	157	159	161	163	164	166	168	170	172	173	174	177	179	181	183	185	187	189	191	194	196	43
44	491	504	459	471	504	507	570	578	573	573	578	569	569	570	575	567	553	549	564	566	588	602	44
45	124	125	127	128	129	131	132	134	135	137	138	139	141	142	144	145	147	148	150	152	154	156	45
46	475	488	469	478	496	501	519	528	525	527	531	530	533	538	543	543	540	541	551	556	569	580	46
47	502	507	525	530	516	521	526	532	545	550	549	552	559	565	571	577	581	586	591	596	611	618	47
48																							48
49	82	77	75	73	65	58	55	53	52	50	50	50	50	50	50	49	50	49	49	50	50	50	49
50	94	92	89	87	83	80	75	70	66	62	58	54	54	54	53	53	54	54	54	55	55	55	50
51	92	82	78	74	71	68	66	63	61	59	57	54	54	55	54	54	54	53	53	54	54	54	55
52	94	92	89	87	83	80	75	70	66	62	58	54	54	54	53	53	54	54	54	55	55	55	52
53	104	105	90	75	68	61	54	47	43	39	39	39	39	39	38	38	39	44	44	44	44	44	53
54																							54

SCHEDULE NO. T-1

AUS TELEPHONE PLANT INDEX

NORTH ATLANTIC REGION 1973-100

LINE NO	PLANT IN SERVICE DESCRIPTION	FCC Acct	COST INDEX NUMBERS														LINE NO
			2019		2020		2021		2022		2023		2024		2025		
			Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	Jan. 1	Jul. 1	
1	Total Plant		304	305	308	308											1
2																	2
3																	3
4	Motor Vehicles	2112	309	305	308	304											4
5	Aircraft	2113	567	574	575	581											5
6	Special Purpose Vehicles	2114	602	612	616	623											6
7	Gargare Work Equipment	2115	541	550	550	555											7
8	Other Work Equipment	2116	333	335	336	340											8
9																	9
10																	10
11	Buildings	2121	647	643	664	664											11
12	Furniture	2122	491	497	503	507											12
13	Office Equipment	2123	170	172	171	169											13
14	General Purpose Computer	2124	0.60	0.60	0.51	0.51											14
15																	15
16																	16
17	Analog Electronic Switching	2211	179	179	181	180											17
18	Ditgital Electronic Switching	2212	29	29	30	30											18
19																	19
20																	20
21	Electro Mechanical Switching	2215	513	517	518	528											21
22																	22
23	Operator Systems	2220	331	334	335	340											23
24																	24
25																	25
26																	26
27	Radio System-Analog	22311	90	90	91	91											27
28	Radio System-Digital	22312	143	144	146	147											28
29	Circuit Equipment-Analog	22321	143	144	145	145											29
30	Circuit Equipment-Digital	22322	47	47	48	48											30
31																	31
32	Public Telephone Term Eq	2351	179	180	181	181											32
33																	33
34																	34
35	Poles	2411	661	671	699	710											35
36	Aerial Cable-Metallic	24211	601	603	605	603											36
37	Aerial Cable-Fiber	24212	157	158	160	162											37
38	Underground Cable-Metallic	24221	558	557	558	553											38
39	Underground Cable-Fiber	24222	126	128	129	130											39
40	Buried Cable-Metallic	24231	545	544	544	538											40
41	Buried Cable-Fiber	24232	121	122	123	125											41
42	Submarine Cable-Metallic	24241	578	580	583	583											42
43	Submarine Cable-Fiber	24241	199	200	203	205											43
44	Intra Building Cable-Metallic	24261	599	601	603	601											44
45	Intra Building Cable-Fiber	24262	158	159	161	163											45
46	Aerial Wire	2431	583	587	592	595											46
47	Conduit Systems	2441	626	631	642	648											47
48																	48
49	Aerial Cable-FTTP (Distribution)	24213	51	51	51	51											49
50	Underground Cable-FTTP (Dist.)	24223	56	56	56	56											50
51	Buried Cable-FTTP (Distribution)	24233	55	55	55	55											51
52	Submarine Cable-FTTP (Dist.)	24243	56	56	56	56											52
53	Intra Building Cable-FTTP (Dist.)	24263	45	45	45	45											53
54																	54

Water and Wastewater Industry

Cost Indices

United States Bureau of Labor Statistics – General Inf Cost Indexes

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

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AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122l linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1913	1/1/1913	12/31/1913		10	7	6
BLS	BLS	All	1914	1/1/1914	12/31/1914		10	7	6
BLS	BLS	All	1915	1/1/1915	12/31/1915		10	7	6
BLS	BLS	All	1916	1/1/1916	12/31/1916		11	8	7
BLS	BLS	All	1917	1/1/1917	12/31/1917		13	10	8
BLS	BLS	All	1918	1/1/1918	12/31/1918		15	11	9
BLS	BLS	All	1919	1/1/1919	12/31/1919		17	12	10
BLS	BLS	All	1920	1/1/1920	12/31/1920		20	14	12
BLS	BLS	All	1921	1/1/1921	12/31/1921		18	13	11
BLS	BLS	All	1922	1/1/1922	12/31/1922		17	12	10
BLS	BLS	All	1923	1/1/1923	12/31/1923		17	12	10
BLS	BLS	All	1924	1/1/1924	12/31/1924		17	12	10
BLS	BLS	All	1925	1/1/1925	12/31/1925		18	13	11
BLS	BLS	All	1926	1/1/1926	12/31/1926		18	13	11
BLS	BLS	All	1927	1/1/1927	12/31/1927		17	12	10
BLS	BLS	All	1928	1/1/1928	12/31/1928		17	12	10
BLS	BLS	All	1929	1/1/1929	12/31/1929		17	12	10
BLS	BLS	All	1930	1/1/1930	12/31/1930		17	12	10
BLS	BLS	All	1931	1/1/1931	12/31/1931		15	11	9
BLS	BLS	All	1932	1/1/1932	12/31/1932		14	10	8
BLS	BLS	All	1933	1/1/1933	12/31/1933		13	9	7
BLS	BLS	All	1934	1/1/1934	12/31/1934		13	9	7
BLS	BLS	All	1935	1/1/1935	12/31/1935		14	10	7
BLS	BLS	All	1936	1/1/1936	12/31/1936		14	10	7
BLS	BLS	All	1937	1/1/1937	12/31/1937		14	10	7
BLS	BLS	All	1938	1/1/1938	12/31/1938		14	10	7
BLS	BLS	All	1939	1/1/1939	12/31/1939		14	10	7
BLS	BLS	All	1940	1/1/1940	12/31/1940		14	10	7
BLS	BLS	All	1941	1/1/1941	12/31/1941		15	11	8
BLS	BLS	All	1942	1/1/1942	12/31/1942		16	12	9
BLS	BLS	All	1943	1/1/1943	12/31/1943		17	13	10
BLS	BLS	All	1944	1/1/1944	12/31/1944		18	14	11
BLS	BLS	All	1945	1/1/1945	12/31/1945		18	14	11
BLS	BLS	All	1946	1/1/1946	12/31/1946		20	16	12
BLS	BLS	All	1947	1/1/1947	12/31/1947		22	18	13
BLS	BLS	All	1948	1/1/1948	12/31/1948		24	20	14
BLS	BLS	All	1949	1/1/1949	12/31/1949		24	20	14
BLS	BLS	All	1950	1/1/1950	12/31/1950		24	20	14
BLS	BLS	All	1951	1/1/1951	12/31/1951		26	22	15

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AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122I linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1952	1/1/1952	12/31/1952		27	23	16
BLS	BLS	All	1953	1/1/1953	12/31/1953		27	23	16
BLS	BLS	All	1954	1/1/1954	12/31/1954		27	23	16
BLS	BLS	All	1955	1/1/1955	12/31/1955		27	23	16
BLS	BLS	All	1956	1/1/1956	12/31/1956		27	23	16
BLS	BLS	All	1957	1/1/1957	12/31/1957		28	24	17
BLS	BLS	All	1958	1/1/1958	12/31/1958		29	25	18
BLS	BLS	All	1959	1/1/1959	12/31/1959		29	25	18
BLS	BLS	All	1960	1/1/1960	12/31/1960		30	26	19
BLS	BLS	All	1961	1/1/1961	12/31/1961		30	26	19
BLS	BLS	All	1962	1/1/1962	12/31/1962		30	26	19
BLS	BLS	All	1963	1/1/1963	12/31/1963		31	27	20
BLS	BLS	All	1964	1/1/1964	12/31/1964		31	27	20
BLS	BLS	All	1965	1/1/1965	12/31/1965		32	28	21
BLS	BLS	All	1966	1/1/1966	12/31/1966		32	28	21
BLS	BLS	All	1967	1/1/1967	12/31/1967		33	29	22
BLS	BLS	All	1968	1/1/1968	12/31/1968		35	31	23
BLS	BLS	All	1969	1/1/1969	12/31/1969		37	33	24
BLS	BLS	All	1970	1/1/1970	12/31/1970		39	35	25
BLS	BLS	All	1971	1/1/1971	12/31/1971		41	37	26
BLS	BLS	All	1972	1/1/1972	12/31/1972		42	38	27
BLS	BLS	All	1973	1/1/1973	12/31/1973		44	40	28
BLS	BLS	All	1974	1/1/1974	12/31/1974		49	44	31
BLS	BLS	All	1975	1/1/1975	12/31/1975		54	49	34
BLS	BLS	All	1976	1/1/1976	12/31/1976		57	52	36
BLS	BLS	All	1977	1/1/1977	12/31/1977		61	56	38
BLS	BLS	All	1978	1/1/1978	12/31/1978		65	60	40
BLS	BLS	All	1979	1/1/1979	12/31/1979		73	67	45
BLS	BLS	All	1980	1/1/1980	12/31/1980		82	75	50
BLS	BLS	All	1981	1/1/1981	12/31/1981		91	83	55
BLS	BLS	All	1982	1/1/1982	12/31/1982		97	89	59
BLS	BLS	All	1983	1/1/1983	12/31/1983		100	92	61
BLS	BLS	All	1984	1/1/1984	12/31/1984		104	96	63
BLS	BLS	All	1985	1/1/1985	12/31/1985		108	100	65
BLS	BLS	All	1986	1/1/1986	12/31/1986		110	102	66
BLS	BLS	All	1987	1/1/1987	12/31/1987		114	104	69
BLS	BLS	All	1988	1/1/1988	12/31/1988		118	104	72
BLS	BLS	All	1989	1/1/1989	12/31/1989		124	106	76
BLS	BLS	All	1990	1/1/1990	12/31/1990		131	108	80

BLS Indexes

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AUS Consultants
Bureau of Labor Statistics Indexes

Index	Table	Region	Year	Begin Date	End Date	CPI	1	2 Communic Equipment pcu3342	3 Technical Labor ecu11122l linked CIU20154
Earliest Year							1913	1986	1985
Index	Table	Region					1	2	3
BLS	BLS	All	1991	1/1/1991	12/31/1991		136	109	84
BLS	BLS	All	1992	1/1/1992	12/31/1992		140	110	88
BLS	BLS	All	1993	1/1/1993	12/31/1993		145	112	92
BLS	BLS	All	1994	1/1/1994	12/31/1994		148	113	95
BLS	BLS	All	1995	1/1/1995	12/31/1995		152	114	97
BLS	BLS	All	1996	1/1/1996	12/31/1996		157	115	100
BLS	BLS	All	1997	1/1/1997	12/31/1997		161	116	102
BLS	BLS	All	1998	1/1/1998	12/31/1998		163	115	106
BLS	BLS	All	1999	1/1/1999	12/31/1999		167	113	109
BLS	BLS	All	2000	1/1/2000	12/31/2000		172	110	114
BLS	BLS	All	2001	1/1/2001	12/31/2001		177	109	119
BLS	BLS	All	2002	1/1/2002	12/31/2002		180	105	123
BLS	BLS	All	2003	1/1/2003	12/31/2003		184	102	127
BLS	BLS	All	2004	1/1/2004	12/31/2004		189	98	132
BLS	BLS	All	2005	1/1/2005	12/31/2005		195	97	135
BLS	BLS	All	2006	1/1/2006	12/31/2006		202	97	139
BLS	BLS	All	2007	1/1/2007	12/31/2007		207	96	146
BLS	BLS	All	2008	1/1/2008	12/31/2008		215	97	152
BLS	BLS	All	2009	1/1/2009	12/31/2009		215	97	155
BLS	BLS	All	2010	1/1/2010	12/31/2010		218	97	157
BLS	BLS	All	2011	1/1/2011	12/31/2011		225	96	161
BLS	BLS	All	2012	1/1/2012	12/31/2012		230	96	164
BLS	BLS	All	2013	1/1/2013	12/31/2013		233	95	167
BLS	BLS	All	2014	1/1/2014	12/31/2014		237	96	170
BLS	BLS	All	2015	1/1/2015	12/31/2015		237	96	173
BLS	BLS	All	2016	1/1/2016	12/31/2016		240	95	176
BLS	BLS	All	2017	1/1/2017	12/31/2017		245	94	179
BLS	BLS	All	2018	1/1/2018	12/31/2018		251	93	183
BLS	BLS	All	2019	1/1/2019	12/31/2019		256	93	187
BLS	BLS	All	2020	1/1/2020	12/31/2020		258	94	188

BLS Indexes

S:\Cost Indices\Communications Power\Central Office Power 1-1-2020

Index	Table	Region	Year	Begin Date	End Date	1 Switch Gear PCU3353 13335313 30%	2 Relays PCU3353 14335314 30%	3 Battery Systems PCU3359 12335912 40%	4 Power Systems Calculation Composite	5 Alarm Systems PCU33429 03342901	6 Motors & Generators PCU33531 2335312	7 Emergency Generators Means Ref 26 32 13.13 2600
Earliest Year						1987	1987	1987	1987	1987	1987	1987
Index	Table	Region				1	2	3	4	5	6	7
POW	POW	All	1987	1/1/1987	12/31/1987	103.6	103.9	125.0	112.3	100.1	110.8	83.4
POW	POW	All	1988	1/1/1988	12/31/1988	106.7	106.6	126.7	114.7	101.6	116.4	83.7
POW	POW	All	1989	1/1/1989	12/31/1989	113.5	110.9	133.5	120.7	104.3	123.3	83.9
POW	POW	All	1990	1/1/1990	12/31/1990	118.5	115.4	137.6	125.2	103.4	127.5	84.1
POW	POW	All	1991	1/1/1991	12/31/1991	121.8	120.5	142.7	129.8	101.9	129.7	84.3
POW	POW	All	1992	1/1/1992	12/31/1992	123.6	123.3	146.1	132.5	102.2	131.5	84.8
POW	POW	All	1993	1/1/1993	12/31/1993	125.9	126.9	149.3	135.6	103.2	133.5	85.0
POW	POW	All	1994	1/1/1994	12/31/1994	128.7	128.3	151.2	137.6	104.2	134.2	90.6
POW	POW	All	1995	1/1/1995	12/31/1995	132.4	130.7	154.5	140.7	106.5	137.5	95.1
POW	POW	All	1996	1/1/1996	12/31/1996	133.6	133.6	157.5	143.2	108.3	139.1	95.3
POW	POW	All	1997	1/1/1997	12/31/1997	135.0	137.8	158.3	145.2	109.4	138.6	99.1
POW	POW	All	1998	1/1/1998	12/31/1998	138.2	140.4	164.2	149.3	111.3	139.8	99.6
POW	POW	All	1999	1/1/1999	12/31/1999	141.0	142.8	165.5	151.3	109.4	139.9	99.8
POW	POW	All	2000	1/1/2000	12/31/2000	143.3	144.4	169.9	154.3	108.4	140.4	100.0
POW	POW	All	2001	1/1/2001	12/31/2001	147.6	148.2	178.2	160.0	109.0	141.6	102.9
POW	POW	All	2002	1/1/2002	12/31/2002	149.8	150.0	179.4	161.7	110.4	142.0	103.4
POW	POW	All	2003	1/1/2003	12/31/2003	151.1	152.3	165.1	157.1	110.8	142.4	103.8
POW	POW	All	2004	1/1/2004	12/31/2004	153.7	155.2	165.1	158.7	109.8	145.8	104.3
POW	POW	All	2005	1/1/2005	12/31/2005	160.4	160.0	166.9	162.9	110.6	154.4	104.7
POW	POW	All	2006	1/1/2006	12/31/2006	167.5	167.6	175.6	170.8	113.1	161.8	104.9
POW	POW	All	2007	1/1/2007	12/31/2007	179.4	173.0	182.5	178.7	113.8	169.6	111.0
POW	POW	All	2008	1/1/2008	12/31/2008	187.5	179.3	189.4	185.8	116.0	177.7	123.0
POW	POW	All	2009	1/1/2009	12/31/2009	193.1	184.7	193.4	190.7	116.8	181.8	126.4
POW	POW	All	2010	1/1/2010	12/31/2010	195.1	190.3	191.8	192.3	117.8	185.4	130.9
POW	POW	All	2011	1/1/2011	12/31/2011	195.1	190.3	192.8	192.7	118.4	196.5	130.9
POW	POW	All	2012	1/1/2012	12/31/2012	198.2	194.5	197.1	196.7	119.9	201.1	139.8
POW	POW	All	2013	1/1/2013	12/31/2013	199.0	196.4	198.4	198.0	121.5	203.2	121.9
POW	POW	All	2014	1/1/2014	12/31/2014	201.5	200.1	198.9	200.0	122.2	206.1	106.5
POW	POW	All	2015	1/1/2015	12/31/2015	200.3	202.7	198.4	200.3	123.2	206.4	111.9
POW	POW	All	2016	1/1/2016	12/31/2016	199.3	205.7	196.6	200.1	123.9	204.6	111.9
POW	POW	All	2017	1/1/2017	12/31/2017	199.6	206.9	203.9	203.5	124.6	206.5	111.9
POW	POW	All	2018	1/1/2018	12/31/2018	200.4	209.8	215.5	209.3	123.9	211.9	119.7
POW	POW	All	2019	1/1/2019	12/31/2019	204.7	211.8	218.3	212.3	124.3	215.6	119.7
POW	POW	All	2020	1/1/2019	12/31/2019	211.5	215.1	220.3	216.1	125.0	217.6	119.7

Power Index Summary

DEPRECIATION AND FUNCTIONAL OBSOLESCENCE

An important step in the appraisal of property using the cost approach is the determination of the depreciation or condition of the property. Depreciation in this appraisal was segregated into normal (mostly physical) depreciation and functional obsolescence. The normal depreciation was determined based on the age of the property and its normal service life; while, functional obsolescence was based on the impact on the property's remaining life caused by factors such as changing technology, service requirements, and competition.

Depreciation - The depreciation was determined based on the property's age and it normal service life using the following formula:

$$\text{Condition} = \frac{\text{Remaining Life}}{\text{Age + Remaining Life}}$$

or

$$\text{Depreciation} = \frac{\text{Age}}{\text{Age + Remaining Life}}$$

Where: Remaining Life = f(Age, Survival Characteristic, Normal Service life)

Functional Obsolescence - The obsolescence inherent in the property was determined using the above described normal service life in comparison to the property's service life is adjusted for functional factors. The obsolescence was quantified base on the difference between the property's normal service life and its functional service life. The following formula was used to calculate the obsolescence:

$$\text{Obsolescence} = \frac{\text{Normal Service Life - Functional Service Life}}{\text{Normal Service Life}}$$

Service Lives - (normal versus functional) - The service life of property is that period of time in which it provides the service to which it was designed and placed into service. In most industrial properties there is a difference between a property's normal or physical life and its functional life. A piece of equipment may physically last for an extended

period; however, as that property ages changing technology, improvements or enhancement in similar equipment, functional and or service requirements change resulting in decreased utility of the existing equipment, and therefore decrease in value to it owner, this additional deterioration over that defined by the equipment's normal life is functional obsolescence.

Wastewater Depreciation Service Life Experience in Pennsylvania

The service lives used in the depreciation and functional obsolescence calculations were developed based on the property and its use, AUS Consultants' experience in developing depreciation studies for the water and wastewater industries and depreciation studies filed with recent PAWC and Aqua America rate cases. With each of their rate case filings PAWC and Aqua America have filed depreciation studies in support of their depreciation service lives and associated depreciation expenses contained within their revenue requirements. The depreciation studies were prepared by Gannett Fleming Rate Consultants a recognized firm in the depreciation consulting area. AUS Consultants has reviewed the PAWC studies which are summarized in the following table:

Summary of PAWC Depreciation Studies Prepared for Rate Case

Account	Account Description	Iowa Curves		Service Life		Remaining Life	
		12/31/2016	12/31/2019	12/31/2016	12/31/2019	12/31/2016	12/31/2019
				years	years	years	years
354.20	STRUCTURES AND IMPROVEMENTS - COLLECTION	R3	R3	45	45	39.1	33.3
354.30	STRUCTURES AND IMPROVEMENTS - SPP	R2.5	S0	50	55	45.2	32.6
354.40	STRUCTURES AND IMPROVEMENTS - TDP	R2	S0	65	55	56.6	31.7
354.70	STRUCTURES AND IMPROVEMENTS - GENERAL	S1	S1	35	35	33.3	23.2
355.00	POWER GENERATION EQUIPMENT	R2.5	S0.5	35	35	29.7	19.3
360.10	COLLECTION SEWERS - FORCE MAINS	S2	R3	70	75	53.1	52.5
361.10	COLLECTION SEWERS - GRAVITY MAINS	R2.5	R2.5	70	80	56.9	54.8
361.20	MANHOLES	S1.5	S2.5	50	50	41.3	32.2
363.00	SERVICES	R3	R3	38	47	22.9	30.2
364.00	FLOW MEASURING DEVICES	L3	L2.5	20	15	13.3	5.1
365.00	FLOW MEASURING INSTALLATIONS	S1.5	S2	30	25	23.1	10.8
370.00	RECEIVING WELLS	R3	R3	50	50	42.7	33.7
371.00	PUMPING EQUIPMENT	SO	S0.5	40	30	35.5	18.2
380.00	TREATMENT EQUIPMENT	5-R2	S1.5	45	35	37.1	20.1
381.00	PLANT SEWERS	R3	R3	50	50	43.1	32.7
382.00	OUTFALL SEWER LINES	R3	R3	50	50	37.8	28.3
389.10	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - INTANGIBLES	S2.5	S2.5	20	20	13.6	11.3
389.60	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - CPS	SQ	SQ	20	5	12.3	3.5
390.00	OFFICE FURNITURE AND EQUIPMENT	L4	SQ	15	20	9.5	10.1
391.00	TRANSPORTATION EQUIPMENT	SQ	L4	25	14	19,9	9.8
392.00	STORES EQUIPMENT	SQ	SQ	20	25	16.4	17.2
393.00	TOOLS, SHOP AND GARAGE EQUIPMENT	SQ	SQ	15	20	11,3	15.4
394.00	LABORATORY EQUIPMENT	L2.5	SQ	16	15	8.7	10.4
395.00	POWER OPERATED EQUIPMENT	SQ	R2	15	22	10.3	13.2
396.00	COMMUNICATION EQUIPMENT	SQ	SQ	15	15	9.6	6.9
397.00	MISCELLANEOUS EQUIPMENT		SQ		15		12.8
398.00	OTHER TANGIBLE PLANT		SQ		25		21.5
	TOTAL DEPRECIABLE PLANT						
	NONDEPRECIABLE PLANT						
352.10	FRANCHISES						
353.20	LAND AND LAND RIGHTS - COLLECTION						

Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)		(5)	(6)	
		(4a)	(4b)		(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve	Normal Service Life	Economic Obsolescence	Tax Depreciation	
			years	% of CORLD	Table	Life
354.00	Stuctures & Improvements	R4.0	55.00	0.00%	MACRS	25.00
355.00	Power Generation Equipment					
360.00	Collection Mains - Force	R2.0	75.00	0.00%	MACRS	25.00
361.00	Collection Mains - Gravity	R2.5	80.00	0.00%	MACRS	25.00
	Collection Mains - Gravity - Relining	R2.5	60.00	0.00%	MACRS	25.00
361.10	Manholes	S2.0	75.00	0.00%	MACRS	25.00
363.00	Service Laterals	R3.0	45.00	0.00%	MACRS	25.00
364.00	Flow Measuring Devices	L2.5	25.00	0.00%	MACRS	25.00
365.00	Flow Measuring Installations	S2.0	30.00	0.00%	MACRS	25.00
371.00	Pumping Equipment	R3.0	35.00	0.00%	MACRS	25.00
380.00	Treatment and Disposal Equipment	R2.0	45.00	0.00%	MACRS	25.00
381.00	Plant Sewers	R3.0	45.00	0.00%	MACRS	25.00
389.00	Other Plant & Misc Equip	R3.0	45.00	0.00%	MACRS	25.00
391.00	Office Furniture and Equipment	R3.0	20.00			
391.00	Transportation Equipment	R3.0	15.00	0.00%	MACRS	10.00
392.00	Stores Equipment	R3.0	35.00	0.00%	MACRS	25.00
393.00	Tools, Shop, & Garage Equipment	R3.0	25.00	0.00%	MACRS	25.00
394.00	Laboratory Equipment	R3.0	20.00	0.00%	MACRS	20.00
395.00	Power Operated Equipment	R3.0	15.00	0.00%	MACRS	15.00
396.00	Communications Equipment	R3.0	15.00	0.00%	MACRS	12.00
397.00	Miscellaneous Equipment	R3.0	20.00	0.00%	MACRS	20.00
352.00	Franchises	Non-Depr	0.00	0.00%	Non-Depr	0.00
353.00	Land & Land Rights	Non-Depr	0.00	0.00%	Non-Depr	0.00

It is of particular importance in the above table the service life extension of the mains plant categories between the 2016 and the 2020 studies the mains service life increased as follows:

Account	Description	Service Life	
		2016	2020
360.10	COLLECTION SEWERS - FORCE MAINS	70	75
361.10	COLLECTION SEWERS - GRAVITY MAINS	70	80

AUS Consultants believe this increase in service lives is attributable to the widespread use of relining older mains instead of replacing mains which are in need of repair. The practice of relining mains with a cured in place plastic liner not only repairs specific main but has the affect of extending the life of the original main by the length of time which the relining can be expected to last. Most relining vendors warranty their product and procedure for 50 years. Thus, in essence the original mains' service life will be extended by 50 plus years at the date the relining occurred. For those mains associated with relining their installation date was established at the date of their relining and their depreciation parameters were established the same as the depreciation parameters of the relining, i.e., R2.5 – 60 years.

The following table presents the depreciation parameters (Iowa-type survivor curve and service life) used in the cost approach in calculating the deprecation of the property:

Pennsylvania American Water Company
Upper Pottsgrove Township
Wastewater Collection System
Investor-Owned Utility
April 28, 2020

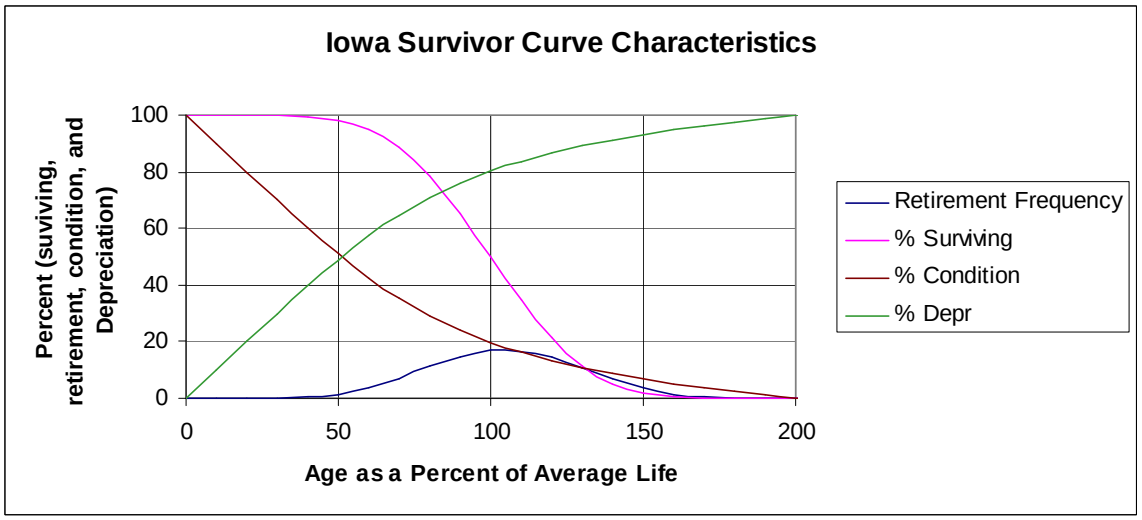
Summary of Account Costing and Depreciation Parameters Used in the Depreciation Original Cost and the Depreciated Replacement Cost New Studies

(1)	(2)	(4)	(4a)	(4b)	(5)	(6)	(6a)	(6b)
Account Number	Description	Iowa Survivor / Retirement Curve		Normal Service Life	Economic Obsolescence	Tax Depreciation		
				years	% of CORLD	Table		Life
353.00	Land & Land Rights	ZNonDep		0.00	0.00%	Non-Depr		0.00
354.00	Stuctures & Improvements - Pumping	R4.0		55.00	0.00%	MACRS		25.00
355.00	Generating Equipment	R3.0		35.00	0.00%	MACRS		25.00
360.10	Collection Sewers - Force - Mains - 4" & Under	R3.0		75.00	0.00%	MACRS		25.00
360.20	Collection Sewers - Force - Mains - 6"-8"	R3.0		75.00	0.00%	MACRS		25.00
360.90	Collection Sewers - Force - Air Release Valve	R3.0		45.00	0.00%	MACRS		25.00
361.11	Collection Sewers - Gravity - Mains - 6" - 8"	R2.5		80.00	0.00%	MACRS		25.00
361.12	Collection Sewers - Gravity - Mains - 10" - 12"	R2.5		80.00	0.00%	MACRS		25.00
361.13	Collection Sewers - Gravity - Mains - 18" & over	R2.5		80.00	0.00%	MACRS		25.00
361.98	Collection Sewers - Gravity - Manholes	S2.0		80.00	0.00%	MACRS		25.00
361.99	Collection Sewers - Gravity - Miscellaneous	R2.5		80.00	0.00%	MACRS		25.00
363.00	Service Laterals	R3.0		70.00	0.00%	MACRS		25.00
380.00	Treatment and Disposal Equipment Purchased Capacity	R2.0		45.00	0.00%	MACRS		25.00

As the above table demonstrates the depreciation lives selected for the AUS Consultants appraisal are consistent with the industry depreciation studies' finding for wastewater plant. However due to the age of some of the property the extend of the depreciation was limited to 85% of the assets original cost and its replacement cost new.

Iowa Survivor Curves

The Iowa Survivor Curves recommended in the McKeesport appraisal are used to determine the remaining life of the property, and therefore its condition, recognizing the properties' service life and age. The Iowa Survivor Curves allows the appraiser to recognize the property being studied (mains, treatment and pumping plant equipment etc placed in a particular year, say1985) is part of a larger group of property, i.e., all the property i.e., mains, treatment and pumping plant equipment, etc. As such, the service lives which we refer to in our appraisal are an average service lives for the group, i.e., the average life of all mains, treatment and pumping plant equipment, etc. The Iowa Survivor curve allows the appraiser to calculate the remaining life, and therefore condition, of a subset of the group (the mains placed in 1985) based on the groups': (1) Iowa Survivor Curve, (2) Service Life and the (3) age of property at the appraisal date. An Iowa Survivor Curves depicts how property from a group survives and retires about that groups' average life.

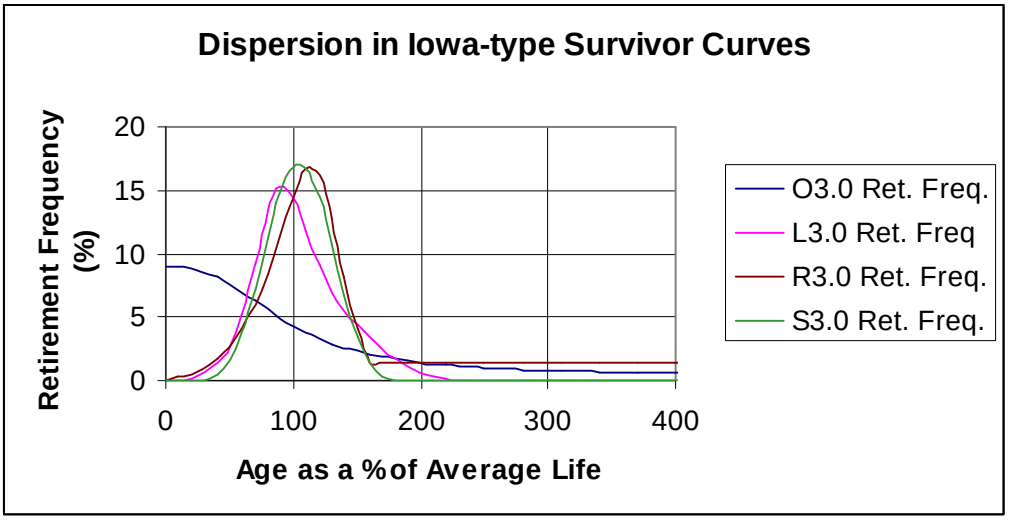


The above figure depicts a typical Iowa-type survivor curve, an S3.0 Iowa-type survivor curve. In this case the survivor curve has been generalized to a service life of 100% of the property's average life, in this generalized form the survivor curve statistics can be utilized with any individual service life in the age-life service life and depreciation calculations. There are four characteristics displayed in the above chart depicting the manner in which property survives and retires about the group's average life, those characteristics are: the retirement frequency (blue), the percent surviving (red), the percent condition (brown) and the percent depreciated (green). The retirement frequency represents the retirement of individual property items about the group's average service life. As can be seen the retirements are distributes about the group's average life with some items retiring before the average life and some items retiring at or after the group's service life. The group's survivor curve is developed from subtracting the retirements as they occur as the property ages. The depreciation curve depicts how much of the property group's life has been consumed; while, the condition curve depict

how much of the property group's life remains. The condition and depreciation curves are complementary in that condition equals 100% minus depreciation and vice versa.

The theory of Iowa Survivor Curves was presented in the 1920s and 30s by Robley Winfrey based on research at Iowa State University (then the Iowa Engineering Experiment Station). Winfrey's research was first published in Bulletin 103 - Life Characteristics of Physical Property and Bulletin 125 - Statistical Analysis of Industrial Property Retirements. (Incidentally, both publications are out of print, I have a copy of Bulletin 125 but not Bulletin 103, I'm still trying to get a copy of that piece of depreciation literature.). Bulletin 125 was updated in 1967 by Professor Harold Cowles of Iowa State University's Department of Industrial Engineering. In conducting his research, Winfrey collected data on industrial property survival and retirement from various sources and analyzed that data as a function of property's age at retirement and ultimately the property groups' service life when all the property in the group was fully retired.

Winfrey discovered the industrial property's survival and retirement fits three basic patterns with relationship to the property's average life:



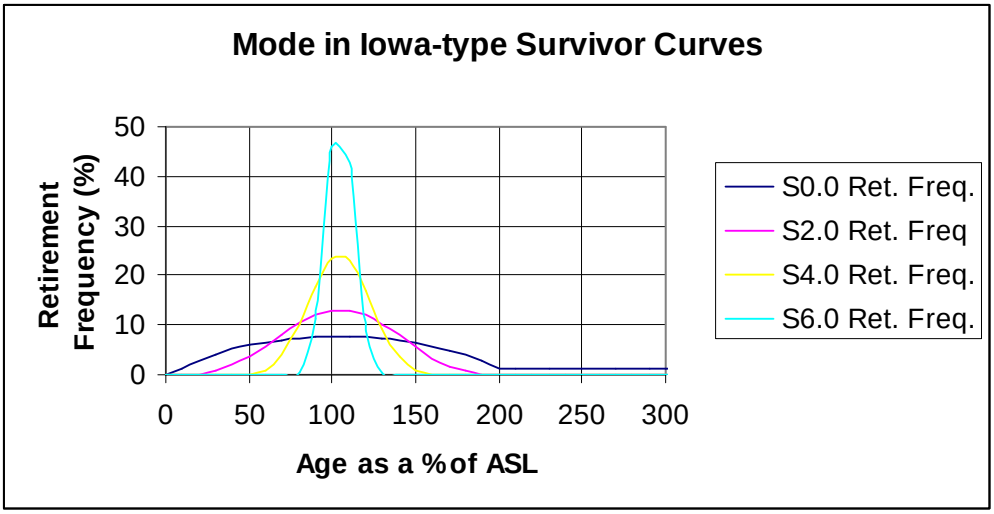
Symmetrically moded (S-type Iowa Survivor Curves) (green) – The S-type Iowa Survivor Curve is one wherein the property's retirements are symmetrically distributed about the mode. Mode in statistics is defined as the highest frequency, in this case retirement frequency. Thus an S-type Iowa curve is like a normal curve; however, its shape is not identical to a normal distribution function.

Right moded (R-type Iowa Curves) (brown) – the R-type Iowa curve has its mode skewed to the right of the property's average life; therefore the retirements tend to be distributed later in the property's life and there are less retirements earlier in the property's life.

Left moded (L-type Iowa Curve) (red) – The L-type Iowa curve has its mode skewed to the left of the property's average life; therefore the retirements tend to be distributed earlier in the property's life and there are less retirements later in the property's life.

In the utility industry, the plant, i.e., mains, treatment and pumping plant equipment tends to have a R-type survival/retirement dispersion as it is designed to provide service over extended periods, requiring little maintenance, and it designers have significant experience in designing and placing such property.

In conjunction with the above described R-, S-, and L-type survival/retirement patterns, Winfrey determine that there were several patterns of the manner in which the retirements' peakedness occur around the average life. In this case, Winfrey described the peakedness of the property retirements with peakedness enumerations of 0, 1, 2, 3, 4, 5, and 6. The low peakedness numbers 0 and 1 represent low levels of retirements being distributed over the property entire life, while high peakedness numbers, 5 and 6 represent retirement patterns where the majority or all the retirement occur tightly grouped around the property's average life. Peakedness numbers 2, 3, and 4 are middle of the road, so to speak, in terms of peakedness.



Origin moded (O-type) survivor curve (blue) – Harold Cowles in his 1967 update of Bulletin 125 introduced the O-type survivor curve with the mode of the curve at the origin or at age equal to zero (0) years. This class of Iowa curves was over looked by Winfrey possibly because it made little intuitive sense that industrial retirement of property would have their maximum retirement frequency at age equal to zero. However, Cowles felt for completeness they should be included. O-type survivor curves do reflect the survival pattern of intangible assets.

Iowa-type survivor curves are parametric, as opposed to formalistic, in that they were derived from empirical survival/retirement data which Winfrey collected. There are Iowa curve equations are presented in Bulletin 125; however in most cases users reference standardized Iowa Survivor Curve tables. The Iowa-type survivor curves used in this appraisal have been generalized to a service life of 100% of the property's average life. By generalizing the service life to 100% of average life these tables can be used to generate survival and retirement statistics for property of any service life.

It should be apparent that Iowa-types survivor curves are valid for any type property as the curves only depict how that property survives and retires about the average life of a group of similar property.

Generalized Iowa-type Survivor Curves

As was discussed earlier, most users of the Iowa-type survivor curves use standardized tables of Iowa curves. The most usable form of these standardized tables are tables which have been generalized to a standard life of 100% of the property's average life. Based on these generalized tables the user can determine the property's remaining life by knowing the Iowa-type survivor curve (mode and peakedness characteristics), the property's (group's) service life, and the specific property's (for which the remaining life is desired) age. The following table reflects how the remaining life, as well as its condition, is determined:

Year	Study Date	Age	Iowa Curve	Service Life	Age % of ASL	Iowa Lookup	Iowa Condition	Remaining Life	Total Life	Condition
				ASL						
		years		years	%			years	years	%
Input		Calc	Input	Input	Calc	Calc	lookup	Calc	Calc	Calc
1970	2006	35.5	R3.0	25	142	R3.0142	0.066388	1.7	37.2	4.47%
1980	2006	25.5	R3.0	25	102	R3.0102	0.192543	4.8	30.3	15.88%
1990	2006	15.5	R3.0	25	62	R3.0062	0.442050	11.1	26.6	41.62%
2000	2006	5.5	R3.0	25	22	R3.0022	0.787294	19.7	25.2	78.16%
2004	2006	1.5	R3.0	25	6	R3.0006	0.941117	23.5	25.0	94.01%
2005	2006	0.5	R3.0	25	2	R3.0002	0.980320	24.5	25.0	98.00%

The above table was develop with reference to the standardized Iowa Survivor curves contained and represent a R3.0 25 year Iowa curve and life table. The standardized Iowa Curves are located in tab database. In order to reference the proper line of the Iowa Curve data the user looks up that data by reference to the property's age as percent of the service life (age % of ASL column) and the Iowa Survivor curve (Iowa Curve column), combining these two criteria the Iowa Lookup column will get the user to the proper Iowa Curve data.

In the above calculation the Iowa-type survivor curve is R3, the service life of the group is 25 years, and its age is defined by property's accounting records which specifies the investment in property by account (A group in service life terms) and by the year of installation of that property. The age is dependent upon the appraisal year (study date) and the year of placement. It is customary to assume that the property placed in any particular placement year was placed continuously during that year and therefore its age is best represented as if that investment was placed in the middle of the year, i.e., July 1; hence, the adoption of the "mid-year" convention where all property is treated as if placed the mid-year.

Service Life and Survival/retirement pattern

The service life and survival/retirement pattern are determined by an analysis of historical survival and retirement experience of the company's property. This historical experience must be adjusted for factor which are known to be impacting the property's

service life but may not exhibited their effect on the property's retirement. Here it is important that a distinction is made between industrial property's physical service life and its functional service life. While physically a type of property may be deployed and remain in use for many years, over those years factors of changing technology, consumers demand and patterns, and even regulation, lessen the property functional life when compared to its physical life. In an industry such as the communications industry, function obsolescence is the primary driver of depreciation.

The following table details the impact of the above described lives on the condition calculations:

Year	Study Date	Age	Iowa Curve	Service Life	Age % of ASL	Iowa Lookup	Iowa Condition	Remaining Life	Total Life	Condition
				ASL						
		years		years	%			years	years	%
Input		Calc	Input	Input	Calc	Calc	lookup	Calc	Calc	Calc
1970	2006	35.5	R3.0	30	118	R3.0118	0.131771	4.0	39.5	10.02%
1979	2006	26.5	R3.0	30	88	R3.0088	0.264919	7.9	34.4	23.07%
1981	2006	24.5	R3.0	25	98	R3.0098	0.211333	5.3	29.8	17.74%
1989	2006	16.5	R3.0	25	66	R3.0066	0.411848	10.3	26.8	38.42%
1990	2006	15.5	R3.0	20	78	R3.0078	0.327281	6.5	22.0	29.69%
2000	2006	5.5	R3.0	20	28	R3.0028	0.731331	14.6	20.1	72.67%
2004	2006	1.5	R3.0	20	8	R3.0008	0.921605	18.4	19.9	92.47%
2005	2006	0.5	R3.0	20	3	R3.0003	0.970499	19.4	19.9	97.49%

Statistical Analyses of Industrial Property Retirements

by

Robley Winfrey

BULLETIN 125
REVISED

ENGINEERING RESEARCH INSTITUTE
IOWA STATE UNIVERSITY • AMES, IOWA

IOWA CURVES

Iowa-type survivor curves are based on a set of empirical data collected (mainly in the 1930s) for the purpose of statistically predicting future service expectancy (remaining service) for physical properties.

The techniques used and methods applied are exactly analogous to those used by the insurance industry for the purpose of predicting human mortality (life expectancy) when determining appropriate insurance premium rates. The only distinction to be made is that the life insurance companies are investigating the life or longevity characteristics of human beings and the studies which developed the Iowa-type survivor curves were developed to predict the longevity or service life experience for physical, inanimate objects. The seminal statistical analyses for industrial property were conducted under the auspices of the Iowa Research Station now known as Iowa State University and were published in Statistical Analyses of Industrial Property Retirements, Bulletin 125, Engineering Research Institute, Iowa State University.

From the preface to the revised 1967 edition of Bulletin 125:

> "With the original publication of Bulletin 125 by the Iowa Engineering Experiment Station in 1935 (now known as the Engineering Research Institute), a significant contribution was made to the practice of industrial property life estimation. This was in the form, first, of a single volume, readily available, which presented in considerable detail the procedures for statistically analyzing historical property retirement data. Secondly, but no less significant, was the presentation of a set of 18 generalized density functions descriptive of industrial property retirement dispersion, mathematically described in terms of the Pearson frequency curve family, but with parameters established empirically from the analysis of a wide range of actual retirement experience.
>
> These curves, the cumulative form of which are commonly referred to as the Iowa-type Survivor Curves, have been used extensively since their introduction and, at the present time, the set is accepted as the standard of industrial property retirement dispersion. Because of the very simple mnemonic coding system which suggests the varying statistical characteristics involved, the Iowa Curves have also become widely used and recognized in the identification or classification of retirement dispersions, even for patterns derived in terms of analytical techniques not using the Curves."

The tables which follow this discussion are the ones used to estimate the remaining life of investment at particular age for an account with a particular service life.

Statistical Analyses of Industrial Property Retirements

by Robley Winfrey

(Revised April, 1967 by Harold A. Cowles, Professor, Department of Industrial Engineering)

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Iowa State University, Ames, Iowa

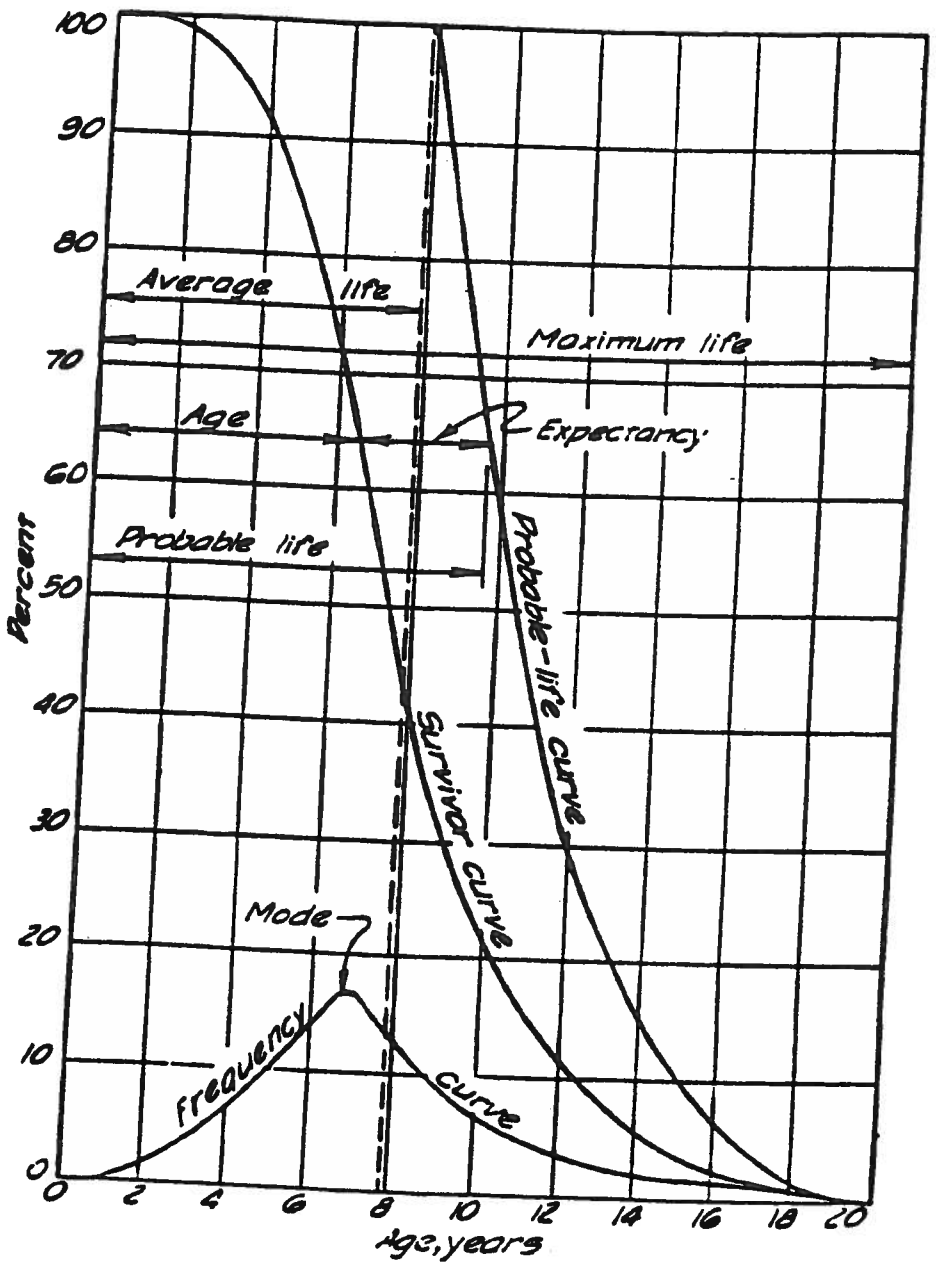


FIG. 1.—A typical survivor curve and its derived curves.

8. The *service life* of a unit is that period of time (or service) extending from the date of its installation to the date of its retirement from service. While the service life of physical property is usually expressed in years it may also be expressed in terms of units of production (screws, wheels, cars, pounds, miles, car-miles), time units of less than a year (months, hours, minutes), or combinations of physical units or services and time (lamp-hours, ton-years).

9. The *probable service life* of an individual unit is that period of time extending from its date of installation to the forecasted date when it probably will be retired from service.

10. The *expectancy* of life of an individual unit is that period of time extending from the observation age (usually the present) to the forecasted date when the unit probably will be retired from service. Age plus expectancy always equals probable life.

11. The *average service life of* a group of individual units is the quotient obtained by dividing the sum of the service lives of all the units by the number of units. The average service life (in years) is equal to the area under the survivor curve in percent-years (or unit-years) divided by 100 percent (or the total number of units).

12. The *probable average service life of* a group of individual units is the average of the probable service lives of the units of the group.

13. The *expectancy* of life of a group of individual units is that period of time extending from the observation age (usually the present) to the average of the forecasted dates when the units probably will be retired. The observation age plus the expectancy always equals the probable average service life.

Note: Service life and average service life are always known quantities since they represent completed service life; probable service life and probable average service life always must be estimated since they are forecasts of uncompleted service.

14. *Maximum life* or *maximum age* is the age of the last unit of a given group to be retired from service; it is also the age at which the survivor curve has a zero ordinate, or zero percent surviving.

15. Property units which are taken out of service for any reason whatsoever are called *retirements*. Retirements may include original units (units of the initial installation) as well as "second-generation" units, that is, replacements (or renewals) which were installed to take the place of the original units as they were removed.

16. *Replacements* are the units put in service to replace retirements.

17. *Renewals* are replacements "in kind" which have exactly the same life characteristics as the retirements.

18. *Installations* are new units placed in service, not as replacement units, but as additions to the property.

19. All renewals, replacements, and installations are *placements*.

20. *Survivor curves* show the number of units of a given group

which are surviving in service at given ages. The ordinates to the curve give at any particular age the percentage (or the actual number) of the original number which are yet surviving in service. The abscissa is measured in years or other suitable service unit. The *original survivor curve* is the curve drawn through the points calculated from the original data without adjustment. Since this original survivor curve is generally irregular it is smoothed to produce a *smoothed survivor curve*, sometimes referred to as an *adjusted curve*.

Survivor curves have in some publications been referred to as *mortality curves*. However, the term *survivor curve* is used in this report because the curves referred to show the *percent surviving*, not the *percent retired*, and because the term *mortality* suggests human beings and not inanimate objects.

21. A *stub survivor curve* is an incomplete survivor curve; that is, one which does not extend to zero percent surviving because of a lack of retirement data on the longer-lived units.

22. A *probable-life curve* shows the probable average life of the survivors at any age from zero to maximum life.

23. If the percent surviving is read at the beginning of each successive age-interval and the differences in these successive readings plotted at ages corresponding to the midpoints of the intervals, the resulting points form a *frequency curve*, or *distribution curve*. Since the ordinates indicate the percentage of the units retired during each interval, the curve shows in what manner the retirements are distributed over the period from zero age to maximum life.

24. The point on the frequency curve having the highest ordinate is called the *mode*. The year in which the mode occurs is called the *modal year*.

25. A *maximum-life cycle* is a period of time corresponding in length to the maximum life of the units. An industrial property may continue to be operated through several maximum-life cycles of some of the units of which it is composed.

26. An *average-life cycle* is a period of time corresponding in length to the *average* life.

27. If a property is continued in service for a long time and maintained with a constant number of like units of substantially the same potential average life, it will reach a *normal condition* or *stabilized condition*, after which the average age of the units in service and the annual renewals will be constant year after year.

28. *Normal renewals* are the annual renewals after the property group has reached a stabilized condition. Normal renewals, in percent of the original number of units, are equal to 100 percent divided by the average life.

29. *Generalized curves* are those whose ordinates are expressed in percent of the total number of units and whose abscissas (age) are expressed in percent of average life.

30. *Type curves* are those theoretical curves derived by the methods described in this report from a study of actual retirements. They depict typical survivor and frequency curves for industrial property. Actual survivor curves are compared with type survivor curves in the process of determining probable average lives.

MORTALITY TABLES AND CURVES OF HUMAN BEINGS

By a study of population and deaths, life insurance companies have arrived at life tables for human beings of different nationalities. From these life tables the normal death rate and life expectancy for people at different ages can be determined as a basis for life insurance premiums and reserves. Life tables can be prepared from the vital statistics for any desired number of years in combination with census returns. By means of mathematical formulas a life table is adjusted to remove any slight irregularities that may exist in the original data.

Table 1 is the United States life table for white males, based upon deaths for the 10 years from 1901 to 1910. Unlike industrial property units whose average lives are continually being affected by many forces, the human average life and distribution of deaths according to age change very little over several generations. The life curve, however, varies considerably for different races as is illustrated in Fig. 2. The deaths at different ages are shown for the United States by the frequency curves in Fig. 3.

This reference to the United States life tables is made to show the similarity between the life characteristics of human beings and industrial properties. The essential differences are three. First, human beings experience a heavy infant mortality which results in a bi-modal frequency curve, one mode occurring between ages 0 and 1, and the other between ages 75 and 76. Second, the mode at the age-interval 75–76 occurs at a much greater percentage of average life than is usually found with physical property employed in industry. Third, the curves for industrial equipment vary in shape over wide limits while human mortality curves vary relatively little. The Makehamized curve in Fig. 3 is one that has been smoothed. (It does not represent the same group of lives as the lower curves of the figure.)

ANALYZING RETIREMENT DATA

The foregoing section discussed the life tables for humans and the accompanying curves. Similar analyses can be made of the behavior of the physical equipment employed in industry when sufficient information is available. The processes employed for analyzing the retirements of industrial property are not so easily handled as are those employed for mortality data of human beings, nor are the results usually as uniform because of the small number of units observed and the more numerous, less uniform causes of retirement of industrial

CHART NO. 9

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE RIGHT-MODAL IOWA TYPE CURVES

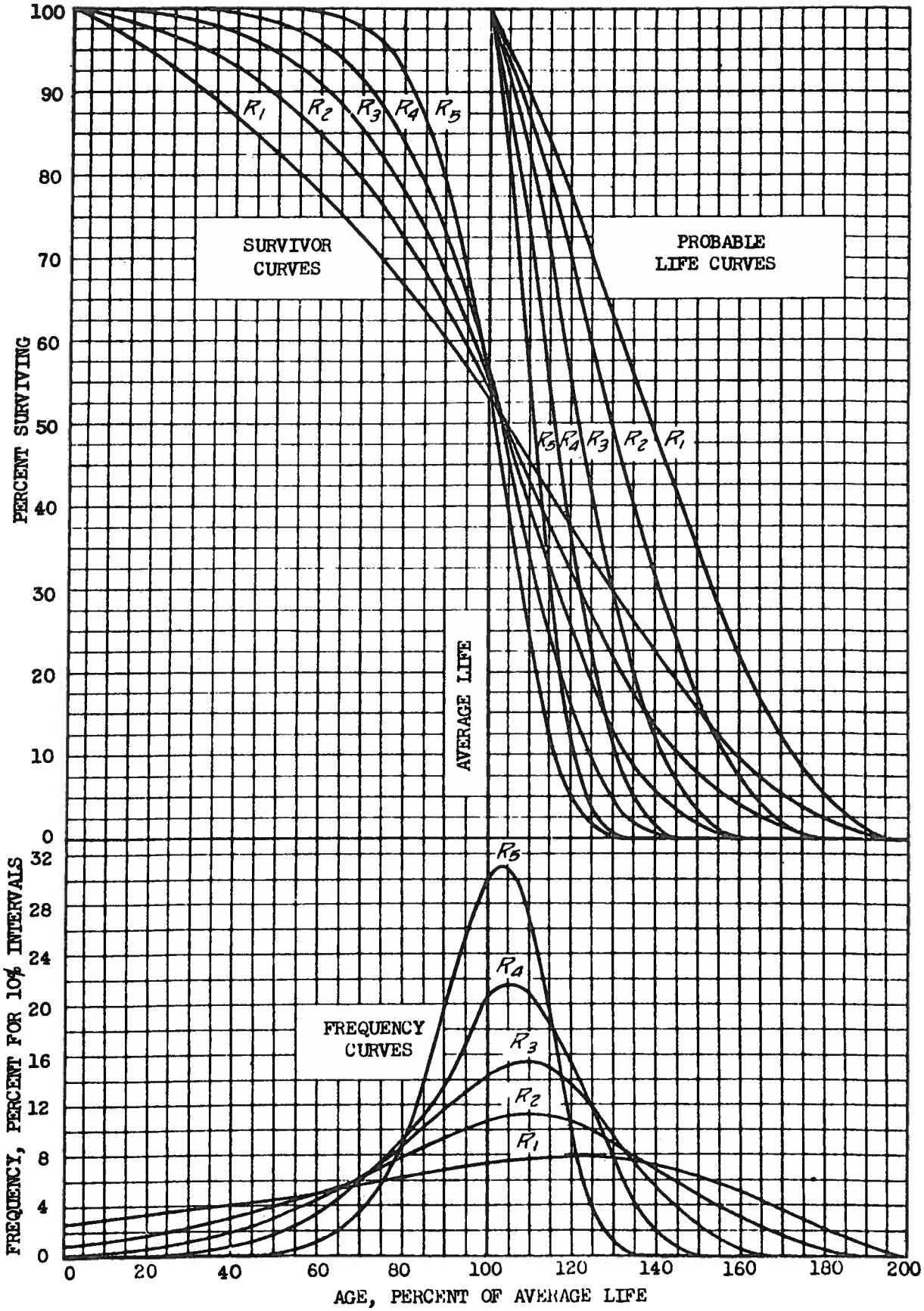
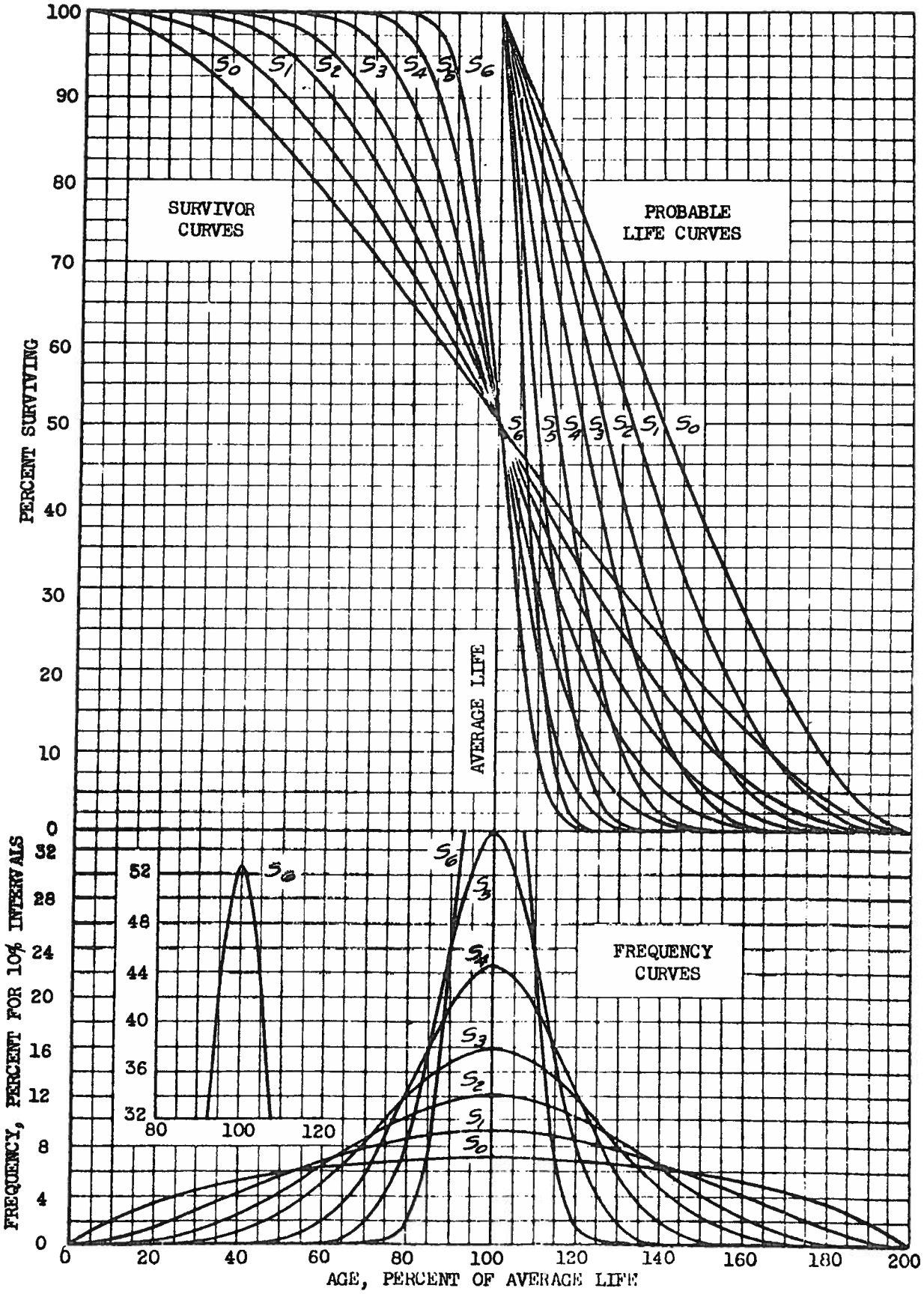


CHART NO. 8

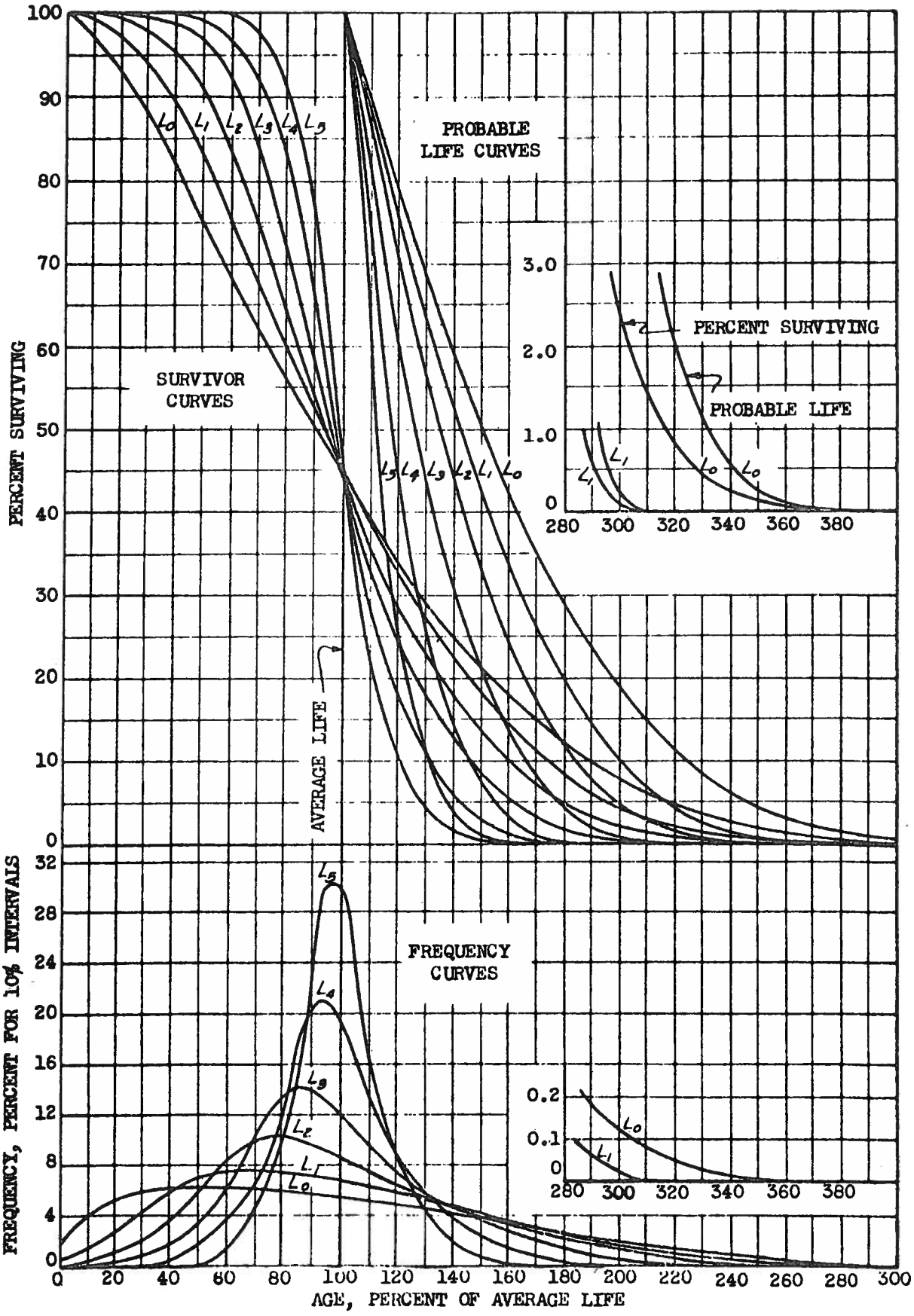
SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE SYMMETRICAL IOWA TYPE CURVES



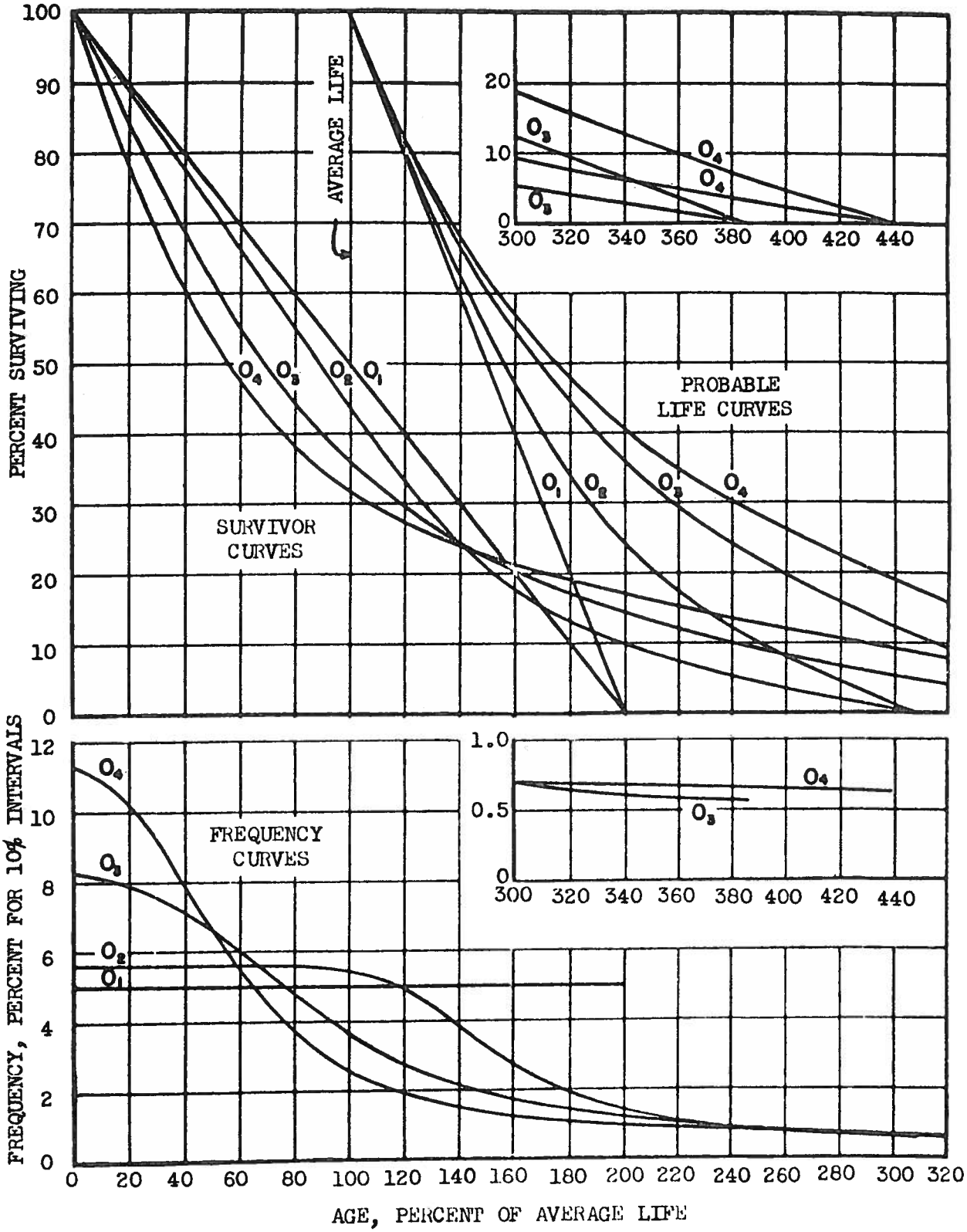
Appendix A-5.1 (AUS)

CHART NO. 7

SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE LEFT-MODAL IOWA TYPE CURVES



SURVIVOR, PROBABLE LIFE AND FREQUENCY CURVES
FOR THE ORIGIN-MODAL TYPE CURVES



Iowacurves.xls

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0000	R2.0	0	0.0948315	100.0000000	100.0000000	0.0000000
R2.0001	R2.0	1	0.0981016	99.9051685	99.0944462	0.9055538
R2.0002	R2.0	2	0.1014623	99.8070669	98.1913567	1.8086433
R2.0003	R2.0	3	0.1049099	99.7056046	97.2907686	2.7092314
R2.0004	R2.0	4	0.1084509	99.6006947	96.3927202	3.6072798
R2.0005	R2.0	5	0.1120825	99.4922438	95.4972458	4.5027542
R2.0006	R2.0	6	0.1158104	99.3801613	94.6043863	5.3956137
R2.0007	R2.0	7	0.1196318	99.2643509	93.7141762	6.2858238
R2.0008	R2.0	8	0.1235532	99.1447191	92.8266525	7.1733475
R2.0009	R2.0	9	0.1275731	99.0211659	91.9418526	8.0581474
R2.0010	R2.0	10	0.1316938	98.8935928	91.0598126	8.9401874
R2.0011	R2.0	11	0.1359167	98.7618990	90.1805687	9.8194313
R2.0012	R2.0	12	0.1402454	98.6259823	89.3041592	10.6958408
R2.0013	R2.0	13	0.1446791	98.4857369	88.4306173	11.5693827
R2.0014	R2.0	14	0.1492214	98.3410578	87.5599813	12.4400187
R2.0015	R2.0	15	0.1538735	98.1918364	86.6922846	13.3077154
R2.0016	R2.0	16	0.1586370	98.0379629	85.8275662	14.1724338
R2.0017	R2.0	17	0.1635142	97.8793259	84.9658604	15.0341396
R2.0018	R2.0	18	0.1685056	97.7158117	84.1072016	15.8927984
R2.0019	R2.0	19	0.1736164	97.5473061	83.2516279	16.7483721
R2.0020	R2.0	20	0.1788426	97.3736897	82.3991718	17.6008282
R2.0021	R2.0	21	0.1841926	97.1948471	81.5498714	18.4501286
R2.0022	R2.0	22	0.1896649	97.0106545	80.7037592	19.2962408
R2.0023	R2.0	23	0.1952619	96.8209896	79.8608723	20.1391277
R2.0024	R2.0	24	0.2009860	96.6257277	79.0212450	20.9787550
R2.0025	R2.0	25	0.2068376	96.4247417	78.1849127	21.8150873
R2.0026	R2.0	26	0.2128210	96.2179041	77.3519096	22.6480904
R2.0027	R2.0	27	0.2189369	96.0050831	76.5222740	23.4777260
R2.0028	R2.0	28	0.2251892	95.7861462	75.6960373	24.3039627
R2.0029	R2.0	29	0.2315760	95.5609570	74.8732357	25.1267643
R2.0030	R2.0	30	0.2381039	95.3293810	74.0539045	25.9460955
R2.0031	R2.0	31	0.2447710	95.0912771	73.2380800	26.7619200
R2.0032	R2.0	32	0.2515831	94.8465061	72.4257956	27.5742044
R2.0033	R2.0	33	0.2585392	94.5949230	71.6170883	28.3829117
R2.0034	R2.0	34	0.2656450	94.3363838	70.8119927	29.1880073
R2.0035	R2.0	35	0.2728977	94.0707388	70.0105457	29.9894543
R2.0036	R2.0	36	0.2803049	93.7978411	69.2127819	30.7872181
R2.0037	R2.0	37	0.2878657	93.5175362	68.4187384	31.5812616
R2.0038	R2.0	38	0.2955808	93.2296705	67.6284504	32.3715496
R2.0039	R2.0	39	0.3034544	92.9340897	66.8419552	33.1580448
R2.0040	R2.0	40	0.3114920	92.6306353	66.0592899	33.9407101
R2.0041	R2.0	41	0.3196878	92.3191433	65.2808571	34.7191429
R2.0042	R2.0	42	0.3280507	91.9994555	64.5055971	35.4944029
R2.0043	R2.0	43	0.3365783	91.6714048	63.7346439	36.2653561
R2.0044	R2.0	44	0.3452769	91.3348265	62.9676700	37.0323300

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lowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0045	R2.0	45	0.3541450	90.9895496	62.2047148	37.7952852
R2.0046	R2.0	46	0.3631840	90.6354046	61.4458170	38.5541830
R2.0047	R2.0	47	0.3723984	90.2722206	60.6910148	39.3089852
R2.0048	R2.0	48	0.3817892	89.8998222	59.9403491	40.0596509
R2.0049	R2.0	49	0.3913574	89.5180330	59.1938582	40.8061418
R2.0050	R2.0	50	0.4011030	89.1266756	58.4515839	41.5484161
R2.0051	R2.0	51	0.4110289	88.7255726	57.7135668	42.2864332
R2.0052	R2.0	52	0.4211368	88.3145437	56.9798470	43.0201530
R2.0053	R2.0	53	0.4314261	87.8934069	56.2504678	43.7495322
R2.0054	R2.0	54	0.4419002	87.4619808	55.5254688	44.4745312
R2.0055	R2.0	55	0.4525547	87.0200806	54.8048959	45.1951041
R2.0056	R2.0	56	0.4633961	86.5675259	54.0887899	45.9112101
R2.0057	R2.0	57	0.4744196	86.1041298	53.3771148	46.6228852
R2.0058	R2.0	58	0.4856272	85.6297102	52.6701531	47.3298469
R2.0059	R2.0	59	0.4970178	85.1440830	51.9677110	48.0322890
R2.0060	R2.0	60	0.5085907	84.6470652	51.2699108	48.7300892
R2.0061	R2.0	61	0.5203457	84.1384745	50.5767999	49.4232001
R2.0062	R2.0	62	0.5322781	83.6181288	49.8884211	50.1115789
R2.0063	R2.0	63	0.5443878	83.0858507	49.2042208	50.7957792
R2.0064	R2.0	64	0.5566711	82.5414629	48.5260449	51.4739551
R2.0065	R2.0	65	0.5691252	81.9847918	47.8521390	52.1478610
R2.0066	R2.0	66	0.5817490	81.4156666	47.1831479	52.8168521
R2.0067	R2.0	67	0.5945339	80.8339176	46.5191188	53.4808812
R2.0068	R2.0	68	0.6074762	80.2393837	45.8600979	54.1399021
R2.0069	R2.0	69	0.6205731	79.6319075	45.2061300	54.7938700
R2.0070	R2.0	70	0.6338167	79.0113344	44.5572619	55.4427381
R2.0071	R2.0	71	0.6471968	78.3775177	43.9135399	56.0864601
R2.0072	R2.0	72	0.6607103	77.7303209	43.2750101	56.7249899
R2.0073	R2.0	73	0.6743469	77.0696106	42.6417151	57.3582849
R2.0074	R2.0	74	0.6880913	76.3952637	42.0137038	57.9862962
R2.0075	R2.0	75	0.7019453	75.7071724	41.3910160	58.6089840
R2.0076	R2.0	76	0.7158861	75.0052271	40.7736988	59.2263012
R2.0077	R2.0	77	0.7299071	74.2893410	40.1617951	59.8382049
R2.0078	R2.0	78	0.7439918	73.5594339	39.5553460	60.4446540
R2.0079	R2.0	79	0.7581263	72.8154421	38.9543939	61.0456061
R2.0080	R2.0	80	0.7722978	72.0573158	38.3589792	61.6410208
R2.0081	R2.0	81	0.7864914	71.2850180	37.7691412	62.2308588
R2.0082	R2.0	82	0.8006802	70.4985266	37.1849198	62.8150802
R2.0083	R2.0	83	0.8148537	69.6978464	36.6063528	63.3936472
R2.0084	R2.0	84	0.8289880	68.8829927	36.0334740	63.9665260
R2.0085	R2.0	85	0.8430577	68.0540047	35.4663181	64.5336819
R2.0086	R2.0	86	0.8570489	67.2109470	34.9049168	65.0950832
R2.0087	R2.0	87	0.8709355	66.3538981	34.3493028	65.6506972
R2.0088	R2.0	88	0.8846855	65.4829626	33.7995038	66.2004962
R2.0089	R2.0	89	0.8982801	64.5982771	33.2555461	66.7444539

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0090	R2.0	90	0.9116889	63.6999970	32.7174568	67.2825432
R2.0091	R2.0	91	0.9248881	62.7883081	32.1852560	67.8147440
R2.0092	R2.0	92	0.9378390	61.8634200	31.6589661	68.3410339
R2.0093	R2.0	93	0.9505158	60.9255810	31.1386020	68.8613980
R2.0094	R2.0	94	0.9628930	59.9750652	30.6241779	69.3758221
R2.0095	R2.0	95	0.9749274	59.0121722	30.1157100	69.8842900
R2.0096	R2.0	96	0.9865956	58.0372448	29.6132040	70.3867960
R2.0097	R2.0	97	0.9978571	57.0506492	29.1166680	70.8833320
R2.0098	R2.0	98	1.0086742	56.0527921	28.6261051	71.3738949
R2.0099	R2.0	99	1.0190200	55.0441179	28.1415110	71.8584890
R2.0100	R2.0	100	1.0288558	54.0250979	27.6628840	72.3371160
R2.0101	R2.0	101	1.0381442	52.9962421	27.1902180	72.8097820
R2.0102	R2.0	102	1.0468449	51.9580979	26.7234991	73.2765009
R2.0103	R2.0	103	1.0549312	50.9112530	26.2627111	73.7372889
R2.0104	R2.0	104	1.0623607	49.8563218	25.8078351	74.1921649
R2.0105	R2.0	105	1.0691033	48.7939611	25.3588469	74.6411531
R2.0106	R2.0	106	1.0751200	47.7248578	24.9157200	75.0842800
R2.0107	R2.0	107	1.0803718	46.6497378	24.4784200	75.5215800
R2.0108	R2.0	108	1.0848422	45.5693660	24.0469079	75.9530921
R2.0109	R2.0	109	1.0884819	44.4845238	23.6211450	76.3788550
R2.0110	R2.0	110	1.0912700	43.3960419	23.2010810	76.7989190
R2.0111	R2.0	111	1.0931697	42.3047719	22.7866659	77.2133341
R2.0112	R2.0	112	1.0941701	41.2116022	22.3778369	77.6221631
R2.0113	R2.0	113	1.0942240	40.1174321	21.9745369	78.0254631
R2.0114	R2.0	114	1.0933342	39.0232081	21.5766909	78.4233091
R2.0115	R2.0	115	1.0914621	37.9298739	21.1842289	78.8157711
R2.0116	R2.0	116	1.0885978	36.8384118	20.7970691	79.2029309
R2.0117	R2.0	117	1.0847301	35.7498140	20.4151239	79.5848761
R2.0118	R2.0	118	1.0798369	34.6650839	20.0383019	79.9616981
R2.0119	R2.0	119	1.0739369	33.5852470	19.6665001	80.3334999
R2.0120	R2.0	120	1.0669980	32.5113101	19.2996221	80.7003779
R2.0121	R2.0	121	1.0590372	31.4443121	18.9375479	81.0624521
R2.0122	R2.0	122	1.0501070	30.3852749	18.5801630	81.4198370
R2.0123	R2.0	123	1.0400660	29.3351679	18.2273769	81.7726231
R2.0124	R2.0	124	1.0290709	28.2951019	17.8789959	82.1210041
R2.0125	R2.0	125	1.0170991	27.2660310	17.5349121	82.4650879
R2.0126	R2.0	126	1.0041568	26.2489319	17.1949849	82.8050151
R2.0127	R2.0	127	0.9902881	25.2447751	16.8590529	83.1409471
R2.0128	R2.0	128	0.9755079	24.2544870	16.5269830	83.4730170
R2.0129	R2.0	129	0.9598532	23.2789791	16.1985951	83.8014049
R2.0130	R2.0	130	0.9433670	22.3191259	15.8737270	84.1262730
R2.0131	R2.0	131	0.9260879	21.3757589	15.5522090	84.4477910
R2.0132	R2.0	132	0.9080550	20.4496710	15.2338660	84.7661340
R2.0133	R2.0	133	0.8893190	19.5416160	14.9185150	85.0814850
R2.0134	R2.0	134	0.8699369	18.6522970	14.6059730	85.3940270

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.0135	R2.0	135	0.8499541	17.7823601	14.2960570	85.7039430
R2.0136	R2.0	136	0.8294290	16.9324060	13.9885750	86.0114250
R2.0137	R2.0	137	0.8084200	16.1029770	13.6833420	86.3166580
R2.0138	R2.0	138	0.7869870	15.2945570	13.3801709	86.6198291
R2.0139	R2.0	139	0.7651829	14.5075700	13.0788760	86.9211240
R2.0140	R2.0	140	0.7430681	13.7423871	12.7792740	87.2207260
R2.0141	R2.0	141	0.7207081	12.9993190	12.4811831	87.5188169
R2.0142	R2.0	142	0.6981599	12.2786109	12.1844341	87.8155659
R2.0143	R2.0	143	0.6754730	11.5804510	11.8888620	88.1111380
R2.0144	R2.0	144	0.6527110	10.9049780	11.5943070	88.4056930
R2.0145	R2.0	145	0.6299220	10.2522670	11.3006270	88.6993730
R2.0146	R2.0	146	0.6071579	9.6223450	11.0076849	88.9923151
R2.0147	R2.0	147	0.5844650	9.0151870	10.7153600	89.2846400
R2.0148	R2.0	148	0.5618890	8.4307220	10.4235460	89.5764540
R2.0149	R2.0	149	0.5394630	7.8688330	10.1321560	89.8678440
R2.0150	R2.0	150	0.5172310	7.3293700	9.8411110	90.1588891
R2.0151	R2.0	151	0.4952170	6.8121390	9.5503610	90.4496390
R2.0152	R2.0	152	0.4734520	6.3169220	9.2598670	90.7401331
R2.0153	R2.0	153	0.4519570	5.8434700	8.9696111	91.0303890
R2.0154	R2.0	154	0.4307510	5.3915130	8.6795980	91.3204020
R2.0155	R2.0	155	0.4098480	4.9607620	8.3898460	91.6101540
R2.0156	R2.0	156	0.3892590	4.5509140	8.1003940	91.8996060
R2.0157	R2.0	157	0.3689940	4.1616550	7.8112940	92.1887060
R2.0158	R2.0	158	0.3490550	3.7926610	7.5226200	92.4773800
R2.0159	R2.0	159	0.3294490	3.4436060	7.2344580	92.7655420
R2.0160	R2.0	160	0.3101780	3.1141570	6.9468990	93.0531010
R2.0161	R2.0	161	0.2912410	2.8039790	6.6600590	93.3399410
R2.0162	R2.0	162	0.2726440	2.5127380	6.3740460	93.6259540
R2.0163	R2.0	163	0.2543900	2.2400940	6.0889820	93.9110180
R2.0164	R2.0	164	0.2364840	1.9857040	5.8049920	94.1950080
R2.0165	R2.0	165	0.2189350	1.7492200	5.5221940	94.4778060
R2.0166	R2.0	166	0.2017570	1.5302850	5.2407130	94.7592870
R2.0167	R2.0	167	0.1849660	1.3285280	4.9606590	95.0393410
R2.0168	R2.0	168	0.1685830	1.1435620	4.6821490	95.3178510
R2.0169	R2.0	169	0.1526310	0.9749790	4.4052860	95.5947140
R2.0170	R2.0	170	0.1371620	0.8223480	4.1301220	95.8698780
R2.0171	R2.0	171	0.1221950	0.6851860	3.8568020	96.1431980
R2.0172	R2.0	172	0.1077830	0.5629910	3.5853840	96.4146160
R2.0173	R2.0	173	0.0939780	0.4552080	3.3159460	96.6840540
R2.0174	R2.0	174	0.0808330	0.3612300	3.0485230	96.9514770
R2.0175	R2.0	175	0.0684150	0.2803970	2.7832120	97.2167880
R2.0176	R2.0	176	0.0567860	0.2119820	2.5201260	97.4798740
R2.0177	R2.0	177	0.0460210	0.1551960	2.2592980	97.7407020
R2.0178	R2.0	178	0.0361913	0.1091750	2.0008840	97.9991160
R2.0179	R2.0	179	0.0273739	0.0729837	1.7451020	98.2548980

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5000	R2.5	0	0.0551548	100.0000000	100.0000000	0.0000000
R2.5001	R2.5	1	0.0574713	99.9448452	99.0549097	0.9450903
R2.5002	R2.5	2	0.0598783	99.8873739	98.1116142	1.8883858
R2.5003	R2.5	3	0.0623808	99.8274956	97.1701632	2.8298368
R2.5004	R2.5	4	0.0649805	99.7651148	96.2306089	3.7693911
R2.5005	R2.5	5	0.0676823	99.7001343	95.2930031	4.7069969
R2.5006	R2.5	6	0.0704880	99.6324520	94.3573971	5.6426029
R2.5007	R2.5	7	0.0734014	99.5619640	93.4238472	6.5761528
R2.5008	R2.5	8	0.0764256	99.4885626	92.4924040	7.5075960
R2.5009	R2.5	9	0.0795669	99.4121370	91.5631256	8.4368744
R2.5010	R2.5	10	0.0828257	99.3325701	90.6360693	9.3639307
R2.5011	R2.5	11	0.0862064	99.2497444	89.7112904	10.2887096
R2.5012	R2.5	12	0.0897122	99.1635380	88.7888441	11.2111559
R2.5013	R2.5	13	0.0933485	99.0738258	87.8687897	12.1312103
R2.5014	R2.5	14	0.0971183	98.9804773	86.9511881	13.0488119
R2.5015	R2.5	15	0.1010247	98.8833590	86.0360956	13.9639044
R2.5016	R2.5	16	0.1050710	98.7823343	85.1235743	14.8764257
R2.5017	R2.5	17	0.1092635	98.6772633	84.2136803	15.7863197
R2.5018	R2.5	18	0.1136026	98.5679998	83.3064766	16.6935234
R2.5019	R2.5	19	0.1180954	98.4543972	82.4020252	17.5979748
R2.5020	R2.5	20	0.1227426	98.3363018	81.5003834	18.4996166
R2.5021	R2.5	21	0.1275521	98.2135592	80.6016140	19.3983860
R2.5022	R2.5	22	0.1325226	98.0860071	79.7057791	20.2942209
R2.5023	R2.5	23	0.1376619	97.9534845	78.8129368	21.1870632
R2.5024	R2.5	24	0.1429729	97.8158226	77.9231520	22.0768480
R2.5025	R2.5	25	0.1484576	97.6728497	77.0364828	22.9635172
R2.5026	R2.5	26	0.1541233	97.5243921	76.1529923	23.8470077
R2.5027	R2.5	27	0.1599703	97.3702688	75.2727404	24.7272596
R2.5028	R2.5	28	0.1660032	97.2102985	74.3957863	25.6042137
R2.5029	R2.5	29	0.1722278	97.0442953	73.5221920	26.4778080
R2.5030	R2.5	30	0.1786452	96.8720675	72.6520176	27.3479824
R2.5031	R2.5	31	0.1852608	96.6934223	71.7853222	28.2146778
R2.5032	R2.5	32	0.1920747	96.5081615	70.9221630	29.0778370
R2.5033	R2.5	33	0.1990958	96.3160868	70.0626001	29.9373999
R2.5034	R2.5	34	0.2063245	96.1169910	69.2066917	30.7933083
R2.5035	R2.5	35	0.2137642	95.9106665	68.3544951	31.6455049
R2.5036	R2.5	36	0.2214194	95.6969023	67.5060663	32.4939337
R2.5037	R2.5	37	0.2292928	95.4754829	66.6614609	33.3385391
R2.5038	R2.5	38	0.2373877	95.2461901	65.8207359	34.1792641
R2.5039	R2.5	39	0.2457084	95.0088024	64.9839459	35.0160541
R2.5040	R2.5	40	0.2542592	94.7630940	64.1511440	35.8488560
R2.5041	R2.5	41	0.2630376	94.5088348	63.3223858	36.6776142
R2.5042	R2.5	42	0.2720566	94.2457972	62.4977222	37.5022778
R2.5043	R2.5	43	0.2813111	93.9737406	61.6772060	38.3227940
R2.5044	R2.5	44	0.2908077	93.6924295	60.8608909	39.1391091

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5045	R2.5	45	0.3005543	93.4016218	60.0488248	39.9511752
R2.5046	R2.5	46	0.3105459	93.1010675	59.2410641	40.7589359
R2.5047	R2.5	47	0.3207922	92.7905216	58.4376559	41.5623441
R2.5048	R2.5	48	0.3312959	92.4697294	57.6386509	42.3613491
R2.5049	R2.5	49	0.3420601	92.1384335	56.8441010	43.1558990
R2.5050	R2.5	50	0.3530903	91.7963734	56.0540552	43.9459448
R2.5051	R2.5	51	0.3643885	91.4432831	55.2685661	44.7314339
R2.5052	R2.5	52	0.3759584	91.0788946	54.4876838	45.5123162
R2.5053	R2.5	53	0.3878079	90.7029362	53.7114601	46.2885399
R2.5054	R2.5	54	0.3999405	90.3151283	52.9399471	47.0600529
R2.5055	R2.5	55	0.4123592	89.9151878	52.1731982	47.8268018
R2.5056	R2.5	56	0.4250708	89.5028286	51.4112682	48.5887318
R2.5057	R2.5	57	0.4380798	89.0777578	50.6542120	49.3457880
R2.5058	R2.5	58	0.4513912	88.6396780	49.9020872	50.0979128
R2.5059	R2.5	59	0.4650126	88.1882868	49.1549511	50.8450489
R2.5060	R2.5	60	0.4789476	87.7232742	48.4128661	51.5871339
R2.5061	R2.5	61	0.4932022	87.2443266	47.6758952	52.3241048
R2.5062	R2.5	62	0.5077830	86.7511244	46.9441018	53.0558982
R2.5063	R2.5	63	0.5226945	86.2433414	46.2175550	53.7824450
R2.5064	R2.5	64	0.5379439	85.7206469	45.4963250	54.5036750
R2.5065	R2.5	65	0.5535354	85.1827030	44.7804852	55.2195148
R2.5066	R2.5	66	0.5694743	84.6291676	44.0701108	55.9298892
R2.5067	R2.5	67	0.5857687	84.0596933	43.3652830	56.6347170
R2.5068	R2.5	68	0.6024160	83.4739246	42.6660848	57.3339152
R2.5069	R2.5	69	0.6194267	82.8715086	41.9726019	58.0273981
R2.5070	R2.5	70	0.6368008	82.2520819	41.2849250	58.7150750
R2.5071	R2.5	71	0.6545391	81.6152811	40.6031480	59.3968520
R2.5072	R2.5	72	0.6726418	80.9607420	39.9273682	60.0726318
R2.5073	R2.5	73	0.6911087	80.2881002	39.2576852	60.7423148
R2.5074	R2.5	74	0.7099390	79.5969915	38.5942020	61.4057980
R2.5075	R2.5	75	0.7291259	78.8870525	37.9370279	62.0629721
R2.5076	R2.5	76	0.7486620	78.1579266	37.2862740	62.7137260
R2.5077	R2.5	77	0.7685376	77.4092646	36.6420512	63.3579488
R2.5078	R2.5	78	0.7887430	76.6407270	36.0044770	63.9955230
R2.5079	R2.5	79	0.8092565	75.8519840	35.3736682	64.6263318
R2.5080	R2.5	80	0.8300667	75.0427275	34.7497439	65.2502561
R2.5081	R2.5	81	0.8511477	74.2126608	34.1328259	65.8671741
R2.5082	R2.5	82	0.8724718	73.3615131	33.5230379	66.4769621
R2.5083	R2.5	83	0.8940096	72.4890413	32.9204998	67.0795002
R2.5084	R2.5	84	0.9157238	71.5950317	32.3253360	67.6746640
R2.5085	R2.5	85	0.9375753	70.6793079	31.7376659	68.2623341
R2.5086	R2.5	86	0.9595194	69.7417326	31.1576109	68.8423891
R2.5087	R2.5	87	0.9815073	68.7822132	30.5852881	69.4147119
R2.5088	R2.5	88	1.0034790	67.8007059	30.0208130	69.9791870
R2.5089	R2.5	89	1.0253773	66.7972269	29.4642980	70.5357020

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5090	R2.5	90	1.0471344	65.7718496	28.9158480	71.0841520
R2.5091	R2.5	91	1.0686831	64.7247152	28.3755679	71.6244321
R2.5092	R2.5	92	1.0899420	63.6560321	27.8435540	72.1564460
R2.5093	R2.5	93	1.1108289	62.5660901	27.3198969	72.6801031
R2.5094	R2.5	94	1.1312651	61.4552612	26.8046770	73.1953230
R2.5095	R2.5	95	1.1511522	60.3239961	26.2979729	73.7020271
R2.5096	R2.5	96	1.1704039	59.1728439	25.7998481	74.2001519
R2.5097	R2.5	97	1.1889191	58.0024400	25.3103621	74.6896379
R2.5098	R2.5	98	1.2065949	56.8135209	24.8295610	75.1704390
R2.5099	R2.5	99	1.2233358	55.6069260	24.3574791	75.6425209
R2.5100	R2.5	100	1.2390403	54.3835902	23.8941431	76.1058569
R2.5101	R2.5	101	1.2536021	53.1445499	23.4395671	76.5604329
R2.5102	R2.5	102	1.2669158	51.8909478	22.9937501	77.0062499
R2.5103	R2.5	103	1.2788939	50.6240320	22.5566781	77.4433219
R2.5104	R2.5	104	1.2894273	49.3451381	22.1283281	77.8716719
R2.5105	R2.5	105	1.2984328	48.0557108	21.7086580	78.2913420
R2.5106	R2.5	106	1.3058210	46.7572780	21.2976141	78.7023859
R2.5107	R2.5	107	1.3115058	45.4514570	20.8951299	79.1048701
R2.5108	R2.5	108	1.3154220	44.1399512	20.5011189	79.4988811
R2.5109	R2.5	109	1.3175020	42.8245292	20.1154850	79.8845150
R2.5110	R2.5	110	1.3176890	41.5070272	19.7381129	80.2618871
R2.5111	R2.5	111	1.3159404	40.1893382	19.3688741	80.6311259
R2.5112	R2.5	112	1.3122248	38.8733978	19.0076220	80.9923780
R2.5113	R2.5	113	1.3065191	37.5611730	18.6541979	81.3458021
R2.5114	R2.5	114	1.2988228	36.2546539	18.3084259	81.6915741
R2.5115	R2.5	115	1.2891360	34.9558311	17.9701180	82.0298820
R2.5116	R2.5	116	1.2774830	33.6666951	17.6390679	82.3609321
R2.5117	R2.5	117	1.2638931	32.3892121	17.3150611	82.6849389
R2.5118	R2.5	118	1.2484150	31.1253190	16.9978631	83.0021369
R2.5119	R2.5	119	1.2311139	29.8769040	16.6872311	83.3127689
R2.5120	R2.5	120	1.2120590	28.6457901	16.3829119	83.6170881
R2.5121	R2.5	121	1.1913381	27.4337311	16.0846400	83.9153600
R2.5122	R2.5	122	1.1690731	26.2423930	15.7921439	84.2078561
R2.5123	R2.5	123	1.1452968	25.0733199	15.5051580	84.4948420
R2.5124	R2.5	124	1.1201971	23.9280231	15.2233681	84.7766319
R2.5125	R2.5	125	1.0938761	22.8078260	14.9465010	85.0534990
R2.5126	R2.5	126	1.0664589	21.7139499	14.6742671	85.3257329
R2.5127	R2.5	127	1.0380819	20.6474910	14.4063790	85.5936210
R2.5128	R2.5	128	1.0088780	19.6094091	14.1425540	85.8574460
R2.5129	R2.5	129	0.9789822	18.6005311	13.8825150	86.1174850
R2.5130	R2.5	130	0.9485328	17.6215489	13.6259940	86.3740060
R2.5131	R2.5	131	0.9176611	16.6730161	13.3727360	86.6272640
R2.5132	R2.5	132	0.8864870	15.7553550	13.1224999	86.8775001
R2.5133	R2.5	133	0.8551400	14.8688680	12.8750581	87.1249419
R2.5134	R2.5	134	0.8237340	14.0137280	12.6302040	87.3697960

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5135	R2.5	135	0.7923711	13.1899940	12.3877521	87.6122479
R2.5136	R2.5	136	0.7611500	12.3976229	12.1475360	87.8524640
R2.5137	R2.5	137	0.7301579	11.6364729	11.9094091	88.0905909
R2.5138	R2.5	138	0.6994760	10.9063150	11.6732490	88.3267510
R2.5139	R2.5	139	0.6691670	10.2068390	11.4389530	88.5610470
R2.5140	R2.5	140	0.6392890	9.5376720	11.2064340	88.7935660
R2.5141	R2.5	141	0.6098980	8.8983830	10.9756200	89.0243800
R2.5142	R2.5	142	0.5810320	8.2884851	10.7464550	89.2535450
R2.5143	R2.5	143	0.5527210	7.7074530	10.5188921	89.4811079
R2.5144	R2.5	144	0.5249980	7.1547320	10.2928760	89.7071240
R2.5145	R2.5	145	0.4978830	6.6297340	10.0683579	89.9316421
R2.5146	R2.5	146	0.4713970	6.1318510	9.8452730	90.1547270
R2.5147	R2.5	147	0.4455530	5.6604540	9.6235380	90.3764620
R2.5148	R2.5	148	0.4203759	5.2149010	9.4030380	90.5969620
R2.5149	R2.5	149	0.3958700	4.7945250	9.1836420	90.8163580
R2.5150	R2.5	150	0.3720580	4.3986550	8.9651520	91.0348480
R2.5151	R2.5	151	0.3489550	4.0265970	8.7473331	91.2526670
R2.5152	R2.5	152	0.3265810	3.6776420	8.5298860	91.4701140
R2.5153	R2.5	153	0.3049580	3.3510610	8.3124470	91.6875531
R2.5154	R2.5	154	0.2841100	3.0461030	8.0945830	91.9054170
R2.5155	R2.5	155	0.2640620	2.7619930	7.8757930	92.1242070
R2.5156	R2.5	156	0.2448380	2.4979310	7.6555050	92.3444950
R2.5157	R2.5	157	0.2264680	2.2530930	7.4330760	92.5669240
R2.5158	R2.5	158	0.2089740	2.0266250	7.2078220	92.7921780
R2.5159	R2.5	159	0.1923820	1.8176510	6.9790150	93.0209850
R2.5160	R2.5	160	0.1767130	1.6252690	6.7459320	93.2540680
R2.5161	R2.5	161	0.1619790	1.4485560	6.5078890	93.4921110
R2.5162	R2.5	162	0.1481900	1.2865770	6.2642780	93.7357220
R2.5163	R2.5	163	0.1353470	1.1383870	6.0146450	93.9853550
R2.5164	R2.5	164	0.1234370	1.0030400	5.7587730	94.2412270
R2.5165	R2.5	165	0.1124400	0.8796030	5.4967510	94.5032490
R2.5166	R2.5	166	0.1023100	0.7671630	5.2291050	94.7708950
R2.5167	R2.5	167	0.0929890	0.6648530	4.9568360	95.0431640
R2.5168	R2.5	168	0.0843740	0.5718640	4.6815480	95.3184520
R2.5169	R2.5	169	0.0763160	0.4874900	4.4052840	95.5947160
R2.5170	R2.5	170	0.0685810	0.4111740	4.1301250	95.8698750
R2.5171	R2.5	171	0.0610970	0.3425930	3.8568110	96.1431890
R2.5172	R2.5	172	0.0538920	0.2814960	3.5853870	96.4146130
R2.5173	R2.5	173	0.0469890	0.2276040	3.3159430	96.6840570
R2.5174	R2.5	174	0.0404160	0.1806150	3.0485420	96.9514580
R2.5175	R2.5	175	0.0342080	0.1401990	2.7832260	97.2167740
R2.5176	R2.5	176	0.0283930	0.1059910	2.5201240	97.4798760
R2.5177	R2.5	177	0.0230100	0.0775980	2.2592850	97.7407150
R2.5178	R2.5	178	0.0181160	0.0545880	2.0008610	97.9991390
R2.5179	R2.5	179	0.0136670	0.0364720	1.7451220	98.2548780

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R2.5180	R2.5	180	0.0098240	0.0228050	1.4924140	98.5075860
R2.5181	R2.5	181	0.0065460	0.0129810	1.2434710	98.7565290
R2.5182	R2.5	182	0.0038930	0.0064350	0.9997670	99.0002330
R2.5183	R2.5	183	0.0019010	0.0025420	0.7651460	99.2348540
R2.5184	R2.5	184	0.0006080	0.0006410	0.5514820	99.4485180
R2.5185	R2.5	185	0.0000330	0.0000330	0.5000000	99.5000000
R2.5186	R2.5	186	0.0000000	0.0000000	0.0000000	100.0000000

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1 Lookup	2 Curve	3 Age %	4 % Ret	5 % Surv	6 % Cond	7 % Depr Resv
R3.0000	R3.0	0	0.0154791	100.0000000	100.0000000	0.0000000
R3.0001	R3.0	1	0.0168400	99.9845209	99.0154038	0.9845962
R3.0002	R3.0	2	0.0182953	99.9676809	98.0319996	1.9680004
R3.0003	R3.0	3	0.0198507	99.9493856	97.0498524	2.9501476
R3.0004	R3.0	4	0.0215111	99.9295349	96.0690317	3.9309683
R3.0005	R3.0	5	0.0232811	99.9080238	95.0896082	4.9103918
R3.0006	R3.0	6	0.0251655	99.8847427	94.1116552	5.8883448
R3.0007	R3.0	7	0.0271702	99.8595772	93.1352463	6.8647537
R3.0008	R3.0	8	0.0292997	99.8324070	92.1604576	7.8395424
R3.0009	R3.0	9	0.0315600	99.8031073	91.1873674	8.8126326
R3.0010	R3.0	10	0.0339584	99.7715473	90.2160540	9.7839460
R3.0011	R3.0	11	0.0364952	99.7375889	89.2465992	10.7534008
R3.0012	R3.0	12	0.0391798	99.7010937	88.2790852	11.7209148
R3.0013	R3.0	13	0.0420189	99.6619139	87.3135939	12.6864061
R3.0014	R3.0	14	0.0450144	99.6198950	86.3502102	13.6497898
R3.0015	R3.0	15	0.0481758	99.5748806	85.3890209	14.6109791
R3.0016	R3.0	16	0.0515060	99.5267048	84.4301109	15.5698891
R3.0017	R3.0	17	0.0550118	99.4751988	83.4735680	16.5264320
R3.0018	R3.0	18	0.0586996	99.4201870	82.5194798	17.4805202
R3.0019	R3.0	19	0.0625744	99.3614874	81.5679340	18.4320660
R3.0020	R3.0	20	0.0666428	99.2989130	80.6190205	19.3809795
R3.0021	R3.0	21	0.0709104	99.2322702	79.6728268	20.3271732
R3.0022	R3.0	22	0.0753794	99.1613598	78.7294426	21.2705574
R3.0023	R3.0	23	0.0800638	99.0859804	77.7889566	22.2110434
R3.0024	R3.0	24	0.0849600	99.0059166	76.8514566	23.1485434
R3.0025	R3.0	25	0.0900774	98.9209566	75.9170332	24.0829668
R3.0026	R3.0	26	0.0954256	98.8308792	74.9857712	25.0142288
R3.0027	R3.0	27	0.1010027	98.7354536	74.0577602	25.9422398
R3.0028	R3.0	28	0.1068191	98.6344509	73.1330843	26.8669157
R3.0029	R3.0	29	0.1128788	98.5276318	72.2118292	27.7881708
R3.0030	R3.0	30	0.1191874	98.4147530	71.2940807	28.7059193
R3.0031	R3.0	31	0.1257477	98.2955656	70.3799210	29.6200790
R3.0032	R3.0	32	0.1325683	98.1698179	69.4694319	30.5305681
R3.0033	R3.0	33	0.1396523	98.0372496	68.5626936	31.4373064
R3.0034	R3.0	34	0.1470041	97.8975973	67.6597862	32.3402138
R3.0035	R3.0	35	0.1546307	97.7505932	66.7607861	33.2392139
R3.0036	R3.0	36	0.1625337	97.5959625	65.8657694	34.1342306
R3.0037	R3.0	37	0.1707211	97.4334288	64.9748087	35.0251913
R3.0038	R3.0	38	0.1791944	97.2627077	64.0879793	35.9120207
R3.0039	R3.0	39	0.1879616	97.0835133	63.2053480	36.7946520
R3.0040	R3.0	40	0.1970244	96.8955517	62.3269858	37.6730142
R3.0041	R3.0	41	0.2063894	96.6985273	61.4529600	38.5470400
R3.0042	R3.0	42	0.2160606	96.4921379	60.5833340	39.4166660
R3.0043	R3.0	43	0.2260437	96.2760773	59.7181711	40.2818289
R3.0044	R3.0	44	0.2363405	96.0500336	58.8575339	41.1424661

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1 Lookup	2 Curve	3 Age %	4 % Ret	5 % Surv	6 % Cond	7 % Depr Resv
R3.0045	R3.0	45	0.2469616	95.8136931	58.0014839	41.9985161
R3.0046	R3.0	46	0.2579089	95.5667315	57.1500778	42.8499222
R3.0047	R3.0	47	0.2691869	95.3088226	56.3033738	43.6966262
R3.0048	R3.0	48	0.2808028	95.0396357	55.4614301	44.5385699
R3.0049	R3.0	49	0.2927637	94.7588329	54.6243000	45.3757000
R3.0050	R3.0	50	0.3050775	94.4660692	53.7920389	46.2079611
R3.0051	R3.0	51	0.3177452	94.1609917	52.9647021	47.0352979
R3.0052	R3.0	52	0.3307829	93.8432465	52.1423440	47.8576560
R3.0053	R3.0	53	0.3441897	93.5124636	51.3250179	48.6749821
R3.0054	R3.0	54	0.3579797	93.1682739	50.5127802	49.4872198
R3.0055	R3.0	55	0.3721629	92.8102942	49.7056861	50.2943139
R3.0056	R3.0	56	0.3867464	92.4381313	48.9037910	51.0962090
R3.0057	R3.0	57	0.4017400	92.0513849	48.1071558	51.8928442
R3.0058	R3.0	58	0.4171553	91.6496449	47.3158379	52.6841621
R3.0059	R3.0	59	0.4330063	91.2324896	46.5299010	53.4700990
R3.0060	R3.0	60	0.4493046	90.7994833	45.7494102	54.2505898
R3.0061	R3.0	61	0.4660597	90.3501787	44.9744310	55.0255690
R3.0062	R3.0	62	0.4832878	89.8841190	44.2050362	55.7949638
R3.0063	R3.0	63	0.5010013	89.4008312	43.4412990	56.5587010
R3.0064	R3.0	64	0.5192156	88.8998299	42.6832981	57.3167019
R3.0065	R3.0	65	0.5379458	88.3806143	41.9311161	58.0688839
R3.0066	R3.0	66	0.5572013	87.8426685	41.1848378	58.8151622
R3.0067	R3.0	67	0.5770016	87.2854672	40.4445572	59.5554428
R3.0068	R3.0	68	0.5973559	86.7084656	39.7103682	60.2896318
R3.0069	R3.0	69	0.6182804	86.1111097	38.9823709	61.0176291
R3.0070	R3.0	70	0.6397857	85.4928293	38.2606740	61.7393260
R3.0071	R3.0	71	0.6618805	84.8530436	37.5453868	62.4546132
R3.0072	R3.0	72	0.6845751	84.1911631	36.8366242	63.1633758
R3.0073	R3.0	73	0.7078676	83.5065880	36.1345072	63.8654928
R3.0074	R3.0	74	0.7317868	82.7987204	35.4391561	64.5608439
R3.0075	R3.0	75	0.7563066	82.0669336	34.7507062	65.2492938
R3.0076	R3.0	76	0.7814388	81.3106270	34.0692878	65.9307122
R3.0077	R3.0	77	0.8071690	80.5291882	33.3950372	66.6049628
R3.0078	R3.0	78	0.8334932	79.7220192	32.7280932	67.2719068
R3.0079	R3.0	79	0.8603878	78.8885260	32.0685968	67.9314032
R3.0080	R3.0	80	0.8878355	78.0281382	31.4166920	68.5833080
R3.0081	R3.0	81	0.9158049	77.1403027	30.7725229	69.2274771
R3.0082	R3.0	82	0.9442616	76.2244978	30.1362350	69.8637650
R3.0083	R3.0	83	0.9731655	75.2802362	29.5079711	70.4920289
R3.0084	R3.0	84	1.0024595	74.3070707	28.8878751	71.1121249
R3.0085	R3.0	85	1.0320921	73.3046112	28.2760870	71.7239130
R3.0086	R3.0	86	1.0619917	72.2725191	27.6727450	72.3272550
R3.0087	R3.0	87	1.0920782	71.2105274	27.0779829	72.9220171
R3.0088	R3.0	88	1.1222725	70.1184492	26.4919291	73.5080709
R3.0089	R3.0	89	1.1524744	68.9961767	25.9147060	74.0852940

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1 Lookup	2 Curve	3 Age %	4 % Ret	5 % Surv	6 % Cond	7 % Depr Resv
R3.0090	R3.0	90	1.1825809	67.8437023	25.3464310	74.6535690
R3.0091	R3.0	91	1.2124787	66.6611214	24.7872109	75.2127891
R3.0092	R3.0	92	1.2420444	65.4486427	24.2371471	75.7628529
R3.0093	R3.0	93	1.2711425	64.2065983	23.6963310	76.3036690
R3.0094	R3.0	94	1.2996359	62.9354558	23.1648400	76.8351600
R3.0095	R3.0	95	1.3273778	61.6358199	22.6427441	77.3572559
R3.0096	R3.0	96	1.3542113	60.3084421	22.1301019	77.8698981
R3.0097	R3.0	97	1.3799820	58.9542308	21.6269579	78.3730421
R3.0098	R3.0	98	1.4045148	57.5742488	21.1333439	78.8666561
R3.0099	R3.0	99	1.4276528	56.1697340	20.6492770	79.3507230
R3.0100	R3.0	100	1.4492231	54.7420812	20.1747630	79.8252370
R3.0101	R3.0	101	1.4690599	53.2928581	19.7097900	80.2902100
R3.0102	R3.0	102	1.4869881	51.8237982	19.2543340	80.7456660
R3.0103	R3.0	103	1.5028572	50.3368101	18.8083510	81.1916490
R3.0104	R3.0	104	1.5164928	48.8339529	18.3717880	81.6282120
R3.0105	R3.0	105	1.5277629	47.3174601	17.9445670	82.0554330
R3.0106	R3.0	106	1.5365224	45.7896972	17.5266011	82.4733989
R3.0107	R3.0	107	1.5426388	44.2531748	17.1177840	82.8822160
R3.0108	R3.0	108	1.5460029	42.7105360	16.7179930	83.2820070
R3.0109	R3.0	109	1.5465211	41.1645331	16.3270869	83.6729131
R3.0110	R3.0	110	1.5441080	39.6180120	15.9449101	84.0550899
R3.0111	R3.0	111	1.5387101	38.0739040	15.5712870	84.4287130
R3.0112	R3.0	112	1.5302810	36.5351939	15.2060260	84.7939740
R3.0113	R3.0	113	1.5188141	35.0049129	14.8489180	85.1510820
R3.0114	R3.0	114	1.5043109	33.4860988	14.4997360	85.5002640
R3.0115	R3.0	115	1.4868099	31.9817879	14.1582340	85.8417660
R3.0116	R3.0	116	1.4663680	30.4949780	13.8241530	86.1758470
R3.0117	R3.0	117	1.4430571	29.0286100	13.4972171	86.5027829
R3.0118	R3.0	118	1.4169929	27.5855529	13.1771280	86.8228720
R3.0119	R3.0	119	1.3882911	26.1685600	12.8635780	87.1364220
R3.0120	R3.0	120	1.3571188	24.7802689	12.5562360	87.4437640
R3.0121	R3.0	121	1.3236401	23.4231501	12.2547650	87.7452350
R3.0122	R3.0	122	1.2880390	22.0995100	11.9588110	88.0411890
R3.0123	R3.0	123	1.2505269	20.8114710	11.6680059	88.3319941
R3.0124	R3.0	124	1.2113230	19.5609441	11.3819740	88.6180260
R3.0125	R3.0	125	1.1706541	18.3496211	11.1003320	88.8996680
R3.0126	R3.0	126	1.1287601	17.1789670	10.8226880	89.1773120
R3.0127	R3.0	127	1.0858769	16.0502069	10.5486490	89.4513510
R3.0128	R3.0	128	1.0422470	14.9643300	10.2778220	89.7221780
R3.0129	R3.0	129	0.9981119	13.9220830	10.0098190	89.9901810
R3.0130	R3.0	130	0.9536992	12.9239711	9.7442570	90.2557430
R3.0131	R3.0	131	0.9092329	11.9702719	9.4807680	90.5192320
R3.0132	R3.0	132	0.8649200	11.0610390	9.2190000	90.7810000
R3.0133	R3.0	133	0.8209611	10.1961190	8.9586190	91.0413810
R3.0134	R3.0	134	0.7775309	9.3751580	8.6993200	91.3006800

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R3.0135	R3.0	135	0.7347881	8.5976270	8.4408310	91.5591691
R3.0136	R3.0	136	0.6928700	7.8628390	8.1829081	91.8170919
R3.0137	R3.0	137	0.6518970	7.1699690	7.9253460	92.0746540
R3.0138	R3.0	138	0.6119650	6.5180720	7.6679810	92.3320190
R3.0139	R3.0	139	0.5731500	5.9061070	7.4106960	92.5893040
R3.0140	R3.0	140	0.5355110	5.3329570	7.1534120	92.8465880
R3.0141	R3.0	141	0.4990880	4.7974460	6.8960930	93.1039070
R3.0142	R3.0	142	0.4639030	4.2983580	6.6387510	93.3612490
R3.0143	R3.0	143	0.4299690	3.8344550	6.3814340	93.6185660
R3.0144	R3.0	144	0.3972850	3.4044860	6.1242290	93.8757710
R3.0145	R3.0	145	0.3658450	3.0072010	5.8672540	94.1327460
R3.0146	R3.0	146	0.3356360	2.6413560	5.6106530	94.3893470
R3.0147	R3.0	147	0.3066410	2.3057200	5.3545910	94.6454090
R3.0148	R3.0	148	0.2788620	1.9990790	5.0992460	94.9007540
R3.0149	R3.0	149	0.2522770	1.7202170	4.8448220	95.1551780
R3.0150	R3.0	150	0.2268850	1.4679400	4.5915160	95.4084840
R3.0151	R3.0	151	0.2026930	1.2410550	4.3395140	95.6604860
R3.0152	R3.0	152	0.1797100	1.0383620	4.0890000	95.9110000
R3.0153	R3.0	153	0.1579600	0.8586520	3.8401530	96.1598470
R3.0154	R3.0	154	0.1374690	0.7006920	3.5931400	96.4068600
R3.0155	R3.0	155	0.1182750	0.5632230	3.3480970	96.6519030
R3.0156	R3.0	156	0.1004170	0.4449480	3.1051630	96.8948370
R3.0157	R3.0	157	0.0839420	0.3445310	2.8644800	97.1355200
R3.0158	R3.0	158	0.0688930	0.2605890	2.6261500	97.3738500
R3.0159	R3.0	159	0.0553160	0.1916960	2.3902580	97.6097420
R3.0160	R3.0	160	0.0432485	0.1363800	2.1569580	97.8430420
R3.0161	R3.0	161	0.0327163	0.0931315	1.9263620	98.0736380
R3.0162	R3.0	162	0.0237359	0.0604152	1.6987790	98.3012210
R3.0163	R3.0	163	0.0163033	0.0366793	1.4745100	98.5254900
R3.0164	R3.0	164	0.0103913	0.0203760	1.2542690	98.7457310
R3.0165	R3.0	165	0.0059434	0.0099847	1.0392430	98.9607570
R3.0166	R3.0	166	0.0028646	0.0040413	0.8322900	99.1677100
R3.0167	R3.0	167	0.0010104	0.0011767	0.6413070	99.3586930
R3.0168	R3.0	168	0.0001662	0.0001662	0.4999820	99.5000180
R3.0169	R3.0	169	0.0000000	0.0000000	0.0000000	100.0000000

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0000	R4.0	0	0.0008278	100.0000000	100.0000000	0.0000000
R4.0001	R4.0	1	0.0009632	99.9991722	99.0013161	0.9986839
R4.0002	R4.0	2	0.0011139	99.9982090	98.0022631	1.9977369
R4.0003	R4.0	3	0.0012894	99.9970951	97.0033197	2.9966803
R4.0004	R4.0	4	0.0014858	99.9958057	96.0045939	3.9954061
R4.0005	R4.0	5	0.0017109	99.9943199	95.0060129	4.9939871
R4.0006	R4.0	6	0.0019645	99.9926090	94.0076304	5.9923696
R4.0007	R4.0	7	0.0022536	99.9906445	93.0094681	6.9905319
R4.0008	R4.0	8	0.0025768	99.9883909	92.0115519	7.9884481
R4.0009	R4.0	9	0.0029430	99.9858141	91.0139113	8.9860887
R4.0010	R4.0	10	0.0033541	99.9828711	90.0165749	9.9834251
R4.0011	R4.0	11	0.0038157	99.9795170	89.0195789	10.9804211
R4.0012	R4.0	12	0.0043325	99.9757013	88.0229569	11.9770431
R4.0013	R4.0	13	0.0049095	99.9713688	87.0267496	12.9732504
R4.0014	R4.0	14	0.0055561	99.9664593	86.0310001	13.9689999
R4.0015	R4.0	15	0.0062743	99.9609032	85.0357533	14.9642467
R4.0016	R4.0	16	0.0070753	99.9546289	84.0410605	15.9589395
R4.0017	R4.0	17	0.0079612	99.9475536	83.0469732	16.9530268
R4.0018	R4.0	18	0.0089484	99.9395924	82.0535498	17.9464502
R4.0019	R4.0	19	0.0100383	99.9306440	81.0608521	18.9391479
R4.0020	R4.0	20	0.0112429	99.9206057	80.0689449	19.9310551
R4.0021	R4.0	21	0.0125732	99.9093628	79.0778990	20.9221010
R4.0022	R4.0	22	0.0140372	99.8967896	78.0877886	21.9122114
R4.0023	R4.0	23	0.0156517	99.8827524	77.0986939	22.9013061
R4.0024	R4.0	24	0.0174217	99.8671007	76.1106977	23.8893023
R4.0025	R4.0	25	0.0193634	99.8496790	75.1238899	24.8761101
R4.0026	R4.0	26	0.0214911	99.8303156	74.1383648	25.8616352
R4.0027	R4.0	27	0.0238161	99.8088245	73.1542206	26.8457794
R4.0028	R4.0	28	0.0263576	99.7850084	72.1715622	27.8284378
R4.0029	R4.0	29	0.0291262	99.7586508	71.1904984	28.8095016
R4.0030	R4.0	30	0.0321426	99.7295246	70.2111445	29.7888555
R4.0031	R4.0	31	0.0354223	99.6973820	69.2336187	30.7663813
R4.0032	R4.0	32	0.0389815	99.6619597	68.2580481	31.7419519
R4.0033	R4.0	33	0.0428438	99.6229782	67.2845621	32.7154379
R4.0034	R4.0	34	0.0470247	99.5801344	66.3132954	33.6867046
R4.0035	R4.0	35	0.0515423	99.5331097	65.3443880	34.6556120
R4.0036	R4.0	36	0.0564251	99.4815674	64.3779860	35.6220140
R4.0037	R4.0	37	0.0616894	99.4251423	63.4142370	36.5857630
R4.0038	R4.0	38	0.0673580	99.3634529	62.4532971	37.5467029
R4.0039	R4.0	39	0.0734539	99.2960949	61.4953232	38.5046768
R4.0040	R4.0	40	0.0800018	99.2226410	60.5404782	39.4595218
R4.0041	R4.0	41	0.0870266	99.1426392	59.5889268	40.4110732
R4.0042	R4.0	42	0.0945492	99.0556126	58.6408401	41.3591599
R4.0043	R4.0	43	0.1025982	98.9610634	57.6963892	42.3036108
R4.0044	R4.0	44	0.1111975	98.8584652	56.7557492	43.2442508

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0045	R4.0	45	0.1203727	98.7472677	55.8190970	44.1809030
R4.0046	R4.0	46	0.1301480	98.6268950	54.8866129	45.1133871
R4.0047	R4.0	47	0.1405506	98.4967470	53.9584770	46.0415230
R4.0048	R4.0	48	0.1516085	98.3561964	53.0348692	46.9651308
R4.0049	R4.0	49	0.1633424	98.2045879	52.1159720	47.8840280
R4.0050	R4.0	50	0.1757803	98.0412455	51.2019682	48.7980318
R4.0051	R4.0	51	0.1889468	97.8654652	50.2930360	49.7069640
R4.0052	R4.0	52	0.2028656	97.6765184	49.3893561	50.6106439
R4.0053	R4.0	53	0.2175588	97.4736528	48.4911060	51.5088940
R4.0054	R4.0	54	0.2326536	97.2560940	47.5984602	52.4015398
R4.0055	R4.0	55	0.2497578	97.0234404	46.7115922	53.2884078
R4.0056	R4.0	56	0.2665119	96.7736826	45.8306670	54.1693330
R4.0057	R4.0	57	0.2845173	96.5071707	44.9558511	55.0441489
R4.0058	R4.0	58	0.3034000	96.2226534	44.0873008	55.9126992
R4.0059	R4.0	59	0.3231707	95.9192534	43.2251711	56.7748289
R4.0060	R4.0	60	0.3438416	95.5960827	42.3696070	57.6303930
R4.0061	R4.0	61	0.3654260	95.2522411	41.5207481	58.4792519
R4.0062	R4.0	62	0.3879290	94.8868151	40.6787262	59.3212738
R4.0063	R4.0	63	0.4113550	94.4988861	39.8436651	60.1563349
R4.0064	R4.0	64	0.4357090	94.0875311	39.0156770	60.9843230
R4.0065	R4.0	65	0.4609852	93.6518221	38.1948690	61.8051310
R4.0066	R4.0	66	0.4871807	93.1908369	37.3813329	62.6186671
R4.0067	R4.0	67	0.5142860	92.7036562	36.5751538	63.4248462
R4.0068	R4.0	68	0.5422850	92.1893702	35.7764020	64.2235980
R4.0069	R4.0	69	0.5711651	91.6470852	34.9851360	65.0148640
R4.0070	R4.0	70	0.6009006	91.0759201	34.2014031	65.7985969
R4.0071	R4.0	71	0.6314631	90.4750195	33.4252348	66.5747652
R4.0072	R4.0	72	0.6628237	89.8435564	32.6566491	67.3433509
R4.0073	R4.0	73	0.6949434	89.1807327	31.8956490	68.1043510
R4.0074	R4.0	74	0.7277765	88.4857893	31.1422219	68.8577781
R4.0075	R4.0	75	0.7612782	87.7580128	30.3963370	69.6036630
R4.0076	R4.0	76	0.7953930	86.9967346	29.6579499	70.3420501
R4.0077	R4.0	77	0.8300562	86.2013416	28.9269941	71.0730059
R4.0078	R4.0	78	0.8652038	85.3712854	28.2033880	71.7966120
R4.0079	R4.0	79	0.9007626	84.5060816	27.4870250	72.5129750
R4.0080	R4.0	80	0.9366550	83.6053190	26.7777820	73.2222180
R4.0081	R4.0	81	0.9727898	82.6686640	26.0755160	73.9244840
R4.0082	R4.0	82	1.0092020	81.6958742	25.3800550	74.6199450
R4.0083	R4.0	83	1.0464849	80.6866722	24.6912470	75.3087530
R4.0084	R4.0	84	1.0855894	79.6401873	24.0091240	75.9908760
R4.0085	R4.0	85	1.1274805	78.5545979	23.3340089	76.6659911
R4.0086	R4.0	86	1.1729546	77.4271174	22.6665139	77.3334861
R4.0087	R4.0	87	1.2225552	76.2541628	22.0074830	77.9925170
R4.0088	R4.0	88	1.2765531	75.0316076	21.3579230	78.6420770
R4.0089	R4.0	89	1.3349047	73.7550545	20.7189319	79.2810681

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0090	R4.0	90	1.3973417	72.4201498	20.0916240	79.9083760
R4.0091	R4.0	91	1.4632540	71.0228081	19.4770801	80.5229199
R4.0092	R4.0	92	1.5318708	69.5595541	18.8762820	81.1237180
R4.0093	R4.0	93	1.6022349	68.0276833	18.2900851	81.7099149
R4.0094	R4.0	94	1.6732702	66.4254484	17.7191961	82.2808039
R4.0095	R4.0	95	1.7437983	64.7521782	17.1641600	82.8358400
R4.0096	R4.0	96	1.8126111	63.0083799	16.6253510	83.3746490
R4.0097	R4.0	97	1.8785019	61.1957688	16.1029799	83.8970201
R4.0098	R4.0	98	1.9403057	59.3172669	15.5971090	84.4028910
R4.0099	R4.0	99	1.9969244	57.3769612	15.1076440	84.8923560
R4.0100	R4.0	100	2.0473556	55.3800368	14.6343750	85.3656250
R4.0101	R4.0	101	2.0907240	53.3326812	14.1769710	85.8230290
R4.0102	R4.0	102	2.1262794	51.2419572	13.7350060	86.2649940
R4.0103	R4.0	103	2.1534547	49.1156778	13.3079650	86.6920350
R4.0104	R4.0	104	2.1718040	46.9622231	12.8952750	87.1047250
R4.0105	R4.0	105	2.1810722	44.7904191	12.4962990	87.5037010
R4.0106	R4.0	106	2.1811419	42.6093469	12.1103610	87.8896390
R4.0107	R4.0	107	2.1720638	40.4282050	11.7367520	88.2632480
R4.0108	R4.0	108	2.1540241	38.2561412	11.3747400	88.6252600
R4.0109	R4.0	109	2.1273389	36.1021171	11.0235781	88.9764219
R4.0110	R4.0	110	2.0924511	33.9747782	10.6825140	89.3174860
R4.0111	R4.0	111	2.0498882	31.8823271	10.3507971	89.6492029
R4.0112	R4.0	112	2.0002858	29.8324389	10.0276790	89.9723210
R4.0113	R4.0	113	1.9443300	27.8321531	9.7124300	90.2875700
R4.0114	R4.0	114	1.8827472	25.8878231	9.4043380	90.5956620
R4.0115	R4.0	115	1.8162958	24.0050759	9.1027160	90.8972840
R4.0116	R4.0	116	1.7457612	22.1887801	8.8069040	91.1930960
R4.0117	R4.0	117	1.6718969	20.4430189	8.5162840	91.4837160
R4.0118	R4.0	118	1.5954540	18.7711220	8.2302750	91.7697250
R4.0119	R4.0	119	1.5171400	17.1756680	7.9483430	92.0516570
R4.0120	R4.0	120	1.4376240	15.6585280	7.6700060	92.3299940
R4.0121	R4.0	121	1.3575180	14.2209040	7.3948390	92.6051610
R4.0122	R4.0	122	1.2773730	12.8633860	7.1224760	92.8775240
R4.0123	R4.0	123	1.1976880	11.5860130	6.8526120	93.1473880
R4.0124	R4.0	124	1.1188790	10.3883250	6.5850130	93.4149870
R4.0125	R4.0	125	1.0413181	9.2694460	6.3195140	93.6804860
R4.0126	R4.0	126	0.9653040	8.2281280	6.0560060	93.9439940
R4.0127	R4.0	127	0.8910890	7.2628240	5.7944580	94.2055420
R4.0128	R4.0	128	0.8188760	6.3717350	5.5348880	94.4651120
R4.0129	R4.0	129	0.7488360	5.5528590	5.2773810	94.7226190
R4.0130	R4.0	130	0.6811100	4.8040230	5.0220640	94.9779360
R4.0131	R4.0	131	0.6158200	4.1229130	4.7691140	95.2308860
R4.0132	R4.0	132	0.5530780	3.5070930	4.5187400	95.4812600
R4.0133	R4.0	133	0.4930080	2.9540150	4.2715210	95.7284790
R4.0134	R4.0	134	0.4357350	2.4610070	4.0273490	95.9726510

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
R4.0135	R4.0	135	0.3814000	2.0252720	3.7864600	96.2135400
R4.0136	R4.0	136	0.3301680	1.6438720	3.5490210	96.4509790
R4.0137	R4.0	137	0.2822160	1.3137040	3.3315155	66.6848450
R4.0138	R4.0	138	0.2377380	1.0314880	3.0849780	96.9150220
R4.0139	R4.0	139	0.1969280	0.7937500	2.8585810	97.1414190
R4.0140	R4.0	140	0.1599700	0.5968220	2.6360510	97.3639490
R4.0141	R4.0	141	0.1270220	0.4368520	2.4174760	97.5825240
R4.0142	R4.0	142	0.0981870	0.3098300	2.2029340	97.7970660
R4.0143	R4.0	143	0.0734960	0.2116430	1.9925030	98.0074970
R4.0144	R4.0	144	0.0529003	0.1381470	1.7862840	98.2137160
R4.0145	R4.0	145	0.0362607	0.0852467	1.5844010	98.4155990
R4.0146	R4.0	146	0.0233463	0.0489860	1.3870900	98.6129100
R4.0147	R4.0	147	0.0138307	0.0256397	1.1948260	98.8051740
R4.0148	R4.0	148	0.0072948	0.0118090	1.0086400	98.9913600
R4.0149	R4.0	149	0.0032339	0.0045142	0.8306070	99.1693930
R4.0150	R4.0	150	0.0010741	0.0012803	0.6657290	99.3342710
R4.0151	R4.0	151	0.0002001	0.0002061	0.5292780	99.4707220
R4.0152	R4.0	152	0.0000060	0.0000060	0.5000830	99.4999170
R4.0153	R4.0	153	0.0000000	0.0000000	0.0000000	100.0000000

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0000	S3.0	0	0.0000000	100.0000000	100.0000000	0.0000000
S3.0001	S3.0	1	0.0000000	100.0000000	99.0000000	1.0000000
S3.0002	S3.0	2	0.0000000	100.0000000	98.0000000	2.0000000
S3.0003	S3.0	3	0.0000000	100.0000000	97.0000000	3.0000000
S3.0004	S3.0	4	0.0000000	100.0000000	96.0000000	4.0000000
S3.0005	S3.0	5	0.0000000	100.0000000	95.0000000	5.0000000
S3.0006	S3.0	6	0.0000009	100.0000000	94.0000000	6.0000000
S3.0007	S3.0	7	0.0000029	99.9999991	93.0000010	6.9999990
S3.0008	S3.0	8	0.0000057	99.9999962	92.0000038	7.9999962
S3.0009	S3.0	9	0.0000124	99.9999905	91.0000086	8.9999914
S3.0010	S3.0	10	0.0000229	99.9999781	90.0000200	9.9999800
S3.0011	S3.0	11	0.0000410	99.9999552	89.0000401	10.9999599
S3.0012	S3.0	12	0.0000706	99.9999142	88.0000773	11.9999227
S3.0013	S3.0	13	0.0001154	99.9998436	87.0001392	12.9998608
S3.0014	S3.0	14	0.0001821	99.9997282	86.0002394	13.9997606
S3.0015	S3.0	15	0.0002785	99.9995461	85.0003939	14.9996061
S3.0016	S3.0	16	0.0004120	99.9992676	84.0006294	15.9993706
S3.0017	S3.0	17	0.0005932	99.9988556	83.0009728	16.9990272
S3.0018	S3.0	18	0.0008402	99.9982624	82.0014629	17.9985371
S3.0019	S3.0	19	0.0011616	99.9974222	81.0021467	18.9978533
S3.0020	S3.0	20	0.0015783	99.9962606	80.0030832	19.9969168
S3.0021	S3.0	21	0.0021086	99.9946823	79.0043373	20.9956627
S3.0022	S3.0	22	0.0027761	99.9925737	78.0059929	21.9940071
S3.0023	S3.0	23	0.0036030	99.9897976	77.0081453	22.9918547
S3.0024	S3.0	24	0.0046177	99.9861946	76.0109024	23.9890976
S3.0025	S3.0	25	0.0058498	99.9815769	75.0143890	24.9856110
S3.0026	S3.0	26	0.0073300	99.9757271	74.0187492	25.9812508
S3.0027	S3.0	27	0.0090951	99.9683971	73.0241404	26.9758596
S3.0028	S3.0	28	0.0111771	99.9593020	72.0307388	27.9692612
S3.0029	S3.0	29	0.0136185	99.9481249	71.0387383	28.9612617
S3.0030	S3.0	30	0.0164585	99.9345064	70.0483513	29.9516487
S3.0031	S3.0	31	0.0197382	99.9180479	69.0598068	30.9401932
S3.0032	S3.0	32	0.0235014	99.8983097	68.0733528	31.9266472
S3.0033	S3.0	33	0.0277939	99.8748083	67.0892544	32.9107456
S3.0034	S3.0	34	0.0326624	99.8470144	66.1077900	33.8922100
S3.0035	S3.0	35	0.0381479	99.8143520	65.1292582	34.8707418
S3.0036	S3.0	36	0.0443048	99.7762041	64.1539688	35.8460312
S3.0037	S3.0	37	0.0511732	99.7318993	63.1822462	36.8177538
S3.0038	S3.0	38	0.0588046	99.6807261	62.2144260	37.7855740
S3.0039	S3.0	39	0.0672397	99.6219215	61.2508540	38.7491460
S3.0040	S3.0	40	0.0765267	99.5546818	60.2918859	39.7081141
S3.0041	S3.0	41	0.0867071	99.4781551	59.3378830	40.6621170
S3.0042	S3.0	42	0.0978231	99.3914480	58.3892121	41.6107879
S3.0043	S3.0	43	0.1099110	99.2936249	57.4462428	42.5537572
S3.0044	S3.0	44	0.1230097	99.1837139	56.5093489	43.4906511

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0045	S3.0	45	0.1371507	99.0607042	55.5788989	44.4211011
S3.0046	S3.0	46	0.1523667	98.9235535	54.6552620	45.3447380
S3.0047	S3.0	47	0.1686792	98.7711868	53.7388029	46.2611971
S3.0048	S3.0	48	0.1861134	98.6025076	52.8298788	47.1701212
S3.0049	S3.0	49	0.2046880	98.4163942	51.9288392	48.0711608
S3.0050	S3.0	50	0.2244149	98.2117062	51.0360251	48.9639749
S3.0051	S3.0	51	0.2453012	97.9872913	50.1517639	49.8482361
S3.0052	S3.0	52	0.2673512	97.7419901	49.2763739	50.7236261
S3.0053	S3.0	53	0.2905626	97.4746389	48.4101572	51.5898428
S3.0054	S3.0	54	0.3149290	97.1840763	47.5534000	52.4466000
S3.0055	S3.0	55	0.3404341	96.8691473	46.7063732	53.2936268
S3.0056	S3.0	56	0.3670616	96.5287132	45.8693328	54.1306672
S3.0057	S3.0	57	0.3947830	96.1616516	45.0425129	54.9574871
S3.0058	S3.0	58	0.4235687	95.7668686	44.2261319	55.7738681
S3.0059	S3.0	59	0.4533825	95.3432999	43.4203882	56.5796118
S3.0060	S3.0	60	0.4841824	94.8899174	42.6254621	57.3745379
S3.0061	S3.0	61	0.5159149	94.4057350	41.8415122	58.1584878
S3.0062	S3.0	62	0.5485287	93.8898201	41.0686789	58.9313211
S3.0063	S3.0	63	0.5819635	93.3412914	40.3070850	59.6929150
S3.0064	S3.0	64	0.6161499	92.7593279	39.5568309	60.4431691
S3.0065	S3.0	65	0.6510201	92.1431780	38.8179989	61.1820011
S3.0066	S3.0	66	0.6864967	91.4921579	38.0906539	61.9093461
S3.0067	S3.0	67	0.7224970	90.8056612	37.3748412	62.6251588
S3.0068	S3.0	68	0.7589350	90.0831642	36.6705899	63.3294101
S3.0069	S3.0	69	0.7957239	89.3242292	35.9779110	64.0220890
S3.0070	S3.0	70	0.8327675	88.5285053	35.2967982	64.7032018
S3.0071	S3.0	71	0.8699665	87.6957378	34.6272311	65.3727689
S3.0072	S3.0	72	0.9072227	86.8257713	33.9691749	66.0308251
S3.0073	S3.0	73	0.9444323	85.9185486	33.3225799	66.6774201
S3.0074	S3.0	74	0.9814892	84.9741163	32.6873822	67.3126178
S3.0075	S3.0	75	1.0182848	83.9926271	32.0635042	67.9364958
S3.0076	S3.0	76	1.0547151	82.9743423	31.4508619	68.5491381
S3.0077	S3.0	77	1.0906649	81.9196272	30.8493540	69.1506460
S3.0078	S3.0	78	1.1260299	80.8289623	30.2588730	69.7411270
S3.0079	S3.0	79	1.1606951	79.7029324	29.6793010	70.3206990
S3.0080	S3.0	80	1.1945553	78.5422373	29.1105120	70.8894880
S3.0081	S3.0	81	1.2275000	77.3476820	28.5523710	71.4476290
S3.0082	S3.0	82	1.2594261	76.1201820	28.0047390	71.9952610
S3.0083	S3.0	83	1.2902269	74.8607559	27.4674680	72.5325320
S3.0084	S3.0	84	1.3198013	73.5705290	26.9404030	73.0595970
S3.0085	S3.0	85	1.3480530	72.2507277	26.4233890	73.5766110
S3.0086	S3.0	86	1.3748846	70.9026747	25.9162619	74.0837381
S3.0087	S3.0	87	1.4002104	69.5277901	25.4188600	74.5811400
S3.0088	S3.0	88	1.4239378	68.1275797	24.9310110	75.0689890
S3.0089	S3.0	89	1.4459896	66.7036419	24.4525449	75.5474551

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0090	S3.0	90	1.4662924	65.2576523	23.9832900	76.0167100
S3.0091	S3.0	91	1.4847698	63.7913599	23.5230711	76.4769289
S3.0092	S3.0	92	1.5013619	62.3065901	23.0717111	76.9282889
S3.0093	S3.0	93	1.5160102	60.8052282	22.6290381	77.3709619
S3.0094	S3.0	94	1.5286632	59.2892180	22.1948710	77.8051290
S3.0095	S3.0	95	1.5392757	57.7605548	21.7690370	78.2309630
S3.0096	S3.0	96	1.5478119	56.2212791	21.3513601	78.6486399
S3.0097	S3.0	97	1.5542393	54.6734672	20.9416640	79.0583360
S3.0098	S3.0	98	1.5585370	53.1192279	20.5397761	79.4602239
S3.0099	S3.0	99	1.5606909	51.5606909	20.1455231	79.8544769
S3.0100	S3.0	100	1.5606909	50.0000000	19.7587349	80.2412651
S3.0101	S3.0	101	1.5585370	48.4393091	19.3792419	80.6207581
S3.0102	S3.0	102	1.5542393	46.8807721	19.0068769	80.9931231
S3.0103	S3.0	103	1.5478119	45.3265328	18.6414750	81.3585250
S3.0104	S3.0	104	1.5392757	43.7787209	18.2828729	81.7171271
S3.0105	S3.0	105	1.5286631	42.2394452	17.9309101	82.0690899
S3.0106	S3.0	106	1.5160103	40.7107821	17.5854299	82.4145701
S3.0107	S3.0	107	1.5013619	39.1947718	17.2462750	82.7537250
S3.0108	S3.0	108	1.4847698	37.6934099	16.9132950	83.0867050
S3.0109	S3.0	109	1.4662919	36.2086401	16.5863359	83.4136641
S3.0110	S3.0	110	1.4459901	34.7423482	16.2652550	83.7347450
S3.0111	S3.0	111	1.4239380	33.2963581	15.9499090	84.0500910
S3.0112	S3.0	112	1.4002102	31.8724201	15.6401500	84.3598500
S3.0113	S3.0	113	1.3748848	30.4722099	15.3358450	84.6641550
S3.0114	S3.0	114	1.3480530	29.0973251	15.0368600	84.9631400
S3.0115	S3.0	115	1.3198011	27.7492721	14.7430561	85.2569439
S3.0116	S3.0	116	1.2902269	26.4294710	14.4543080	85.5456920
S3.0117	S3.0	117	1.2594261	25.1392441	14.1704850	85.8295150
S3.0118	S3.0	118	1.2275000	23.8798180	13.8914710	86.1085290
S3.0119	S3.0	119	1.1945550	22.6523180	13.6171401	86.3828599
S3.0120	S3.0	120	1.1606951	21.4577630	13.3473700	86.6526300
S3.0121	S3.0	121	1.1260300	20.2970679	13.0820510	86.9179490
S3.0122	S3.0	122	1.0906648	19.1710379	12.8210681	87.1789319
S3.0123	S3.0	123	1.0547152	18.0803731	12.5643160	87.4356840
S3.0124	S3.0	124	1.0182848	17.0256579	12.3116800	87.6883200
S3.0125	S3.0	125	0.9814891	16.0073731	12.0630680	87.9369320
S3.0126	S3.0	126	0.9444329	15.0258840	11.8183630	88.1816370
S3.0127	S3.0	127	0.9072221	14.0814511	11.5774790	88.4225210
S3.0128	S3.0	128	0.8699670	13.1742290	11.3403140	88.6596860
S3.0129	S3.0	129	0.8327670	12.3042620	11.1067700	88.8932300
S3.0130	S3.0	130	0.7957240	11.4714950	10.8767610	89.1232390
S3.0131	S3.0	131	0.7589350	10.6757710	10.6501980	89.3498020
S3.0132	S3.0	132	0.7224970	9.9168360	10.4270001	89.5729999
S3.0133	S3.0	133	0.6864971	9.1943390	10.2070690	89.7929310
S3.0134	S3.0	134	0.6510199	8.5078420	9.9903250	90.0096750

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Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0135	S3.0	135	0.6161500	7.8568220	9.7766990	90.2233011
S3.0136	S3.0	136	0.5819630	7.2406720	9.5661089	90.4338911
S3.0137	S3.0	137	0.5485290	6.6587090	9.3584729	90.6415271
S3.0138	S3.0	138	0.5159150	6.1101800	9.1537210	90.8462790
S3.0139	S3.0	139	0.4841820	5.5942650	8.9517880	91.0482121
S3.0140	S3.0	140	0.4533830	5.1100830	8.7525981	91.2474020
S3.0141	S3.0	141	0.4235690	4.6567000	8.5560840	91.4439160
S3.0142	S3.0	142	0.3947830	4.2331310	8.3621800	91.6378200
S3.0143	S3.0	143	0.3670610	3.8383480	8.1708230	91.8291770
S3.0144	S3.0	144	0.3404340	3.4712870	7.9819520	92.0180480
S3.0145	S3.0	145	0.3149290	3.1308530	7.7955040	92.2044960
S3.0146	S3.0	146	0.2905630	2.8159240	7.6114220	92.3885780
S3.0147	S3.0	147	0.2673510	2.5253610	7.4296480	92.5703520
S3.0148	S3.0	148	0.2453010	2.2580100	7.2501270	92.7498730
S3.0149	S3.0	149	0.2244150	2.0127090	7.0728060	92.9271940
S3.0150	S3.0	150	0.2046880	1.7882940	6.8976320	93.1023680
S3.0151	S3.0	151	0.1861140	1.5836060	6.7245530	93.2754470
S3.0152	S3.0	152	0.1686790	1.3974920	6.5535220	93.4464780
S3.0153	S3.0	153	0.1523660	1.2288130	6.3844900	93.6155100
S3.0154	S3.0	154	0.1371510	1.0764470	6.2174110	93.7825890
S3.0155	S3.0	155	0.1230100	0.9392960	6.0522380	93.9477620
S3.0156	S3.0	156	0.1099110	0.8162860	5.8889290	94.1110710
S3.0157	S3.0	157	0.0978230	0.7063750	5.7274410	94.2725590
S3.0158	S3.0	158	0.0867070	0.6085520	5.5677320	94.4322680
S3.0159	S3.0	159	0.0765270	0.5218450	5.4097620	94.5902380
S3.0160	S3.0	160	0.0672400	0.4453180	5.2534920	94.7465080
S3.0161	S3.0	161	0.0588040	0.3780780	5.0988860	94.9011140
S3.0162	S3.0	162	0.0511730	0.3192740	4.9459060	95.0540940
S3.0163	S3.0	163	0.0443050	0.2681010	4.7945200	95.2054800
S3.0164	S3.0	164	0.0381480	0.2237960	4.6446910	95.3553090
S3.0165	S3.0	165	0.0326620	0.1856480	4.4963870	95.5036130
S3.0166	S3.0	166	0.0277940	0.1529860	4.3495800	95.6504200
S3.0167	S3.0	167	0.0235020	0.1251920	4.2042330	95.7957670
S3.0168	S3.0	168	0.0197375	0.1016900	4.0603190	95.9396810
S3.0169	S3.0	169	0.0164582	0.0819525	3.9178100	96.0821900
S3.0170	S3.0	170	0.0136189	0.0654943	3.7766790	96.2233210
S3.0171	S3.0	171	0.0111777	0.0518754	3.6369070	96.3630930
S3.0172	S3.0	172	0.0090944	0.0406977	3.4984640	96.5015360
S3.0173	S3.0	173	0.0073307	0.0316033	3.3613300	96.6386700
S3.0174	S3.0	174	0.0058498	0.0242726	3.2254840	96.7745160
S3.0175	S3.0	175	0.0046178	0.0184228	3.0909090	96.9090910
S3.0176	S3.0	176	0.0036030	0.0138050	2.9575850	97.0424150
S3.0177	S3.0	177	0.0027755	0.0102020	2.8255000	97.1745000
S3.0178	S3.0	178	0.0021089	0.0074265	2.6946400	97.3053600
S3.0179	S3.0	179	0.0015783	0.0053176	2.5649990	97.4350010

database

S:\Depreciation\Iowacurves.xls

Iowa-type Retirement - Survival Tables

Percent Retired, Surviving, Condition, and Depreciation Reserve
as a function of Age as a Percent of Average Service Life

1	2	3	4	5	6	7
Lookup	Curve	Age %	% Ret	% Surv	% Cond	% Depr Resv
S3.0180	S3.0	180	0.0011617	0.0037393	2.4365660	97.5634340
S3.0181	S3.0	181	0.0008396	0.0025776	2.3093440	97.6906560
S3.0182	S3.0	182	0.0005946	0.0017381	2.1833410	97.8166590
S3.0183	S3.0	183	0.0004116	0.0011435	2.0585660	97.9414340
S3.0184	S3.0	184	0.0002778	0.0007319	1.9350420	98.0649580
S3.0185	S3.0	185	0.0001821	0.0004541	1.8128020	98.1871980
S3.0186	S3.0	186	0.0001156	0.0002720	1.6918880	98.3081120
S3.0187	S3.0	187	0.0000706	0.0001564	1.5723710	98.4276290
S3.0188	S3.0	188	0.0000413	0.0000858	1.4543500	98.5456500
S3.0189	S3.0	189	0.0000229	0.0000446	1.3379620	98.6620380
S3.0190	S3.0	190	0.0000119	0.0000217	1.2234140	98.7765860
S3.0191	S3.0	191	0.0000058	0.0000097	1.1110030	98.8889970
S3.0192	S3.0	192	0.0000025	0.0000040	1.0011880	98.9988120
S3.0193	S3.0	193	0.0000010	0.0000014	0.8946340	99.1053660
S3.0194	S3.0	194	0.0000003	0.0000004	0.7925260	99.2074740
S3.0195	S3.0	195	0.0000001	0.0000001	0.6968450	99.3031550
S3.0196	S3.0	196	0.0000000	0.0000000	0.6112800	99.3887200
S3.0197	S3.0	197	0.0000000	0.0000000	0.5431250	99.4568750
S3.0198	S3.0	198	0.0000000	0.0000000	0.5056800	99.4943200
S3.0199	S3.0	199	0.0000000	0.0000000	0.5000000	99.5000000
S3.0200	S3.0	200	0.0000000	0.0000000	0.0000000	100.0000000

VOLUME 11

PENNSYLVANIA-AMERICAN WATER COMPANY

2020 GENERAL BASE RATE CASE
R-2020-3019369 (WATER)
R-2020-3019371 (WASTEWATER)

EXHIBIT NO. 11-C, 11-D
DEPRECIATION STUDY

WATER OPERATIONS EXCLUDING STEELTON
AS OF DECEMBER 31, 2021, 2022

EXHIBIT NO. 11-C - DEPRECIATION STUDY

WATER OPERATIONS EXCLUDING STEELTON

AS OF DECEMBER 31, 2021

Exhibit No. 11-C
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

MECHANICSBURG, PENNSYLVANIA

WATER OPERATIONS EXCLUDING STEELTON

2021 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2021

Prepared by:

Gannett Fleming

Excellence Delivered ***As Promised***

Exhibit No. 11-C
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

Mechanicsburg, Pennsylvania

WATER OPERATIONS EXCLUDING STEELTON

2021 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WATER PLANT
AS OF DECEMBER 31, 2021

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Camp Hill, Pennsylvania

Gannett Fleming

Excellence Delivered ***As Promised***

April 22, 2020

Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

Attention: Ashley E. Everette
Director, Rates and Regulatory

Ladies and Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to water plant as of December 31, 2021. The results of our study at December 31, 2020 are presented in our report titled "2020 Depreciation Study - Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2020". The same methods, procedures and estimates are used in both studies.

Summaries of the original cost, annual accruals, book depreciation reserve and amortization of net salvage are presented in Tables 1 through 5, beginning on page I-3 of the attached report.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
President

JJS:mle

066548.100

Gannett Fleming Valuation and Rate Consultants, LLC
207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.4590
www.gfvrc.com

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PART I. RESULTS OF STUDY

PENNSYLVANIA-AMERICAN WATER COMPANY

WATER OPERATIONS EXCLUDING STEELTON

DEPRECIATION STUDY

RESULTS OF STUDY

DESCRIPTION OF SUMMARY TABULATIONS

Tables 1 through 5 presented on pages 3 through 13 summarize the results of the depreciation study as of December 31, 2021. Table 1 sets forth the development of the net original cost by account as of December 31, 2021. Table 2 sets forth, by depreciable group, the estimated survivor curve, original cost, book depreciation reserve as of December 31, 2021, future book accruals, calculated annual accrual amount and rate, and composite remaining life for plant in service. Table 3 presents the bringforward of the book reserve to December 31, 2021. Table 4 sets forth the calculation of the depreciation accruals for the twelve months ended December 31, 2021. Table 5 presents the annual amortization of experienced and estimated net salvage based on the period 2017 through 2021.

DESCRIPTION OF DETAILED TABULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page II-8. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount. The amounts of regular retirements, gross salvage and cost of removal are set forth by account for the years 2017 through 2021, beginning on pages III-2 through III-6.

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2021

	DEPRCIABLE GROUP (1)	ORIGINAL COST AS OF DECEMBER 31, 2021 (2)	-	CUSTOMER ADVANCES (3)	-	CONTRIBUTIONS IN AID OF CONSTRUCTION (4)	-	EXCLUDED PROPERTY (5)	=	NET ORIGINAL COST AS OF DECMEBER 31, 2021 (6)
INTANGIBLE PLANT										
301.00	ORGANIZATION	766,405.12								766,405.12
302.00	FRANCHISES AND CONSENTS	2,404,599.20								2,404,599.20
303.00	MISCELLANEOUS INTANGIBLE PLANT	1,453,020.77								1,453,020.77
	TOTAL INTANGIBLE PLANT	**4,624,025.09**		**0.00**		**0.00**		**0.00**		**4,624,025.09**
NONDEPRECIABLE PLANT										
303.20	POWER AND PUMPING LAND	4,315,318.23								4,315,318.23
303.30	PURIFICATION LAND	15,412.25								15,412.25
303.40	TRANSMISSION AND DISTRIBUTION LAND AND RIGHTS OF WAY	3,724,070.21				215,927.20				3,508,143.01
303.50	DISTRIBUTION RESERVOIRS AND STANDPIPE LAND	2,001,789.51								2,001,789.51
303.51	TRANSMISSION AND DISTRIBUTION - LAND	1,762,423.06								1,762,423.06
303.52	TRANSMISSION AND DISTRIBUTION - RIGHTS OF WAY	5,288,947.81								5,288,947.81
303.61	OFFICE LAND	5,260,832.58								5,260,832.58
	TOTAL NONDEPRECIABLE PLANT	**22,368,793.65**		**0.00**		**215,927.20**		**0.00**		**22,152,866.45**
DEPRECIABLE PLANT										
303.14	WATER RIGHTS - HIBERNIA	1,942,822.51								1,942,822.51
303.35	WASTE HANDLING AND TREATMENT LAND	155,025.17								155,025.17
303.99	COMPREHENSIVE PLANNING STUDIES	9,710,061.35								9,710,061.35
304.15	OTHER WATER SOURCE STRUCTURES	44,248,707.65								44,248,707.65
304.20	POWER AND PUMPING STRUCTURES	121,818,280.30				1,289,607.60		41,310.00		120,487,362.70
304.30	PURIFICATION BUILDINGS	289,983,841.49				169,605.01		230,375.00		289,583,861.48
304.36	WASTE HANDLING AND TREATMENT STRUCTURES	11,668,886.83								11,668,886.83
304.38	WASTE HANDLING AND TREATMENT STRUCTURES PAINTING	65,958.42								65,958.42
304.39	PURIFICATION BUILDINGS - TANK PAINTING	119,362.95								119,362.95
304.61	OFFICE BUILDINGS	44,005,306.44				60,000.00		12,834.00		43,932,472.44
304.62	STORES, SHOP AND GARAGE BUILDINGS	55,111,889.86				576.00				55,111,313.86
304.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	4,132,815.74								4,132,815.74
305.00	COLLECTING AND IMPOUNDING RESERVOIRS	135,672,663.72				3,575.00				135,669,088.72
306.00	LAKE, RIVER AND OTHER INTAKES	18,257,338.08				41,551.00				18,215,787.08
307.00	WELLS AND SPRINGS	10,694,793.00				71,610.27				10,623,182.73
310.00	POWER GENERATION EQUIPMENT	19,954,396.50				118,273.00		26,561.00		19,809,562.50
311.20	PUMPING EQUIPMENT - ELECTRIC PUMPING EQUIPMENT	25,829,705.97				1,954,569.05		116,716.00		23,758,420.92
311.50	PUMPING EQUIPMENT - OTHER	2,389,457.83								2,389,457.83
311.52	PUMPING EQUIPMENT - SOURCE OF SUPPLY	14,212,241.21								14,212,241.21
311.53	PUMPING EQUIPMENT - WATER TREATMENT	46,865,937.19								46,865,937.19
311.54	PUMPING EQUIPMENT - TRANSMISSION AND DISTRIBUTION	6,787,710.63								6,787,710.63
320.10	PURIFICATION SYSTEM - LARGE STRUCTURES	278,019,906.37				27,162.27		627,852.00		277,364,892.10
320.18	PURIFICATION SYSTEM - LARGE STRUCTURES PAINT	103,245.73								103,245.73
320.19	PURIFICATION SYSTEM - LARGE STRUCTURES PAINT	3,522,542.77								3,522,542.77
320.20	PURIFICATION SYSTEM - CHEMICAL TREATMENT	84,745,690.42				42,367.00				84,703,323.42
320.29	PURIFICATION SYSTEM - CHEM. TREATMENT PAINT	8,167.87								8,167.87
320.30	GRANULAR ACTIVATED CARBON	8,601,165.21								8,601,165.21
320.37	WASTE HANDLING AND TREATMENT - EQUIPMENT	14,969,798.93								14,969,798.93
330.00	DISTRIBUTION RESERVOIRS AND STANDPIPES	117,655,216.74				2,905,114.51				114,750,102.23

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2021

	DEPRCIABLE GROUP	ORIGINAL COST AS OF DECEMBER 31, 2021	- CUSTOMER ADVANCES	- CONTRIBUTIONS IN AID OF CONSTRUCTION	- EXCLUDED PROPERTY	= NET ORIGINAL COST AS OF DECMEBER 31, 2021
	(1)	(2)	(3)	(4)	(5)	(6)
330.10	ELEVATED TANKS AND STANDPIPES	14,100,477.17				14,100,477.17
330.20	GROUND LEVEL FACILITIES	18,929,725.89				18,929,725.89
330.30	BELOW GRADE FACILITIES	818,672.56				818,672.56
330.40	CLEARWELL	12,806,094.73				12,806,094.73
330.58	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	2,211,111.35				2,211,111.35
330.59	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	34,570,376.62				34,570,376.62
331.00	MAINS AND ACCESSORIES	3,064,685,925.46	63,514,361.86	200,747,868.78	502,366.00	2,799,921,328.82
333.00	SERVICES	649,550,756.85	5,782,801.70	11,851,183.63		631,916,771.52
334.00	METERS AND METER INSTALLATIONS	207,962,808.09		1,707,754.19		206,255,053.90
335.00	FIRE HYDRANTS	127,625,861.91	71,848.81	4,768,402.44		122,785,610.66
340.10	OFFICE FURNITURE AND EQUIPMENT - FURNITURE	7,475,864.68				7,475,864.68
340.20	OFFICE FURNITURE AND EQUIPMENT - COMPUTERS AND PERIPHERAL EQUIPMENT	24,511,435.46				24,511,435.46
340.30	OFFICE FURNITURE AND EQUIPMENT - COMPUTER SOFTWARE	45,994,769.94				45,994,769.94
340.31	OFFICE FURNITURE AND EQUIPMENT - COMPUTER SOFTWARE - BUSINESS TRANSFORMATION	62,990,459.09				62,990,459.09
340.50	OFFICE FURNITURE AND EQUIPMENT - OTHER OFFICE EQUIPMENT	7,644.67		354.00		7,290.67
341.00	TRANSPORTATION EQUIPMENT - NOT CLASSIFIED	349.00				349.00
341.10	TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS	28,802,310.96				28,802,310.96
341.20	TRANSPORTATION EQUIPMENT - EQUIPMENT	23,205,811.64				23,205,811.64
341.30	TRANSPORTATION EQUIPMENT - AUTOS	3,874,730.49				3,874,730.49
341.40	TRANSPORTATION EQUIPMENT - OTHER	10,439,225.68				10,439,225.68
342.00	STORES EQUIPMENT	448,033.65				448,033.65
343.00	TOOLS AND WORK EQUIPMENT	32,097,198.82		61.00		32,097,137.82
344.00	LABORATORY EQUIPMENT	2,606,821.35				2,606,821.35
345.00	POWER OPERATED EQUIPMENT	2,405,805.64				2,405,805.64
346.00	COMMUNICATOIN EQUIPMENT - EQUIPMENT	3,459,420.00				3,459,420.00
346.10	COMMUNICATOIN EQUIPMENT - NON-TELEPHONE	6,770,729.39				6,770,729.39
346.19	COMMUNICATOIN EQUIPMENT - REMOTE CONTROL AND INSTRUMENTATION	2,790,901.75				2,790,901.75
346.20	COMMUNICATOIN EQUIPMENT - TELEPHONE	188,390.60				188,390.60
347.00	MISCELLANEOUS EQUIPMENT	11,608,430.21		4,085.00		11,604,345.21
348.00	OTHER TANGIBLE EQUIPMENT	793,796.73				793,796.73
	TOTAL DEPRECIABLE PLANT	**5,774,986,877.26**	**69,369,012.37**	**225,763,719.75**	**1,558,014.00**	**5,478,296,131.14**
	TOTAL UTILITY PLANT IN SERVICE	**5,801,979,696.00**	**69,369,012.37**	**225,979,646.95**	**1,558,014.00**	**5,505,073,022.68**

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2021

	DEPRECIABLE GROUP		SURVIVOR CURVE		NET ORIGINAL COST AS OF DECEMBER 31, 2021	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)		(2)		(3)	(4)	(5)	(6)	(7)	(8)
INTANGIBLE PLANT										
301.00	ORGANIZATION		NONDEPR.		766,405.12					
302.00	FRANCHISES AND CONSENTS		NONDEPR.		2,404,599.20					
303.00	MISCELLANEOUS INTANGIBLE PLANT		NONDEPR.		1,453,020.77					
	TOTAL INTANGIBLE PLANT				**4,624,025.09**					
NONDEPRECIABLE PLANT										
303.20	POWER AND PUMPING LAND		NONDEPR.		4,315,318.23					
303.30	PURIFICATION LAND		NONDEPR.		15,412.25					
303.40	TRANSMISSION AND DISTRIBUTION LAND AND RIGHTS OF WAY		NONDEPR.		3,508,143.01					
303.50	DISTRIBUTION RESERVOIRS AND STANDPIPES LAND		NONDEPR.		2,001,789.51					
303.51	TRANSMISSION AND DISTRIBUTION - LAND		NONDEPR.		1,762,423.06					
303.52	TRANSMISSION AND DISTRIBUTION - RIGHTS OF WAY		NONDEPR.		5,288,947.81					
303.61	OFFICE LAND		NONDEPR.		5,260,832.58					
	TOTAL NONDEPRECIABLE PLANT				**22,152,866.45**					
DEPRECIABLE PLANT										
303.14	WATER RIGHTS - HIBERNIA		25-SQ		1,942,822.51	1,942,823	0	0	-	-
303.35	WASTE HANDLING AND TREATMENT LAND	*	100-R2		155,025.17	150,407	4,618	4,618	2.98	1.0
303.99	COMPREHENSIVE PLANNING STUDIES		5-SQ		9,710,061.35	7,494,569	2,215,492	751,049	7.73	2.9
304.15	OTHER WATER SOURCE STRUCTURES		60-R1.5		44,248,707.65	8,283,077	35,965,631	970,351	2.19	37.1
304.20	POWER AND PUMING STRUCTURES									
	LARGE STRUCTURES	*	70-R2.5		69,567,251.92	9,280,689	60,286,563	1,787,063	2.57	33.7
	OTHER STRUCTURES		55-R3		50,920,110.78	9,270,044	41,650,067	1,298,796	2.55	32.1
	TOTAL ACCOUNT 304.2				120,487,362.70	18,550,733	101,936,630	3,085,859	2.56	33.0
304.30	PURIFICATION BUILDINGS									
	LARGE STRUCTURES	*	60-R2.5		248,267,049.87	78,898,085	169,368,965	5,619,625	2.26	30.1
	OTHER STRUCTURES		60-R3		41,316,811.61	12,978,751	28,338,061	730,378	1.77	38.8
	TOTAL ACCOUNT 304.3				289,583,861.48	91,876,836	197,707,026	6,350,003	2.19	31.1
304.36	WASTE HANDLING AND TREATMENT STRUCTURES	*	60-S2.5		11,668,886.83	6,315,009	5,353,878	309,282	2.65	17.3
304.38	WASTE HANDLING AND TREATMENT STRUCTURES PAINTING		10-SQ		65,958.42	57,775	8,183	2,338	3.54	3.5
304.39	PURIFICATION BUILDINGS - TANK PAINTING		10-SQ		119,362.95	107,705	11,658	3,331	2.79	3.5
304.61	OFFICE BUILDINGS									
	LARGE STRUCTURES	*	50-R1.5		31,024,747.89	5,523,525	25,501,224	970,539	3.13	26.3
	OTHER STRUCTURES		50-R3		12,907,724.55	3,482,369	9,425,356	295,081	2.29	31.9
	TOTAL ACCOUNT 304.61				43,932,472.44	9,005,894	34,926,580	1,265,620	2.88	27.6

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2021

	DEPRECIABLE GROUP	SURVIVOR CURVE		NET ORIGINAL COST AS OF DECEMBER 31, 2021	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
304.62	STORES, SHOP AND GARAGE BUILDINGS								
	LARGE STRUCTURES	55-S0.5	*	48,973,108.70	11,428,586	37,544,523	1,323,667	2.70	28.4
	OTHER STRUCTURES	45-R3		6,138,205.16	3,952,462	2,185,743	82,351	1.34	26.5
	TOTAL ACCOUNT 304.62			55,111,313.86	15,381,048	39,730,266	1,406,018	2.55	28.3
304.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	35-S0.5		4,132,815.74	2,198,599	1,934,217	86,804	2.10	22.3
	TOTAL ACCOUNT 304			569,350,742.07	151,776,676	417,574,069	13,479,606	2.37	31.0
305.00	COLLECTING AND IMPOUNDING RESERVOIRS								
	LARGE RESERVOIRS	125-R2	*	128,044,777.60	18,481,585	109,563,192	1,809,335	1.41	60.6
	OTHER RESERVOIRS	75-R3		7,624,311.12	2,729,327	4,894,984	215,147	2.82	22.8
	TOTAL ACCOUNT 305			135,669,088.72	21,210,912	114,458,176	2,024,482	1.49	56.5
306.00	LAKE, RIVER AND OTHER INTAKES								
	LARGE INTAKES	55-S1	*	14,029,064.70	4,448,923	9,580,142	336,818	2.40	28.4
	OTHER INTAKES	50-S0.5		4,186,722.38	1,524,770	2,661,952	110,315	2.63	24.1
	TOTAL ACCOUNT 306			18,215,787.08	5,973,693	12,242,094	447,133	2.45	27.4
307.00	WELLS AND SPRINGS	55-S0		10,623,182.73	3,343,133	7,280,050	246,499	2.32	29.5
310.00	POWER GENERATION EQUIPMENT	43-S1		19,809,562.50	5,157,558	14,652,004	541,291	2.73	27.1
	PUMPING EQUIPMENT								
311.20	ELECTRIC	42-S0		23,758,420.92	4,483,984	19,274,437	769,961	3.24	25.0
311.50	OTHER	42-S0		2,389,457.83	559,308	1,830,150	74,670	3.12	24.5
311.52	SOURCE OF SUPPLY	42-S0		14,212,241.21	2,191,102	12,021,139	477,564	3.36	25.2
311.53	WATER TREATMENT	42-S0		46,865,937.19	18,885,547	27,980,390	1,331,345	2.84	21.0
311.54	TRANSMISSION AND DISTRIBUTION	42-S0		6,787,710.63	2,125,816	4,661,895	197,458	2.91	23.6
	TOTAL ACCOUNT 311			94,013,767.78	28,245,757	65,768,011	2,850,998	3.03	23.1
	PURIFICATION SYSTEM								
320.10	LARGE STRUCTURES								
	LARGE STRUCTURES	60-S0.5	*	255,675,564.06	73,452,571	182,222,993	7,332,914	2.87	24.9
	OTHER STRUCTURES	55-R3		21,689,328.04	3,259,936	18,429,392	451,433	2.08	40.8
	TOTAL ACCOUNT 320.1			277,364,892.10	76,712,507	200,652,385	7,784,347	2.81	25.8
320.18	LARGE STRUCTURES PAINT	10-SQ		103,245.73	103,246	0	0	-	-
320.19	LARGE STRUCTURES PAINT	10-SQ		3,522,542.77	3,513,661	8,882	2,537	0.07	3.5
320.20	CHEMICAL TREATMENT	36-R0.5		84,703,323.42	32,767,124	51,936,199	2,724,881	3.22	19.1
320.29	CHEMICAL TREATMENT PAINT	FULLY ACCRUED		8,167.87	8,168	0	0	-	-
320.30	GRANULAR ACTIVATED CARBON	7-L2		8,601,165.21	6,864,049	1,737,116	577,102	6.71	3.0
320.37	WASTE HANDLING AND TREATMENT - EQUIPMENT	30-R3		14,969,798.93	10,336,097	4,633,702	255,895	1.71	18.1
	TOTAL ACCOUNT 320			389,273,136.03	130,304,852	258,968,284	11,344,762	2.91	22.8

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2021

	DEPRECIABLE GROUP	SURVIVOR CURVE	NET ORIGINAL COST AS OF DECEMBER 31, 2021	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
330.00	DISTRIBUTION RESERVOIRS AND STANDPIPES	65-S0.5	114,750,102.23	37,604,850	77,145,252	2,040,752	1.78	37.8
330.10	ELEVATED TANKS AND STANDPIPES	65-S0.5	14,100,477.17	1,396,944	12,703,533	302,304	2.14	42.0
330.20	GROUND LEVEL FACILITIES	65-S0.5	18,929,725.89	1,478,786	17,450,940	411,613	2.17	42.4
330.30	BELOW GRADE FACILITIES	65-S0.5	818,672.56	134,722	683,951	16,514	2.02	41.4
330.40	CLEARWELL	65-S0.5	12,806,094.73	2,241,101	10,564,994	256,016	2.00	41.3
330.58	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	10-SQ	2,211,111.35	2,124,822	86,289	24,654	1.12	3.5
330.59	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	10-SQ	34,570,376.62	22,983,972	11,586,405	2,403,686	6.95	4.8
	TOTAL ACCOUNT 330		198,186,560.55	67,965,197	130,221,364	5,455,539	2.75	23.9
331.00	MAINS AND ACCESSORIES	110-R2	2,799,921,328.82	327,632,397	2,472,288,932	33,559,667	1.20	73.7
333.00	SERVICES	70-R2.5	631,916,771.52	153,302,150	478,614,622	10,466,170	1.66	45.7
334.00	METERS AND METER INSTALLATIONS	21-L1	206,255,053.90	85,792,067	120,462,987	10,770,670	5.22	11.2
335.00	FIRE HYDRANTS	75-R2.5	122,785,610.66	21,454,868	101,330,743	1,959,904	1.60	51.7
340.00	OFFICE FURNITURE AND EQUIPMENT							
	FURNITURE	20-SQ	7,475,864.68	1,347,541	6,128,324	386,093	5.16	15.9
	COMPUTERS AND PERIPHERAL EQUIPMENT	5-SQ	24,511,435.46	5,940,437	18,570,998	5,214,238	21.27	3.6
	COMPUTER SOFTWARE	5-SQ	45,994,769.94	21,924,860	24,069,910	8,444,686	18.36	2.9
	COMPUTER SOFTWARE - BUSINESS TRANSFORMATION	10-SQ	62,990,459.09	52,072,253	10,918,206	8,099,503	12.86	1.3
	OTHER OFFICE EQUIPMENT	10-SQ	7,290.67	1,744	5,547	740	10.15	7.5
	TOTAL ACCOUNT 340		140,979,819.84	81,286,835	59,692,985	22,145,260	15.71	2.7
341.00	TRANSPORATION EQUIPMENT							
	NOT CLASSIFIED	7-L3	349.00	349	0	0	-	-
	LIGHT DUTY TRUCKS	7-L3	28,802,310.96	17,540,380	11,261,931	2,978,791	10.34	3.8
	EQUIPMENT	7-L3	23,205,811.64	13,407,514	9,798,298	2,686,946	11.58	3.6
	AUTOS	7-L3	3,874,730.49	2,379,267	1,495,463	347,892	8.98	4.3
	OTHER	7-L3	10,439,225.68	5,565,457	4,873,769	1,261,319	12.08	3.9
	TOTAL ACCOUNT 341		66,322,427.77	38,892,967	27,429,461	7,274,948	10.97	3.8
342.00	STORES EQUIPMENT	20-SQ	448,033.65	97,064	350,970	26,762	5.97	13.1
343.00	TOOLS AND WORK EQUIPMENT	20-SQ	32,097,137.82	7,101,221	24,995,917	1,893,452	5.90	13.2
344.00	LABORATORY EQUIPMENT	20-L0.5	2,606,821.35	1,152,886	1,453,935	152,376	5.85	9.5
345.00	POWER OPERATED EQUIPMENT	19-S0.5	2,405,805.64	1,655,168	750,638	98,401	4.09	7.6
346.00	COMUNICATION EQUIPMENT							
	EQUIPMENT	15-SQ	3,459,420.00	476,123	2,983,297	226,521	6.55	13.2
	NON-TELEPHONE	15-SQ	6,770,729.39	1,148,483	5,622,246	452,423	6.68	12.4
	REMOTE CONTROL AND INSTRUMENTATION	10-SQ	2,790,901.75	1,618,957	1,171,945	256,489	9.19	4.6
	TELEPHONE	10-SQ	188,390.60	121,502	66,889	17,853	9.48	3.7
	TOTAL ACCOUNT 346		13,209,441.74	3,365,065	9,844,377	953,286	7.22	10.3

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2021

	DEPRECIABLE GROUP	SURVIVOR CURVE	NET ORIGINAL COST AS OF DECEMBER 31, 2021	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
347.00	MISCELLANEOUS EQUIPMENT	25-SQ	11,604,345.21	2,121,851	9,482,494	803,731	6.93	11.8
348.00	OTHER TANGIBLE EQUIPMENT	25-SQ	793,796.73	433,683	360,114	31,961	4.03	11.3
	TOTAL DEPRECIABLE PLANT		**5,478,296,131.14**	**1,147,853,799**	**4,330,442,337**	**127,282,565**	**2.32**	
	AMORTIZATION OF NET SALVAGE					**18,150,547**		
	TOTAL UTILITY PLANT IN SERVICE		**5,505,073,022.68**	**1,147,853,799**	**4,330,442,337**	**145,433,112**		

* Life Span Procedure was used. Curve shown is Interim Survivor Curve.

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 3. BRINGFORWARD TO DECEMBER 31, 2021, OF BOOK RESERVE AS OF DECEMBER 31, 2020

Account	BOOK RESERVE BALANCE AS OF 12/31/2020	+	PROJECTED DEPRECIATION ACCRUALS	-	PROJECTED RETIREMENTS	-	PROJECTED COST OF REMOVAL	+	PROJECTED SALVAGE	+	ACQUISITIONS	=	PROJECTED BOOK RESERVE BALANCE AS OF 12/31/2021
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)
303.14	1,942,823		0										1,942,823
303.35	141,137		9,270										150,407
303.99	6,351,030		1,204,524		60,985								7,494,569
304.15	7,899,182		1,048,120		390,721		285,226		11,722				8,283,077
304.20	16,349,816		2,976,022		674,004		121,321		20,220				18,550,733
304.30	88,458,520		6,134,387		2,425,064		315,258		24,251				91,876,836
304.36	5,992,818		322,191										6,315,009
304.38	55,437		2,338										57,775
304.39	104,374		3,331										107,705
304.61	7,849,697		1,216,908		55,698		5,013						9,005,894
304.62	13,999,901		1,402,722		23,709		3,319		5,453				15,381,048
304.63	2,130,689		84,121		14,220		2,844		853				2,198,599
305.00	18,943,519		2,267,393										21,210,912
306.00	5,508,799		464,894										5,973,693
307.00	3,088,287		259,686		4,840								3,343,133
310.00	4,866,142		517,290		179,265		46,609						5,157,558
311.20	3,771,805		1,021,432		264,319		44,934						4,483,984
311.50	481,982		77,326										559,308
311.52	1,945,471		445,658		170,963		29,064						2,191,102
311.53	18,177,110		1,212,264		430,621		73,206						18,885,547
311.54	1,921,773		204,043										2,125,816
320.10	76,059,881		6,303,140		5,000,455		650,059						76,712,507
320.18	103,246		0										103,246
320.19	3,511,123		2,538										3,513,661
320.20	30,554,763		2,678,001		412,071		53,569						32,767,124
320.29	8,168		0										8,168
320.30	5,943,551		920,498										6,864,049
320.37	10,000,742		335,355										10,336,097
330.00	35,124,500		3,507,933		642,239		385,344						37,604,850
330.10	1,540,919		243,438		242,133		145,280						1,396,944
330.20	1,787,324		345,686		408,890		245,334						1,478,786
330.30	117,944		16,778										134,722

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 3. BRINGFORWARD TO DECEMBER 31, 2021, OF BOOK RESERVE AS OF DECEMBER 31, 2020

Account	BOOK RESERVE BALANCE AS OF 12/31/2020	+	PROJECTED DEPRECIATION ACCRUALS	-	PROJECTED RETIREMENTS	-	PROJECTED COST OF REMOVAL	+	PROJECTED SALVAGE	+	ACQUISITIONS	=	PROJECTED BOOK RESERVE BALANCE AS OF 12/31/2021
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)
330.40	1,980,284		260,817										2,241,101
330.58	2,100,168		24,654										2,124,822
330.59	20,863,908		2,449,147		329,083								22,983,972
331.00	302,790,062		45,553,978		10,787,314		9,924,329						327,632,397
333.00	144,244,631		11,456,303		1,654,334		744,450						153,302,150
334.00	74,409,987		12,124,741		663,090		86,202		6,631				85,792,067
335.00	20,020,642		2,278,774		620,991		223,557						21,454,868
340.10	971,125		376,416										1,347,541
340.20	7,343,075		4,532,973		5,935,611								5,940,437
340.30	17,701,446		10,353,824		6,130,410								21,924,860
340.31	41,731,922		10,340,331										52,072,253
340.40	1,004		740										1,744
341.00	349		0										349
341.10	14,623,372		3,145,900		238,429		4,769		14,306				17,540,380
341.20	11,191,984		2,532,823		330,514		6,610		19,831				13,407,514
341.30	2,126,610		307,184		56,799		1,136		3,408				2,379,267
341.40	4,729,807		1,013,708		185,477		3,710		11,129				5,565,457
342.00	68,032		29,032										97,064
343.00	5,263,107		1,838,114										7,101,221
344.00	978,341		174,545										1,152,886
345.00	1,541,860		113,308										1,655,168
346.00	407,979		212,013		143,869								476,123
346.10	797,215		351,268										1,148,483
346.19	1,556,269		283,385		220,697								1,618,957
346.20	608,614		39,337		526,449								121,502
347.00	1,328,449		848,537		55,135								2,121,851
348.00	401,551		32,132										433,683
TOTAL	**1,054,514,266**		**145,901,271**		**39,278,399**		**13,401,143**		**117,804**		**0**		**1,147,853,799**

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 4. CALCULATION OF DEPRECIATION ACCRUALS FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

ACCOUNT (1)	NET ORIGINALCOST AS OF 12/31/2020 (2)	NET ORIGINALCOST AS OF 12/31/2021 (3)	ACCRUAL RATE (4)	AVERAGE ACCRUALS (5)*	AMORTIZATION OF NET SALVAGE (6)	PROJECTED DEPRECIATION ACCRUALS (7)=(5)+(6)
303.14	1,942,822.51	1,942,822.51	0.00	(487)	487	0
303.35	155,025.17	155,025.17	5.98	9,270		9,270
303.99	8,413,546.31	9,710,061.35	13.83	1,203,911	613	1,204,524
304.15	40,603,116.18	44,248,707.65	2.14	906,382	141,738	1,048,120
304.20	110,059,548.11	120,487,362.70	2.56	2,930,331	45,691	2,976,022
304.30	266,957,000.42	289,583,861.48	2.15	5,850,996	283,391	6,134,387
304.36	11,668,886.83	11,668,886.83	2.69	313,454	8,737	322,191
304.38	65,958.42	65,958.42	3.54	2,338		2,338
304.39	119,362.95	119,362.95	2.79	3,331		3,331
304.61	43,412,787.39	43,932,472.44	2.97	1,298,373	(81,465)	1,216,908
304.62	54,890,101.85	55,111,313.86	2.58	1,418,230	(15,508)	1,402,722
304.63	4,000,139.23	4,132,815.74	2.06	83,448	673	84,121
305.00	135,669,088.72	135,669,088.72	1.47	1,996,136	271,257	2,267,393
306.00	18,215,787.08	18,215,787.08	2.51	456,818	8,076	464,894
307.00	9,898,022.81	10,623,182.73	2.34	235,405	24,281	259,686
310.00	18,136,948.65	19,809,562.50	2.71	495,783	21,507	517,290
311.20	21,292,217.56	23,758,420.92	3.28	725,917	295,515	1,021,432
311.50	2,389,457.83	2,389,457.83	3.24	77,326		77,326
311.52	12,617,080.84	14,212,241.21	3.35	445,658		445,658
311.53	42,848,060.38	46,865,937.19	2.80	1,212,264		1,212,264
311.54	6,787,710.63	6,787,710.63	3.01	204,043		204,043
320.10	225,716,944.63	277,364,892.10	2.44	5,905,753	397,387	6,303,140
320.18	103,245.73	103,245.73	0.00	0		0
320.19	3,522,542.77	3,522,542.77	0.07	2,538		2,538
320.20	80,858,527.99	84,703,323.42	3.26	2,678,001		2,678,001
320.29	8,167.87	8,167.87	0.00	0		0
320.30	8,601,165.21	8,601,165.21	9.68	832,282	88,216	920,498
320.37	14,969,798.93	14,969,798.93	1.81	271,256	64,099	335,355
330.00	106,929,232.38	114,750,102.23	1.80	1,970,376	1,537,557	3,507,933
330.10	10,930,110.10	14,100,477.17	2.06	243,438		243,438
330.20	15,192,040.47	18,929,725.89	2.09	345,686		345,686
330.30	818,672.56	818,672.56	2.05	16,778		16,778

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 4. CALCULATION OF DEPRECIATION ACCRUALS FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

ACCOUNT	NET ORIGINALCOST AS OF 12/31/2020	NET ORIGINALCOST AS OF 12/31/2021	ACCRUAL RATE	AVERAGE ACCRUALS	AMORTIZATION OF NET SALVAGE	PROJECTED DEPRECIATION ACCRUALS
(1)	(2)	(3)	(4)	(5)*	(6)	(7)=(5)+(6)
330.40	12,806,094.73	12,806,094.73	2.04	260,817		260,817
330.58	2,211,111.35	2,211,111.35	1.12	24,654		24,654
330.59	29,919,635.20	34,570,376.62	7.86	2,449,147		2,449,147
331.00	2,675,857,649.51	2,799,921,328.82	1.21	32,758,152	12,795,826	45,553,978
333.00	604,695,086.73	631,916,771.52	1.66	10,245,705	1,210,598	11,456,303
334.00	196,137,446.01	206,255,053.90	5.51	11,091,554	1,033,187	12,124,741
335.00	115,429,813.60	122,785,610.66	1.60	1,894,800	383,974	2,278,774
340.10	5,339,828.99	7,475,864.68	5.31	340,079	36,337	376,416
340.20	19,364,761.45	24,511,435.46	21.66	4,532,973		4,532,973
340.30	42,907,597.73	45,994,769.94	21.25	10,353,824		10,353,824
340.31	62,990,459.09	62,990,459.09	16.42	10,340,331		10,340,331
340.50	7,290.67	7,290.67	10.15	740		740
341.00	349.00	349.00	0.00	0		0
341.10	26,577,670.21	28,802,310.96	11.00	3,063,529	82,371	3,145,900
341.20	20,121,976.99	23,205,811.64	11.93	2,532,823		2,532,823
341.30	3,344,774.93	3,874,730.49	8.40	307,184		307,184
341.40	8,708,645.51	10,439,225.68	11.54	1,013,708		1,013,708
342.00	448,033.65	448,033.65	6.04	27,046	1,986	29,032
343.00	29,078,050.31	32,097,137.82	5.99	1,829,220	8,894	1,838,114
344.00	2,606,821.35	2,606,821.35	6.50	169,353	5,192	174,545
345.00	2,405,805.64	2,405,805.64	4.67	112,304	1,004	113,308
346.00	2,539,854.88	3,459,420.00	6.19	188,316	23,697	212,013
346.10	4,581,387.28	6,770,729.39	6.62	351,268		351,268
346.19	3,011,599.18	2,790,901.75	9.44	283,385		283,385
346.20	714,839.66	188,390.60	5.68	39,337		39,337
347.00	11,260,526.60	11,604,345.21	7.24	827,967	20,570	848,537
348.00	793,796.73	793,796.73	4.03	31,976	156	32,132
TOTAL	**5,161,654,025.49**	**5,478,296,131.14**		**127,205,227**	**18,696,044**	**145,901,271**

* Annual Accrual developed based on monthly averages.

PENNSYLVANIA-AMERICAN WATER COMPANY
WATER OPERATIONS EXCLUDING STEELTON

TABLE 5. AMORTIZATION OF EXPERIENCED AND ESTIMATED NET SALVAGE

ACCOUNT	2017 GROSS SALVAGE	2017 COST OF REMOVAL	2018 GROSS SALVAGE	2018 COST OF REMOVAL	2019 GROSS SALVAGE	2019 COST OF REMOVAL	PROJECTED 2020 GROSS SALVAGE	PROJECTED 2020 COST OF REMOVAL	PROJECTED 2021 GROSS SALVAGE	PROJECTED 2021 COST OF REMOVAL	NET SALVAGE	SALVAGE ACCRUAL
(1)	(2)	- (3)	+ (4)	- (5)	+ (6)	- (7)	+ (8)	- (9)	+ (10)	- (11)	= (12)*	(13)=(12)/5
303.14				2,459.00		3,062.78					(2,459.00)	(492)
303.20		2,459.00		(2,459.00)							0.00	0
303.99											(3,062.78)	(613)
304.15		68,090.61	1,582.30	180,812.86	27,560.73	387,837.75	1,329.00	32,333.00	11,722.00	285,226.00	(912,106.19)	(182,421)
304.20		38,831.70	13,853.00	39,684.28	31,830.10	147,277.43	4,421.00	26,528.00	20,220.00	121,321.00	(303,318.31)	(60,664)
304.30		36,848.82	14,493.83	1,091,908.37	66,260.61	148,391.82	2,461.00	31,989.00	24,251.00	315,258.00	(1,516,929.57)	(303,386)
304.36				43,138.55		546.00					(43,684.55)	(8,737)
304.61		71,906.49			1,864,549.94	1,304,656.48		9,724.00		5,013.00	473,249.97	94,650
304.62		10,015.90	729.22	6,567.28	192,159.79	54,481.40	9,550.00	5,813.00	5,453.00	3,319.00	127,695.43	25,539
304.63		2,051.43		3,068.49	25,209.50	8,030.27	1,607.00	5,357.00	853.00	2,844.00	6,318.31	1,264
305.00		5,620.91				1,266,548.34					(1,272,169.25)	(254,434)
306.00		16,836.83				17,003.99					(33,840.82)	(6,768)
307.00		618.42		1,391.04		118,341.25					(120,350.71)	(24,070)
310.00		2,903.30		11,634.03		42,462.99		4,760.00		46,609.00	(108,369.32)	(21,674)
311.00	880.05	72,179.55		191,399.40	13,739.63	1,092,490.18		33,004.00		147,204.00	(1,521,657.45)	(304,331)
320.00	3.44	115,579.33	512.50	619,426.48	229.83	924,729.91		225,992.00		703,628.00	(2,588,609.95)	(517,722)
320.30		1,622.00				423,003.27					(424,625.27)	(84,925)
320.37		7,150.00		29,963.00	23.00	90,807.00					(127,897.00)	(25,579)
330.00		645,827.57	162.78	2,820,506.21		2,686,207.69		165,227.00		775,958.00	(7,093,563.69)	(1,418,713)
331.00	107,310.05	7,290,999.85	25,598.82	11,746,655.36	13,124.96	21,381,790.52		12,141,393.00		9,924,329.00	(62,339,133.90)	(12,467,827)
333.00	2,339.38	1,164,164.90	(214.01)	1,300,493.65	9,792.38	1,897,743.49		714,893.00		744,450.00	(5,809,827.29)	(1,161,965)
334.00	98,185.09	960,401.22	115,629.32	913,142.15	93,029.52	2,727,391.38	8,480.00	110,240.00	6,631.00	86,202.00	(4,475,421.82)	(895,084)
335.00	248.83	227,143.79	2,311.49	309,652.61	4,063.03	908,970.88		204,109.00		223,557.00	(1,866,809.93)	(373,362)
340.00		6,364.74	8,779.58	30,861.14	10,745.87	122,477.36					(140,177.79)	(28,036)
341.00		1,430.78	205,163.90	148,702.02	261,902.01	761,298.60	50,503.00	16,835.00	48,674.00	16,225.00	(378,248.49)	(75,650)
342.00				245.80		9,682.12					(9,927.92)	(1,986)
343.00		8,345.37		7,924.48	48,579.17	57,836.24					(25,526.92)	(5,105)
344.00		1,202.11		4,823.99		14,919.23					(20,945.33)	(4,189)
345.00		98.42		860.13	12,288.18	15,876.66					(4,547.03)	(909)
346.00		646.24	132.58	30,002.27		87,193.50					(117,709.43)	(23,542)
347.00		12,915.37		20,027.66	8,306.50	73,665.55					(98,302.08)	(19,660)
348.00				(29.21)		808.08					(778.87)	(156)
TOTAL	208,966.84	10,772,254.65	388,735.31	19,552,862.04	2,683,394.75	36,775,532.16	78,351.00	13,728,197.00	117,804.00	13,401,143.00	(90,752,736.95)	(18,150,547)

*mmation of Columns (2) through (11).

Appendix A-5.1 (AUS)

Exhibit No. 11-L
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

MECHANICSBURG, PENNSYLVANIA

WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

2022 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WASTEWATER PLANT AS OF DECEMBER 31, 2022

Prepared by:

Gannett Fleming

Excellence Delivered ***As Promised***

Exhibit No. 11-L
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

Mechanicsburg, Pennsylvania

WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

2022 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WASTEWATER PLANT
AS OF DECEMBER 31, 2022

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Camp Hill, Pennsylvania

Gannett Fleming

Excellence Delivered ***As Promised***

April 22, 2020

Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

Attention Ashley E. Everette
Director, Rates & Regulatory

Ladies and Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to wastewater plant as of December 31, 2022. The results of our study at December 31, 2020 are presented in our report titled "2020 Depreciation Study - Calculated Annual Depreciation Accruals Related to Wastewater Plant as of December 31, 2020". The same methods, procedures and estimates are used in both studies.

Summaries of the original cost, annual accruals, book depreciation reserve and amortization of net salvage are presented in Tables 1 through 5, beginning on page I-3 of the attached report.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
President

JJS:mle

066548.100

Gannett Fleming Valuation and Rate Consultants, LLC
207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.4590
www.gfvrc.com

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PART I. RESULTS OF STUDY

PENNSYLVANIA-AMERICAN WATER COMPANY

WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

DEPRECIATION STUDY

PART I. RESULTS OF STUDY

SUMMARY OF RESULTS

Tables 1 through 5 presented on pages I-3 through I-7 summarize the results of the depreciation study as of December 31, 2022. Table 1 sets forth the development of the net original cost by account as of December 31, 2022. Table 2 sets forth, by depreciable group, the estimated survivor curve, original cost, book depreciation reserve as of December 31, 2022, future book accruals, calculated annual accrual amount and rate, and composite remaining life for plant in service. Table 3 presents the bringforward of the book reserve to December 31, 2022. Table 4 sets forth the calculation of the depreciation accruals for the twelve months ended December 31, 2022. Table 5 presents the annual amortization of experienced and estimated net salvage based on the period 2018 through 2022.

DESCRIPTION OF DETAILED TABULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page II-7. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount. The amounts of regular retirements, gross salvage and cost of removal are set forth by account for the years 2018 through 2022, beginning on pages III-2 through III-4.

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2022

DEPRCIABLE GROUP (1)	ORIGINAL COST AS OF DECEMBER 31, 2022 (2)	- CUSTOMER ADVANCES (3)	- CONTRIBUTIONS IN AID OF CONSTRUCTION (4)	- EXCLUDED PROPERTY (5)	= NET ORIGINAL COST AS OF DECMEBER 31, 2022 (6)
DEPRECIABLE PLANT					
354.20 STRUCTURES AND IMPROVEMENTS - COLLECTION	1,372,711.27				1,372,711.27
354.30 STRUCTURES AND IMPROVEMENTS - SPP	17,988,212.97		2,734,528.70		15,253,684.27
354.40 STRUCTURES AND IMPROVEMENTS - TDP	55,042,602.26		1,853,012.73		53,189,589.53
354.70 STRUCTURES AND IMPROVEMENTS - GENERAL	3,153,826.87				3,153,826.87
355.00 POWER GENERATION EQUIPMENT	4,180,589.06		144,517.16		4,036,071.90
360.10 COLLECTION SEWERS - FORCE MAINS	50,575,251.29	157,753.14	11,251,126.61		39,166,371.54
361.10 COLLECTION SEWERS - GRAVITY MAINS	120,095,333.20	133,423.53	13,295,536.11		106,666,373.56
361.20 MANHOLES	17,657,269.96		4,387,312.76		13,269,957.20
363.00 SERVICES	24,656,795.81	70,197.45	3,753,803.46		20,832,794.90
364.00 FLOW MEASURING DEVICES	371,151.65		14,726.81		356,424.84
365.00 FLOW MEASURING INSTALLATIONS	14,938.00				14,938.00
370.00 RECEIVING WELLS	143,419.77				143,419.77
371.00 PUMPING EQUIPMENT	13,374,027.20		66,626.22		13,307,400.98
380.00 TREATMENT EQUIPMENT	67,907,787.21		2,200,080.47		65,707,706.74
381.00 PLANT SEWERS	6,212,540.44		30,192.33		6,182,348.11
382.00 OUTFALL SEWER LINES	604,388.91				604,388.91
389.10 OTHER PLANT AND MISCELLANEOUS EQUIPMENT - INTANGIBLES	582,205.16				582,205.16
389.60 OTHER PLANT AND MISCELLANEOUS EQUIPMENT - CPS	1,707,500.00				1,707,500.00
390.00 OFFICE FURNITURE AND EQUIPMENT	168,706.08				168,706.08
391.00 TRANSPORTATION EQUIPMENT	3,034,840.81				3,034,840.81
392.00 STORES EQUIPMENT	107,351.44				107,351.44
393.00 TOOLS, SHOP AND GARAGE EQUIPMENT	1,505,097.79				1,505,097.79
394.00 LABORATORY EQUIPMENT	729,305.71				729,305.71
395.00 POWER OPERATED EQUIPMENT	917,645.43		10,000.00		907,645.43
396.00 COMMUNICATION EQUIPMENT	1,744,213.66				1,744,213.66
397.00 MISCELLANEOUS EQUIPMENT	661,593.59		29,000.00		632,593.59
398.00 OTHER TANGIBLE PLANT	14,231.50				14,231.50
TOTAL DEPRECIABLE PLANT	**394,523,537.04**	**361,374.12**	**39,770,463.36**	**0.00**	**354,391,699.56**
NONDEPRECIABLE PLANT					
352.10 FRANCHISES	221,139.78				221,139.78
353.20 LAND AND LAND RIGHTS - COLLECTION	1,093,483.20				1,093,483.20
353.30 LAND AND LAND RIGHTS - SPP	85,560.07				85,560.07
353.40 LAND AND LAND RIGHTS - TDP	1,717,020.09		125,000.00		1,592,020.09
TOTAL NONDEPRECIABLE PLANT	**3,117,203.14**	**0.00**	**125,000.00**	**0.00**	**2,992,203.14**
TOTAL UTILITY PLANT	**397,640,740.18**	**361,374.12**	**39,895,463.36**	**0.00**	**357,383,902.70**

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVE, ORIGINAL COST, BOOK RESERVE, AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WASTEWATER PLANT AS OF DECEMBER 31, 2022

	DEPRECIABLE GROUP	SURVIVOR CURVE	ORIGINAL COST AS OF DECEMBER 31, 2022	BOOK RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(6)/(3)	(8)
	DEPRECIABLE PLANT							
354.20	STRUCTURES AND IMPROVEMENTS - COLLECTION	45-R3	1,372,711.27	97,323	1,275,388	38,320	2.79	33.3
354.30	STRUCTURES AND IMPROVEMENTS - SPP	55-S0	15,253,684.27	5,449,788	9,803,896	300,957	1.97	32.6
354.40	STRUCTURES AND IMPROVEMENTS - TDP	55-S0	53,189,589.53	13,447,768	39,741,821	1,254,377	2.36	31.7
354.70	STRUCTURES AND IMPROVEMENTS - GENERAL	35-S1	3,153,826.87	1,687,584	1,466,242	63,310	2.01	23.2
355.00	POWER GENERATION EQUIPMENT	35-S0.5	4,036,071.90	2,807,978	1,228,094	63,471	1.57	19.3
360.10	COLLECTION SEWERS - FORCE MAINS	75-R3	39,166,371.54	3,526,886	35,639,485	678,631	1.73	52.5
361.10	COLLECTION SEWERS - GRAVITY MAINS	80-R2.5	106,666,373.56	13,972,547	92,693,827	1,691,826	1.59	54.8
361.20	MANHOLES	50-S2.5	13,269,957.20	2,036,681	11,233,276	348,535	2.63	32.2
363.00	SERVICES	47-R3	20,832,794.90	4,780,861	16,051,934	531,451	2.55	30.2
364.00	FLOW MEASURING DEVICES	15-L2.5	356,424.84	170,648	185,777	36,426	10.22	5.1
365.00	FLOW MEASURING INSTALLATIONS	25-S2	14,938.00	2,513	12,425	1,154	7.73	10.8
370.00	RECEIVING WELLS	50-R3	143,419.77	34,923	108,497	3,219	2.24	33.7
371.00	PUMPING EQUIPMENT	30-S0.5	13,307,400.98	2,331,656	10,975,745	602,548	4.53	18.2
380.00	TREATMENT EQUIPMENT	35-S1.5	65,707,706.74	18,480,154	47,227,552	2,355,132	3.58	20.1
381.00	PLANT SEWERS	50-R3	6,182,348.11	1,591,522	4,590,827	140,418	2.27	32.7
382.00	OUTFALL SEWER LINES	50-R3	604,388.91	244,690	359,698	12,727	2.11	28.3
389.10	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - INTANGIBLES	20-S2.5	582,205.16	231,563	350,642	31,102	5.34	11.3
389.60	OTHER PLANT AND MISCELLANEOUS EQUIPMENT - CPS	5-SQ	1,707,500.00	457,989	1,249,511	357,607	20.94	3.5
390.00	OFFICE FURNITURE AND EQUIPMENT	20-SQ	168,706.08	37,591	131,115	13,043	7.73	10.1
391.00	TRANSPORTATION EQUIPMENT	14-L4	3,034,840.81	718,213	2,316,627	235,403	7.76	9.8
392.00	STORES EQUIPMENT	25-SQ	107,351.44	33,748	73,604	4,273	3.98	17.2
393.00	TOOLS, SHOP AND GARAGE EQUIPMENT	20-SQ	1,505,097.79	299,112	1,205,986	78,428	5.21	15.4
394.00	LABORATORY EQUIPMENT	15-SQ	729,305.71	275,058	454,248	43,556	5.97	10.4
395.00	POWER OPERATED EQUIPMENT	22-R2	907,645.43	389,500	518,146	39,364	4.34	13.2
396.00	COMMUNICATION EQUIPMENT	15-SQ	1,744,213.66	998,400	745,814	107,830	6.18	6.9
397.00	MISCELLANEOUS EQUIPMENT	15-SQ	632,593.59	205,091	427,503	33,372	5.28	12.8
398.00	OTHER TANGIBLE PLANT	25-SQ	14,231.50	2,461	11,771	547	3.84	21.5
	TOTAL DEPRECIABLE PLANT		**354,391,699.56**	**74,312,248**	**280,079,451**	**9,067,027**	**2.56**	**30.9**
	NONDEPRECIABLE PLANT							
352.10	FRANCHISES		221,139.78					
353.20	LAND AND LAND RIGHTS - COLLECTION		1,093,483.20					
353.30	LAND AND LAND RIGHTS - SPP		85,560.07					
353.40	LAND AND LAND RIGHTS - TDP		1,592,020.09					
	TOTAL NONDEPRECIABLE PLANT		**2,992,203.14**					
	AMORTIZATION OF NET SALVAGE					**897,190**		
	TOTAL UTILITY PLANT		**357,383,902.70**	**74,312,248**	**280,079,451**	**9,964,217**		

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

TABLE 3. BRINGFORWARD TO DECEMBER 31, 2022, OF BOOK RESERVE AS OF DECEMBER 31, 2021

ACCOUNT	PROJECTED BOOK RESERVE BALANCE AS OF 12/31/2021	+	PROJECTED DEPRECIATION ACCRUALS	-	PROJECTED RETIREMENTS	-	PROJECTED COST OF REMOVAL	+	PROJECTED SALVAGE	+	ACQUISITIONS	=	PROJECTED BOOK RESERVE BALANCE AS OF 12/31/2022
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)
354.20	49,219		63,092		1,401		13,587						97,323
354.30	5,144,884		325,647		18,356		2,386						5,449,788
354.40	12,232,042		1,272,456		56,167		562						13,447,768
354.70	1,613,097		88,037		3,218		10,331						1,687,584
355.00	2,739,150		68,828										2,807,978
360.10	2,894,314		759,287		62,421		64,294						3,526,886
361.10	12,678,919		1,999,555		480,223		225,705						13,972,547
361.20	1,778,786		417,490		22,832		137,220		457				2,036,681
363.00	4,422,337		604,967		122,608		123,835						4,780,861
364.00	127,900		42,748										170,648
365.00	1,315		1,198										2,513
370.00	31,682		3,241										34,923
371.00	1,690,669		652,922		9,472		2,463						2,331,656
380.00	16,084,154		2,433,983		33,913		4,070						18,480,154
381.00	1,449,946		141,576										1,591,522
382.00	231,500		13,190										244,690
389.10	199,257		32,306										231,563
389.60	106,944		351,045										457,989
390.00	24,328		13,263										37,591
391.00	533,900		218,897		29,813		4,770						718,213
392.00	29,475		4,273										33,748
393.00	227,278		71,834										299,112
394.00	233,029		42,973		859		86						275,058
395.00	361,954		35,148		7,453		149						389,500
396.00	887,391		113,680		2,450		221						998,400
397.00	176,585		28,506										205,090
398.00	1,652		809										2,461
TOTAL	65,951,706		9,800,949		851,187		589,676		457		0		74,312,248

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

TABLE 4. CALCULATION OF DEPRECIATION ACCRUALS FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022

ACCOUNT	NET ORIGINAL COST AS OF 12/31/2021	NET ORIGINAL COST AS OF 12/31/2022	ACCRUAL RATE	DEPRECIATION ACCRUALS	AMORTIZATION OF NET SALVAGE	PROJECTED DEPRECIATION ACCRUALS
(1)	(2)	(3)	(4)	(5)*	(6)	(7)=(5)+(6)
354.20	1,350,155.77	1,372,711.27	2.84	38,574	24,518	63,092
354.30	14,958,113.65	15,253,684.27	2.01	302,788	22,859	325,647
354.40	52,285,165.25	53,189,589.53	2.41	1,267,886	4,570	1,272,456
354.70	3,102,005.24	3,153,826.87	2.01	62,724	25,313	88,037
355.00	4,036,071.90	4,036,071.90	1.63	65,788	3,040	68,828
360.10	38,161,242.14	39,166,371.54	1.75	673,706	85,581	759,287
361.10	99,296,640.99	106,666,373.56	1.60	1,633,382	366,173	1,999,555
361.20	12,812,001.40	13,269,957.20	2.63	342,146	75,344	417,490
363.00	18,663,546.11	20,832,794.90	2.55	500,757	104,210	604,967
364.00	356,424.84	356,424.84	11.98	42,700	48	42,748
365.00	14,938.00	14,938.00	8.02	1,198		1,198
370.00	143,419.77	143,419.77	2.26	3,241		3,241
371.00	13,154,873.34	13,307,400.98	4.71	619,894	33,028	652,922
380.00	64,581,620.12	65,707,706.74	3.67	2,371,867	62,116	2,433,983
381.00	6,182,348.11	6,182,348.11	2.29	141,576		141,576
382.00	604,388.91	604,388.91	2.13	12,873	317	13,190
389.10	582,205.16	582,205.16	5.48	31,905	401	32,306
389.60	1,655,000.00	1,707,500.00	20.97	351,045		351,045
390.00	168,706.08	168,706.08	7.76	13,092	171	13,263
391.00	2,554,774.18	3,034,840.81	7.83	213,813	5,084	218,897
392.00	107,351.44	107,351.44	3.98	4,273		4,273
393.00	1,199,614.28	1,505,097.79	5.29	71,382	452	71,834
394.00	628,336.51	729,305.71	6.14	41,616	1,357	42,973
395.00	787,628.77	907,645.43	4.17	34,678	470	35,148
396.00	1,669,700.06	1,744,213.66	6.33	107,931	5,749	113,680
397.00	496,492.71	632,593.59	4.84	26,200	2,306	28,506
398.00	14,231.50	14,231.50	3.93	559	250	809
TOTAL	339,566,996.23	354,391,699.56		8,977,592	823,357	9,800,949

* Total accruals shown are based on average monthly balances.

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER SSS OPERATIONS EXCLUDING SADSBURY AND EXETER

TABLE 5. AMORTIZATION OF EXPERIENCED AND ESTIMATED NET SALVAGE

ACCOUNT	2018			2019			PROJECTED 2020			PROJECTED 2021			PROJECTED 2022				
	GROSS SALVAGE	-	COST OF REMOVAL	+	GROSS SALVAGE	-	COST OF REMOVAL	+	GROSS SALVAGE	-	COST OF REMOVAL	+	GROSS SALVAGE	-	COST OF REMOVAL	=	NET SALVAGE	SALVAGE ACCRUAL
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)*	(13)=(12)/5
354.20			2,367				27,531				29,175				63,211				13,587		(135,871)	(27,174)
354.30			87				61,135				5,124				11,101				2,386		(79,833)	(15,967)
354.40			(18,539)				1,986				1,206				2,613				562		12,172	2,434
354.70			36,100				18,075				22,182				48,060				10,331		(134,747)	(26,949)
355.00			4,539				9,730														(14,269)	(2,854)
360.10			85,350				245,202				41,420				54,123				64,294		(490,390)	(98,078)
361.10			345,943				1,038,559				170,104				222,272				225,705		(2,002,583)	(400,517)
361.20							109,567		440		132,346		452		135,702		457		137,220		(513,485)	(102,697)
363.00			48,455				150,830				130,023				122,465				123,835		(575,608)	(115,122)
364.00							240														(240)	(48)
371.00			(18,885)				141,438				37,534								2,463		(162,550)	(32,510)
380.00			12,304				214,843				11,073				65,469				4,070		(307,759)	(61,552)
382.00			981																		(981)	(196)
389.10			(3,678)				5,682														(2,003)	(401)
390.00			94																		(94)	(19)
391.00			9,708				6,029				5,013				4,669				4,770		(30,189)	(6,038)
393.00							1,931														(1,931)	(386)
394.00			118				5,593				1,012								86		(6,809)	(1,362)
395.00							2,048				157				146				149		(2,500)	(500)
396.00							1,898				21,079				293				221		(23,491)	(4,698)
397.00			6,019				5,513														(11,532)	(2,306)
398.00							1,251														(1,251)	(250)
TOTAL	0		510,964		0		2,049,082		440		607,449		452		730,122		457		589,676		(4,485,944)	(897,190)

* Column (12) equals the summation of Columns (2) through (11).

Appendix A-5.1 (AUS)

Pennsylvania American Water Company

Valley Township, Chester County, Pennsylvania

Water System
Appraisal Work Papers
As of December 17, 2019

PAWC General Rate Cases Depreciation Studies
Water and Wastewater 2017

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

VOLUME 11

PENNSYLVANIA-AMERICAN WATER COMPANY

2017 GENERAL BASE RATE CASE

R-2017-2595853

EXHIBIT NO. 11-C - DEPRECIATION STUDY

WATER OPERATIONS AS OF

DECEMBER 31, 2018

Exhibit No. 11-C
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

HERSHEY, PENNSYLVANIA

2018 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WATER PLANT
AS OF DECEMBER 31, 2018

Prepared by:

Gannett Fleming

Excellence Delivered As Promised

Exhibit No. 11-C
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

Hershey, Pennsylvania

2018 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WATER PLANT
AS OF DECEMBER 31, 2018

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Camp Hill, Pennsylvania

Gannett Fleming

*Excellence Delivered **As Promised***

April 21, 2017

Pennsylvania-American Water Company
800 West Hersheypark Drive
Hershey, PA 17033

Attention: Mr. John R. Cox
Manager of Rates and Regulations

Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to water plant as of December 31, 2018. The results of our study at December 31, 2013 are presented in our report titled "2017 Depreciation Study - Calculated Annual Depreciation Accruals Related to Water Plant as of December 31, 2017". The same methods, procedures and estimates are used in both studies.

Summaries of the original cost, annual accruals, book depreciation reserve and amortization of net salvage are presented in Tables 1 through 5, beginning on page I-3 of the attached report.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
Sr. Vice President

JJS:mlw

062027.100

Gannett Fleming Valuation and Rate Consultants, LLC
P.O. Box 67100 • Harrisburg, PA 17106-7100 | 207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.4590
www.gfvrc.com

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PART I. RESULTS OF STUDY

PENNSYLVANIA-AMERICAN WATER COMPANY

DEPRECIATION STUDY

RESULTS OF STUDY

DESCRIPTION OF SUMMARY TABULATIONS

Tables 1 through 5 presented on pages 3 through 10 summarize the results of the depreciation study as of December 31, 2018. Table 1 sets forth the development of the net original cost by account as of December 31, 2018. Table 2 sets forth, by depreciable group, the estimated survivor curve, original cost, book depreciation reserve as of December 31, 2018, future book accruals, calculated annual accrual amount and rate, and composite remaining life for plant in service. Table 3 presents the bringforward of the book reserve to December 31, 2018. Table 4 sets forth the calculation of the depreciation accruals for the twelve months ended December 31, 2018. Table 5 presents the annual amortization of experienced and estimated net salvage based on the period 2014 through 2018.

DESCRIPTION OF DETAILED TABULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page II-2. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount. The amounts of regular retirements, gross salvage and cost of removal are set forth by account for the years 2014 through 2018, beginning on pages III-2 through III-5.

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2018

	DEPRCIABLE GROUP (1)	ORIGINAL COST AS OF DECEMBER 31, 2018 (2)	- CUSTOMER ADVANCES (3)	- CONTRIBUTIONS IN AID OF CONSTRUCTION (4)	- EXCLUDED PROPERTY (5)	= NET ORIGINAL COST AS OF DECMEBER 31, 2018 (6)
INTANGIBLE PLANT						
301.00	ORGANIZATION	774,398.06				774,398.06
302.00	FRANCHISES AND CONSENTS	2,404,599.20				2,404,599.20
303.00	MISCELLANEOUS INTANGIBLE PLANT	15,569.16				15,569.16
	TOTAL INTANGIBLE PLANT	**3,194,566.42**	**0.00**	**0.00**	**0.00**	**3,194,566.42**
NONDEPRECIABLE PLANT						
303.20	POWER AND PUMPING LAND	3,576,428.03				3,576,428.03
303.30	PURIFICATION LAND	15,412.25				15,412.25
303.40	TRANS. AND DISTR. LAND AND RIGHTS OF WAY	4,578,480.03		215,927.20		4,362,552.83
303.50	DISTRIBUTION RESERVOIRS AND STANDPIPE LAND	2,389,882.77				2,389,882.77
303.51	TRANSMISSION AND DISTRIBUTION - LAND	1,762,423.06				1,762,423.06
303.52	TRANSMISSION AND DISTRIBUTION - RIGHTS OF WAY	5,288,947.81				5,288,947.81
303.61	OFFICE LAND	3,918,022.99				3,918,022.99
	TOTAL NONDEPRECIABLE PLANT	**21,529,596.94**	**0.00**	**215,927.20**	**0.00**	**21,313,669.74**
DEPRECIABLE PLANT						
303.14	WATER RIGHTS - HIBERNIA	1,942,822.51				1,942,822.51
303.35	WASTE HANDLING AND TREATMENT LAND	155,025.17				155,025.17
303.99	COMPREHENSIVE PLANNING STUDIES	9,920,726.11				9,920,726.11
304.15	OTHER WATER SOURCE STRUCTURES	34,442,969.90				34,442,969.90
304.20	POWER AND PUMPING STRUCTURES	107,320,207.30		1,289,607.60	41,310.00	105,989,289.70
304.30	PURIFICATION BUILDINGS	274,724,337.33		169,605.01	230,375.00	274,324,357.32
304.36	WASTE HANDLING AND TREATMENT STRUCTURE	11,733,221.74				11,733,221.74
304.38	WASTE HANDLING & TREATMENT STRUCTURE PAINTING	65,958.42				65,958.42
304.39	PURIFICATION BUILDINGS - TANK PAINTING	134,806.79				134,806.79
304.61	OFFICE BUILDINGS	40,019,986.62		60,000.00	12,834.00	39,947,152.62
304.62	STORES, SHOP AND GARAGE BUILDINGS	55,222,287.14		576.00		55,221,711.14
304.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	4,933,374.39				4,933,374.39
305.00	COLLECTING AND IMPOUNDING RESERVOIRS	134,357,766.90		3,575.00		134,354,191.90
306.00	LAKE, RIVER AND OTHER INTAKES	20,005,870.35		41,551.00		19,964,319.35
307.00	WELLS AND SPRINGS	11,241,893.43		71,610.27		11,170,283.16
310.00	OTHER POWER PRODUCTION EQUIPMENT	18,152,052.81		118,273.00	26,561.00	18,007,218.81
311.20	ELECTRIC PUMPING EQUIPMENT	21,282,287.19		1,954,569.05	116,716.00	19,211,002.14
311.50	OTHER	1,634,152.00				1,634,152.00
311.52	SOURCE OF SUPPLY	8,509,617.14				8,509,617.14
311.53	WATER TREATMENT	47,732,222.90				47,732,222.90
311.54	TRANSMISSION AND DISTRIBUTION	8,693,988.14				8,693,988.14

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2018

	DEPRCIABLE GROUP	ORIGINAL COST AS OF DECEMBER 31, 2018	- CUSTOMER ADVANCES	- CONTRIBUTIONS IN AID OF CONSTRUCTION	- EXCLUDED PROPERTY	= NET ORIGINAL COST AS OF DECMEBER 31, 2018
	(1)	(2)	(3)	(4)	(5)	(6)
320.10	PURIFICATION SYSTEM - LARGE STRUCTURES	203,017,958.78		27,162.27	627,852.00	202,362,944.51
320.18	PURIFICATION SYSTEM - LARGE STRUCTURES PAINT	103,245.73				103,245.73
320.19	PURIFICATION SYSTEM - LARGE STRUCTURES PAINT	3,770,702.48				3,770,702.48
320.20	PURIFICATION SYSTEM - CHEMICAL TREATMENT	83,453,443.30		42,367.00		83,411,076.30
320.29	PURIFICATION SYSTEM - CHEM. TREATMENT PAINT	8,167.87				8,167.87
320.30	GRANULAR ACTIVATED CARBON	8,693,834.87				8,693,834.87
320.37	WASTE HANDLING & TREATMENT - EQUIPMENT	16,075,077.23				16,075,077.23
330.00	DISTRIBUTION RESERVOIRS AND STANDPIPES	101,037,841.09		2,905,114.51		98,132,726.58
330.10	ELEVATED TANKS AND STANDPIPES	17,636,401.77				17,636,401.77
330.20	GROUND LEVEL FACILITIES	22,144,158.48				22,144,158.48
330.30	BELOW GRADE FACILITIES	818,744.06				818,744.06
330.40	CLEARWELL	14,179,641.14				14,179,641.14
330.58	DISTR. RESERVOIRS AND STANDPIPES - PAINTING	2,375,281.44				2,375,281.44
330.59	DISTR. RESERVOIRS AND STANDPIPES - PAINTING	36,418,707.41				36,418,707.41
331.00	MAINS AND ACCESSORIES	2,676,234,771.44	81,810,993.14	178,351,203.78	502,366.00	2,415,570,208.52
333.00	SERVICES	578,601,077.41	1,753,981.88	9,002,408.46		567,844,687.07
334.00	METERS	203,441,435.13	305,369.35	1,653,080.42		201,482,985.36
335.00	FIRE HYDRANTS	107,503,420.52		4,275,268.25		103,228,152.27
340.10	OFFICE FURNITURE	19,179,166.67				19,179,166.67
340.20	COMPUTERS AND PERIPHERAL EQUIPMENT	18,458,835.00		354.00		18,458,481.00
340.30	COMPUTER SOFTWARE - 5 YEAR	36,694,738.71				36,694,738.71
340.31	COMPUTER SOFTWARE - 10 YEAR	62,548,894.51				62,548,894.51
341.00	NOT CLASSIFIED	16,002.14				16,002.14
341.10	LIGHT DUTY TRUCKS	18,911,227.50				18,911,227.50
341.20	EQUIPMENT	14,430,392.96				14,430,392.96
341.30	AUTOS	4,883,332.68				4,883,332.68
341.40	OTHER	5,895,986.16				5,895,986.16
342.00	STORES EQUIPMENT	400,072.70				400,072.70
343.00	TOOLS AND WORK EQUIPMENT	26,095,362.58		61.00		26,095,301.58
344.00	LABORATORY EQUIPMENT	3,323,028.15				3,323,028.15
345.00	POWER OPERATED EQUIPMENT	2,571,357.61				2,571,357.61
346.00	EQUIPMENT	2,585,584.40				2,585,584.40
346.10	NON-TELEPHONE	918,926.11				918,926.11
346.19	REMOTE CONTROL AND INSTRUMENTATION	6,460,864.86				6,460,864.86
346.20	TELEPHONE	831,870.50				831,870.50
347.00	MISCELLANEOUS EQUIPMENT	17,035,118.69		4,085.00		17,031,033.69
348.00	OTHER TANGIBLE EQUIPMENT	735,410.29				735,410.29
	TOTAL DEPRECIABLE PLANT	**5,129,715,656.65**	**83,870,344.37**	**199,970,471.62**	**1,558,014.00**	**4,844,316,826.66**
	TOTAL WATER PLANT IN SERVICE	**5,154,439,820.01**	**83,870,344.37**	**200,186,398.82**	**1,558,014.00**	**4,868,825,062.82**

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP (1)	SURVIVOR CURVE (2)		NET ORIGINAL COST AS OF DECEMBER 31, 2018 (3)	BOOK RESERVE (4)	FUTURE ACCRUALS (5)	ANNUAL ACCRUAL AMOUNT (6)	ANNUAL ACCRUAL RATE, PERCENT (7)	COMPOSITE REMAINING LIFE (8)
INTANGIBLE PLANT									
301.00	ORGANIZATION	NONDEPR.		774,398.06					
302.00	FRANCHISES AND CONSENTS	NONDEPR.		2,404,599.20					
303.00	MISCELLANEOUS INTANGIBLE PLANT	NONDEPR.		15,569.16					
	TOTAL INTANGIBLE PLANT			**3,194,566.42**					
NONDEPRECIABLE PLANT									
303.20	POWER AND PUMPING LAND	NONDEPR.		3,576,428.03					
303.30	PURIFICATION LAND	NONDEPR.		15,412.25					
303.40	TRANSMISSION AND DISTRIBUTION LAND AND RIGHTS OF WAY	NONDEPR.		4,362,552.83					
303.50	DISTRIBUTION RESERVOIRS AND STANDPIPES LAND	NONDEPR.		2,389,882.77					
303.51	TRANSMISSION AND DISTRIBUTION - LAND	NONDEPR		1,762,423.06					
303.52	TRANSMISSION AND DISTRIBUTION - RIGHTS OF WAY	NONDEPR.		5,286,947.81					
303.61	OFFICE LAND	NONDEPR		3,918,022.99					
	TOTAL NONDEPRECIABLE PLANT			**21,313,669.74**					
DEPRECIABLE PLANT									
303.14	WATER RIGHTS - HIBERNIA	25-SQ	*	1,942,822.51	1,763,172	179,651	119,767	6.16	1.5
303.35	WASTE HANDLING AND TREATMENT LAND	100-R2	*	155,025.17	155,025	0	0	-	-
303.99	COMPREHENSIVE PLANNING STUDIES	5-SQ		9,920,726.11	6,716,899	3,203,827	1,251,002	12.61	2.6
304.15	OTHER WATER SOURCE STRUCTURES	60-R3		34,442,969.90	7,573,274	26,869,696	624,862	1.81	43.0
304.20	POWER AND PUMING STRUCTURES								
	LARGE STRUCTURES	70-R2.5	*	64,671,856.38	7,894,471	56,777,385	1,515,893	2.34	37.5
	OTHER STRUCTURES	55-R3		41,317,433.32	9,408,085	31,909,348	1,013,195	2.45	31.5
	TOTAL ACCOUNT 304.2			105,989,289.70	17,302,556	88,686,733	2,529,088	2.39	35.1
304.30	PURIFICATION BUILDINGS								
	LARGE STRUCTURES	60-R2.5	*	221,661,139.93	71,976,298	149,684,840	4,739,588	2.14	31.6
	OTHER STRUCTURES	55-R3		52,663,217.39	17,798,107	34,865,110	965,350	1.83	36.1
	TOTAL ACCOUNT 304.3			274,324,357.32	89,774,405	184,549,950	5,704,938	2.08	32.3
304.36	WASTE HANDLING AND TREATMENT STRUCTURES	60-R2.5	*	11,733,221.74	5,437,209	6,296,013	317,692	2.71	19.8
304.38	WASTE HANDLING AND TREATMENT STRUCTURES PAINTING	10-SQ		65,958.42	53,322	12,636	1,944	2.95	6.5
304.39	PURIFICATION BUILDINGS - TANK PAINTING	10-SQ		134,806.79	118,388	16,419	2,526	1.87	6.5
304.61	OFFICE BUILDINGS								
	LARGE STRUCTURES	50-R1.5	*	33,043,308.29	2,227,308	30,816,000	1,588,814	4.81	19.4
	OTHER OTHER STRUCTURES	45-R3		6,903,844.33	1,760,585	5,143,259	252,918	3.66	20.3
	TOTAL ACCOUNT 304.61			39,947,152.62	3,987,893	35,959,259	1,841,732	4.61	19.5
304.62	STORES, SHOP AND GARAGE BUILDINGS								
	LARGE STRUCTURES	75-R2	*	46,534,320.53	5,760,761	40,773,559	1,216,856	2.61	33.5
	OTHER OTHER STRUCTURES	45-R3		8,687,390.61	2,972,865	5,714,526	197,657	2.28	28.9
	TOTAL ACCOUNT 304.62			55,221,711.14	8,733,626	46,488,085	1,414,513	2.56	32.9

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	SURVIVOR CURVE	NET ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
304.63	MISCELLANEOUS STRUCTURES AND IMPROVEMENTS	50-R2.5	4,933,374.39	688,106	4,245,268	118,887	2.41	35.7
	TOTAL ACCOUNT 304		526,792,842.02	133,668,779	393,124,059	12,556,182	2.38	31.3
305.00	COLLECTING AND IMPOUNDING RESERVOIRS							
	LARGE RESERVOIRS	125-R2.5 *	127,795,628.42	12,895,938	114,899,691	1,855,378	1.45	61.9
	OTHER RESERVOIRS	75-R3	6,558,563.48	1,994,257	4,564,306	211,899	3.23	21.5
	TOTAL ACCOUNT 305		134,354,191.90	14,890,195	119,463,997	2,067,277	1.54	57.8
306.00	LAKE, RIVER AND OTHER INTAKES							
	LARGE RESERVOIRS	65-S1.5 *	14,550,654.76	4,232,561	10,318,093	281,627	1.94	36.6
	OTHER RESERVOIRS	60-S1	5,413,664.59	1,518,542	3,895,123	114,947	2.12	33.9
	TOTAL ACCOUNT 306		19,964,319.35	5,751,103	14,213,216	396,574	1.99	35.8
307.00	WELLS AND SPRINGS	55-R2	11,170,283.16	4,335,267	6,835,016	214,258	1.92	31.9
310.00	POWER GENERATION EQUIPMENT	40-R2.5	18,007,218.81	4,138,472	13,868,747	507,133	2.82	27.3
	PUMPING EQUIPMENT							
311.20	ELECTRIC PUMPING EQUIPMENT	50-R1	19,211,002.14	2,866,110	16,344,892	607,142	3.16	26.9
311.50	OTHER	50-R1	1,634,152.00	442,578	1,191,574	38,877	2.38	30.6
311.52	SOURCE OF SUPPLY	50-R1	8,509,617.14	1,490,308	7,019,309	230,180	2.70	30.5
311.53	WATER TREATMENT	50-R1	47,732,222.90	24,443,262	23,288,961	844,364	1.77	27.6
311.54	TRANSMISSION AND DISTRIBUTION	50-R1	8,693,988.14	2,116,640	6,577,348	228,997	2.63	28.7
	TOTAL ACCOUNT 311		85,780,982.32	31,358,898	54,422,084	1,949,560	2.27	27.9
	PURIFICATION SYSTEM							
320.10	PURIFICATION STRUCTURES							
	LARGE STRUCTURES	70-R2 *	184,705,299.72	68,522,614	116,182,684	3,855,315	2.09	30.1
	OTHER OTHER STRUCTURES	55-R3	17,657,644.79	6,494,933	11,162,712	326,633	1.85	34.2
	TOTAL ACCOUNT 320.1		202,362,944.51	75,017,547	127,345,396	4,181,948	2.07	30.5
320.18	LARGE STRUCTURES PAINT	10-SQ	103,245.73	103,246	0	0	-	-
320.19	LARGE STRUCTURES PAINT	10-SQ	3,770,702.48	3,730,550	40,152	6,177	0.16	6.5
320.20	CHEMICAL TREATMENT	32-R1	83,411,076.30	32,322,374	51,088,702	3,007,085	3.61	17.0
320.29	CHEMICAL TREATMENT PAINT	FULLY ACCRUED	8,167.87	8,168	0	0	-	-
	TOTAL PURIFICATION SYSTEM		289,656,136.89	111,181,885	178,474,250	7,195,210	2.48	24.8
320.30	GRANULAR ACTIVATED CARBON	6-L2.5	8,693,834.87	7,889,111	804,724	352,710	4.06	2.3
320.37	WASTE HANDLING AND TREATMENT - EQUIPMENT	25-R3	16,075,077.23	10,177,065	5,898,012	454,920	2.83	13.0
	TOTAL ACCOUNT 320		314,425,048.99	129,248,061	185,176,986	8,002,840	2.55	23.1
330.00	DISTRIBUTION RESERVOIRS AND STANDPIPES	65-R2	98,132,726.58	33,734,636	64,398,091	1,654,187	1.69	38.9
330.10	ELEVATED TANKS AND STANDPIPES	65-R2	17,636,401.77	1,995,151	15,641,251	351,909	2.00	44.4
330.20	GROUND LEVEL FACILITIES	65-R2	22,144,158.48	1,625,703	20,518,455	461,150	2.08	44.5
330.30	BELOW GRADE FACILITIES	65-R2	818,744.06	94,397	724,347	15,980	1.95	45.3
330.40	CLEARWELL	65-R2	14,179,641.14	1,641,824	12,537,817	277,639	1.96	45.2
330.58	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	10-SQ	2,375,281.44	2,271,962	103,319	15,895	0.67	6.5
330.59	DISTRIBUTION RESERVOIRS AND STANDPIPES - PAINTING	10-SQ	36,418,707.41	23,152,151	13,266,556	1,947,156	5.35	6.8
	TOTAL ACCOUNT 330		191,705,660.88	64,515,824	127,189,836	4,723,916	2.46	26.9

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVES, ORIGINAL COST, BOOK RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WATER PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	SURVIVOR CURVE	NET ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK RESERVE	FUTURE ACCRUALS	ANNUAL ACCRUAL AMOUNT	ANNUAL ACCRUAL RATE, PERCENT	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
331.00	MAINS AND ACCESSORIES	110-R2	2,415,570,208.52	334,433,465	2,081,136,744	28,333,986	1.17	73.5
333.00	SERVICES	70-R2	567,844,687.07	138,762,554	429,082,133	9,665,934	1.70	44.4
334.00	METERS AND METER INSTALLATIONS	19-L1.5	201,482,985.36	86,722,828	114,760,157	11,361,534	5.64	10.1
335.00	FIRE HYDRANTS	72-R2	103,228,152.27	21,864,870	81,363,282	1,738,263	1.68	46.8
340.00	OFFICE FURNITURE AND EQUIPMENT							
	FURNITURE	20-SQ	19,179,166.67	10,246,557	8,932,610	1,167,381	6.09	7.7
	COMPUTERS AND PERIPHERAL EQUIPMENT	5-SQ	18,458,481.00	10,236,065	8,222,416	4,056,320	21.98	2.0
	COMPUTER SOFTWARE - 5 YEAR	5-SQ	36,694,738.71	11,923,801	24,770,938	7,550,771	20.58	3.3
	COMPUTER SOFTWARE - 10 YEAR	10-SQ	62,548,894.51	33,663,138	28,885,757	7,061,454	11.27	4.1
	TOTAL ACCOUNT 340		136,881,280.89	66,069,561	70,811,721	19,825,926	14.48	3.6
341.00	TRANSPORATION EQUIPMENT							
	NOT CLASSIFIED	6-L3	16,002.14	16,002	0	0	-	-
	LIGHT DUTY TRUCKS	6-L3	18,911,227.50	11,779,314	7,131,914	2,386,794	12.62	3.0
	EQUIPMENT	6-L3	14,430,392.96	8,523,832	5,906,561	1,912,723	13.25	3.1
	AUTOS	6-L3	4,883,332.68	3,523,998	1,359,335	437,513	8.96	3.1
	OTHER	6-L3	5,895,966.16	3,635,257	2,260,729	740,427	12.56	3.1
	TOTAL ACCOUNT 341		44,136,941.44	27,478,403	16,658,539	5,477,457	12.41	3.0
342.00	STORES EQUIPMENT	20-SQ	400,072.70	175,368	224,705	25,808	6.45	8.7
343.00	TOOLS AND WORK EQUIPMENT	20-SQ	26,095,301.58	6,924,992	19,170,310	1,386,538	5.31	13.8
344.00	LABORATORY EQUIPMENT	20-R0.5	3,323,028.15	1,953,912	1,369,116	149,806	4.51	9.1
345.00	POWER OPERATED EQUIPMENT	10-S2	2,571,357.61	2,356,661	214,697	54,619	2.12	3.9
346.00	COMUNICATION EQUIPMENT							
	EQUIPMENT	15-SQ	2,585,584.40	1,596,948	988,636	191,330	7.40	5.2
	NON-TELEPHONE	15-SQ	918,926.11	337,227	581,699	62,431	6.79	9.3
	REMOTE CONTROL AND INSTRUMENTATION	10-SQ	6,460,864.86	2,304,114	4,156,751	639,314	9.90	6.5
	TELEPHONE	10-SQ	831,870.50	576,271	255,600	90,692	10.90	2.8
	TOTAL ACCOUNT 346		10,797,245.87	4,814,560	5,982,686	983,767	9.11	6.1
347.00	MISCELLANEOUS EQUIPMENT	25-SQ	17,031,033.69	7,190,728	9,840,306	740,716	4.35	13.3
348.00	OTHER TANGIBLE EQUIPMENT	25-SQ	735,410.29	336,044	399,366	29,846	4.06	13.4
	TOTAL DEPRECIABLE PLANT		**4,844,316,826.66**	**1,095,625,841**	**3,748,691,181**	**111,562,709**	**2.30**	
	AMORTIZATION OF NET SALVAGE					10,118,367		
	TOTAL WATER PLANT IN SERVICE		**4,868,826,062.82**	**1,095,625,841**	**3,748,691,181**	**121,681,076**		

* Life Span Procedure was used. Curve shown is Interim Survivor Curve.

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 3. BRINGFORWARD TO DECEMBER 31, 2018, OF BOOK RESERVE AS OF DECEMBER 31, 2017

Account	BOOK RESERVE BALANCE AS OF 12/31/2017	+	PROJECTED DEPRECIATION ACCRUALS	-	PROJECTED RETIREMENTS	-	PROJECTED COST OF REMOVAL	+	PROJECTED SALVAGE	+	ACQUISITIONS AND ADJUSTMENTS	=	PROJECTED BOOK RESERVE BALANCE AS OF 12/31/2018
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)
303.14	1,643,499		119,673										1,763,172
303.35	155,025		1								(1)		155,025
303.99	5,352,539		1,364,360										6,716,899
304.15	6,909,235		664,039										7,573,274
304.20	15,033,851		2,322,205		50,000		3,500						17,302,556
304.30	85,330,298		5,335,142		625,500		125,100		31,275				89,946,115
304.36	5,115,719		321,490										5,437,209
304.61	8,272,646		492,346		4,118,189		658,910						3,987,893
304.62	8,353,831		863,511		420,623		63,093						8,733,626
304.63	587,392		100,714										688,106
305.00	13,760,888		1,974,307		676,000		169,000						14,890,195
306.00	5,387,209		363,894										5,751,103
307.00	4,108,224		227,043										4,335,267
310.00	3,660,377		478,095										4,138,472
311.00	29,682,739		1,686,559		10,000		400						31,358,898
320.00	105,563,784		6,709,898		983,601		108,196						111,181,885
320.30	7,281,524		618,087		10,000		500						7,889,111
320.37	9,643,694		533,371										10,177,065
330.00	59,927,838		5,281,086		415,030		278,070						64,515,824
331.00	307,251,055		33,308,236		2,001,904		4,143,941		20,019				334,433,465
333.00	130,484,389		10,279,715		758,163		1,288,877		45,490				138,762,554
334.00	82,002,013		12,137,416		5,794,220		1,796,208		173,827				86,722,828
335.00	20,413,015		1,835,503		132,750		253,553		2,655				21,864,870
340.00	54,302,838		19,960,056		8,193,333								66,069,561
341.00	23,491,852		5,385,886		1,385,480		13,855						27,478,403
342.00	148,957		26,411										175,368
343.00	5,794,792		1,403,657		273,457								6,924,992
344.00	1,785,651		168,261										1,953,912
345.00	2,212,806		143,855										2,356,661
346.00	4,832,669		939,756		957,865								4,814,560
347.00	7,210,908		780,531		800,711								7,190,728
348.00	306,186		29,858										336,044
TOTAL	**1,016,007,443**		**115,854,962**		**27,606,826**		**8,903,203**		**273,266**		**(1)**		**1,095,625,641**

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 4. CALCULATION OF DEPRECIATION ACCRUALS FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2018

ACCOUNT (1)	NET ORIGINAL COST AS OF 12/31/2017 (2)	NET ORIGINAL COST AS OF 12/31/2018 (3)	ACCRUAL RATE (4)	AVERAGE ACCRUALS (5) **	AMORTIZATION OF NET SALVAGE (6) **	PROJECTED DEPRECIATION ACCRUALS (7)=(5)+(6)
303.14	1,942,822.51	1,942,822.51	6.16	119,678	(5)	119,673
303.35	155,025.17	155,025.17	0.00	0	1	1
303.99	9,576,726.11	9,920,726.11	13.49	1,364,360	0	1,364,360
304.15	34,442,969.90	34,442,969.90	1.83	630,306	33,733	664,039
304.20	93,905,163.70	105,989,289.70	2.43	2,294,131	28,074	2,322,205
304.30	243,136,140.53	274,525,122.53	2.04	5,060,596	274,546	5,335,142
304.36	11,733,221.74	11,733,221.74	2.74	321,490	0	321,490
304.61	17,094,819.62	39,947,152.62	2.57	463,808	28,538	492,346
304.62	32,773,506.14	55,221,711.14	2.43	827,212	36,299	863,511
304.63	3,533,821.39	4,933,374.39	2.36	84,774	15,940	100,714
305.00	104,994,473.90	134,354,191.90	1.59	1,841,311	132,996	1,974,307
306.00	17,500,498.35	19,964,319.35	2.01	362,121	1,773	363,894
307.00	11,170,283.16	11,170,283.16	1.96	218,938	8,105	227,043
310.00	16,166,661.81	18,007,218.81	2.80	459,831	18,264	478,095
311.00	75,163,955.32	85,780,982.32	2.09	1,580,172	106,387	1,686,559
320.00	249,747,732.89	289,656,136.89	2.42	6,175,354	534,544	6,709,898
320.30	8,392,061.87	8,693,834.87	6.87	577,398	40,689	618,087
320.37	16,075,077.23	16,075,077.23	3.07	493,505	39,866	533,371
330.00	175,036,176.88	191,705,660.88	2.38	4,247,686	1,033,400	5,281,086
331.00	2,266,777,896.52	2,415,570,208.52	1.18	27,309,171	5,999,065	33,308,236
333.00	544,561,188.07	567,844,687.07	1.71	9,499,159	780,556	10,279,715
334.00	190,951,156.36	201,482,985.36	5.65	11,052,527	1,084,889	12,137,416
335.00	97,220,732.27	103,228,152.27	1.69	1,691,756	143,747	1,835,503
340.00	128,187,365.27	136,881,280.89	14.81	19,947,271	12,785	19,960,056
341.00	38,595,020.44	44,136,941.44	13.47	5,380,407	5,479	5,385,886
342.00	400,072.70	400,072.70	6.57	26,285	126	26,411
343.00	24,418,459.37	26,095,301.58	5.47	1,390,131	13,526	1,403,657
344.00	3,323,028.15	3,323,028.15	4.99	165,819	2,442	168,261
345.00	2,571,357.61	2,571,357.61	5.56	142,967	888	143,855
346.00	9,582,111.31	10,797,245.87	9.36	935,813	3,943	939,756
347.00	16,642,716.36	17,031,033.69	4.55	773,172	7,359	780,531
348.00	735,410.29	735,410.29	4.06	29,858	0	29,858
TOTAL	**4,446,507,652.94**	**4,844,316,826.66**		**105,467,007**	**10,387,955**	**115,854,962**

** developed in monthly bringforward schedule

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY

TABLE 5. AMORTIZATION OF EXPERIENCED AND ESTIMATED NET SALVAGE

Account	EXPERIENCED AND ESTIMATED NET SALVAGE					5 - YEAR
	2014	2015	2016	2017	2018	AMORT.
(1)	(2)	(3)	(4)	(5)	(5)	(7)
	0	0	26	0	0	(5)
303.35	(4)	0	0	0	0	1
304.15	(46,636)	(46,243)	(70,089)	0	0	32,594
304.20	(53,488)	(56,757)	(26,237)	0	(3,500)	27,996
304.30	319,920	(476,945)	(191,035)	(19,080)	(93,825)	92,193
304.61	(65,824)	0	(70,936)	0	(658,910)	159,134
304.62	(80,107)	(3,615)	(48,019)	(14,400)	(63,093)	41,847
304.63	0	(59,776)	(11,676)	(8,250)	0	15,940
305.00	(317,805)	(46,348)	(84,116)	(59,314)	(169,000)	135,316
306.00	(2,002)	(324)	(6,542)	0	0	1,773
307.00	(13,938)	(16,118)	(1,054)	0	0	6,222
310.00	0	(8,915)	(45,776)	0	0	10,938
311.00	(162,341)	(159,509)	(103,119)	0	(400)	85,074
320.00	(93,583)	(182,337)	(101,953)	(91,944)	(108,196)	115,603
320.30	(27,730)	(78,144)	(16,457)	0	(500)	24,566
320.37	(6,734)	0	(192,597)	0	0	39,866
330.00	(631,746)	(1,024,942)	(1,370,181)	(475,306)	(278,070)	756,049
331.00	(3,496,437)	(7,578,550)	(11,564,326)	(4,703,868)	(4,123,922)	6,293,421
333.00	(446,624)	(606,667)	(987,614)	(1,239,963)	(1,243,387)	904,851
334.00	(764,036)	(1,258,131)	(770,084)	(1,414,519)	(1,622,381)	1,165,830
335.00	(146,091)	81,394	(276,615)	(244,260)	(250,898)	167,294
340.00	1,941	(20,871)	(41,508)	0	0	12,088
341.00	(1,555)	(13,623)	(1,158)	(11,060)	(13,855)	8,250
342.00	0	(630)	0	0	0	126
343.00	(9,640)	(19,321)	(18,941)	0	0	9,580
344.00	(983)	(3,939)	(5,015)	0	0	1,987
345.00	(201)	(3,680)	(472)	0	0	871
346.00	(1,029)	(7,472)	(777)	0	0	1,856
347.00	(9,534)	(21,448)	(4,547)	0	0	7,106
TOTAL	(6,056,209)	(11,612,910)	(16,010,818)	(8,281,964)	(8,629,937)	10,118,367

PART II. DETAILED DEPRECIATION CALCULATIONS

VOLUME 12

PENNSYLVANIA-AMERICAN WATER COMPANY

2017 GENERAL BASE RATE CASE

R-2017-2595853

EXHIBITS NO. 11-D, 11-E, 11-F

DEPRECIATION STUDY

WASTEWATER OPERATIONS

(EXCLUDING SCRANTON WASTEWATER)

AS OF DECEMBER 31, 2016, 2017, 2018

Exhibit No. 11-D
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

HERSHEY, PENNSYLVANIA

WASTEWATER OPERATIONS

(Excluding Scranton Wastewater)

2016 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WASTEWATER PLANT
AS OF DECEMBER 31, 2016

Prepared by:

Gannett Fleming

Excellence Delivered As Promised

Exhibit No. 11-D
Witness: J. J. Spanos

PENNSYLVANIA-AMERICAN WATER COMPANY

Hershey, Pennsylvania

WASTEWATER OPERATIONS

(Excluding Scranton Wastewater)

2016 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO WASTEWATER PLANT
AS OF DECEMBER 31, 2016

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Camp Hill, Pennsylvania

Gannett Fleming

*Excellence Delivered **As Promised***

April 21, 2017

Pennsylvania-American Water Company
800 West Hersheypark Drive
Hershey, PA 17033

Attention Mr. John R. Cox
Manager of Rates and Regulations

Gentlemen:

Pursuant to your request, we have determined the annual depreciation accruals applicable to wastewater plant as of December 31, 2016. Summaries of the original cost, annual accruals and the book depreciation reserve are presented in Tables 1 through 3, beginning on page I-3 of the attached report.

A description of the methods and procedures upon which the study was based, as well as support for the service life estimates, is set forth in a companion report "2017 Depreciation Study - Calculated Annual Depreciation Accruals Related to Wastewater Plant as of December 31, 2017".

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
Sr. Vice President

JJS:mlw

062027.100

Gannett Fleming Valuation and Rate Consultants, LLC
P.O. Box 67100 • Harrisburg, PA 17106-7100 | 207 Senate Avenue • Camp Hill, PA 17011-2316
t: 717.763.7211 • f: 717.763.4590
www.gfvrc.com

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PART I. RESULTS OF STUDY

PENNSYLVANIA-AMERICAN WATER COMPANY

WASTEWATER OPERATIONS
(Excluding Scranton Wastewater)

DEPRECIATION STUDY

PART I. RESULTS OF STUDY

SUMMARY OF RESULTS

Table 1 presents the development of net original cost used in the study. The net original cost is the original cost of wastewater plant less advances and contributions. The results of the depreciation study are summarized in Table 2, which sets forth the book reserve and the calculated annual depreciation related to net original cost as of December 31, 2016, and the annual amortization of net negative salvage. Table 3 presents the calculation of the amortization of experienced net salvage, by account, based on the five-year period, 2012-2016.

DETAILED TABULATIONS OF DEPRECIATION CALCULATIONS

The supporting data for the depreciation calculations are presented in account sequence in the section beginning on page II-2. The original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual are shown for each vintage of each account or subaccount. The amounts of regular retirements, gross salvage, and cost of removal are set forth by account for the years 2012 through 2016, on pages III-2 through III-6.

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER OPERATIONS (EXCLUDING SCRANTON WASTEWATER)

TABLE 1. DEVELOPMENT OF NET ORIGINAL COST AS OF DECEMBER 31, 2016

DEPRCIABLE GROUP (1)	ORIGINAL COST AS OF DECEMBER 31, 2016 (2)	- CUSTOMER ADVANCES (3)	- CONTRIBUTIONS IN AID OF CONSTRUCTION (4)	- EXCLUDED PROPERTY (5)	= NET ORIGINAL COST AS OF DECMEBER 31, 2016 (6)
DEPRECIABLE PLANT					
354.20 STRUCTURES AND IMPROVEMENTS - COLLECTION	479,296.86				479,296.86
354.30 STRUCTURES AND IMPROVEMENTS - SPP	18,169,291.90		2,734,528.70		15,434,763.20
354.40 STRUCTURES AND IMPROVEMENTS - TDP	50,958,423.67		1,853,012.73		49,105,410.94
354.70 STRUCTURES AND IMPROVEMENTS - GENERAL	2,130,769.53				2,130,769.53
355.00 POWER GENERATING EQUIPMENT	4,881,040.73		144,517.16		4,736,523.57
360.10 COLLECTION SEWERS - FORCE MAINS	30,666,434.21	157,753.14	11,251,126.61		19,257,554.46
361.10 COLLECTION SEWERS - GRAVITY MAINS	73,305,655.63	143,423.53	9,166,636.12		63,995,595.98
361.20 MANHOLES	13,045,669.35		4,387,312.76		8,658,356.59
363.00 SERVICES	15,575,965.95	70,197.45	3,737,893.58		11,767,874.92
364.00 FLOW MEASURING DEVICES	533,521.59		14,726.81		518,794.78
365.00 FLOW MEASURING INSTALLATIONS	20,918.30				20,918.30
370.00 RECEIVING WELLS	103,531.95				103,531.95
371.00 PUMPING EQUIPMENT	7,114,659.39		66,626.22		7,048,033.17
380.00 TREATMENT EQUIPMENT	52,675,840.17		2,200,080.47		50,475,759.70
381.00 PLANT SEWERS	6,450,916.81		30,192.33		6,420,724.48
382.00 OUTFALL SEWER LINES	674,274.67				674,274.67
389.10 OTHER PLANT AND MISCELLANEOUS EQUIPMENT	273,149.74				273,149.74
390.00 OFFICE FURNITURE AND EQUIPMENT	199,675.37				199,675.37
391.00 TRANSPORTATION EQUIPMENT	440,469.70				440,469.70
392.00 STORES EQUIPMENT	64,249.97				64,249.97
393.00 TOOLS, SHOP AND GARAGE EQUIPMENT	536,841.71				536,841.71
394.00 LABORATORY EQUIPMENT	342,757.97				342,757.97
395.00 POWER OPERATED EQUIPMENT	532,736.59		10,000.00		522,736.59
396.00 COMMUNICATION EQUIPMENT	1,522,349.38				1,522,349.38
397.00 MISCELLANEOUS EQUIPMENT	3,256,051.56		29,000.00		3,227,051.56
TOTAL DEPRECIABLE PLANT	**283,954,492.70**	**371,374.12**	**35,625,653.49**	**0.00**	**247,957,465.09**
NONDEPRECIABLE PLANT					
352.10 FRANCHISES	221,139.78				221,139.78
353.20 LAND AND LAND RIGHTS - COLLECTION	1,093,483.20				1,093,483.20
353.30 LAND AND LAND RIGHTS - SPP	85,560.07				85,560.07
353.40 LAND AND LAND RIGHTS - TDP	1,677,525.60		125,000.00		1,552,525.60
TOTAL NONDEPRECIABLE PLANT	**3,077,708.65**	**0.00**	**125,000.00**	**0.00**	**2,952,708.65**
TOTAL WASTEWATER PLANT IN SERVICE	**287,032,201.35**	**371,374.12**	**35,750,653.49**	**0.00**	**250,910,173.74**

Appendix A-5.1 (AUS)

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER OPERATIONS (EXCLUDING SCRANTON WASTEWATER)

TABLE 2. SUMMARY OF ESTIMATED SURVIVOR CURVE, ORIGINAL COST, BOOK RESERVE, AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO WASTEWATER PLANT AS OF DECEMBER 31, 2016

	DEPRECIABLE GROUP	SURVIVOR CURVE	ORIGINAL COST AS OF DECEMBER 31, 2016	BOOK RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(6)/(3)	(8)
	DEPRECIABLE PLANT							
354.20	STRUCTURES AND IMPROVEMENTS - COLLECTION	45-R3	479,296.86	49,350	429,947	11,001	2.30	39.1
354.30	STRUCTURES AND IMPROVEMENTS - SPP	50-R2.5	15,434,763.20	4,146,488	11,288,276	249,925	1.62	45.2
354.40	STRUCTURES AND IMPROVEMENTS - TDP	65-R2	49,105,410.94	9,948,199	39,157,212	691,430	1.41	56.6
354.70	STRUCTURES AND IMPROVEMENTS - GENERAL	35-S1	2,130,769.53	1,306,466	824,304	24,748	1.16	33.3
355.00	POWER GENERATING EQUIPMENT	35-R2.5	4,736,523.57	2,652,039	2,084,484	70,197	1.48	29.7
360.10	COLLECTION SEWERS - FORCE MAINS	70-S2	19,257,554.46	175,918	19,081,636	359,040	1.86	53.1
361.10	COLLECTION SEWERS - GRAVITY MAINS	70-R2.5	63,995,595.98	11,371,594	52,624,002	925,253	1.45	56.9
361.20	MANHOLES	50-S1.5	8,658,356.59	1,103,203	7,555,154	183,051	2.11	41.3
363.00	SERVICES	38-R3	11,767,874.92	3,048,755	8,719,120	380,797	3.24	22.9
364.00	FLOW MEASURING DEVICES	20-L3	518,794.78	(3,852)	522,647	39,167	7.55	13.3
365.00	FLOW MEASURING INSTALLATIONS	30-S1.5	20,918.30	4,022	16,896	733	3.50	23.1
370.00	RECEIVING WELLS	50-R3	103,531.95	16,346	87,186	2,042	1.97	42.7
371.00	PUMPING EQUIPMENT	40-S0	7,048,033.17	1,267,841	5,780,192	162,743	2.31	35.5
380.00	TREATMENT EQUIPMENT	45-R2	50,475,759.70	10,681,481	39,794,279	1,072,308	2.12	37.1
381.00	PLANT SEWERS	50-R3	6,420,724.48	831,789	5,588,936	129,614	2.02	43.1
382.00	OUTFALL SEWER LINES	50-R3	674,274.67	157,760	516,515	13,676	2.03	37.8
389.10	OTHER PLANT AND MISCELLANEOUS EQUIPMENT	20-S2.5	273,149.74	72,881	200,268	14,747	5.40	13.6
390.00	OFFICE FURNITURE AND EQUIPMENT	20-SQ	199,675.37	53,384	146,291	11,861	5.94	12.3
391.00	TRANSPORTATION EQUIPMENT	15-L4	440,469.70	245,469	195,000	20,435	4.64	9.5
392.00	STORES EQUIPMENT	25-SQ	64,249.97	18,187	46,063	2,310	3.60	19.9
393.00	TOOLS, SHOP AND GARAGE EQUIPMENT	20-SQ	536,841.71	241,652	295,190	18,017	3.36	16.4
394.00	LABORATORY EQUIPMENT	15-SQ	342,757.97	193,677	149,081	13,157	3.84	11.3
395.00	POWER OPERATED EQUIPMENT	16-L2.5	522,736.59	242,424	280,312	32,263	6.17	8.7
396.00	COMMUNICATION EQUIPMENT	15-SQ	1,522,349.38	854,060	668,289	65,055	4.27	10.3
397.00	MISCELLANEOUS EQUIPMENT	15-SQ	3,227,051.56	467,686	2,759,366	288,902	8.95	9.6
	TOTAL DEPRECIABLE PLANT		**247,957,465.09**	**49,146,818**	**198,810,646**	**4,782,472**	**1.93**	
	AMORTIZATION OF NET SALVAGE					**65,222**		
	NONDEPRECIABLE PLANT							
352.10	FRANCHISES		221,139.78					
353.20	LAND AND LAND RIGHTS - COLLECTION		1,093,483.20					
353.30	LAND AND LAND RIGHTS - SPP		85,560.07					
353.40	LAND AND LAND RIGHTS - TDP		1,552,525.60					
	TOTAL NONDEPRECIABLE PLANT		**2,952,708.65**					
	TOTAL WASTEWATER PLANT IN SERVICE		**250,910,173.74**	**49,146,818**	**198,810,646**	**4,847,694**		

PENNSYLVANIA-AMERICAN WATER COMPANY
WASTEWATER OPERATIONS (EXCLUDING SCRANTON WASTEWATER)

TABLE 3. AMORTIZATION OF EXPERIENCED NET SALVAGE

Account (1)	EXPERIENCED NET SALVAGE 2012 (2)	2013 (3)	2014 (4)	2015 (5)	2016 (5)	5 - YEAR AMORT. (7)
354.20	0	0	(17,282)	(1,398)	(42)	3,744
354.30	(3,707)	(1,424)	(0)	(4,141)	0	1,854
354.40	(159,227)	(27,581)	(10,305)	(1,027)	(4,581)	40,544
354.70	0	0	0	(480)	0	96
355.00	(3,170)	(963)	(510)	(1,666)	(4,934)	2,248
360.10	(461)	(8,182)	(1,577)	(3,256)	(12,703)	5,236
361.10	(14,158)	(34,624)	(16,027)	(65,334)	(6,970)	27,423
361.20	0	0	0	(7,497)	(53,000)	12,099
363.00	(2,580)	(15,735)	(26,515)	(27,377)	(11,694)	16,780
364.00	0	0	(816)	0	0	163
371.00	(2,645)	(2,291)	(4,325)	(4,902)	(11,515)	5,136
380.00	(120,523)	(6,028)	(21,655)	(1,623)	(23,917)	34,749
381.00	0	0	0	0	(2,110)	422
382.00	(1)	0	0	0	0	0
390.00	0	0	0	0	(276)	55
393.00	0	(240)	(240)	0	171,552	(34,214)
394.00	0	(6)	0	0	(566)	115
395.00	0	0	0	0	44,960	(8,992)
396.00	(1,192)	(2,027)	0	(4,190)	131,476	(24,813)
397.00	0	0	0	0	87,116	(17,423)
TOTAL	(307,663)	(99,101)	(99,252)	(122,889)	302,795	65,222

Appendix A-5.1 (AUS)

PART II. DETAILED DEPRECIATION CALCULATIONS

Water and Wastewater Industry

Cost of Capital / Required Return
Water and Wastewater Industry
As of 4-1-2020

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Cost of Capital / Required Return

The net cashflows described in the income approach section of this report were discounted to present value using a cost of capital reflective of the investor owned water industry with particular emphasis on investor owned water and wastewater in the Commonwealth of Pennsylvania capital costs for both debt and equity summarized as follows:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	100.0%						**8.09%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.16%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Capitlization Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Market Capital Cost (2)*(3)
Debt	26%	Market	4.12%	Market	Not Applicable	Not Applicable	1.07%
Equity	74%	Market	9.90%	Market	Not Applicable	Not Applicable	7.33%
Total Capital r	100.0%						**8.40%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.46%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Rate of Return on Rate Base)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Required Return on Rate Base (2)*(3)
Debt	45%	Embedded	4.14%	Embedded	Not Applicable	Not Applicable	1.86%
Equity	55%	Embedded	9.90%	Market	Not Applicable	Not Applicable	5.45%
Total Capital r	100.0%						**7.31%**
Growth (g)						Not Applicable	**0.00%**
Rate without Growth: [(1+r)/(1+g)]-1							**7.31%**

The cost of capital and required return was based on the weighted cost of capital (WACC) method; wherein the market capital cost of debt and equity at the April 1, 2020 appraisal date are weighted based on the market capital structure typical of the industry. The inputs to the WACC required return determination are described summarized below.

Debt Cost – The market cost of debt at the study data was determined based on review of financial information published by Value Line Investment Surveys in their Selected Yield weekly publication. These sources were helpful in determining the typical debt rating for investments in water industry to be A Standard and Poor's corporate debt rating. The above sources were also useful in determining that the market cost of debt at A rating to be 4.12% on April 1, 2020. Issuance cost of 0.90% was determined based on analysis annual Public Utility Financing Tracker reports over the period 2008 through 2019 published by PUFT, Inc. The final market cost of debt of 4.12% was determined for the water industry using the following formula which incorporates the above described issuance costs:

Water Industry
As of Second Quarter 2020 (4-1-2020)

	S&P Debt Rating	Long Term Debt	Long Term Interest	Long Term Interest Rate (embedded)
		Input Value Line	Input Value Line	(4) / (3)
American States Water		281.0	24.5	8.7%
American Water		8,639.0	354.0	4.10%
California Water		786.8	40.0	5.08%
Consolidated Water Company		0.1	-	
Essential Utilities, Inc.		2,943.3	123.5	4.20%
Middlesex Water		230.8	7.2	3.12%
SJW Corporation		1,283.6	35.0	2.73%
York Water		94.5	5.5	5.82%
		14,259.1	589.7	4.14%
Minimum				2.73%
wtd Mean				4.14%
Mean				4.82%
Median				4.20%
Maximum				8.72%

Debt Rating and Cost of Debt

Embedded	4.14%	wtd mean col 5
Rating (S&P)	Utility A	Input
Market Cost of Debt @ Value Line		
Selected Yields	4.12%	Input 04/01/2020
Use	4.12%	AUS Input

$K_d = K_u / (100\% - f)$

where:

K_d =Cost of Debt recognizing issuance costs

K_u is the market cost of debt without consideration of issuance costs

f is the cost of issuance as a percentage of the debt's par value

$K_d = 4.12\% / (100\% - 0.90\%)$

K_d = 4.12%

Equity Cost – The cost of equity was evaluated using the Capital Asset Pricing Model (CAPM) and the dividend growth model (DGM) which looks to market returns to quantify the cost equity capital.

Water Industry
As of Second Quarter 2020 (4-1-2020)

Company	Exchange	Ticker	Valueline No.	Valueline Issue	Beta	Dividend	Revenues			Cash Flows			Earnings			Dividends			Book Value		
							Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line
American States Water	NYSE	AWR	1785	4/10/2020	0.60	1.5%	3.5%	0.0%	5.0%	6.0%	3.0%	7.0%	9.5%	5.0%	6.5%	8.0%	7.5%	9.5%	5.5%	4.0%	5.5%
American Water	NYSE	AWK	1786	4/10/2020	0.50	1.7%	3.0%	3.0%	4.5%	13.0%	6.0%	6.5%	45.5%	6.5%	8.5%	16.0%	10.5%	8.5%	2.5%	4.0%	5.0%
California Water	NYSE	CWT	1787	4/10/2020	0.60	1.6%	4.0%	2.5%	0.5%	5.5%	5.5%	2.0%	4.5%	4.5%	6.5%	2.5%	3.5%	5.5%	4.5%	4.5%	1.0%
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.85	2.1%	5.0%	0.5%	11.0%	2.0%	0.5%	9.0%	-3.0%	-4.5%	17.5%	5.0%	0.0%	13.0%	5.0%	2.0%	3.0%
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	0.60	2.3%	1.5%	0.5%	12.0%	5.0%	2.0%	10.5%	7.0%	1.5%	10.0%	7.5%	8.0%	7.5%	8.0%	9.0%	6.5%
Middlesex Water	NDQ	MSEX	1790	4/10/2020	0.70	1.7%	2.0%	2.5%	2.0%	6.0%	9.5%	4.5%	8.0%	12.0%	6.0%	2.5%	4.0%	5.5%	4.5%	6.0%	1.5%
SJW Corporation	NYSE	SJW	1791	4/10/2020	0.60	2.1%	5.0%	5.5%	4.0%	7.0%	11.0%	2.5%	8.0%	18.5%	6.0%	4.5%	5.0%	7.0%	5.5%	8.0%	6.5%
York Water	NDQ	YORW	1792	4/10/2020	0.65	1.5%	3.0%	3.0%	4.5%	6.0%	6.0%	7.0%	5.5%	6.5%	7.0%	3.5%	4.0%	5.5%	4.5%	4.0%	4.5%
Minimum					0.50	1.50%	1.50%	0.00%	0.50%	2.00%	0.50%	2.00%	-3.00%	-4.50%	6.00%	2.50%	0.00%	5.50%	2.50%	2.00%	1.00%
wtd Mean																					
Mean					0.64	1.81%	3.38%	2.19%	5.44%	6.31%	5.44%	6.13%	10.63%	6.25%	8.50%	6.19%	5.31%	7.75%	5.00%	5.19%	4.19%
Median					0.60	1.70%	3.25%	2.50%	4.50%	6.00%	5.75%	6.75%	7.50%	5.75%	6.75%	4.75%	4.50%	7.25%	4.75%	4.25%	4.75%
Maximum					0.85	2.30%	5.00%	5.50%	12.00%	13.00%	11.00%	10.50%	45.50%	18.50%	17.50%	16.00%	10.50%	13.00%	8.00%	9.00%	6.50%

Capital Assets Pricing Model (CAPM) - The CAPM method estimates the cost of equity capital by quantifying the premium, or additional return required to entice investors to purchase equities, over an investment in which the investors would receive riskless return like that from a long-term U.S. government security.

The mathematical form of this model is:

Capital Asset Pricing Model:

$$r_e = r_f + B_c(r_p) + r_s + r_i$$

where:

B_c is an estimation of the subject Company's risk premium relative to the risk premium of the entire market. In these equity cost estimating methods the risk premium of the entire market is defined as unity or B_m = 1.0.

The inputs to this model are developed from an analysis of the financial markets. The risk-free

government securities rate (rf) is readily available from financial sources; we have used the risk-free rate at the study date of 4.94% as determined from the average long-term income returns of government bonds over the period 1926 through 2019 as detailed on table A-7 in Ibbotson Associates' 2020 Yearbooks of Stocks, Bonds, Bills, and Inflation (SBBI).

The risk premiums (rp) and size premiums (rs) were established based on analysis of the data presented by Ibbotson Associates and published in Ibbotson Associates' 2010 through 2019 Yearbooks of Stocks, Bonds, Bills, and Inflation (SBBI), detailing the financial market returns of stocks, bonds, U.S. Treasury Bills, and Inflation for the period 1926 through 2019.

The total market risk premium (r_p) required to entice an investor to invest in equity securities over risk-free government securities was established at 6.95% based on the Ibbotson Associates research, while the size premiums (r_s) were established at:

1.7% for mid-capitalization companies with market equity capitalization between $3,636.881 and $631.058 million.

3.1% for low-capitalization companies with market equity capitalization between $289.658 and $631.058 million.

5.8 for micro-capitalization companies with market equity capitalization under $289.658 million.

There is no size premium (0.0%) for companies with market equity capitalization above $3,636.881 million.

Dividend Yield and Growth Model (DGM)

The dividend yield and growth model was also review in estimating the cost of equity. Two models were considered, those of:

re = Dividend Yield + Dividend Growth

re = Dividend Yield + Earnings Growth

Cost of Equity Conclusion - Based on these procedures the cost of equity using previous described cost of equity estimating techniques the cost of equity was determined as follows:

Cost of Equity Dividend Growth Model				Cost of Equity Capital Asset Pricing Model (CAPM)		
Dividend	1.81%	mean Col 7				
Growth	Past 10 yrs	Past 5 yrs	Est'd 13-15 to 19-21	Beta		
Revenues	3.38%	2.19%	5.44%			
Cash Flow	6.00%	5.44%	6.13%			
Earnings	10.63%	6.25%	8.50%			
Dividends	4.75%	5.31%	7.75%			
Book Value	4.75%	5.19%	4.19%	Input	Min-Max	
Mean	5.90%	4.88%	6.40%	0.64	0.5-0.85	
Growth	6.40%	AUS Input				

Cost of Equity Dividend Growth Model		Cost of Equity Capital Asset Pricing Model (CAPM)				
						Long term Government Bonds
Dividend	1.81%	Risk Free Rate		4.94%	Input	Income Return SBBI (Mean)
Growth	6.40%	Risk Premium				
Cost of Equity	8.21%	Beta		0.64		
		Risk Premia	6.90% Input SBBI	6.90%	Input	$r_p=r_m-r_f$ per PA PUC
		Size Premia			$ Millions	$ Millions
		Micro	5.80% Input SBBI		-	289.7
		Small	3.10% Input SBBI		289.7	1,341.7
		Mid	1.70% Input SBBI		1,341.7	3,636.9
		Large	0.00% Input SBBI		3,636.9	
		Size Premia		0.00%	Input	
		Cost of Equity		9.34%		

Cost of Equity		Pennsylvania PUC	9.90%
Dividend Growth Model	8.21%	Bureau of Technical Utility Services	
Capital Asset Pricing Model (CAPM)	9.34%	Report on the Quarterly Earnings	
Mean	8.78%	of Jurisdictional Utilities	
Cost of Equity	9.90%	AUS Input Jurisdictional Exception	
Growth	6.87%	Input	
Inflation	1.82%	SBBI	

Equity issuance cost (f) of 3.60% was determined based on analysis annual Public Utility Financing Tracker reports over the period 2008 through 2019 published by PUFT, Inc. The final market cost of equity of 9.90% was determined for the water industry using the following formula which incorporates the above described issuance costs:

$$K_e = K_e' / (100\% - f)$$

where:

K_e =Cost of equity recognizing issuance costs

$K_{e'}$ is the market cost of equity without consideration of issuance costs (9.90%)

f is the cost of issuance as a percentage of the equity par value (3.60%)

K_e= 9.90% / (100% -3.60%)

K_e= 9.90%

An equity cost of 9.90% was used in the determination of the cost of capital based on the determination of Pennsylvania PUC's Bureau of Technical Utility Services (TUS) Report on Quarterly Earnings of Jurisdictional Utilities for year-ending December 31, 2019.

Tax Rate

The tax rate was determined at 28.89% (State and Federal) based on the Value Line Investment Survey as follows:

Water Industry
As of Second Quarter 2020 (4-1-2020)

Company	Exchange	Ticker	Valueline No.	Valueline Issue	Tax Rate			
					2019	2020	2021	23-25
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line
American States Water	NYSE	AWR	1785	4/10/2020	22.6%	23.0%	23.0%	23.0%
American Water	NYSE	AWK	1786	4/10/2020	25.5%	21.0%	21.0%	21.0%
California Water	NYSE	CWT	1787	4/10/2020	19.1%	21.0%	21.0%	21.0%
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.0%	0.0%	0.0%	0.0%
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	6.6%	7.0%	7.5%	9.0%
Middlesex Water	NDQ	MSEX	1790	4/10/2020	2.8%	21.0%	21.0%	21.0%
SJW Corporation	NYSE	SJW	1791	4/10/2020	21.0%	21.0%	21.0%	21.0%
York Water	NDQ	YORW	1792	4/10/2020	21.0%	21.0%	21.0%	21.0%
Minimum					0.00%	0.00%	0.00%	0.00%
wtd Mean								
Mean					14.83%	16.88%	16.94%	17.13%
Median					20.05%	21.00%	21.00%	21.00%
Maximum					25.50%	23.00%	23.00%	23.00%

	Historical		Current	
Embedded Tax Rate	14.83%	Mean 2017	16.88%	Mean 2018
Federal Tax Rate (Marginal)	35.00%	AUS Input	21.00%	AUS Input
US 50-state average	4.91%	AUS Input	4.91%	AUS Input
Pennsylvania	9.99%	AUS Input	9.99%	AUS Input
Composite Federal and State Tax Rate	41.49%	Calculated =Federal Tax * (1-State Tax)+State Tax	28.89%	Calculated =Federal Tax * (1-State Tax)+State Tax

Capital Structure

The capital structure was determined based on the water industry market indictors published by Value Line Investment Survey published April 1, 2020 as detailed as follows:

Value Line Investment Surveys
Water Industry
As of Second Quarter 2020 (4-1-2020)

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Company	Exchange	Ticker	Valueline No.	Valueline Issue	Total Debt	Market Debt	Long Term Debt	Long Term Interest	Long Term Interest Rate (embedded)	Proportion of Debt	Book Debt	Book Equity	Preferred Stock	% Preferred	Shares Outstanding	Price per Share	Market Equity	Portion Market Equity	Capitalization	Total Market Capital
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	(6) / (21)	Input Value Line	Input Value Line	(9) / (8)	Input Value Line	Input Value Line	Input Value Line	Input Value Line	(14) / (21)	Input Value Line	Input Value Line	Input Value Line	(18) / (21)	Input Value Line	(6)+(14)+(18)
					$s Million	%	$s Million	$s Million	%	%	%	%	$s Million	%	Shares Million	$ per Share	$s Million	%		$s Million
American States Water	NYSE	AWR	1785	4/10/2020	286.3	8.41%	281.0	24.5	8.72%	32.0%	44.4%	55.6%	-	0.00%	36.8595050	84.60	3,118.3	91.59%	Mid Cap	3,404.6
American Water	NYSE	AWK	1786	4/10/2020	9453	29.18%	8,639.0	354.0	4.10%	59.0%	58.5%	41.4%	5.0	0.02%	180.9747190	126.72	22,933.1	70.80%	Large Cap	32,391.1
California Water	NYSE	CWT	1787	4/10/2020	983.8	27.93%	786.8	40.0	5.08%	50.0%	50.2%	49.8%	-	0.00%	48.5320000	52.32	2,539.2	72.07%	Mid Cap	3,523.0
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.1	0.04%	0.1	-		0.0%	0.0%	100.0%		0.00%	15.0784990	15.93	240.2	99.96%	Small Cap	240.3
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	3074.1	24.27%	2,943.3	123.5	4.20%	43.0%	43.1%	56.9%	-	0.00%	222.7815360	43.05	9,590.7	75.73%	Large Cap	12,664.8
Middlesex Water	NDQ	MSEX	1790	4/10/2020	258	19.37%	230.8	7.2	3.12%	42.0%	41.5%	58.2%	2.4	0.18%	17.4340000	61.47	1,071.7	80.45%	Mid Cap	1,332.1
SJW Corporation	NYSE	SJW	1791	4/10/2020	1305.9	43.43%	1,283.6	35.0	2.73%	59.0%	59.0%	41.0%	-	0.00%	28.4565080	59.78	1,701.1	56.57%	Mid Cap	3,007.0
York Water	NDQ	YORW	1792	4/10/2020	101	14.23%	94.5	5.5	5.82%	41.0%	41.3%	58.7%	-	0.00%	13.0148980	46.77	608.7	85.77%	Small Cap	709.7
Total					15,462.2	27.00%	14,259.1	589.7	4.14%				7.4	0.01%			41,803.1	72.99%		57,272.7
Minimum						0.04%			2.73%	0.00%	0.00%	41.00%		0.00%				56.57%		
wtd Mean						27.00%			4.14%					0.01%				72.99%		
Mean						20.86%			4.82%	40.75%	42.25%	57.70%		0.03%				79.12%		
Median						21.82%			4.20%	42.50%	43.75%	56.25%		0.00%				78.09%		
Maximum						43.43%			8.72%	59.00%	59.00%	100.00%		0.18%				99.96%		

Note 1: Aqua America changed its name to Essential Utilities, Inc.

In arriving at the capital structure, the market capital structure was used in developing the market cost of capital while an embedded capital structure was used in developing the required return on rate base as follows:

Water Industry Capital Structure

Capital Structure	Market Proportion	Market Reference	Embedded Proportion	Embedded Reference
Debt	27.00%	wtd mean col 7	40.75%	mean col 11
Preferred	0.01%	wtd mean col 15	0.03%	mean col 15
Equity	72.99%	wtd mean col 19	57.70%	mean col 13
Total	100.00%		98.48%	
Use				
Debt	26%	AUS Input	45%	AUS Input Jurisdictional Execption
Equity	74%	AUS Input	55%	AUS Input Jurisdictional Execption
Total	100%		100%	

Market Cost of Capital and Required Return on Rate Base

Using the above described cost of debt and equity, the rate of returned required for an investment in property similar to the Company's was determined to be 8.09% as follows:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	100.0%						8.09%
Growth (g)							1.82%
Rate without Growth: [(1+r)/(1+g)]-1							6.16%

While the require return on rate base was determined to be 7.31% follows:

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Rate of Return on Rate Base)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Required Return on Rate Base (2)*(3)
Debt	45%	Embedded	4.14%	Embedded	Not Applicable	Not Applicable	1.86%
Equity	55%	Embedded	9.90%	Market	Not Applicable	Not Applicable	5.45%
Total Capital r	**100.0%**						**7.31%**
Growth (g)						Not Applicable	**0.00%**
Rate without Growth: [(1+r)/(1+g)]-1							**7.31%**

The statistics supporting these findings can be found in the Cost of Capital section of this report.

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Discount Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	After-tax Market Capital Cost (2)*(3)*(4a)
Debt	26%	Market	4.12%	Market	28.89%	71.11%	0.76%
Equity	74%	Market	9.90%	Market	0.0%	100.0%	7.33%
Total Capital r	**100.0%**						**8.09%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.16%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Capitlization Rate)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Market Capital Cost (2)*(3)
Debt	26%	Market	4.12%	Market	Not Applicable	Not Applicable	1.07%
Equity	74%	Market	9.90%	Market	Not Applicable	Not Applicable	7.33%
Total Capital r	**100.0%**						**8.40%**
Growth (g)							**1.82%**
Rate without Growth: [(1+r)/(1+g)]-1							**6.46%**

Water and Wastewater Cost of Capital
04/01/2020

As an Investor-Owned Utility

Weighted Cost of Capital (Rate of Return on Rate Base)

(1)	(2)	(2a)	(3)	(3a)	(4)	(4a)	(5)
	Portion of Capital AUS Input	Type of Data	Capital Cost AUS Input	Type of Data	Tax Rate	Tax affect on cost of capital	Required Return on Rate Base (2)*(3)
Debt	45%	Embedded	4.14%	Embedded	Not Applicable	Not Applicable	1.86%
Equity	55%	Embedded	9.90%	Market	Not Applicable	Not Applicable	5.45%
Total Capital r	**100.0%**						**7.31%**
Growth (g)						Not Applicable	**0.00%**
Rate without Growth: [(1+r)/(1+g)]-1							**7.31%**

58	59	60	61	62
Water Industry				
As of Second Quarter 2020 (4-1-2020)				
	S&P Debt Rating	Long Term Debt	Long Term Interest	Long Term Interest Rate (embedded)
		Input Value Line	Input Value Line	(4) / (3)
American States Water		281.0	24.5	8.7%
American Water		8,639.0	354.0	4.10%
California Water		786.8	40.0	5.08%
Consolidated Water Company		0.1	-	
Essential Utilities, Inc.		2,943.3	123.5	4.20%
Middlesex Water		230.8	7.2	3.12%
SJW Corporation		1,283.6	35.0	2.73%
York Water		94.5	5.5	5.82%
		14,259.1	589.7	4.14%
Minimum				2.73%
wtd Mean				4.14%
Mean				4.82%
Median				4.20%
Maximum				8.72%

Debt Rating and Cost of Debt

Embedded	4.14%	wtd mean col 5	
Rating (S&P)	Utility A	Input	
Market Cost of Debt @Bond Rating			
Value Line Selected Yields	4.12%	Input	04/01/2020
Use	4.12%	AUS Input	

5:\water industry\PA American - Upper Pottsgrove\Upper Pottsgrove Wastewater System Valuation as of 4-28-2020 - Created 10-14-2020

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Dates of Information			U.S. Treasury Securities				Corporate Bonds and Preffered Stock							Municipal Bonds				
							Corporate Bonds					Preferred Stock		GeneralObligation Bonds (G))				Revenue Bonds (Revs) (1S years)
Cost of Capital Date	Value Line Selected Yield Date	Rencent Data	3-Month	1-year	10-year	30-year	Financial (10-year) A	Industrial (25/30 year) A	Utility (25/30 year) A	Utility (25/30 year) Baa/BBB	S& P 500 High Yield Corp. Bond Index	Utility A	Financial BBB	1-Year A	S-year A	10-Year A	25/30-year A	Water / Sewer
01/01/2020	01/03/2020	12/24/2019	1.57%	1.52%	1.90%	2.33%	2.71%	3.35%	3.43%	3.80%	3.95%	5.99%	5.99%	1.14%	1.29%	1.81%	2.48%	1.93%
04/01/2020	04/03/2020	03/23/2020	0.02%	0.17%	0.76%	1.33%	3.69%	4.24%	4.12%	4.72%	8.50%	6.88%	6.37%	2.90%	2.97%	3.15%	3.64%	3.31%
07/01/2020	07/03/2020	06/22/2020	0.16%	0.17%	0.71%	1.46%	1.99%	2.82%	2.99%	3.32%	4.64%	6.15%	5.48%	0.75%	1.04%	1.45%	2.25%	1.43%
10/01/2020	10/02/2020	09/21/2020	0.10%	0.12%	0.68%	1.43%	1.76%	2.67%	2.79%	3.06%	4.24%	6.23%	5.46%	0.44%	0.69%	1.27%	2.02%	1.34%

Named Range: ValueLineDebt

Value Line Selected Yields

Water Industry
As of Second Quarter 2020 (4-1-2020)

Company	Exchange	Ticker	Valueline No.	Valueline Issue	Beta	Dividend	Revenues			Cash Flows			Earnings			Dividends			Book Value		
							Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25	Past 10 yrs	Past 5 yrs	Est'd 17-19 to 23-25
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line
American States Water	NYSE	AWR	1785	4/10/2020	0.60	1.5%	3.5%	0.0%	5.0%	6.0%	3.0%	7.0%	9.5%	5.0%	6.5%	8.0%	7.5%	9.5%	5.5%	4.0%	5.5%
American Water	NYSE	AWK	1786	4/10/2020	0.50	1.7%	3.0%	3.0%	4.5%	13.0%	6.0%	6.5%	45.5%	6.5%	8.5%	16.0%	10.5%	8.5%	2.5%	4.0%	5.0%
California Water	NYSE	CWT	1787	4/10/2020	0.60	1.6%	4.0%	2.5%	0.5%	5.5%	5.5%	2.0%	4.5%	4.5%	6.5%	2.5%	3.5%	5.5%	4.5%	4.5%	1.0%
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.85	2.1%	5.0%	0.5%	11.0%	2.0%	0.5%	9.0%	-3.0%	-4.5%	17.5%	5.0%	0.0%	13.0%	5.0%	2.0%	3.0%
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	0.60	2.3%	1.5%	0.5%	12.0%	5.0%	2.0%	10.5%	7.0%	1.5%	10.0%	7.5%	8.0%	7.5%	8.0%	9.0%	6.5%
Middlesex Water	NDQ	MSEX	1790	4/10/2020	0.70	1.7%	2.0%	2.5%	2.0%	6.0%	9.5%	4.5%	8.0%	12.0%	6.0%	2.5%	4.0%	5.5%	4.5%	6.0%	1.5%
SJW Corporation	NYSE	SJW	1791	4/10/2020	0.60	2.1%	5.0%	5.5%	4.0%	7.0%	11.0%	2.5%	8.0%	18.5%	6.0%	4.5%	5.0%	7.0%	5.5%	8.0%	6.5%
York Water	NDQ	YORW	1792	4/10/2020	0.65	1.5%	3.0%	3.0%	4.5%	6.0%	6.0%	7.0%	5.5%	6.5%	7.0%	3.5%	4.0%	5.5%	4.5%	4.0%	4.5%
Minimum					0.50	1.50%	1.50%	0.00%	0.50%	2.00%	0.50%	2.00%	-3.00%	-4.50%	6.00%	2.50%	0.00%	5.50%	2.50%	2.00%	1.00%
wtd Mean																					
Mean					0.64	1.81%	3.38%	2.19%	5.44%	6.31%	5.44%	6.13%	10.63%	6.25%	8.50%	6.19%	5.31%	7.75%	5.00%	5.19%	4.19%
Median					0.60	1.70%	3.25%	2.50%	4.50%	6.00%	5.75%	6.75%	7.50%	5.75%	6.75%	4.75%	4.50%	7.25%	4.75%	4.25%	4.75%
Maximum					0.85	2.30%	5.00%	5.50%	12.00%	13.00%	11.00%	10.50%	45.50%	18.50%	17.50%	16.00%	10.50%	13.00%	8.00%	9.00%	6.50%

Cost of Equity Dividend Growth Model

Dividend 1.81% mean Col 7

Growth	Past 10 yrs	Past 5 yrs	Est'd 13-15 to 19-21	Beta
Revenues	3.38%	2.19%	5.44%	
Cash Flow	6.00%	5.44%	6.13%	
Earnings	10.63%	6.25%	8.50%	
Dividends	4.75%	5.31%	7.75%	
Book Value	4.75%	5.19%	4.19%	Input Min-Max
Mean	5.90%	4.88%	6.40%	0.64 0.5-0.85
Growth	6.40%	AUS Input		

Cost of Equity Dividend Growth Model

Dividend	1.81%
Growth	6.40%
Cost of Equity	8.21%

Cost of Equity Capital Asset Pricing Model (CAPM)

Risk Free Rate			4.94% Input	Long term Government Bonds Income Return SBBI (Mean)
Risk Premium				
Beta			0.64	
Risk Premia	6.90%	Input SBBI	6.90% Input	$r_p=r_m-r_f$ per PA PUC
Size Premia			S Millions	S Millions
Micro	5.80%	Input SBBI		289.7
Small	3.10%	Input SBBI	289.7	1,341.7
Mid	1.70%	Input SBBI	1,341.7	3,636.9
Large	0.00%	Input SBBI	3,636.9	
Size Premia			0.00% Input	
Cost of Equity			9.34%	

Cost of Equity	
Dividend Growth Model	8.21%
Capital Asset Pricing Model (CAPM)	9.34%
Mean	8.78%

Pennsylvania PUC 9.90%
Bureau of Technical Utility Services
Report on the Quarterly Earnings
of Jurisdictional Utilities

Cost of Equity	9.90%	AUS Input Jurisdictional Exception
Growth	6.87%	Input
Inflation	1.82%	SBBI

48	49	50	51	52	53	54	55	56
Water Industry								
As of Second Quarter 2020 (4-1-2020)								
Company	Exchange	Ticker	Valueline No.	Valueline Issue	Tax Rate			
					2019	2020	2021	23-25
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line
American States Water	NYSE	AWR	1785	4/10/2020	22.6%	23.0%	23.0%	23.0%
American Water	NYSE	AWK	1786	4/10/2020	25.5%	21.0%	21.0%	21.0%
California Water	NYSE	CWT	1787	4/10/2020	19.1%	21.0%	21.0%	21.0%
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.0%	0.0%	0.0%	0.0%
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	6.6%	7.0%	7.5%	9.0%
Middlesex Water	NDQ	MSEX	1790	4/10/2020	2.8%	21.0%	21.0%	21.0%
SJW Corporation	NYSE	SJW	1791	4/10/2020	21.0%	21.0%	21.0%	21.0%
York Water	NDQ	YORW	1792	4/10/2020	21.0%	21.0%	21.0%	21.0%
Minimum					0.00%	0.00%	0.00%	0.00%
wtd Mean								
Mean					14.83%	16.88%	16.94%	17.13%
Median					20.05%	21.00%	21.00%	21.00%
Maximum					25.50%	23.00%	23.00%	23.00%

	Historical		Current	
Embedded Tax Rate	14.83%	Mean 2017	16.88%	Mean 2018
Federal Tax Rate (Marginal)	35.00%	AUS Input	21.00%	AUS Input
US 50-state average	4.91%	AUS Input	4.91%	AUS Input
Pennsylvania	9.99%	AUS Input	9.99%	AUS Input
Composite Federal and State Tax Rate	41.49%	Calculated =Federal Tax * (1-State Tax)+State Tax	28.89%	Calculated =Federal Tax * (1-State Tax)+State Tax

Value Line Investment Surveys
Water Industry
As of Second Quarter 2020 (4-1-2020)

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Company	Exchange	Ticker	Valueline No.	Valueline Issue	Total Debt	Market Debt	Long Term Debt	Long Term Interest	Long Term Interest Rate (embedded)	Proportion of Debt	Book Debt	Book Equity	Preferred Stock	% Preferred	Shares Outstanding	Price per Share	Market Equity	Portion Market Equity	Capitalization	Total Market Capital
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	(6) / (21)	Input Value Line	Input Value Line	(9) / (8)	Input Value Line	Input Value Line	Input Value Line	Input Value Line	(14) / (21)	Input Value Line	Input Value Line	Input Value Line	(18) / (21)	Input Value Line	(6)+(14)+(18)
					$s Million	%	$s Million	$s Million	%	%	%	%	$s Million	%	Shares Million	$s per Share	$s Million	%		$s Million
American States Water	NYSE	AWR	1785	4/10/2020	286.3	8.41%	281.0	24.5	8.72%	32.0%	44.4%	55.6%	-	0.00%	36.8595050	84.60	3,118.3	91.59%	Mid Cap	3,404.6
American Water	NYSE	AWK	1786	4/10/2020	9453	29.18%	8,639.0	354.0	4.10%	59.0%	58.5%	41.4%	5.0	0.02%	180.9747190	126.72	22,933.1	70.80%	Large Cap	32,391.1
California Water	NYSE	CWT	1787	4/10/2020	983.8	27.93%	786.8	40.0	5.08%	50.0%	50.2%	49.8%	-	0.00%	48.5320000	52.32	2,539.2	72.07%	Mid Cap	3,523.0
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	0.1	0.04%	0.1	-		0.0%	0.0%	100.0%	-	0.00%	15.0784990	15.93	240.2	99.96%	Small Cap	240.3
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	3074.1	24.27%	2,943.3	123.5	4.20%	43.0%	43.1%	56.9%	-	0.00%	222.7815360	43.05	9,590.7	75.73%	Large Cap	12,664.8
Middlesex Water	NDQ	MSEX	1790	4/10/2020	258	19.37%	230.8	7.2	3.12%	42.0%	41.5%	58.2%	2.4	0.18%	17.4340000	61.47	1,071.7	80.45%	Mid Cap	1,332.1
SJW Corporation	NYSE	SJW	1791	4/10/2020	1305.9	43.43%	1,283.6	35.0	2.73%	59.0%	59.0%	41.0%	-	0.00%	28.4565080	59.78	1,701.1	56.57%	Mid Cap	3,007.0
York Water	NDQ	YORW	1792	4/10/2020	101	14.23%	94.5	5.5	5.82%	41.0%	41.3%	58.7%	-	0.00%	13.0148980	46.77	608.7	85.77%	Small Cap	709.7
Total					15,462.2	27.00%	14,259.1	589.7	4.14%				7.4	0.01%			41,803.1	72.99%		57,272.7
Minimum						0.04%			2.73%	0.00%	0.00%	41.00%		0.00%				56.57%		
wtd Mean						27.00%			4.14%					0.01%				72.99%		
Mean						20.86%			4.82%	40.75%	42.25%	57.70%		0.03%				79.12%		
Median						21.82%			4.20%	42.50%	43.75%	56.25%		0.00%				78.09%		
Maximum						43.43%			8.72%	59.00%	59.00%	100.00%		0.18%				99.96%		

Note 1: Aqua America changed its name to Essential Utilities, Inc.

Water Industry Capital Structure

Capital Structure	Market Proportion	Market Reference	Embedded Proportion	Embedded Reference
Debt	27.00%	wtd mean col 7	40.75%	mean col 11
Preferred	0.01%	wtd mean col 15	0.03%	mean col 15
Equity	72.99%	wtd mean col 19	57.70%	mean col 13
Total	100.00%		98.48%	
Use				
Debt	26%	AUS Input	45%	AUS Input Jurisdictional Execption
Equity	74%	AUS Input	55%	AUS Input Jurisdictional Execption
Total	100%		100%	

Appendix A-5.1 (AUS)

64	65	66	67	68	69	70	71	72	73
Water Industry **As of Second Quarter 2020 (4-1-2020)**									
Company	Exchange	Ticker	Valueline No.	Valueline Issue	Total Return				
Input Value Line	Input Value Line	Input Value Line	Input Value Line	Input Value Line	1 year Input Value Line	3 Years Input Value Line	3 years annualized Calculation	5 Years Input Value Line	5 years annualized Calculation
							=((1+3 year Total Return)^(1/3))-1		=((1+5 year Total Return)^(1/5))-1
American States Water	NYSE	AWR	1785	4/10/2020	8.9%	79.8%	21.6%	109.4%	15.9%
American Water	NYSE	AWK	1786	4/10/2020	23.3%	67.3%	18.7%	152.2%	20.3%
California Water	NYSE	CWT	1787	4/10/2020	-6.7%	36.9%	11.0%	108.3%	15.8%
Consolidated Water Company	NDQ	CWCO	1788	4/10/2020	25.2%	68.1%	18.9%	63.8%	10.4%
Essential Utilities, Inc.	NYSE	WTRG	1789	4/10/2020	21.6%	44.6%	13.1%	82.3%	12.8%
Middlesex Water	NDQ	MSEX	1790	4/10/2020	2.3%	66.8%	18.6%	185.1%	23.3%
SJW Corporation	NYSE	SJW	1791	4/10/2020	1.4%	32.5%	9.8%	102.4%	15.1%
York Water	NDQ	YORW	1792	4/10/2020	18.0%	24.4%	7.5%	97.7%	14.6%
Total					11.8%		14.9%		16.0%
Minimum					-6.70%		7.55%		10.37%
wtd Mean									
Mean					11.75%		14.91%		16.03%
Median					13.45%		15.84%		15.48%
Maximum					25.20%		21.60%		23.31%

Appendix A-5.1 (AUS)

Source: Ibbotson SBBI 2018 Stock, Bonds, Bills, and Inflation Yearbook

	A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	A-14	A-15	A-16
Year	Large Company Stocks Total Returns Jan-Dec *	Large Company Stocks Income Returns Jan-Dec *	Large Company Stocks Capital Appreciation Returns Jan-Dec *	Small Company Stocks Total Returns Jan-Dec *	Long-Term Corporate Bonds Total Returns Jan-Dec *	Long-Term Government Bonds Total Returns Jan-Dec *	Long-Term Government Bonds Income Returns Jan-Dec *	Long-Term Government Bonds Capital Appreciation Returns Jan-Dec *	Long-Term Government Bonds Yields Jan-Dec *	Intermediate-Term Government Bonds Total Returns Jan-Dec *	Intermediate-Term Government Bonds Income Returns Jan-Dec *	Intermediate-Term Government Bonds Capital Appreciation Returns Jan-Dec *	Intermediate-Term Government Bonds Yields Jan-Dec *	U.S. Treasury Bills Total Returns Jan-Dec *	Inflation Jan-Dec *	Risk Premia (A-1)-(A-7)
1926	0.1162	0.0541	0.0572	0.0028	0.0737	0.0777	0.0373	0.0391	0.0354	0.0538	0.0378	0.0151	0.0361	0.0327	-0.0149	0.0789
1927	0.3749	0.0571	0.3091	0.2210	0.0744	0.0893	0.0341	0.0540	0.0316	0.0452	0.0349	0.0096	0.0340	0.0312	-0.0208	0.3408
1928	0.4361	0.0481	0.3788	0.3969	0.0284	0.0010	0.0322	-0.0312	0.0340	0.0092	0.0364	-0.0273	0.0401	0.0356	-0.0097	0.4039
1929	-0.0842	0.0398	-0.1191	-0.5136	0.0327	0.0342	0.0347	-0.0020	0.0340	-0.0601	0.0407	0.0177	0.0362	0.0475	0.0020	-0.1189
1930	-0.2490	0.0457	-0.2848	-0.3815	0.0798	0.0466	0.0332	0.0128	0.0330	0.0672	0.0330	0.0333	0.0291	0.0241	-0.0603	-0.2822
1931	-0.4334	0.0535	-0.4707	-0.4975	-0.0185	-0.0531	0.0333	-0.0846	0.0407	-0.0232	0.0316	-0.0540	0.0412	0.0107	-0.0952	-0.4667
1932	-0.0819	0.0616	-0.1515	-0.0539	0.1082	0.1684	0.0369	0.1294	0.0315	0.0810	0.0363	0.0502	0.0304	0.0096	-0.1030	-0.1188
1933	0.5399	0.0639	0.4659	1.4287	0.1038	-0.0007	0.0312	-0.0314	0.0336	0.0183	0.0283	-0.0099	0.0325	0.0030	0.0051	0.5087
1934	-0.0144	0.0446	-0.0594	0.2422	0.1384	0.1003	0.0318	0.0676	0.0293	0.0900	0.0293	0.0597	0.0249	0.0016	0.0203	-0.0462
1935	0.4767	0.0495	0.4137	0.4019	0.0961	0.0498	0.0281	0.0214	0.0276	0.0701	0.0202	0.0494	0.0163	0.0017	0.0299	0.4486
1936	0.3392	0.0536	0.2792	0.6480	0.0674	0.0752	0.0277	0.0464	0.0255	0.0306	0.0144	0.0160	0.0129	0.0018	0.0121	0.3115
1937	-0.3503	0.0466	-0.3859	-0.5801	0.0275	0.0023	0.0266	-0.0248	0.0273	0.0156	0.0148	0.0005	0.0114	0.0031	0.0310	-0.3769
1938	0.3112	0.0483	0.2521	0.3280	0.0613	0.0553	0.0264	0.0283	0.0252	0.0623	0.0182	0.0437	0.0152	-0.0002	-0.0278	0.2848
1939	-0.0041	0.0469	-0.0545	0.0035	0.0397	0.0594	0.0240	0.0348	0.0226	0.0452	0.0131	0.0318	0.0098	0.0002	-0.0048	-0.0281
1940	-0.0978	0.0536	-0.1529	-0.0516	0.0339	0.0609	0.0223	0.0377	0.0194	0.0296	0.0090	0.0204	0.0057	0.0000	0.0096	-0.1201
1941	-0.1159	0.0671	-0.1786	-0.0900	0.0273	0.0093	0.0194	-0.0101	0.0204	0.0050	0.0067	-0.0017	0.0082	0.0006	0.0972	-0.1353
1942	0.0234	0.0679	0.1243	0.4451	0.0260	0.0322	0.0246	0.0074	0.0246	0.0194	0.0076	0.0117	0.0072	0.0027	0.0929	-0.0012
1943	0.2590	0.0624	0.1945	0.8837	0.0283	0.0208	0.0244	-0.0037	0.0248	0.0281	0.0156	0.0123	0.0145	0.0035	0.0316	0.2346
1944	0.1975	0.0548	0.1380	0.5372	0.0473	0.0281	0.0246	0.0032	0.0246	0.0180	0.0144	0.0035	0.0140	0.0033	0.0211	0.1729
1945	0.3611	0.0497	0.3072	0.7361	0.0408	0.1073	0.0234	0.0827	0.0199	0.0222	0.0119	0.0102	0.0103	0.0033	0.0225	0.3377
1946	-0.0807	0.0409	-0.1187	-0.1163	0.0172	-0.0010	0.0204	-0.0215	0.0212	0.0100	0.0108	-0.0008	0.0112	0.0035	0.1816	-0.1011
1947	0.0571	0.0549	0.0000	0.0092	-0.0234	-0.0262	0.0213	-0.0470	0.0243	0.0091	0.0121	-0.0030	0.0134	0.0050	0.0901	0.0358
1948	0.0550	0.0608	-0.0065	-0.0211	0.0414	0.0340	0.0240	0.0096	0.0237	0.0185	0.0156	0.0027	0.0151	0.0081	0.0271	0.0310
1949	0.1879	0.0750	0.1026	0.1975	0.0331	0.0645	0.0225	0.0415	0.0209	0.0232	0.0136	0.0095	0.0123	0.0110	-0.0180	0.1654
1950	0.3171	0.0877	0.2178	0.3875	0.0212	0.0006	0.0212	-0.0206	0.0224	0.0070	0.0139	-0.0069	0.0162	0.0120	0.0579	0.2959
1951	0.2402	0.0691	0.1646	0.0780	-0.0269	-0.0393	0.0238	-0.0627	0.0269	0.0036	0.0198	-0.0163	0.0217	0.0149	0.0587	0.2164
1952	0.1837	0.0593	0.1178	0.0303	0.0352	0.0116	0.0266	-0.0148	0.0279	0.0163	0.0219	-0.0057	0.0235	0.0166	0.0088	0.1571
1953	-0.0099	0.0546	-0.0662	-0.0649	0.0341	0.0364	0.0284	0.0067	0.0274	0.0323	0.0255	0.0061	0.0218	0.0182	0.0062	-0.0383
1954	0.5262	0.0621	0.4502	0.6058	0.0539	0.0719	0.0279	0.0435	0.0272	0.0268	0.0160	0.0108	0.0172	0.0086	-0.0050	0.4983
1955	0.3156	0.0456	0.2640	0.2044	0.0048	-0.0129	0.0275	-0.0407	0.0295	-0.0065	0.0245	-0.0310	0.0280	0.0157	0.0037	0.2881
1956	0.0656	0.0383	0.0262	0.0428	-0.0681	-0.0559	0.0299	-0.0846	0.0345	-0.0042	0.0305	-0.0345	0.0363	0.0246	0.0286	0.0357
1957	-0.1078	0.0384	-0.1431	-0.1457	0.0871	0.0746	0.0344	0.0382	0.0323	0.0784	0.0359	0.0405	0.0284	0.0314	0.0302	-0.1422
1958	0.4336	0.0438	0.3806	0.6489	-0.0222	-0.0609	0.0327	-0.0923	0.0382	-0.0129	0.0293	-0.0417	0.0381	0.0154	0.0176	0.4009
1959	0.1196	0.0331	0.0848	0.1640	-0.0097	-0.0226	0.0401	-0.0620	0.0447	-0.0039	0.0418	-0.0456	0.0498	0.0295	0.0150	0.0795
1960	0.0047	0.0326	-0.0297	-0.0329	0.0907	0.1378	0.0426	0.0929	0.0380	0.1176	0.0415	0.0742	0.0331	0.0266	0.0148	-0.0379
1961	0.2689	0.0348	0.2313	0.3209	0.0482	0.0097	0.0383	-0.0286	0.0415	0.0185	0.0354	-0.0172	0.0384	0.0213	0.0067	0.2306
1962	-0.0873	0.0298	-0.1110	-0.1190	0.0795	0.0689	0.0400	0.0278	0.0395	0.0556	0.0373	0.0173	0.0350	0.0273	0.0122	-0.1273
1963	0.2280	0.0361	0.1889	0.2357	0.0219	0.0121	0.0389	-0.0270	0.0417	0.0164	0.0371	-0.0210	0.0404	0.0312	0.0165	0.1891
1964	0.1648	0.0333	0.1297	0.2352	0.0477	0.0351	0.0415	-0.0072	0.0423	0.0404	0.0400	-0.0003	0.0403	0.0354	0.0119	0.1233
1965	0.1245	0.0321	0.0906	0.4175	-0.0046	0.0071	0.0419	-0.0345	0.0450	0.0120	0.0415	-0.0310	0.0490	0.0393	0.0192	0.0826
1966	-0.1006	0.0311	-0.1309	-0.0701	0.0020	0.0365	0.0449	-0.0106	0.0455	0.0469	0.0493	-0.0041	0.0479	0.0476	0.0335	-0.1455
1967	0.2398	0.0364	0.2090	0.8357	-0.0495	-0.0918	0.0459	-0.1355	0.0556	0.0101	0.0488	-0.0385	0.0577	0.0421	0.0304	0.1939
1968	0.1106	0.0318	0.0766	0.3597	0.0257	-0.0026	0.0550	-0.0551	0.0598	0.0454	0.0549	-0.0099	0.0596	0.0521	0.0472	0.0556

Source: Ibbotson SBBI 2018 Stock, Bonds, Bills, and Inflation Yearbook

Year	A-1 Large Company Stocks Total Returns Jan-Dec *	A-2 Large Company Stocks Income Returns Jan-Dec *	A-3 Large Company Stocks Capital Appreciation Returns Jan-Dec *	A-4 Small Company Stocks Total Returns Jan-Dec *	A-5 Long-Term Corporate Bonds Total Returns Jan-Dec *	A-6 Long-Term Government Bonds Total Returns Jan-Dec *	A-7 Long-Term Government Bonds Income Returns Jan-Dec *	A-8 Long-Term Government Bonds Capital Appreciation Returns Jan-Dec *	A-9 Long-Term Government Bonds Yields Jan-Dec *	A-10 Intermediate-Term Government Bonds Total Returns Jan-Dec *	A-11 Intermediate-Term Government Bonds Income Returns Jan-Dec *	A-12 Intermediate-Term Government Bonds Capital Appreciation Returns Jan-Dec *	A-13 Intermediate-Term Government Bonds Yields Jan-Dec *	A-14 U.S. Treasury Bills Total Returns Jan-Dec *	A-15 Inflation Jan-Dec *	A-16 Risk Premia (A-1)-(A-7)
2012	0.1600	0.0250	0.1341	0.1824	0.1068	0.0331	0.0240	0.0088	0.0241	0.0207	0.0058	0.0148	0.0046	0.0006	0.0174	0.1360
2013	0.3239	0.0248	0.2960	0.4507	-0.0707	-0.1278	0.0288	-0.1570	0.0378	-0.0368	0.0102	-0.0468	0.0149	0.0002	0.0151	0.2951
2014	0.1369	0.0216	0.1139	0.0292	0.1728	0.2471	0.0341	0.2093	0.0246	0.0300	0.0163	0.0135	0.0155	0.0002	0.0076	0.1028
2015	0.0138	0.0210	-0.0073	-0.0360	-0.0102	-0.0065	0.0247	-0.0311	0.0268	0.0179	0.0151	0.0029	0.0169	0.0002	0.0073	-0.0109
2016	0.1196	0.0226	0.0954	0.2565	0.0670	0.0175	0.0230	-0.0040	0.0272	0.0192	0.0136	0.0058	0.0185	0.0020	0.0207	0.0966
2017	0.2183	0.0221	0.1942	0.1119	0.1225	0.0624	0.0267	0.0351	0.0254	0.0164	0.0193	-0.0029	0.0211	0.0080	0.0211	0.1916
2018	-0.0438	0.0201	-0.0624	-0.1160	-0.0473	-0.0057	0.0282	-0.0350	0.0284	0.0116	0.0265	-0.0155	0.0250	0.0181	0.0191	-0.0720
2019	0.3149	0.0234	0.2888	0.2063	0.1995	0.1216	0.0255	0.0953	0.0225	0.0826	0.0208	0.0454	0.0170	0.0214	0.0229	0.2894
Average	**0.1189**	**0.0394**	**0.0793**	**0.1655**	**0.0640**	**0.0598**	**0.0494**	**0.0082**	**0.0499**	**0.0513**	**0.0437**	**0.0069**	**0.0432**	**0.0337**	**0.0295**	**0.0695**
Median	**0.1307**	**0.0378**	**0.1053**	**0.1832**	**0.0480**	**0.0368**	**0.0408**	**0.0033**	**0.0416**	**0.0336**	**0.0372**	**0.0032**	**0.0363**	**0.0293**	**0.0268**	**0.0797**
High	**0.5399**	**0.0877**	**0.4659**	**1.4287**	**0.4256**	**0.4036**	**0.1350**	**0.2395**	**0.1334**	**0.2910**	**0.1297**	**0.1423**	**0.1396**	**0.1471**	**0.1816**	**0.5087**
Low	**-0.4334**	**0.0110**	**-0.4707**	**-0.5801**	**-0.0809**	**-0.1490**	**0.0194**	**-0.1825**	**0.0194**	**-0.0601**	**0.0058**	**-0.1114**	**0.0046**	**-0.0002**	**-0.1030**	**-0.4667**
Last 5 year (60 months)																
Average	**0.1246**	**0.0218**	**0.1017**	**0.0845**	**0.0663**	**0.0379**	**0.0256**	**0.0121**	**0.0261**	**0.0295**	**0.0191**	**0.0071**	**0.0197**	**0.0099**	**0.0182**	**0.0989**
Median	**0.1196**	**0.0221**	**0.0954**	**0.1119**	**0.0670**	**0.0175**	**0.0255**	**-0.0040**	**0.0268**	**0.0179**	**0.0193**	**0.0029**	**0.0185**	**0.0080**	**0.0207**	**0.0966**
High	**0.3149**	**0.0234**	**0.2888**	**0.2565**	**0.1995**	**0.1216**	**0.0282**	**0.0953**	**0.0284**	**0.0826**	**0.0265**	**0.0454**	**0.0250**	**0.0214**	**0.0229**	**0.2894**
Low	**-0.0438**	**0.0201**	**-0.0624**	**-0.1160**	**-0.0473**	**-0.0065**	**0.0230**	**-0.0350**	**0.0225**	**0.0116**	**0.0136**	**-0.0155**	**0.0169**	**0.0002**	**0.0073**	**-0.0720**

* Compound Annual Return

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Public Meeting held June 18, 2020

Docket Number: M-2020-3019868

BUREAU OF TECHNICAL UTILITY SERVICES

REPORT ON THE QUARTERLY EARNINGS

OF JURISDICTIONAL UTILITIES

FOR THE YEAR ENDED

December 31, 2019

Gladys Brown Dutrieuille, Chairman
David W. Sweet, Vice Chairman
John F. Coleman, Jr., Commissioner
Ralph V. Yanora, Commissioner

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* UGI Utilities, Inc. – South, UGI Utilities, Inc. – North, and UGI Utilities, Inc. – Central, have rate filings at Docket Nos. R-2018-3006814, R-2018-3006814, and R-2018-3006814 respectively, and filed a letter with the Secretary in place of a report in accordance with 52 Pa. Code § 71.4.

Attachment A – Summary of Equity Returns 5

Attachment B – Summary of Returns 12

This chart depicts the overall and equity returns (actual and adjusted) for the filing utilities for the current quarter. The last authorized equity return and the year authorized is also shown.

Attachment C – Allowed Rates of Return on Common Equity 14

This is a historical chart that shows the most recent rate cases for select companies in electric, gas, and water. A docket number followed by their final return on equity and year is also given.

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Criteria for determining the industry barometer groups used in ROE calculations. Also, provides details of the Discounted Cash Flow equation and Capital Asset Pricing Model equation.

Attachment F – Market Based Returns on Equity – Electric 18

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Attachment F – Historic DCF and CAPM – Electric 19

Historic barometer group DCF and CAPM average ROEs.

Attachment F – Electric Barometer Group Calculation of a Current and 52 Week Average Dividend Yield 20-21

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Attachment G – Market Based Returns on Equity – Gas 23

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Attachment G – Historic DCF and CAPM – Gas 24
Historic barometer group DCF and CAPM average ROEs, including a linear trend line graph.

Attachment G – Gas Barometer Group Calculation of a Current and 52 Week Average Dividend Yield 25
Gas barometer companies are used to calculate a current DCF in the first chart. The second chart demonstrates the companies 52-week average DCF. A final average of the two calculations is also shown at the bottom.

Attachment G – Development of a Representative Dividend Growth Rate 26
Multiple sources of the gas barometer companies projected 5-year Earnings Per Share are used to calculate the Group Average Dividend Growth Estimate.

Attachment H – Market Based Returns on Equity – Water 27
The market indicated common equity cost rate range consists of data used from the water barometer groups and is based on a series of calculations to average the DCF methods. Also, indicates Distribution System Improvement Charge Return.

Attachment H – Historic DCF and CAPM – Water 28
Historic barometer group DCF and CAPM average ROEs, including a linear trend line graph.

Attachment H – Water Barometer Group Calculation of a Current and 52 Week Average Dividend Yield 29
Water barometer companies are used to calculate a current DCF in the first chart. The second chart demonstrates the companies 52-week average DCF. A final average of the two calculations is also shown at the bottom.

Attachment H – Development of a Representative Dividend Growth Rate 30
Multiple sources of the water barometer companies projected 5-year Earnings Per Share are used to calculate the Group Average Dividend Growth Estimate.

Introduction:

On September 20, 1991, the Commission initiated a rulemaking at L-00910061 pertaining to earnings disclosures by the public utilities subject to its jurisdiction. At that docket, the Commission stated that the submission of accurate, reliable and complete earnings disclosure reports, at regular intervals, is essential to the fulfillment of the broad regulatory oversight responsibilities entrusted to the Commission by the Legislature in the Public Utility Code. The earnings disclosure regulations promulgated by the Commission were adopted October 1, 1992, and published January 23, 1993, at 23 Pa.B. 463. Based upon those regulations, codified at 52 Pa. Code, Chapter 71, a reporting format was developed and distributed to the jurisdictional fixed utilities of Pennsylvania.

All fixed utilities having jurisdictional revenues of $1,000,000 or more, for a calendar year, are required to file the report by March 31 of each year. Such reports are to be based upon the results of operations for the 12-month period ending December 31 of the prior year. Utilities having more than $10,000,000 in jurisdictional revenues are also required to file reports for the 12 months ending on March 31, June 30, and September 30 of each year. On November 30, 2004, however, the Pennsylvania General Assembly signed into law Act 183 concerning alternative telecommunications regulation and broadband deployment. As a result of Act 183, the reporting requirements for the PUC jurisdictional telecommunications companies of Pennsylvania have been streamlined at section 3015(e) of the Public Utility Code. A quarterly earnings report is not listed among those reports now required of PUC jurisdictional telecommunications utilities in Pennsylvania and, therefore, this report does not address telephone company earnings.

The reports have been filed for the period ended December 31, 2019.[1] The Finance Staff of the Bureau of Technical Utility Services has reviewed the reports and has prepared this summary report for public release. This report sets forth the achieved return on equity for each company, the last allowed return for that utility, a market return as determined through the analysis of the barometer group data and the most recent returns allowed, per industry, by the Pennsylvania Public Utility Commission and by other regulatory bodies. Where a utility has not filed a report, the reasons for not filing are indicated.

Questions pertaining to the preparation and contents of this Report should be directed to Ms. Erin Laudenslager, Manager - Finance, Bureau of Technical Utility Services, at (717) 705-4364.

[1] UGI Utilities, Inc. – South, UGI Utilities, Inc. – North, and UGI Utilities, Inc. – Central, have rate filings at Docket Nos. R-2018-3006814, R-2018-3006814, and R-2018-3006814 respectively, and filed a letter with the Secretary in place of a report in accordance with 52 Pa. Code § 71.4.

The equity return summaries that follow in Attachment A are, for each quarter;

ACTUAL

1. Based on actual results of operations

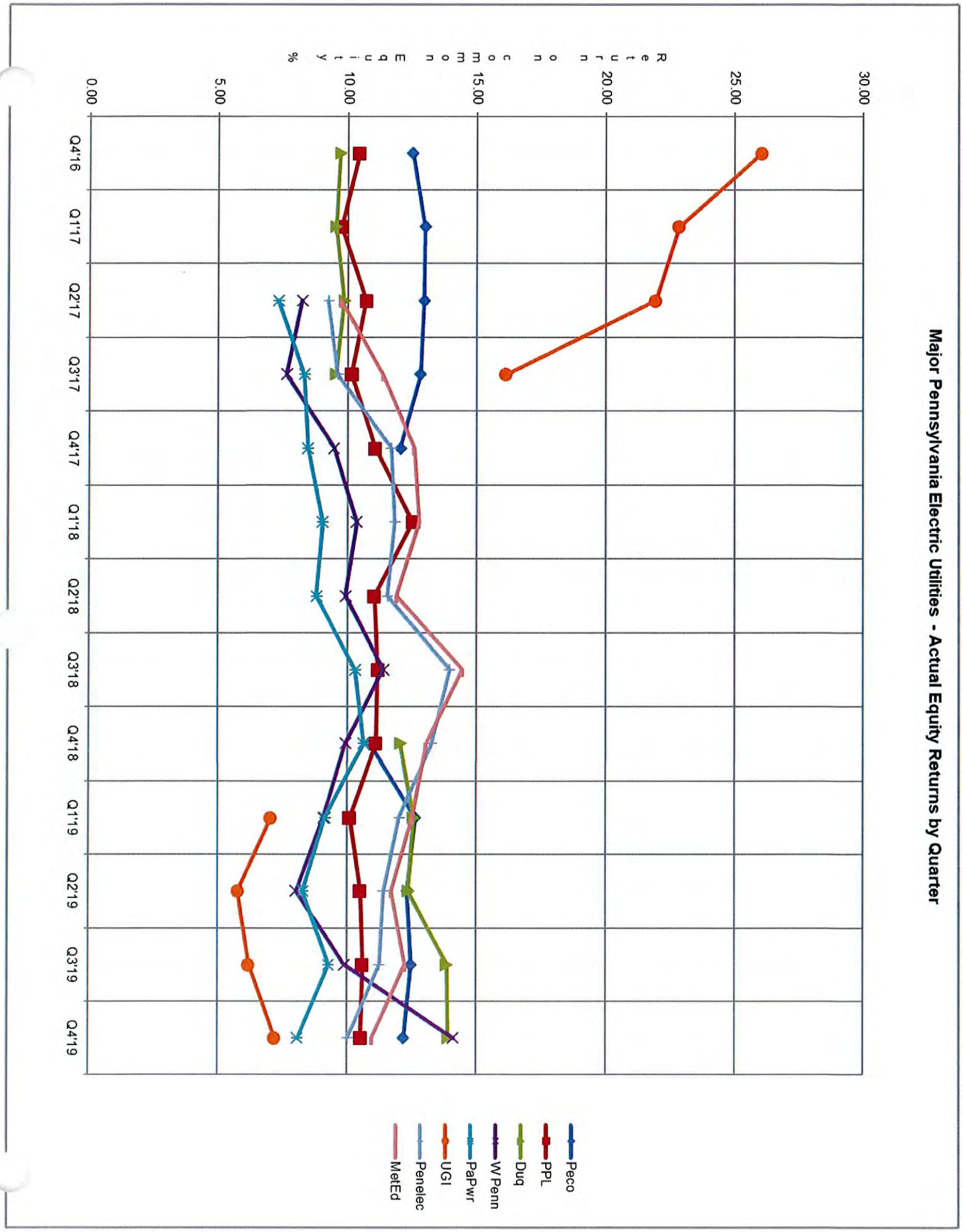
and

ADJUSTED

2. Based on company proposed pro forma and ratemaking adjustments

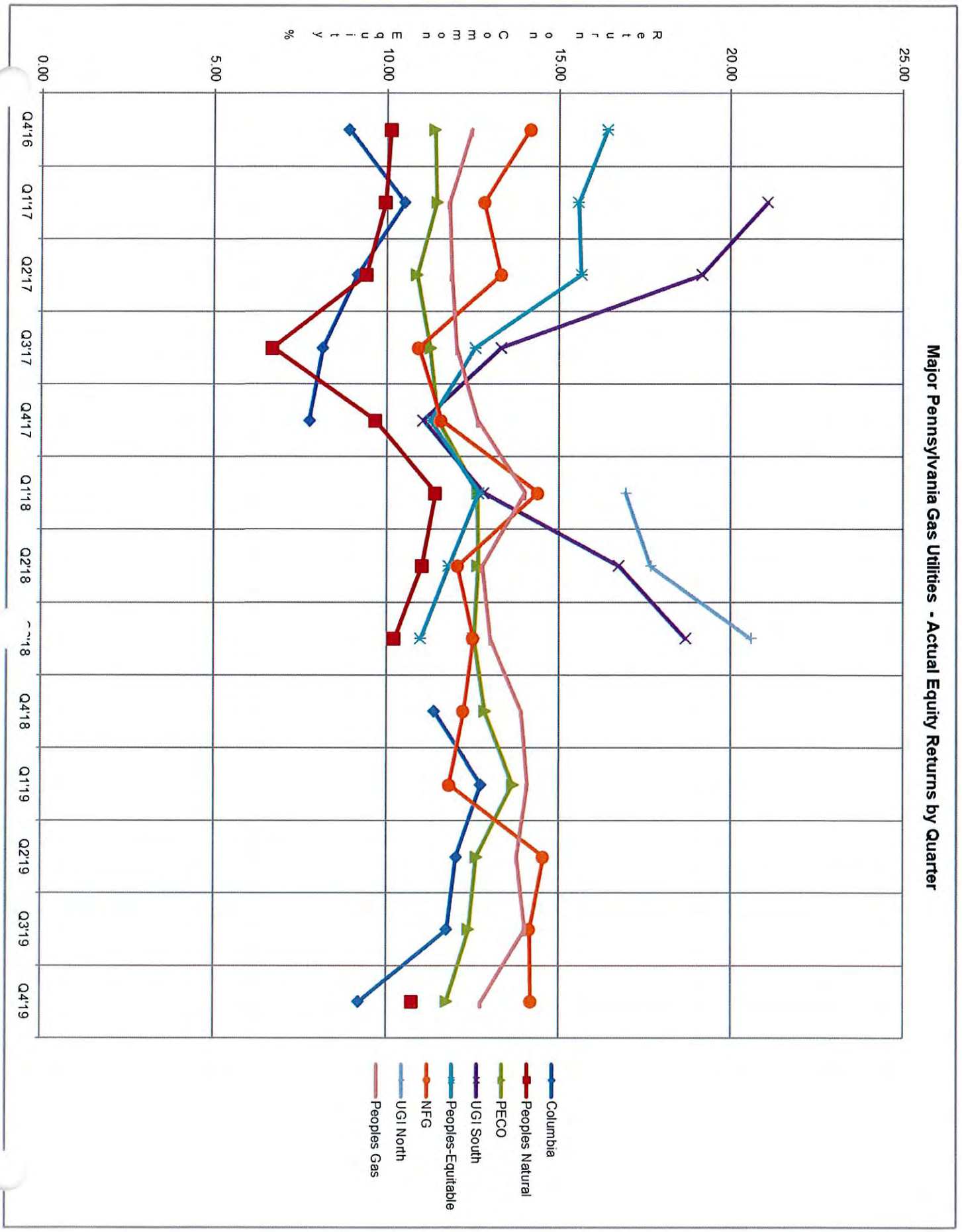
ELECTRIC UTILITIES
EQUITY RETURNS BY QUARTER

QTR		PECO		PPL		Duq		W Penn		PaPwr		UGI		Penelec		MetEd	
END		ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ
2014	1	9.97	10.34	10.02	10.04			11.58	9.45	15.28	15.04	13.36	10.25	5.17	3.34	-6.40	-8.13
	2	10.05	10.08	9.50	10.09	9.77	9.29					12.64	9.21				
	3	8.93	9.25	10.07	9.99	9.97	9.48					8.76	9.22				
	4	8.23	9.58			9.77	9.40					9.01	10.00				
2015	1					10.08	9.65					10.88	10.39				
	2					9.80	9.42					13.57	9.49				
	3					10.11	9.73	6.45	6.45	5.77	5.77	15.93	7.57	2.94	2.94	3.69	3.69
	4	10.74	8.84	8.89	8.48	9.73	9.36	8.09	8.09	5.13	5.13	9.74	9.21	5.45	5.45	7.04	7.04
2016	1	10.86	9.74	7.75	6.94	9.87	9.89					10.41	8.69				
	2	11.46	10.15	9.15	8.51	9.57	9.47					8.29	8.10				
	3	13.42	11.44	10.15	9.59	10.12	9.46					19.18	6.99				
	4	12.52	10.65	10.45	10.29	9.71	9.01					26.07	7.30				
2017	1	13.01	11.40	9.76	8.49	9.53	8.99					22.86	6.81				
	2	12.98	11.40	10.71	9.70	9.86	9.24	8.23	7.38	7.32	7.97	21.96	6.74	9.23	9.20	9.74	9.35
	3	12.84	10.52	10.15	9.30	9.53	9.23	7.63	7.24	8.32	9.08	16.13	5.22	9.61	9.50	11.37	10.97
	4	12.07	9.11	11.07	10.63			9.47	9.12	8.46	8.19			11.70	10.93	12.58	11.67
2018	1			12.53	11.36			10.35	9.08	9.03	8.08			11.84	9.93	12.77	11.38
	2			11.05	9.49			9.92	8.52	8.79	7.57			11.56	9.39	11.90	10.26
	3			11.19	9.83			11.41	6.74	10.30	5.80			13.97	8.44	14.46	9.62
	4	10.88	7.61	11.10	10.15	12.06	9.39	9.92	6.78	10.64	7.43			13.27	9.31	13.05	7.40
2019	1	12.65	7.93	10.10	8.96	12.58	9.73	9.08	6.62	9.14	7.61	7.05	5.22	12.03	8.07	12.54	7.66
	2	12.34	7.94	10.51	8.95	12.38	9.34	8.02	5.99	8.29	7.10	5.77	3.22	11.42	8.16	11.72	7.21
	3	12.49	7.96	10.61	8.99	13.88	9.33	9.90	7.87	9.28	7.76	6.20	2.04	11.26	8.78	12.25	7.77
	4	12.21	8.50	10.53	10.40	13.92	9.08	14.13	7.07	8.08	6.90	7.20	2.38	10.02	8.54	10.96	9.27


Major Pennsylvania Electric Utilities - Actual Equity Returns by Quarter
Return on common Equity %
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Q4'16
Q1'17
Q2'17
Q3'17
Q4'17
Q1'18
Q2'18
Q3'18
Q4'18
Q1'19
Q2'19
Q3'19
Q4'19
Peco
PPL
Duq
W Penn
PaPwr
UGI
Penelec
MetEd

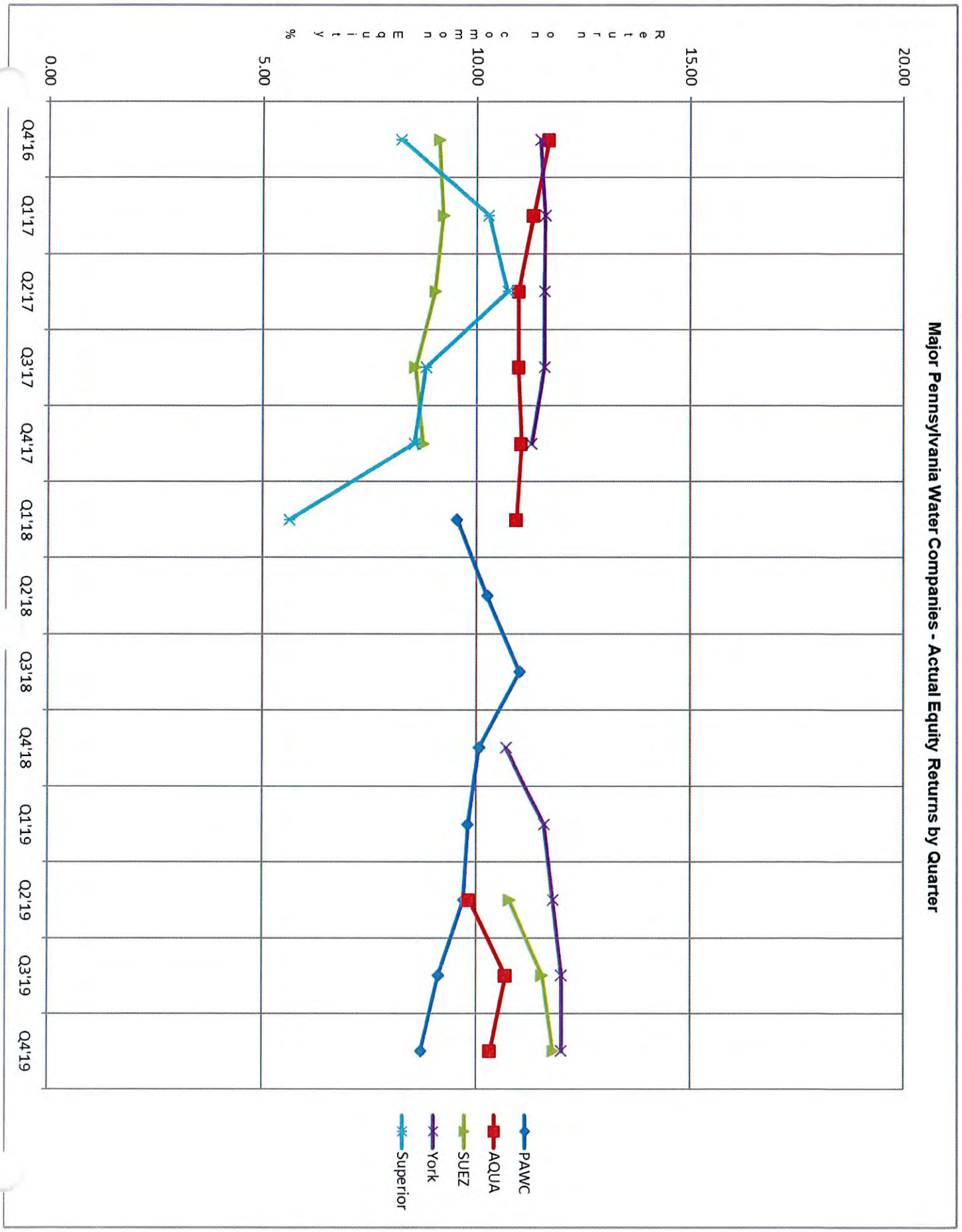
GAS UTILITIES
EQUITY RETURNS BY QUARTER

QTR		Columbia		Peoples Natural		PECO		UGI South		Peoples-Equitable		NFG		UGI North		Peoples Gas	
END		ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ
2014	1			14.68	9.94	15.23	13.52	16.81	8.35	12.00	8.73	23.11	9.78	16.67	10.06	12.19	11.87
	2			13.05	9.78	15.32	13.24	16.71	8.39	13.54	8.49	22.97	12.00	15.30	10.90	14.06	12.32
	3			13.43	9.16	15.45	13.21	16.63	8.64	14.41	9.15	21.36	11.03	13.77	10.15	15.07	12.62
	4	9.71	9.97	11.85	7.89	13.86	12.59	15.00	7.93	14.52	12.46	20.40	10.79	15.64	9.82	16.91	11.83
2015	1			14.22	7.90	14.60	13.01	15.76	7.87	15.36	12.14	20.17	10.31	15.57	9.52	16.36	11.23
	2			14.37	8.88	13.89	12.32	14.07	7.62	14.08	11.26	18.82	10.39	13.76	8.90	16.15	12.90
	3			13.55	8.14	13.29	11.77	15.67	6.51	11.30	10.87	16.41	10.27	13.16	8.32	15.69	12.58
	4	9.75	9.73	8.80	9.83	12.50	12.70			10.60	10.00	15.01	10.59	9.17	7.25	12.71	12.14
2016	1			7.01	10.02	10.73	13.58			8.98	10.20	12.60	10.97	7.85	8.85	8.54	10.48
	2			6.24	9.99	11.55	13.85			8.29	10.40	12.31	11.08	9.41	8.37	9.20	10.43
	3			6.93	9.34	12.09	14.40			13.05	10.82	13.00	10.34	6.47	8.81	9.07	12.02
	4	8.90	9.26	10.11	11.03	11.39	12.37			16.42	11.07	14.18	9.58			12.47	11.87
2017	1	10.52	10.17	9.96	9.27	11.45	12.55	21.08	10.09	15.85	10.58	12.84	9.26			11.82	12.34
	2	9.15	9.81	9.41	9.71	10.87	12.17	19.16	9.44	15.66	10.30	13.33	10.53			11.89	13.47
	3	8.15	8.77	6.69	6.40	11.26	10.92	13.34	9.03	12.59	9.85	10.92	10.00			12.04	13.36
	4	7.76	8.48	9.66	7.27	11.48	9.83	11.06	8.62	11.28	9.23	11.58	10.56			12.65	11.79
2018	1			11.42	7.00	12.65	9.77	12.82	7.90	12.68	8.22	14.40	10.20	16.95	7.83	14.02	10.17
	2			11.03	6.80	12.66	9.05	16.75	6.80	11.81	9.57	12.06	9.89	17.68	8.02	12.78	10.15
	3			10.21	7.43	12.54	8.36	18.69	8.04	10.99	9.44	12.52	10.12	20.60	9.16	13.03	10.20
	4	11.39	9.81			12.86	8.68					12.24	10.21			13.92	11.13
2019	1	12.76	10.22			13.68	9.06					11.83	10.93			14.10	10.71
	2	12.04	9.92			12.62	8.41					14.56	9.99			13.80	11.66
	3	11.77	9.85			12.40	8.31					14.17	9.75			14.02	11.63
	4	9.21	9.09	10.74	12.26	11.75	6.99					14.20	9.77			12.76	11.20


Major Pennsylvania Gas Utilities - Actual Equity Returns by Quarter
Return on Common Equity %
0.00
5.00
10.00
15.00
20.00
25.00
Q4'16
Q1'17
Q2'17
Q3'17
Q4'17
Q1'18
Q2'18
Q3'18
Q4'18
Q1'19
Q2'19
Q3'19
Q4'19
Columbia
Peoples Natural
PECO
UGI South
Peoples-Equitable
NFG
UGI North
Peoples Gas

WATER UTILITIES
EQUITY RETURNS BY QUARTER

QTR		PAWC		AQUA		SUEZ		York	
END		ACT	ADJ	ACT	ADJ	ACT	ADJ	ACT	ADJ
2014	1	10.52	9.98	13.29	11.56	8.45	9.02	10.2	10.2
	2	10.51	10.02	13.01	11.42	8.81	9.32	10.7	10.7
	3	11.11	10.57	12.82	11.29	8.57	9.06	10.9	10.9
	4	10.49	9.38	12.62	11.49	8.90	9.44	12.3	11.6
2015	1	10.33	9.14	12.46	11.11	9.11	9.83	12.7	12.7
	2	10.51	9.31	12.66	11.62	8.36	9.25	12.7	12.7
	3	10.06	8.81	12.41	11.95	8.39	9.37	13.6	13.6
	4	9.80	8.48	12.61	12.16	8.54	8.77	12.50	11.10
2016	1	10.12	8.68	12.31	11.71	9.27	10.19	12.40	10.90
	2	9.99	8.47	11.71	11.21	11.00	12.37	12.20	10.80
	3	9.82	8.47	11.55	10.32	8.23	9.99	12.20	11.00
	4	9.37	8.51	11.70	10.57	9.13	9.90	11.50	10.40
2017	1			11.34	10.04	9.22	9.60	11.61	9.50
	2			10.99	9.22	9.03	9.07	11.60	9.10
	3			10.99	9.23	8.57	8.57	11.60	8.70
	4			11.05	8.63	8.75	8.73	11.30	8.40
2018	1	9.55	8.97	10.94	8.41				
	2	10.27	9.65						
	3	11.03	9.48						
	4	10.08	9.03					10.70	10.30
2019	1	9.82	8.87					11.60	11.60
	2	9.72	8.90	9.84	9.04	10.78	10.36	11.80	11.80
	3	9.13	8.41	10.69	8.84	11.55	11.75	12.00	12.00
	4	8.71	8.09	10.33	8.24	11.80	12.15	12.00	9.80


Major Pennsylvania Water Companies - Actual Equity Returns by Quarter
Return on Common Equity %
0.00
5.00
10.00
15.00
20.00
Q4'16
Q1'17
Q2'17
Q3'17
Q4'17
Q1'18
Q2'18
Q3'18
Q4'18
Q1'19
Q2'19
Q3'19
Q4'19
PAWC
AQUA
SUEZ
York
Superior

Attachment B includes:

A. Overall Returns on rate base
1. Actual
2. Company proposed pro forma and ratemaking adjustments

and

B. Equity Returns
1. Actual
2. Company proposed pro forma and ratemaking adjustments

Summary of Returns
For the Year Ended December 31, 2019

COMPANY NAME	OVERALL RETURN ACTUAL	OVERALL RETURN ADJ	EQUITY RETURN ACTUAL	EQUITY RETURN ADJ	ROE AUTH	YEAR AUTH
ELECTRIC						
$10,000,000 Revenues						
PECO Energy - Electric Operations	8.40	6.35	12.21	8.50	Settled	2018
PPL Electric Utilities Corp.	7.78	7.71	10.53	10.40	Settled	2015
Duquesne Light Company	9.77	7.07	13.92	9.08	Settled	2018
West Penn Power Company	8.97	5.53	14.13	7.07	Settled	2017
Pennsylvania Power Company	6.74	6.09	8.08	6.90	Settled	2017
UGI Utilities, Inc. - Electric Division	6.03	3.24	7.20	2.38	9.85	2018
Pennsylvania Electric Company	7.34	6.55	10.02	8.54	Settled	2017
Metropolitan Edison Company	7.47	6.59	10.96	9.27	Settled	2017
$1,000,000 to $10,000,000 Revenues						
Citizens Electric Company	10.43	10.43	11.61	11.61	9.54	2020
Pike County Light & Power Co.	5.28	4.02	6.38	3.78	Settled	2014
Wellsboro Electric Company	8.84	8.84	21.51	21.51	9.31	2020
GAS						
$10,000,000 Revenues						
Columbia Gas of PA, Inc.	7.10	7.10	9.21	9.09	Settled	2018
Peoples Natural Gas Company LLC	7.79	8.49	10.74	12.26	Settled	2019
PECO Energy - Gas Operations	8.19	5.53	11.75	6.99	Settled	2010
UGI Utilities, Inc. – South*					Settled	2019
National Fuel Gas Distribution Co.	9.45	7.25	14.20	9.77	Settled	2006
UGI Utilities, Inc. – North*					Settled	2019
Peoples Gas Company, LLC	9.12	8.09	12.76	11.20	Settled	2013
UGI Utilities, Inc. – Central*					Settled	2019
$1,000,000 to $10,000,000 Revenues						
North East Heat & Light Co.	9.56	9.56	9.72	9.72	11.00	2008
Valley Energy	8.89	8.89	6.64	6.64	9.73	2020
Pike County Light & Power Co.	7.40	6.13	11.56	8.79	Settled	2014
WATER						
$10,000,000 Revenues						
PA American Water Company	6.85	6.49	8.71	8.09	Settled	2018
Aqua Pennsylvania	7.34	6.21	10.33	8.24	Settled	2018
York Water Company	9.10	7.70	12.00	9.80	Settled	2019
SUEZ Water Pennsylvania, Inc.	8.22	8.40	11.80	12.15	Settled	2018
$1,000,000 to $10,000,000 Revenues						
Newtown Artesian Water Co.	4.78	4.39	3.99	3.28	Settled	2019
Columbia Water Company	5.18	5.18	5.31	5.31	Settled	2015

* UGI Utilities, Inc. – South, UGI Utilities, Inc. – North, and UGI Utilities, Inc. – Central, have rate filings at Docket Nos. R-2018-3006814, R-2018-3006814, and R-2018-3006814 respectively, and filed a letter with the Secretary in place of a report in accordance with 52 Pa. Code § 71.4.

ALLOWED RATES OF RETURN ON COMMON EQUITY

This is a historical chart that shows the most recent rate cases for select companies in electric, gas, and water. A docket number followed by their final return on equity and year is also given.

ELECTRIC	**Docket Number**	**ROE (%)**	**Year**
Recent PA PUC Allowed			
Duquesne Light Company	R-2018-3000124	Settled	2018
PECO Energy Company	R-2018-3000164	Settled	2018
UGI - Electric	R-2017-2640058	9.85	2018
Pennsylvania Electric Company	R-2016-2537352	Settled	2017
Metropolitan Edison Company	R-2016-2537349	Settled	2017
Pennsylvania Power Company	R-2016-2537355	Settled	2017
West Penn Power Company	R-2016-2537359	Settled	2017
Current Market Indicated ROE as calculated by the Bureau of Technical Utility Services.			**7.52-10.03**

GAS			
Recent PA PUC Allowed			
Columbia Gas of Pa.	R-2018-2647577	Settled	2018
UGI Utilities, Inc. - South	R-2018-3006814	Settled	2019
Peoples Natural Gas Company	R-2018-3006818	Settled	2019
UGI Utilities, Inc. - North	R-2018-3006814	Settled	2019
UGI Utilities, Inc. - Central	R-2018-3006814	Settled	2019
PECO Energy	R-2010-2161592	Settled	2010
Peoples Gas Company	R-2013-2355886	Settled	2013
Current Market Indicated ROE as calculated by the Bureau of Technical Utility Services.			**7.33-11.82**

WATER			
Recent PA PUC Allowed			
Aqua Pennsylvania	R-2018-3003558	Settled	2018
PA American Water	R-2017-2595853	Settled	2017
Columbia Water	R-2017-2598203	Settled	2017
York Water	R-2018-3000019	Settled	2019
SUEZ Water	R-2018-3000834	Settled	2018
Current Market Indicated ROE as calculated by the Bureau of Technical Utility Services.			**7.94-9.80**

Distribution System Improvement Charge (DSIC) Eligible Utilities
Return on Equity (ROE) Summary

	Utility Adjusted ROE[2] (%)	Commission Approved ROE[3] (%)
ELECTRIC		
PECO Energy – Electric Operations	8.50	9.45
PPL Electric Utilities Corp.	10.40	9.45
Duquesne Light Company	9.08	9.45
West Penn Power Company	7.07	9.45
Pennsylvania Power Company	6.90	9.45
Pennsylvania Electric Company	8.54	9.45
Metropolitan Edison Company	9.27	9.45
UGI Utilities, Inc.- Electric Division	2.38	9.85
GAS		
Columbia Gas of PA, Inc.	9.09	10.00
Peoples Natural Gas Company LLC	12.26	10.00
PECO Energy – Gas Operations	6.99	10.00
UGI Utilities, Inc. – South*		10.00
UGI Utilities, Inc. – North*		10.00
Peoples Gas Company, LLC	11.20	10.00
UGI Utilities, Inc. – Central*		10.00
WATER		
PA American Water Company	8.09	9.90
PA American – Wastewater	8.09	9.90
AQUA Pennsylvania	8.24	9.90
AQUA Pennsylvania – Wastewater	8.24	9.90
York Water Company	9.80	9.90
SUEZ Water Pennsylvania Inc.	12.15	9.90
Columbia Water Company	5.31	9.90
Newtown Artesian Water	3.28	9.90

* UGI Utilities, Inc. – South, UGI Utilities, Inc. – North, and UGI Utilities, Inc. – Central have rate filings at Docket Nos. R-2018-3006814, R-2018-3006814, and R-2018-3006814 respectively, and filed a letter with the Secretary in place of a report in accordance with 52 Pa. Code § 71.4.

2 Each utility lists adjustments on Schedule B of their quarterly financial report.

3 The ROE is approved in a utility's most recent fully litigated base rate proceeding for which a final order was entered not more than two years prior to the effective date of the DSIC. If more than two years have elapsed between the entry of a final order and the DSIC effective date, the ROE is from this report. If the base rate proceeding is settled, without a stipulated ROE, the ROE is from this report.

Explanation of Discounted Cash Flow (DCF) and Capital Asset Pricing Model (CAPM)

Barometer Group Criteria

The criteria used for determining the industry barometer groups used to calculate ROEs in this report are as follows:

- 50% or more of the company's assets must be related to the jurisdictional utility industry;
- The company's stock must be publicly traded;
- Companies involved in merger & acquisition activity will be excluded;
- Investment information for the company must be available to the Commission from more than one source; and
- Geographic Regions:
  EDCs: *Value Line* East, Central, and West Group Electric Utility companies;
  NGDCs: *Value Line* Investment Survey's Natural Gas Utility industry group companies;
  Water/Wastewater: *Value Line* Investment Survey's Water Utility industry group companies.

The barometer group companies are reviewed by staff on a quarterly basis and make any changes to these companies based upon the criteria above.

ROE Calculations

The Commission consistently uses the DCF model to determine the appropriate cost of equity for utilities. In this report, the DSIC ROE is calculated using two DCF models.

TUS uses the following formula to calculate the current dividend DCF: $K = D_1/P_0 + G$

TUS uses the following formula to calculate the 52-week average dividend DCF: $K = D_0/P_a + G$

Definitions:

K	=	Cost of equity
D_1	=	Dividend expected during the year
	=	$D_0 + \frac{1}{2}g$
D_0	=	Latest indicated dividend, obtained from Yahoo! Finance
g	=	Expected 5-year dividend growth rate of barometer group obtained from Value Line Investment Survey.
P_0	=	Current price of the stock, obtained from Yahoo! Finance
P_a	=	Average of high and low stock price over the latest 52-week period, obtained from Yahoo! Finance
G	=	Average of 5-year expected earnings growth rate forecasts obtained from Value Line Investment Survey, Zacks Investment Survey, Yahoo! Finance, Morningstar and/or Reuters.

The CAPM uses the yield of a risk-free interest-bearing obligation plus a rate of return premium that is proportional to the systematic risk of an investment.

TUS uses the following formula to calculate CAPM: $K = \beta(R_m - R_f)$

Three components are necessary to calculate the CAPM cost of equity:

β	=	Beta, a measure of systematic risk for each stock
R_f	=	The risk-free rate of return, 10-year U.S. Treasury yields are used for R_f. Yields are taken from the previous two quarters and forecasted next four quarters.
R_m	=	Total return of the equity market as determined by the SBBI Yearbook

The Commission determines the ROE used for DSIC purposes based on the range of reasonableness from the DCF barometer group data, CAPM data, recent ROEs adjudicated by the Commission, and informed judgment.

The market indicated common equity cost rate range consists of data used from the barometer groups and is based on a series of calculations to average the DCF methods.

Market Based Returns on Common Equity[1]

May 5, 2020

Electric Company Barometer Group

	Cost Rates %
(1) Current DCF:	8.90
(2) 52-Week Average DCF:	8.65
(3) Overall DCF ((1) + (2)) / 2 :	8.78
(4) Market Indicated Common Equity Cost Rate Range: @ 1 standard deviation around the mean.[2]	7.52-10.03
(5) CAPM Check of DCF Reasonableness:	7.22
(6) Recent Commission Approved ROEs[3]: *UGI Utilities, Inc. - Electric, R-2017-2640058, does not include 0.05% management effectiveness adjustment	9.80*
(7) Distribution System Improvement Charge (DSIC) Return[4]:	**9.45%**

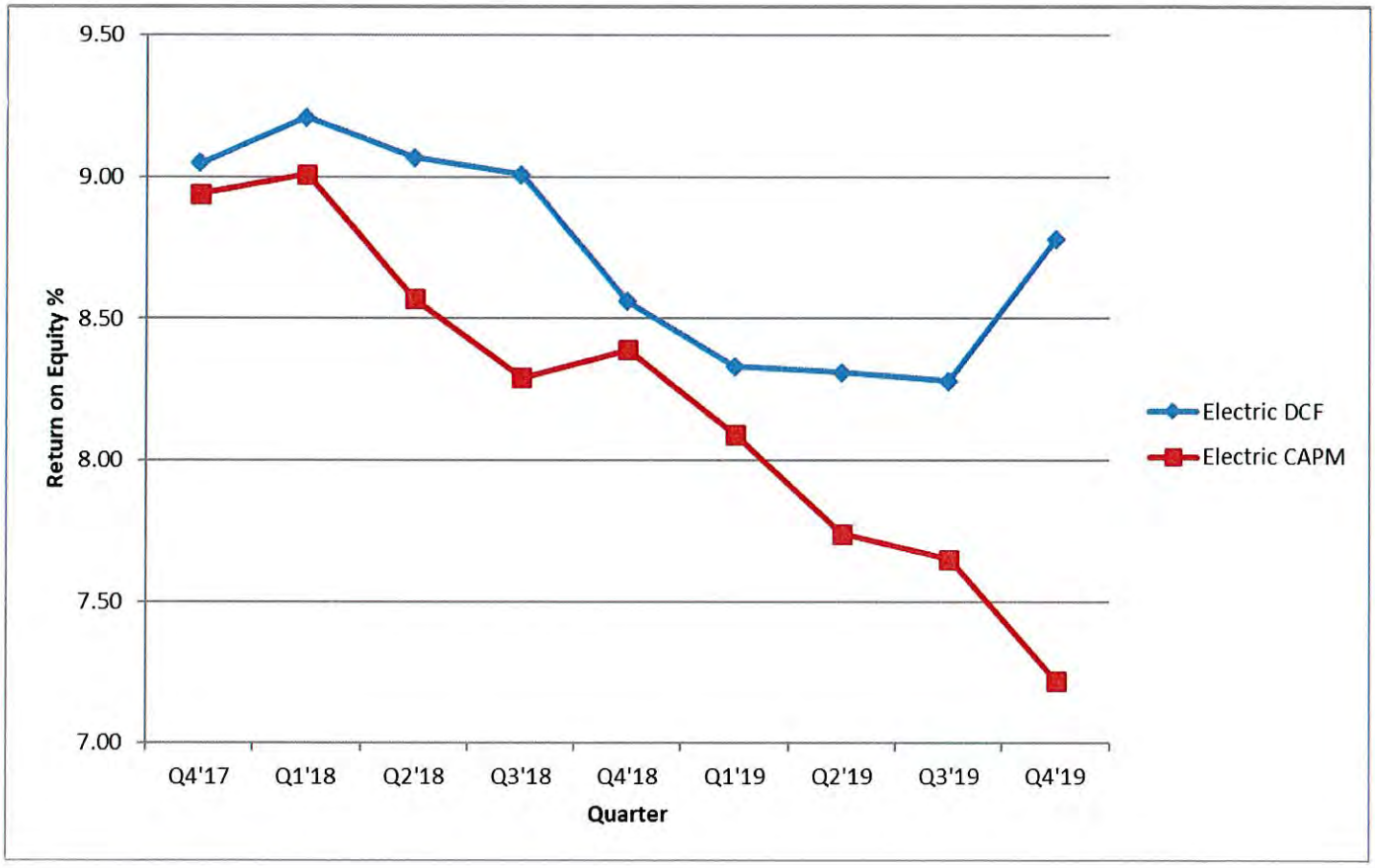
[1] As calculated by the Bureau of Technical Utility Services
[2] Standard Deviation of 52 DCF observations
[3] Base rate case ROEs within last two years, fully litigated or stipulated for DSIC purposes
[4] Commission authorized Return on Equity (ROE) for DSIC purposes

Any questions concerning DSIC should be directed to Marc Hoffer of the Bureau of Technical Utility Services at (717) 787-1869.

Historic Electric Industry Barometer Group DCF and CAPM Average ROEs

Electric		
	DCF	CAPM
Q4'17	9.05	8.94
Q1'18	9.21	9.01
Q2'18	9.07	8.57
Q3'18	9.01	8.29
Q4'18	8.56	8.39
Q1'19	8.33	8.09
Q2'19	8.31	7.74
Q3'19	8.28	7.65
Q4'19	8.78	7.22

Chart of Historic Electric Industry DCF and CAPM Average ROEs



Water and Wastewater General Information

Appraisal Work Papers

Value Line Investment Surveys
Water and Wastewater Industry
Market and Financial Ratios

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

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Part 3 Ratings & Reports

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★★ Rank 1 (Highest) for Timeliness.
★ Rank 2 (Above Average).

ESPECIALLY NOTEWORTHY:

Please note that in The Value Line Investment Survey, we are replacing the Insider Decisions box with the 18-Month Target Price Range, which seeks to predict a stock's price range over an 18-month horizon. In addition to the high and low values of the range, the percentage difference between the recent stock price and the midpoint of the range is provided. The quantitative formula behind the 18-month range includes a number of variables, such as our analyst estimates and historical figures.

Meanwhile, we welcome one new company to the Survey this week. ***Smartsheet Inc.*** *is a newcomer to the E-Commerce Industry on page 1835.*

TD Ameritrade *has accepted a buyout offer from* ***Charles Schwab****. The all-stock transaction is valued at $26 billion. Please turn to pages 1805 and 1806 to learn more.*

LogMeIn, Inc. *has entered into a definitive agreement to be acquired in an all cash deal valued at roughly $4.3 billion. Read more on the pending transaction on page 1825.*

In three parts: Part 1 is the Summary & Index. Part 2 is Selection & Opinion. This is Part 3, Ratings & Reports. Volume LXXV, No. 22

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See back cover for important disclosures.

Appendix A-51 (AUS)

Value Line's estimates of sales and earnings growth for individual companies are derived by correlating sales, earnings, and dividends to appropriate components or subcomponents of the Gross Domestic Product, presented below. A more detailed forecast appears periodically in *Selection & Opinion*.

HYPOTHESIZED ECONOMIC ENVIRONMENT 3 TO 5 YEARS HENCE

The hypothesized 2022-2024 economic environment into which earnings are forecast is as follows: Unemployment will average about 4% of the national labor force. There will be no major wars in progress at that time. Industrial production will be expanding slowly. Inflation will continue to be relatively low. Prices as measured by the broad-based GDP deflator will advance by 2.5% per year on average. Long-term interest rates on AAA corporate bonds are projected to average just under 4% in the years 2022-2024. We expect the Federal Reserve to pursue stable monetary policies except in years in which the economy is slowing or there is a recession. Based on these assumptions, the Gross Domestic Product will average nearly $25,300 billion in the years 2022-2024, a level that is roughly 23% above the estimated 2018 total of just over $20,500 billion.

Things may turn out differently. But in the absence of knowledge of the future, we use the above assumptions, which appear to be most plausible. Thus we are able to apply a common economic environment to all stocks for the purpose of measuring relative growth potential.

THESE ARE THE NATIONAL INCOME SERIES TO WHICH VALUE LINE SALES, EARNINGS, AND DIVIDEND ESTIMATES ARE CORRELATED

ANNUAL STATISTICS	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	2020*	2022-24*
Gross Domestic Product ($Bill.)	14713	14449	14992	15543	16197	16785	17522	18219	18707	19485	20525	*21437*	*22335*	*25278*
Real GDP (2012 Chained $Bill.)	15605	15209	15599	15841	16197	16495	16900	17387	17659	18051	18571	*18956*	*19335*	*20360*
Total Consumption ($Bill.)	10593	10460	10643	10844	11007	11167	11497	11922	12248	12567	12945	*13283*	*13636*	*14597*
Nonresidential Fixed Investment ($Bill.)	1994	1704	1781	1935	2119	2206	2365	2408	2425	2531	2692	*2753*	*2796*	*3027*
Industrial Prod. (% Change, Annualized)	-3.5	-11.5	5.5	3.1	3.0	2.0	3.1	-1.0	-2.0	2.3	3.9	*-1.0*	*0.8*	*1.0*
Housing Starts (Mill. Units)	0.90	0.55	0.59	0.61	0.78	0.93	1.00	1.11	1.18	1.21	1.25	*1.26*	*1.28*	*1.25*
Total Light Vehicle Sales (Mill. Units)	13.2	10.4	11.6	12.7	14.4	15.5	16.4	17.4	17.5	17.1	17.2	*16.9*	*16.7*	*16.5*
Personal Savings Rate (%)	5.0	6.1	6.6	7.2	8.9	6.4	7.4	7.6	6.8	7.0	7.7	*8.1*	*7.6*	*7.0*
National Unemployment Rate (%)	5.8	9.3	9.6	8.9	8.1	7.4	6.2	5.3	4.9	4.4	3.9	*3.7*	*3.4*	*4.0*
AAA Corp Bond Rate (%)	5.6	5.3	4.9	4.6	3.7	4.2	4.2	3.9	3.7	3.8	3.9	*3.4*	*3.2*	*3.8*
10-Year Treasury Note Rate (%)	3.7	3.3	3.2	2.8	1.8	2.4	2.5	2.2	1.9	2.3	2.9	*2.1*	*2.1*	*3.0*
3-Month Treasury Bill Rate (%)	1.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.9	1.9	*2.1*	*1.6*	*2.3*
ANNUAL RATES OF CHANGE														
Real GDP	-0.1	-2.5	2.6	1.6	2.2	1.8	2.5	2.9	1.6	2.4	2.9	*2.1*	*2.0*	*1.6*
GDP Deflator	1.9	0.8	1.2	2.1	1.9	1.8	1.8	1.0	1.0	1.9	2.4	*1.9*	*2.2*	*2.5*
Consumer Price Index	3.8	-0.3	1.6	3.1	2.1	1.5	1.6	0.1	1.3	2.1	2.4	*2.0*	*1.9*	*2.5*

QUARTERLY ANNUALIZED RATES	2018				2019				2020			
	1st	2nd	3rd	4th	1st	2nd	3rd*	4th*	1st*	2nd*	3rd*	4th*
Gross Domestic Product ($Bill.)	20041	20412	20658	20865	21115	21346	*21537*	*21751*	*21984*	*22219*	*22451*	*22685*
Real GDP (2012 Chained $Bill.)	18324	18512	18665	18765	18821	18915	*19004*	*19084*	*19188*	*19288*	*19384*	*19480*
Total Consumption ($Bill.)	12783	12909	13020	13066	13102	13250	*13345*	*13434*	*13517*	*13598*	*13675*	*13753*
Nonresidential Fixed Investment ($Bill.)	2640	2690	2704	2736	2766	2759	*2738*	*2751*	*2772*	*2785*	*2803*	*2824*
Industrial Production (% Change, Annualized)	2.3	4.6	5.2	3.9	-1.9	-2.2	*1.2*	*-1.0*	*0.5*	*0.5*	*1.0*	*1.3*
Housing Starts (Mill. Units)	1.32	1.26	1.23	1.19	1.21	1.26	*1.28*	*1.30*	*1.30*	*1.28*	*1.28*	*1.26*
Total Light Vehicle Sales (Mill. Units)	17.1	17.3	17.0	17.4	16.8	17.0	*17.0*	*16.8*	*16.8*	*16.7*	*16.7*	*16.6*

*Estimated

Arnold Bernhard, *Founder (1901-1987)*

Harvey S. Katz, *Managing Editor*

Ian Gendler, *Executive Director of Research*

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William G. Ferguson, ***Assoc. Director of Research***
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The Water Utility Industry consists of eight investor-owned utilities that are mostly regulated by state authorities.

Consolidation continues to occur at a slow, but steady pace.

Regulation continues to be one of the strengths of this sector. Unlike the electric and gas utility sectors, there is less confrontation among regulators and water utilities.

Over the past five years, the performance from the eight primary stocks in the group has been excellent. Indeed, the typical water equity has outperformed the broader market averages by a wide margin. In the fourth quarter of 2019, this was not the case, however.

Due in part to three cuts by the Federal Reserve, short-term rates have declined. Still, on a comparable basis, they seem more attractive than water utility stocks, which carry an average yield of only about 2.0%.

Based on many key indicators, the valuation of this group is close to a historical high.

Finally, even though several equities in the Water Utility Industry are ranked 1 (Highest) for year-ahead relative price performance, almost all have substantially less than average prospects over the next 18-month- and three- to five-year periods. Most equities here are already trading well within their estimated long-term Target Price Range.

Is The Rally Over?

For the most part, water utility stocks turned in another excellent performance in 2019. This has pretty much been the norm over the past decade. The group was once bought by investors for its high dividend yield, good annual payout prospects, and reliable earnings stream. Considered a conservative vehicle, investors were willing to forgo appreciation potential in return for certainty. The price performance has been so strong that the average yield is now lower than the average stock in the *Value Line* universe. Over the past few years, Wall Street questioned several times whether the rally here could continue. Was the last quarter the beginning of the end? Indeed, these stocks didn't fare well when compared to the broader market averages.

Industry Fundamentals

The water industry in the United States is extremely fragmented. Most water service is provided by authorities that are controlled by municipal or state agencies. There are currently, tens of thousands of these entities in operation. Consolidation has been accelerating as smaller districts are merging with larger ones. *American Water Works* and *Aqua America* are two examples of growth through acquisitions. In addition to increasing the size of their rate base (on which they earn a return), these firms have been able to achieve substantial economies of scale as there are many cost redundancies.

A construction boom is also underway. In the past, insufficient investment was made in maintaining the nation's pipelines and waste water facilities. The average age of a pipe in the United States is well over 50 years, with some assets being much older. Water utilities have been addressing the problem by increasing their capital budgets meaningfully. A good percentage of the outlays are being targeted at replacing older pipes and valves.

INDUSTRY TIMELINESS: 1 (of 95)

Regulation

Investor-owned utilities are overseen by state regulators. In return for permitting a company to have a monopoly, authorities are allowed to determine what rate of return can be made on investments. Both regulators and companies have had a constructive relationship in determining the best way to improve the country's water system. By comparison, other regulated areas, such as electric and natural gas, relations have been less than cordial. For example, natural gas utilities are trying to expand their pipelines to increase the use of the low-priced commodity. However, there has been push back here due to cost and environmental concerns.

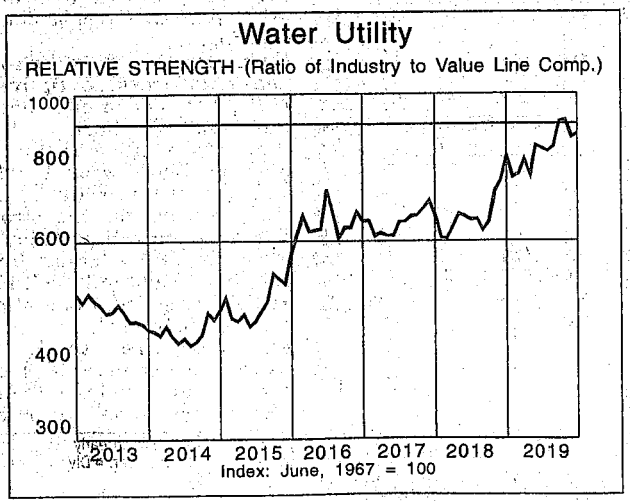
Liquid Gold?

As the world's population continues to grow, so will the demand for potable water. Due to insufficient supply in certain regions, some experts are calling water the next hot commodity. This could very well be true, but we do not know. For certain, a severe supply/demand imbalance is getting worse. In any case, the regulated water sector would not benefit, as these companies' earnings are capped (with the partial exception of *Consolidated Water*). Hence, the allowed rate of return will be set at a reasonable level. Excessive profits generated from operations would be returned to ratepayers in the form of lower water bills.

Conclusion

Despite the many positives of this group, the premium that investors have to pay to own a water stock is high based on most metrics. Several stand out for year-ahead performance. However, potential returns over the next 18 months, and through 2022-2024 are subpar. As always, we recommend that subscribers carefully read each individual report before investing to have a better understanding of each company's specific risk profile.

James A. Flood



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AMER. STATES WATER NYSE-AWR

RECENT PRICE 87.33 | P/E RATIO 41.0 (Trailing: 39.7 Median: 21.0) | RELATIVE P/E RATIO 2.23 | DIV'D YLD 1.4% | VALUE LINE 1787

TIMELINESS 1 Raised 8/9/19
SAFETY 2 Raised 7/20/12
TECHNICAL 2 Lowered 12/20/19
BETA .65 (1.00 = Market)

18-Month Target Price Range

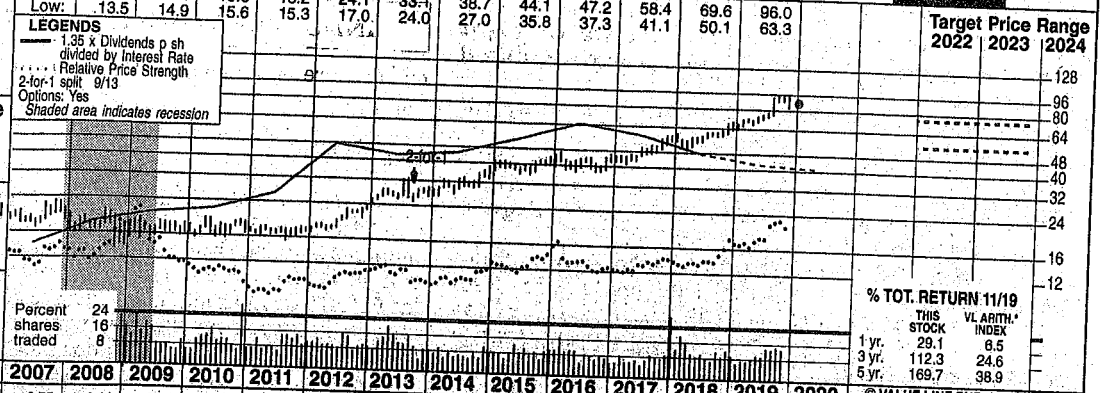
Low-High	Midpoint (% to Mid)
$68-$97	$83 (-5%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(-15%)	-2%
Low	55	(-35%)	-8%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	138	139	149
to Sell	105	109	124
Hld's(000)	26624	26893	27173



2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
6.99	6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	*12.85*	*13.10*	Revenues per sh	*15.75*
1.04	1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	*3.10*	*3.25*	"Cash Flow" per sh	*4.00*
.39	.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	*2.15*	*2.20*	Earnings per sh A	*2.75*
.44	.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	*1.26*	Div'd Decl'd per sh B■	*1.70*
1.88	2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	*3.95*	*3.50*	Cap'l Spending per sh	*3.25*
6.98	7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	*16.10*	*17.00*	Book Value per sh D	*19.35*
30.42	33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	*36.90*	*37.00*	Common Shs Outst'g C	*37.50*
31.9	23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.5*
1.82	1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.83			Relative P/E Ratio	*1.30*
3.5%	3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%			Avg Ann'l Div'd Yield	*2.6%*
						361.0	398.9	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	*475*	*485*	Revenues ($mill)	*590*
						29.5	41.4	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	*80.0*	*82.0*	Net Profit ($mill)	*105*
						38.9%	43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	*23.0%*	*23.0%*	Income Tax Rate	*23.0%*
						3.2%	5.8%	2.0%	2.5%	--	--	--	--	2.5%	--	*Nil*	*1.0%*	AFUDC % to Net Profit	*1.0%*
						45.9%	44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	*44.0%*	*44.5%*	Long-Term Debt Ratio	*46.0%*
						54.1%	55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	*56.0%*	*55.5%*	Common Equity Ratio	*54.0%*
						665.0	677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	*1070*	*1130*	Total Capital ($mill)	*1350*
						866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	*1390*	*1475*	Net Plant ($mill)	*1650*
						5.9%	7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	*8.5%*	*8.5%*	Return on Total Cap'l	*9.0%*
						8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	*13.5%*	*13.0%*	Return on Shr. Equity	*14.0%*
						8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	*13.5%*	*13.0%*	Return on Com Equity	*14.0%*
						3.2%	5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	*6.0%*	*6.0%*	Retained to Com Eq	*5.5%*
						61%	47%	49%	45%	47%	53%	54%	56%	52%	61%	*54%*	*57%*	All Div'ds to Net Prof	*62%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $475.3 mill. **Due in 5 Yrs** $100.7 mill.
LT Debt $475.0 mill. **LT Interest** $24.0 mill. (45% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.6 mill.
Pension Assets-12/18 $162.5 mill. **Oblig.** $196.1 mill.

Pfd Stock None

Common Stock 36,839,301 shs. as of 11/1/19

MARKET CAP: $3.2 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	.2	7.1	10.4
Accts Receivable	26.1	23.4	28.1
Other	129.2	101.0	94.0
Current Assets	155.5	131.5	132.5
Accts Payable	51.0	59.5	59.8
Debt Due	59.3	40.3	.3
Other	46.4	46.8	59.7
Current Liab.	156.7	146.6	119.8

ANNUAL RATES of change (per sh)

	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.5%	--	*4.5%*
"Cash Flow"	6.0%	3.0%	*6.0%*
Earnings	9.0%	4.5%	*8.0%*
Dividends	7.5%	9.0%	*9.5%*
Book Value	5.0%	4.0%	*5.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	93.5	112.0	123.8	106.8	436.1
2017	98.8	113.2	124.4	104.2	440.6
2018	94.7	106.9	124.2	111.0	436.8
2019	101.7	124.6	134.5	*114.2*	*475*
2020	*105*	*125*	*140*	*115*	*485*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.28	.45	.59	.30	1.62
2017	.34	.62	.57	.35	1.88
2018	.29	.44	.62	.37	1.72
2019	.35	.72	.76	*.32*	*2.15*
2020	*.38*	*.67*	*.70*	*.45*	*2.20*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.224	.224	.224	.242	.91
2017	.242	.242	.255	.255	.99
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020					

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 259,919 customers in 70 cities in 10 counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,353 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS sub. Sold Chaparral City Wtr. of AZ. (6/11). Employs about 815. BlackRock, Inc. owns 15.1% of out. shares; Vanguard, 11.5%; off. & dir. 1.2%. (4/19 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc: CA. Addr.: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

Shares of American States Water have not participated in the recent market rally. In the last quarter of 2019, the S&P 500 Index rallied almost 10%. Over that same time span, the value of AWR has actually declined approximately 3%, an underperformance of more than 1200 basis points. We think profit taking and sector rotation by institutional investors were at least partially responsible for the poor showing.

Earnings in 2020 should top last year's impressive figure. Even though 2019 likely ended on a down note, American States' share earnings probably climbed to $2.15, a 25% increase above the previous year's weak number. Rate relief and cost cutting were most likely the primary reasons for the strong comparison. These factors will probably have less of an impact on 2020's bottom line, but earnings per share could still well rise 2% to $2.20, as the unregulated operations' gain in importance (more below).

Finances are solid. The company remains a distance third in terms of size in the water industry (American Water Works and Aqua America are the two giants). Nevertheless, thanks to a balance sheet that doesn't have a large amount of debt, American Water is one of the two utilities in this nine-member group that carries a Financial Strength rating as high as an A.

Nonutility operations are generating a steady amount of income. The company's ASUS subsidiary provides water services to military bases via 50-year fixed-priced contracts. As more military installations privatize their water systems, we expect ASUS to raise its presence in this sector, by being successful in the competitive bidding process. This business should account for between 20% to 30% of total income by early next decade.

These shares are only for short-term investors. AWR carries a 1 (Highest) rank for year-ahead relative performance. Over the next 18-month period, our quantitative system believes the stock will actually decrease in value, however. In addition, even with the recent price decline, the equity is trading above our projected 2022-2024 Target Price Range. Finally, the dividend yield is subpar.

James A. Flood *January 10, 2020*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due mid-February.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.
(D) Includes intangibles. As of 6/30/19: $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	85
Price Growth Persistence	95
Earnings Predictability	90

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AMERICAN WATER NYSE-AWK

RECENT PRICE 123.05 | P/E RATIO 33.3 (Trailing: 35.1 / Median: 19.0) | RELATIVE P/E RATIO 1.81 | DIV'D YLD 1.7% | VALUE LINE 1788

TIMELINESS 1 Raised 4/5/19
SAFETY 3 New 7/25/08
TECHNICAL 3 Lowered 12/13/19
BETA .55 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$105-$146	$126 (0%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	120	(Nil)	2%
Low	80	(-35%)	-7%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	364	360	385
to Sell	325	331	322
Hld's(000)	155942	155051	153329

	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	23.7	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	92.4	98.2	129.9	88.0
Low:	16.5	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0	

LEGENDS
1.10 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
Options: Yes
Shaded area indicates recession

Percent shares traded: 21, 14, 7

Target Price Range 2022 | 2023 | 2024: 200, 160, 100, 80, 60, 50, 40, 30, 20

% TOT. RETURN 11/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	29.1	6.5
3 yr.	77.2	24.6
5 yr.	153.0	38.9

2003	2004	2005	2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
--	--	--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	*20.05*	*20.95*	Revenues per sh	*23.80*
--	--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	*6.75*	*7.10*	"Cash Flow" per sh	*8.30*
--	--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	*3.60*	*3.90*	Earnings per sh A	*4.70*
--	--	--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	*2.12*	Div'd Decl'd per sh B■	*2.75*
--	--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	*8.70*	*9.20*	Cap'l Spending per sh	*9.00*
--	--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	*34.40*	*36.35*	Book Value per sh D	*41.25*
--	--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	*181.00*	*182.00*	Common Shs Outst'g C	*189.00*
--	--	--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*21.5*
--	--	--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47			Relative P/E Ratio	*1.20*
--	--	--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%			Avg Ann'l Div'd Yield	*2.8%*
2440.7	2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	*3630*	*3810*	Revenues ($mill)	*4500*
209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	*650*	*700*	Net Profit ($mill)	*890*
37.9%	40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
--	--	--	6.2%	5.1%	--	--	--	5.1%	4.0%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
56.9%	56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	*58.0%*	*58.0%*	Long-Term Debt Ratio	*59.0%*
43.1%	43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	*42.0%*	*42.0%*	Common Equity Ratio	*41.0%*
9289.0	9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	*14900*	*15700*	Total Capital ($mill)	*18800*
10524	11059	11021	11739	12391	12900	13933	14992	16246	17409	*18350*	*19300*	Net Plant ($mill)	*22500*
3.8%	4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	*5.5%*	*5.5%*	Return on Total Cap'l	*6.0%*
5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	*10.5%*	*10.5%*	Return on Shr. Equity	*11.5%*
5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	*10.5%*	*10.5%*	Return on Com Equity	*11.5%*
1.8%	2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	*5.0%*	*5.0%*	Retained to Com Eq	*5.0%*
65%	56%	52%	57%	40%	50%	50%	56%	68%	56%	*54%*	*54%*	All Div'ds to Net Prof	*59%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $9143.0 mil. Due in 5 Yrs $1555.0 mil.
LT Debt $8640.0 mil. LT Interest $370.0 mil. (59% of Cap'l)

Leases, Uncapitalized: Annual rentals $17.0 mill.
Pension Assets12/18 $1499.0 mill
Oblig. $1892.0 mill.
Pfd Stock $7.0 mill. Pfd Div'd $.4 mill

Common Stock 180,776,169 shares as of 10/24/19

MARKET CAP: $22.2 billion (Large Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	82	166	116
Accts Receivable	272	301	335
Other	366	322	348
Current Assets	720	791	799
Accts Payable	195	176	149
Debt Due	1227	1035	603
Other	903	884	838
Current Liab.	2325	2094	1486

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'19 to '22-'24
Revenues	3.0%	3.5%	*4.0%*
"Cash Flow"	18.5%	6.0%	*7.0%*
Earnings	--	6.5%	*9.5%*
Dividends	--	10.5%	*9.0%*
Book Value	1.5%	4.0%	*5.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	743.0	827.0	930.0	802.0	3302.0
2017	756.0	844.0	936.0	821.0	3357.0
2018	761.0	853.0	976.0	850.0	3440.0
2019	813.0	882.0	1013.0	*922*	*3630*
2020	*850*	*930*	*1080*	*950*	*3810*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.46	.77	.83	.57	2.62
2017	.52	.73	1.12	.01	2.38
2018	.59	.91	1.03	.62	3.15
2019	.62	.94	1.33	*.71*	*3.60*
2020	*.65*	*1.00*	*1.45*	*.80*	*3.90*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.34	.375	.375	.375	1.47
2017	.375	.415	.415	.415	1.62
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020					

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to more than 14 million people in 46 states and Ontario, Canada. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 87% of 2018 revenues. New Jersey is its largest market accounting for 24% of regulated revenues; Pennsylvania, 23%. Has 7,100 employees. The Vanguard Grp. owns 11.0% of outstanding shares; BlackRock, Inc., 7.9%; officers & directors, less than 1.0%. (3/19 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

American Water Works enters the new decade as the most dominant member in this group. By any measure, it is the largest investor-owned water utility in the country. With its acquisition strategy and large spending budget (more below), the company should continue to grow its rate base substantially for the foreseeable future.

The consolidation of the water industry is providing the company with plenty of opportunities. The U.S. water sector is composed of thousands of small, inefficient water districts that are mostly run by local municipalities. As more capital is required to upgrade antiquated pipelines and wastewater facilities, many of these districts are looking to be acquired by larger entities. American has been buying up some of these districts every year. Its bottom line benefits from this process because economies of scale are very achievable in this space.

The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about $1.8 billion this year and about $21 billion over the next 10 years on expanding and improving its infrastructure. Relations with the different state regulators will remain very important as these authorities will decide what kind of return can be made on these investments. Based on the historical record, the regulatory climate should remain constructive.

Finances will likely just remain average, though. Over the past decade or so, the water utility has relied almost exclusively on debt and internally generated cash to fund the building program. With the value of the equity increasing more than sixfold during the period, the company could do well by increasing its equity base. Until this happens, we don't expect the balance sheet to stand out.

Shares of American Water Works hold our Highest (1) rank for Timeliness. Like most equities in the water utility industry, however, AWK is highly overvalued by several key financial measures. Our 18-month quantitative model also indicates that the stock will not do well. Too, total return potential to 2022-2024 is very unattractive.

James A. Flood *January 10, 2020*

(A) Diluted earnings. Excludes nonrecur. losses: '08, $4.62; '09, $2.63; '11, $0.07. Disc. oper.: '06, ($0.04); '11, $0.03; '12, ($0.10); '13,($0.01). GAAP used as of 2014. Next earnings report due mid-February. Quarterly earnings do not sum in '16 due to rounding.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. (D) Includes intangibles. On 9/30/19: $1.650 billion, $9.13/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B+
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	80

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AQUA AMERICA NYSE-WTR

RECENT PRICE 47.08 | P/E RATIO 35.9 (Trailing: 67.3) (Median: 22.0) | RELATIVE P/E RATIO 1.95 | DIV'D YLD 2.1% | VALUE LINE 1789

TIMELINESS 1 Raised 12/20/19
SAFETY 2 Raised 4/20/12
TECHNICAL 3 Lowered 12/20/19
BETA .65 (1.00 = Market)

18-Month Target Price Range

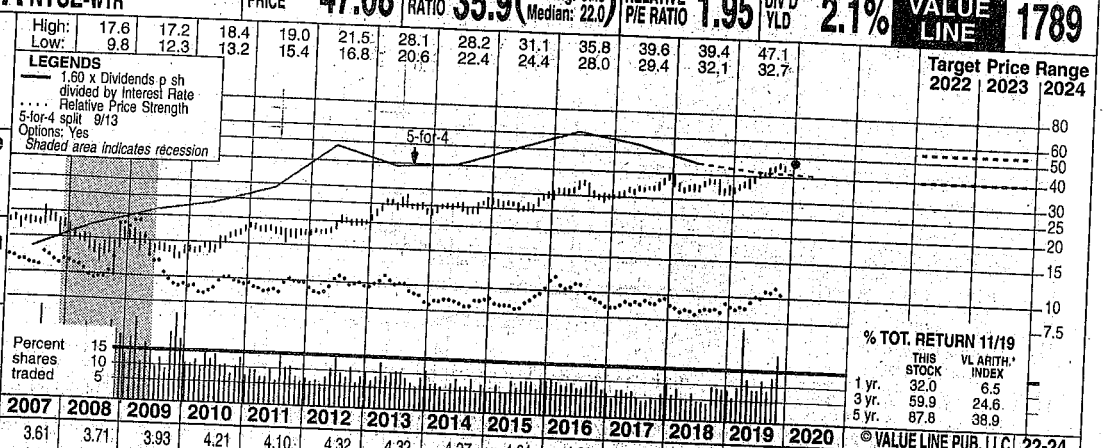
Low-High	Midpoint (% to Mid)
$34-$52	$43 (-10%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+15%)	6%
Low	40	(-15%)	-1%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	238	280	248
to Sell	184	167	210
Hld's(000)	103658	140358	143792



2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
2.38	2.78	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	*4.10*	*4.30*	Revenues per sh	*5.70*
.77	.87	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	*1.80*	*2.15*	"Cash Flow" per sh	*2.85*
.46	.51	.57	.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	*1.05*	*1.40*	Earnings per sh A	*2.00*
.28	.29	.32	.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	*.96*	Div'd Decl'd per sh B■	*1.25*
1.06	1.23	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	*2.40*	*2.50*	Cap'l Spending per sh	*2.75*
4.27	4.71	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	*18.00*	*18.50*	Book Value per sh	*18.40*
154.31	158.97	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	*216.00*	*217.00*	Common Shs Outst'g C	*220.00*
24.5	25.1	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*24.0*
1.40	1.33	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76			Relative P/E Ratio	*1.35*
2.5%	2.3%	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%			Avg Ann'l Div'd Yield	*2.6%*
						670.5	726.1	712.0	757.8	768.6	779.9	814.2	819.9	809.5	838.1	*890*	*930*	Revenues ($mill)	*1250*
						104.4	124.0	144.8	153.1	205.0	213.9	201.8	234.2	239.7	192.0	*230*	*305*	Net Profit ($mill)	*440*
						39.4%	39.2%	32.9%	39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	6.6%	*NMF*	*5.0%*	Income Tax Rate	*7.0%*
						--	--	--	--	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	*12.5%*	*10.0%*	AFUDC % to Net Profit	*10.0%*
						55.6%	56.6%	52.7%	52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	*42.5%*	*43.5%*	Long-Term Debt Ratio	*53.0%*
						44.4%	43.4%	47.3%	47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	*57.5%*	*56.5%*	Common Equity Ratio	*47.0%*
						2495.5	2706.2	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	*6800*	*7100*	Total Capital ($mill)	*7600*
						3227.3	3469.3	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	*6250*	*6525*	Net Plant ($mill)	*7600*
						5.6%	5.9%	6.9%	6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	*5.0%*	*5.0%*	Return on Total Cap'l	*7.0%*
						9.4%	10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	*6.0%*	*8.5%*	Return on Shr. Equity	*11.0%*
						9.4%	10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	*6.0%*	*8.5%*	Return on Com Equity	*11.0%*
						2.7%	3.7%	4.6%	4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	*4.0%*	*3.0%*	Retained to Com Eq	*4.0%*
						72%	65%	60%	61%	50%	52%	60%	56%	59%	79%	*87%*	*63%*	All Div'ds to Net Prof	*63%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $3086.4 mill. **Due in 5 Yrs** $698.8 mill.
LT Debt $2898.3 mill. **LT Interest** $122.0 mill. (43% of Cap'l)

Pension Assets-12/18 $239.0 mill. **Oblig.** $282.0 mill.

Pfd Stock None
Common Stock 215,840,774 shares as of 10/23/19

MARKET CAP: $10.2 billion (Large Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	4.2	3.6	2030.6
Receivables	98.6	101.2	117.0
Inventory (AvgCst)	14.4	15.8	17.0
Other	14.0	26.6	14.3
Current Assets	131.2	147.2	2178.9
Accts Payable	59.2	77.3	57.6
Debt Due	117.4	160.0	188.1
Other	107.9	161.7	106.4
Current Liab.	284.5	399.0	352.1

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.0%	1.5%	*3.5%*
"Cash Flow"	6.5%	5.0%	*6.5%*
Earnings	8.0%	5.5%	*8.0%*
Dividends	7.5%	8.0%	*8.0%*
Book Value	6.5%	6.5%	*9.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	192.6	203.9	226.6	196.8	819.9
2017	187.8	203.4	215.0	203.3	809.5
2018	194.3	211.9	226.2	205.7	838.1
2019	201.1	218.9	243.6	*226.4*	*890*
2020	*215*	*235*	*250*	*230*	*930*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.29	.34	.41	.28	1.32
2017	.28	.34	.43	.30	1.35
2018	.29	.37	.44	d.02	1.08
2019	.09	.25	.38	*.33*	*1.05*
2020	*.25*	*.35*	*.47*	*.33*	*1.40*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.178	.178	.1913	.1913	.74
2017	.1913	.1913	.2047	.2047	.79
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020					

BUSINESS: Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately three million residents in Pennsylvania (responsible for 53% of 2018 revenues), Ohio, Texas, Illinois, North Carolina, New Jersey, Indiana, and Virginia. Has 1,570 employees. Acquired AquaSource, 7/13; North Maine Utilities, 7/15; and others. Water supply revenues 2018: residential, 58%; commercial, 16%; industrial, wastewater & other, 26%. Off. & dir. own less than 1% of the common stock; Vanguard Group, 10.7%; Blackrock, Inc, 9.5%; State Street Capital, 4.9% (3/19 Proxy). President & Chief Executive Officer: Christopher Franklin, Inc.: PA Addr.: 762 West Lancaster Avenue, Bryn Mawr, PA 19010. Tel.: 610-525-1400. Internet: www.aquaamerica.com.

Aqua America is still awaiting final approval of its acquisition of Peoples Gas. The water utility reached an agreement to buy the regulated Pittsburgh-based natural gas company in 2018 for $4.3 billion in cash, and the assumption of $1.4 billion of debt. Because both entities operate in many different states, a host of regulators must provide permission for the transaction to be completed. Currently, our best estimate is that the purchase will close in the early part of this year.

The company will have a new profile. The natural gas distributor has almost 750,000 customers. Though this is in a sector also overseen by state authorities, the gas sector has historically had a much more adversarial relationship with regulators. In the water segment, both utilities and regulators realize that large amounts of investment are needed to modernize the country's antiquated infrastructure. Cooperation between companies and their overseers has been very constructive. By comparison, in the gas arena, there is much resistance to construction programs such as expanding existing pipelines to meet the needs of a service area.

The balance sheet partially reflects the acquisition. To finance the transaction, a large equity offering was completed last year. More than $1.3 billion was raised in the transaction, which increased shares outstanding by about 20% (37.3 million). Proceed from the sale of tangible equity units also raised approximately $700 million. About $900 million of debt due in 2029 and 2049 was also sold last April. The remaining funds should come from existing credit facilities.

Meanwhile, another rate hike was granted. On October 29th, about $60 million in higher rates went into effect in Pennsylvania. During 2019, New Jersey, North Carolina, and Ohio also increased tariffs.

Only short-term investors should take a look here. By most financial metrics, including the P/E ratio and its yield relative to the average equity, WTR is highly overvalued. It is ranked 1 (Highest) for year-ahead performance, but our 18-month model predicts the stock will post a negative performance. In addition, total return prospects to 2022-2024 are poor.

James A. Flood *January 10, 2020*

Company's Financial Strength	A
Stock's Price Stability	95
Price Growth Persistence	75
Earnings Predictability	65

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(A) Diluted egs. Excl. nonrec. gains: '03, 3¢; '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. May not sum due to rounding. Next earnings report due mid-February.
(B) Dividends historically paid in early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available (5% discount).
(C) In millions, adjusted for stock splits.
(D) Includes intangibles: 9/30/19, $52.7 mill./$0.24 a share.

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CALIFORNIA WATER NYSE-CWT

RECENT PRICE 51.52 | P/E RATIO 31.0 (Trailing: 37.1 / Median: 22.0) | RELATIVE P/E RATIO 1.68 | DIV'D YLD 1.5% | VALUE LINE 1790

TIMELINESS 2 Raised 10/25/19
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Lowered 12/27/19
BETA .70 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$44-$69	$57 (10%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+5%)	3%
Low	35	(-30%)	-7%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	132	120	118
to Sell	81	102	94
Hld's(000)	35698	36947	36133

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
High:	23.3	24.1	19.8	19.4	19.3	23.4	26.4	26.0	36.8	46.2	49.1	57.5								Target Price Range 2022 2023 2024
Low:	13.8	16.7	16.9	16.7	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6								
	8.18	8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	*14.70*	*14.80*	Revenues per sh	*15.00*
	1.26	1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	*3.05*	*3.30*	"Cash Flow" per sh	*3.50*
	.61	.73	.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	*1.40*	*1.70*	Earnings per sh [A]	*2.00*
	.56	.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.82	Div'd Decl'd per sh [B] ■	*1.05*
	2.19	1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	*3.95*	*4.00*	Cap'l Spending per sh	*3.65*
	7.22	7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	*15.85*	*15.70*	Book Value per sh [C]	*16.05*
	33.86	36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	*48.25*	*50.00*	Common Shs Outst'g [D]	*53.00*
	22.1	20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.0*
	1.26	1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64			Relative P/E Ratio	*1.25*
	4.2%	3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%			Avg Ann'l Div'd Yield	*2.5%*
	449.4	460.4	501.8	560.0	584.1	597.5	588.4	609.4	666.9	698.2	*710*	*740*	Revenues ($mill) [E]	*795*
	40.6	37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	65.6	*68.0*	*85.0*	Net Profit ($mill)	*105*
	40.3%	39.5%	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
	7.6%	4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
	47.1%	52.4%	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	*51.0%*	*47.0%*	Long-Term Debt Ratio	*39.5%*
	52.9%	47.6%	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	*49.0%*	*53.0%*	Common Equity Ratio	*60.5%*
	794.9	914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	*1565*	*1485*	Total Capital ($mill)	*1400*
	1198.1	1294.3	1381.1	1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	*2300*	*2385*	Net Plant ($mill)	*2500*
	6.5%	5.5%	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	*5.0%*	*6.5%*	Return on Total Cap'l	*8.5%*
	9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	*9.0%*	*11.0%*	Return on Shr. Equity	*12.5%*
	9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	*9.0%*	*11.0%*	Return on Com Equity	*12.5%*
	3.8%	3.0%	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	*4.0%*	*5.5%*	Retained to Com Eq	*6.0%*
	60%	66%	71%	62%	56%	55%	71%	68%	51%	55%	*56%*	*48%*	All Div'ds to Net Prof	*53%*

% TOT. RETURN 11/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	14.1	6.5
3 yr.	56.9	24.6
5 yr.	128.0	38.9

CAPITAL STRUCTURE as of 9/30/19
Total Debt $967.9 mill. Due in 5 Yrs $430.1 mill.
LT Debt $807.5 mill. LT Interest $40.0 mill.
(Total interest coverage: 4.1x) (53% of Cap'l)

Pension Assets-12/18 $469.7 mill.
Oblig. $639.9 mill.

Pfd Stock None

Common Stock 48,145,000 shs.

MARKET CAP: $2.5 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	94.8	47.2	51.3
Other	133.1	141.5	160.8
Current Assets	227.9	188.7	212.1
Accts Payable	94.0	95.6	108.6
Debt Due	291.0	170.0	160.4
Other	106.0	55.6	64.9
Current Liab.	491.0	321.2	333.9

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	4.5%	2.0%	*1.5%*
"Cash Flow"	6.0%	5.0%	*3.5%*
Earnings	5.0%	5.5%	*8.0%*
Dividends	2.0%	3.0%	*6.5%*
Book Value	4.5%	4.5%	*2.0%*

Calendar	QUARTERLY REVENUES ($ mill.) [E] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	121.7	152.4	184.3	151.0	609.4
2017	122.1	171.1	211.7	162.0	666.9
2018	134.6	174.9	221.3	167.4	698.2
2019	126.1	179.0	232.5	*172.4*	*710*
2020	*140*	*185*	*237*	*178*	*740*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	d.02	.24	.48	.31	1.01
2017	.02	.39	.70	.29	1.40
2018	d.02	.31	.75	.32	1.36
2019	d.16	.35	.88	*.33*	*1.40*
2020	*.03*	*.42*	*.85*	*.40*	*1.70*

Calendar	QUARTERLY DIVIDENDS PAID [B] ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1725	.1725	.1725	.1725	.69
2017	.18	.18	.18	.18	.72
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020					

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 486,900 customers in 100 communities in the state of California. Accounts for over 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '18: residential, 67%; business, 19%; industrial, 5%; public authorities, 5%; other 4%. Off. and dir. own 1% of common stock (4/19 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki, Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

California Water Service Group's net income rose sharply in the third quarter. Share net of $0.88 increased 17%, year over year, handily topping our $0.79 call. The solid performance was driven largely by higher rates and lower business development expenses, as these positives more than offset increased water production and operating costs. On balance, we think the water provider closed out the year with earnings of $1.40 a share. For 2020, we expect noteworthy share-net expansion, which should be supported by a healthy top-line advance.

The company's outstanding share count is poised to rise. This is due primarily to the recent initiation of a three-year equity program in which California Water will periodically sell shares of common stock at market value. The rate of issuance will depend on respective market conditions, with total gross sales not to exceed $300 million. California Water will likely use net proceeds for general corporate purposes, such as construction and acquisitions, investments, and the redemption of securities.

Long term, investment spending and rate increases are probably on tap. Indeed, management is in the early innings of its extensive capital allocation program. As previously noted, upward of $750 million has been earmarked for infrastructure upgrades, namely improvements to its water transportation systems and treatment plants. To support these initiatives, another settlement agreement was filed in October to address additional matters in its general rate case. To that end, should the Public Utilities Commission approve the agreement, California Water may be able to pass along to customers approximately $600 million-$625 million in project spending in the form of rate hikes.

The issue has been upgraded one notch for Timeliness, to 2 (Above Average), and thus it ought to appeal to near-term subscribers. Further, price upside over the 18 month stretch is worthwhile. But despite the equity's attractive business prospects, those with a 3- to 5-year holding period are better off waiting on the sidelines, as CWT is presently trading near the upper end of our Target Price Range.

Nicholas P. Patrikis *January 10, 2020*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early Feb.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '18 : $24.7 mill., $0.51/sh.
(D) In millions, adjusted for splits.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	60
Earnings Predictability	65

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CONSOL. WATER CO. NDQ-CWCO

RECENT PRICE 16.46 | P/E RATIO 27.4 (Trailing: 30.5 Median: 23.0) | RELATIVE P/E RATIO 1.49 | DIV'D YLD 2.1% | VALUE LINE 1791

TIMELINESS 3 Raised 8/24/16
SAFETY 3 New 1/17/14
TECHNICAL 2 Lowered 12/27/19
BETA .85 (1.00 = Market)

18-Month Target Price Range

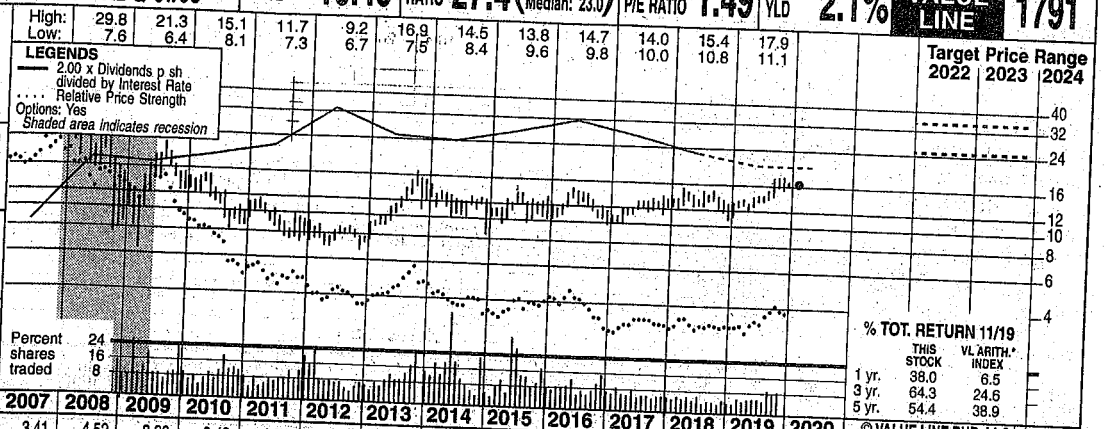
Low-High	Midpoint (% to Mid)
$10-$19	$15 (-10%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	35	(+115%)	23%
Low	25	(+50%)	14%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	34	34	44
to Sell	35	44	32
Hld's(000)	8032	8148	8224



2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
1.68	2.02	1.12	2.71	3.41	4.52	3.99	3.49	3.79	4.49	4.35	4.46	3.86	3.89	4.18	4.39	4.50	4.55	Revenues per sh	9.40
.63	.77	.37	.87	1.20	.95	1.18	.86	.83	1.17	.96	.80	.89	.95	1.12	1.15	1.00	1.10	"Cash Flow" per sh	2.00
.42	.49	.23	.59	.79	.50	.74	.43	.42	.64	.58	.42	.51	.27	.41	.68	.58	.65	Earnings per sh A	1.40
.21	.23	.12	.24	.20	.33	.28	.30	.30	.30	.30	.30	.30	.30	.31	.34	.34	.34	Div'd Decl'd per sh B■	.75
.19	.24	.77	1.83	.54	.46	.18	.09	.96	.31	.29	.32	.21	.23	.31	1.08	.25	.45	Cap'l Spending per sh	.50
3.89	4.20	2.54	7.49	8.21	8.36	8.53	8.69	8.83	9.20	9.44	9.58	9.81	9.79	9.91	10.34	10.95	11.20	Book Value per sh D	12.20
11.37	11.51	23.46	14.13	14.40	14.53	14.54	14.55	14.57	14.59	14.69	14.72	14.78	14.87	14.92	14.98	15.10	15.20	Common Shs Outst'g C	16.00
19.3	23.1	NMF	43.0	35.4	37.8	19.0	26.9	22.4	12.4	20.0	28.3	22.7	44.8	29.0	19.4	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	22.0
1.10	1.22	NMF	2.32	1.88	2.27	1.27	1.71	1.41	.79	1.12	1.49	1.14	2.35	1.46	1.05			Relative P/E Ratio	1.20
2.6%	2.0%	.7%	.9%	.7%	1.7%	2.0%	2.6%	3.2%	3.8%	2.6%	2.5%	2.6%	2.5%	2.6%	2.6%			Avg Ann'l Div'd Yield	2.5%
						58.0	50.7	55.2	65.5	63.8	65.6	57.1	57.9	62.3	65.7	68.0	69.0	Revenues ($mill)	150
						10.8	6.3	6.1	9.3	8.6	6.3	7.5	4.0	6.1	10.2	9.0	10.0	Net Profit ($mill)	23.0
						--	--	--	--	--	--	--	--	--	--	NMF	NMF	Income Tax Rate	NMF
						--	--	4.0%	--	--	--	--	--	--	--	NMF	NMF	AFUDC % to Net Profit	NMF
						13.8%	11.8%	5.1%	3.7%	--	--	--	--	--	--	Nil	Nil	Long-Term Debt Ratio	Nil
						86.2%	88.2%	94.9%	96.3%	99.8%	99.8%	100.0%	100.0%	100.0%	100.0%	100%	100%	Common Equity Ratio	100%
						143.9	143.3	135.6	139.4	138.9	141.2	145.0	145.6	147.9	155.0	165	170	Total Capital ($mill)	195
						61.2	56.2	64.3	61.6	58.6	56.4	53.7	53.1	50.5	64.9	65.0	70.0	Net Plant ($mill)	100
						8.1%	4.9%	5.0%	7.0%	6.2%	4.4%	5.2%	2.7%	4.2%	6.6%	5.5%	6.0%	Return on Total Cap'l	12.0%
						8.7%	5.0%	4.7%	6.9%	6.2%	4.4%	5.2%	2.7%	4.2%	6.6%	5.5%	6.0%	Return on Shr. Equity	12.0%
						8.7%	5.0%	4.7%	6.9%	6.2%	4.4%	5.2%	2.7%	4.1%	6.6%	5.5%	6.0%	Return on Com Equity	12.0%
						4.6%	1.5%	1.0%	3.6%	3.0%	1.2%	2.1%	NMF	1.1%	3.3%	2.0%	3.0%	Retained to Com Eq	5.5%
						46%	69%	79%	46%	51%	73%	59%	112%	73%	50%	59%	52%	All Div'ds to Net Prof	54%

CAPITAL STRUCTURE as of 9/30/19
Total Debt None

Leases, Uncapitalized: Annual rentals $.5 mill.

No Defined Benefit Pension Plan

Pfd Stock NMF (34,796 shares out.)
Div'd NMF

Common Stock 15,027,574 shs.
as of 11/15/19

MARKET CAP: $250 million (Small Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	47.2	31.3	43.6
Accts Receivable	15.0	24.2	23.0
Other	4.5	6.9	6.8
Current Assets	66.7	62.4	73.4
Accts Payable	5.7	4.6	2.2
Debt Due	.7	--	--
Other	1.2	3.3	2.3
Current Liab.	7.6	7.9	5.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'19 to '22-'24
Revenues	5.0%	.5%	14.5%
"Cash Flow"	2.0%	.5%	11.0%
Earnings	-3.0%	-4.5%	20.5%
Dividends	5.0%	--	15.5%
Book Value	5.0%	2.0%	3.5%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	14.0	15.4	14.4	14.1	57.9
2017	15.6	15.3	16.6	14.8	62.3
2018	14.3	15.9	18.8	16.7	65.7
2019	17.0	18.3	15.9	16.8	68.0
2020	17.0	18.0	16.5	17.5	69.0

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.15	.15	d.13	.10	.27
2017	.18	.11	.08	.04	.41
2018	.14	.14	.30	.10	.68
2019	.17	.16	.11	.14	.58
2020	.18	.17	.15	.15	.65

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.075	.075	.075	.075	.30
2017	.075	.075	.075	.075	.30
2018	.085	.085	.085	.085	.34
2019	.085	.085	.085	.085	.34
2020					

BUSINESS: Consolidated Water Co. Ltd. develops and operates seawater desalination plants and water distribution systems in areas where naturally occurring supplies of potable water are scarce or nonexistent. It provides water in the Cayman Islands, the Bahamas, the British Virgin Isl, and Bali. At 12/31/18, it operated 11 plants with a capacity of 24.6 million gallons per day. In 2017, Bali classified as disc. oper. Divested Belize assets 2019. Inc.: Cayman Islands. Has 108 employees, Pres. & CEO : F. McTaggart. Offs./Dirs. own 4.8% of stock; Amundi Asset Mgt.: 7.7%; BlackRock, 6.6% (4/19 proxy). Addr.: Regatta Off. Pk, Windward Three, 4th Floor, West Bay Road, P.O. Box 1114 Grand Cayman, KY1-1102, Cayman Islands. Tel.: (345) 945-4277. Int.: www.cwco.com.

Consolidated Water's share earnings will probably recover, to some extent, in 2020. Last year's bottom line was hurt when bulk water rates were reduced in the Cayman Islands. Year-over-year comparisons were also not favorable due to some unusual gains recorded in 2018. However, increased activity at the Aerex business, which manufactures parts for desalination facilities, should rise as more of these projects are built. All told, Consolidated share net could climb 11%.

The desalination segment of the water sector remains attractive. Management currently estimates that there are 18,500 desalination plants in the world that supply water to over 300 million people. Annual growth in this sector is expected to average close to 10%. Much of this will be attributable to rising populations in many parts of the world were potable water is not plentiful. Indeed, in California and the southwestern United States, the use of this process ought to pick up considerably. In the Golden State, there are 11 projects in operation, with another 10 in the planning stages. Consolidated has most of its plants domiciled in countries where operating can be difficult, at times, and would like to increase its presence here.

All approvals for the Rosarito project have not yet been granted. The company has completed all of the preconstruction work for developing a desalination plant to serve the city of Tijuana. The most recent delay was due to a newly elected administration coming into office. While the regulatory process may take longer than expected, the chances of it being permitted are excellent, as the water is needed. In any case, Consolidated is limiting its risk here as it will only be the operator and minority owner. Suez International will construct Rosarito.

This stock is not for the typical water utility investor. For starters, the company's earnings stream is much less predictable than the other regulated companies in this group. Part of this is due to its extensive overseas operations. An average selection for the year ahead, these shares have negative potential in the 18-month period. Over the pull to 2022-2024, however, the equity may well generate above-average returns.

James A. Flood *January 10, 2020*

(A) Fully diluted earnings. Excludes gains from discontinued operations: '17, $0.07 a share; '18, $0.07 a share; '19, $0.24 a share. Next earnings report due mid-February.
(B) Dividends historically paid in late January, April, July, and October. ■ Dividend reinvestment plan available.
(C) In millions, adjusted for stock split.
(D) Includes intangibles. As of 9/30/19, $9.3 million/$0.62 a share.

Company's Financial Strength	B+
Stock's Price Stability	50
Price Growth Persistence	30
Earnings Predictability	40

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MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 63.56 | P/E RATIO 31.5 (Trailing: 32.3 / Median: 21.0) | RELATIVE P/E RATIO 1.71 | DIV'D YLD 1.6% | VALUE LINE 1792

TIMELINESS 3 Lowered 5/24/19
SAFETY 2 New 10/21/11
TECHNICAL 2 Raised 1/3/20
BETA .75 (1.00 = Market)

18-Month Target Price Range

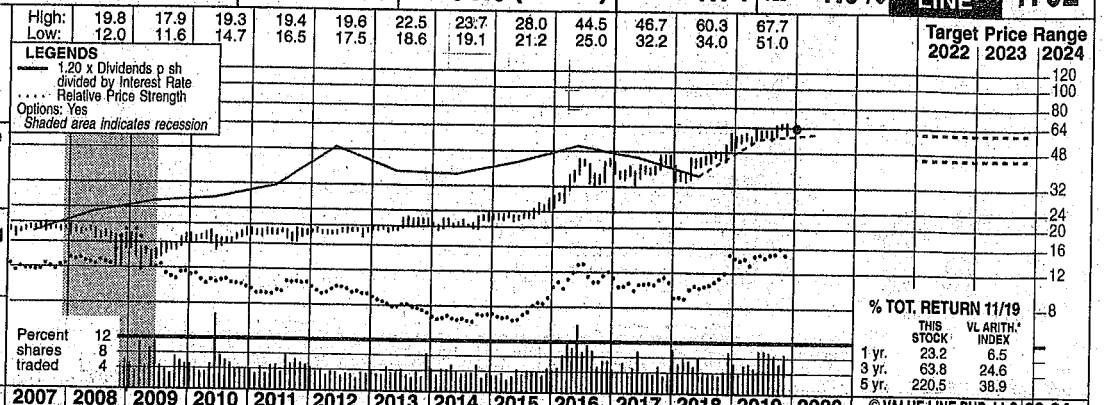
Low-High	Midpoint (% to Mid)
$52-$89	$71 (10%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	60	(-5%)	Nil
Low	45	(-30%)	-6%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	72	79	56
to Sell	67	58	67
Hld's(000)	9424	9432	9915



	High:	19.8	17.9	19.3	19.4	19.6	22.5	23.7	28.0	44.5	46.7	60.3	67.7
	Low:	12.0	11.6	14.7	16.5	17.5	18.6	19.1	21.2	25.0	32.2	34.0	51.0

% TOT. RETURN 11/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	23.2	6.5
3 yr.	63.8	24.6
5 yr.	220.5	38.9

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
6.12	6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	*7.70*	*8.20*	Revenues per sh	*9.15*
1.15	1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	*2.80*	*2.95*	"Cash Flow" per sh	*3.45*
.61	.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	*1.95*	*2.10*	Earnings per sh A	*2.45*
.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	*1.04*	Div'd Decl'd per sh B■	*1.15*
1.87	2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	*3.50*	*3.50*	Cap'l Spending per sh	*3.50*
7.60	8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	*15.70*	*16.15*	Book Value per sh	*17.05*
10.48	11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	*17.50*	*17.65*	Common Shs Outst'g C	*18.00*
30.0	26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*21.0*
1.71	1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20			Relative P/E Ratio	*1.15*
3.5%	3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%			Avg Ann'l Div'd Yield	*2.2%*
91.2	102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	*135*	*145*	Revenues ($mill)	*165*
10.0	14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	*34.0*	*37.0*	Net Profit ($mill)	*44.0*
34.1%	32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
--	6.8%	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	*2.0%*	*2.0%*	AFUDC % to Net Profit	*2.5%*
46.6%	43.1%	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	*45.0%*	*42.5%*	Long-Term Debt Ratio	*39.5%*
52.1%	55.8%	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	*54.5%*	*57.5%*	Common Equity Ratio	*60.5%*
267.9	310.5	312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	*505*	*500*	Total Capital ($mill)	*510*
376.5	405.9	422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	*625*	*635*	Net Plant ($mill)	*650*
5.0%	5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	*7.5%*	*8.0%*	Return on Total Cap'l	*9.0%*
7.0%	8.1%	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	*12.5%*	*13.0%*	Return on Shr. Equity	*14.0%*
7.0%	8.2%	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	*12.5%*	*13.0%*	Return on Com Equity	*14.5%*
.1%	2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	*6.0%*	*6.5%*	Retained to Com Eq	*7.5%*
98%	75%	87%	83%	73%	67%	63%	58%	62%	46%	*50%*	*49%*	All Div'ds to Net Prof	*47%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $294.0 mill. **Due in 5 Yrs** $65.7 mill.
LT Debt $228.3 mill. **LT Interest** $6.8 mill.
(Total interest coverage: 8.5x)
(45% of Cap'l)

Pension Assets-12/18 $66.8 mill.
Oblig. $83.9 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 16,669,540 shs.
as of 10/31/19

MARKET CAP: $1.1 billion (Mid-Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	4.9	3.7	3.2
Other	24.3	27.1	31.5
Current Assets	29.2	30.8	34.7
Accts Payable	13.9	19.3	20.2
Debt Due	34.9	55.8	65.7
Other	15.7	19.3	17.6
Current Liab.	64.5	94.4	103.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	2.5%	3.5%	*2.0%*
"Cash Flow"	5.5%	9.0%	*6.5%*
Earnings	6.0%	11.0%	*7.5%*
Dividends	2.0%	3.0%	*5.0%*
Book Value	3.5%	4.5%	*3.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	30.6	32.7	37.8	31.8	132.9
2017	30.1	33.0	36.2	31.5	130.8
2018	31.2	34.9	38.7	33.3	138.1
2019	30.7	33.4	37.8	*33.1*	*135*
2020	*32.0*	*36.0*	*42.0*	*35.0*	*145*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.29	.36	.54	.19	1.38
2017	.27	.33	.46	.32	1.38
2018	.27	.52	.74	.43	1.96
2019	.39	.49	.66	*.41*	*1.95*
2020	*.40*	*.55*	*.70*	*.45*	*2.10*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.19875	.19875	.19875	.21125	.81
2017	.21125	.21125	.21125	.22375	.86
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020					

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 61,000 retail customers, primarily in Middlesex County, New Jersey. In 2018, the Middlesex System accounted for 59% of operating revenues. At 12/31/18, the company had 330 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.5% of the com. stock; BlackRock Inst. Trust Co., 6.8% (4/19 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Middlesex Water Company has tapped the equity markets. The company recently finalized a public offering of approximately 760,000 shares of common stock at a price of $60.50 per share (includes additional shares purchased by underwriters). Middlesex received total net proceeds of $43.8 million, which have been earmarked for a number of efforts, including general corporate purposes, paying off short-term obligations, completing acquisitions, and funding the continuation of infrastructure investment initiatives.

We are moderately tempering our 2019 and 2020 earnings forecasts. The Northeast water and wastewater operator saw net income contract year-over-year in the third quarter, to $0.66 per share, partly due to weaker revenues stemming from softer water consumption related to unfavorable weather. Operating expenses were essentially unchanged, on an annual basis. All told, we are slicing a nickel and a dime off our 2019 and 2020 share-net estimates, to $1.95 and $2.10, respectively.

Middlesex shares may be cooling off a bit. The stock price pulled back modestly since our last report, despite stamping a fresh all-time high in late October. For much of 2019, the stock has traded in a relatively tight range. Indeed, investors may be starting to take some profits off the table following several years of strong price appreciation and the recent dilution.

The board of directors increased the quarterly payout 7%, to $0.2562 per share. While consistent dividend hikes are reassuring, at current levels, this equates to an annual yield of about 1.6%, which does not necessarily jump out to the income-seeking crowd.

What about Middlesex stock? The company is in decent shape from a fundamental perspective, and long-term business prospects should be enhanced by multiple catalysts, such as an expanding customer base (particularly in Delaware), periodic rate increases, and strong infrastructure spending. However, the issue is presently void of investment appeal. Middlesex shares are just an average selection for relative year-ahead price performance, and most of the gains we envision three to five years out appear to already be baked into the recent quotation.

Nicholas P. Patrikis *January 10, 2020*

(A) Diluted earnings. Next earnings report due late January.
(B) Dividends historically paid in mid-Feb., May, Aug., and November. ■ Div'd reinvestment plan available.
(C) In millions.

Company's Financial Strength	B++
Stock's Price Stability	65
Price Growth Persistence	55
Earnings Predictability	75

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SJW GROUP NYSE-SJW

RECENT PRICE 71.79 | P/E RATIO 44.3 (Trailing: 51.6) (Median: 21.0) | RELATIVE P/E RATIO 2.41 | DIV'D YLD 1.7% | VALUE LINE 1793

TIMELINESS — Suspended 5/4/18
SAFETY 3 New 4/22/11
TECHNICAL — Suspended 5/4/18
BETA .60 (1.00 = Market)

18-Month Target Price Range

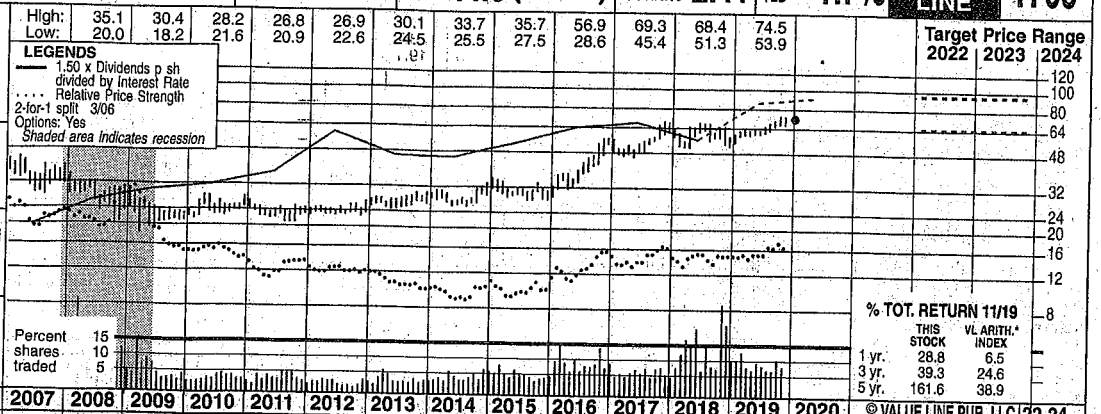
Low-High	Midpoint (% to Mid)
$51-$85	$68 (-5%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+30%)	9%
Low	65	(-10%)	Nil

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	88	91	94
to Sell	71	62	69
Hld's(000)	19349	19526	19354



% TOT. RETURN 11/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	28.8	6.5
3 yr.	39.3	24.6
5 yr.	161.6	38.9

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
8.20	9.14	9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	18.97	14.00	*14.15*	*18.15*	Revenues per sh	*20.85*
1.75	1.89	2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	5.24	3.29	*3.15*	*4.15*	"Cash Flow" per sh	*5.30*
.91	.87	1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	*1.45*	*2.45*	Earnings per sh [A]	*3.65*
.49	.51	.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	*1.28*	Div'd Decl'd per sh [B■]	*1.50*
3.41	2.31	2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	7.26	5.08	*5.00*	*5.25*	Cap'l Spending per sh	*5.25*
9.11	10.11	10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	22.57	31.31	*31.20*	*32.70*	Book Value per sh	*38.35*
18.27	18.27	18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	20.52	28.40	*29.00*	*29.50*	Common Shs Outst'g [C]	*30.00*
15.4	19.6	19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	*Bold figures are*		Avg Ann'l P/E Ratio	*22.0*
.88	1.04	1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.76	*Value Line*		Relative P/E Ratio	*1.20*
3.5%	3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	1.9%	1.9%	*estimates*		Avg Ann'l Div'd Yield	*1.9%*
216.1	215.6	239.0	261.5	276.9	319.7	305.1	339.7	389.2	397.7	*410*	*535*	Revenues ($mill)	*625*
15.2	15.8	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	*42.0*	*72.0*	Net Profit ($mill)	*110*
40.4%	38.8%	41.1%	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
2.0%	--	--	--	--	--	--	--	2.0%	1.0%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
49.4%	53.7%	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	*36.5%*	*35.0%*	Long-Term Debt Ratio	*32.5%*
50.6%	46.3%	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	*63.5%*	*65.0%*	Common Equity Ratio	*67.5%*
499.6	550.7	607.9	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	*1420*	*1490*	Total Capital ($mill)	*1700*
718.5	785.5	756.2	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	*1365*	*1400*	Net Plant ($mill)	*1500*
4.4%	4.3%	4.9%	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	*4.0%*	*5.5%*	Return on Total Cap'l	*7.0%*
6.0%	6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	*4.5%*	*7.5%*	Return on Shr. Equity	*9.5%*
6.0%	6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	*4.5%*	*7.5%*	Return on Com Equity	*9.5%*
1.2%	1.2%	3.1%	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	*1.0%*	*3.5%*	Retained to Com Eq	*5.5%*
80%	80%	61%	59%	62%	29%	42%	31%	36%	60%	*83%*	*52%*	All Div'ds to Net Prof	*41%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $511.1 mill. **Due in 5 Yrs** $14.3 mill.
LT Debt $511.1 mill. **LT Interest** $20.0 mill.
(LT Interest Coverage: 7.1x)
(37% of Cap'l)

Leases, Uncapitalized: Annual rentals $4.4 mill.

Pension Assets-12/18 $127.6 mill.
Oblig. $187.9 mill.

Pfd Stock None.
Common Stock 28,456,490 shs.
as of 10/28/19
MARKET CAP: $2.0 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	9/30/19
Cash Assets	7.8	420.7	424.7
Accts Receivable	17.3	19.2	28.0
Other	41.8	62.8	55.1
Current Assets	66.9	502.7	507.8
Accts Payable	23.0	24.9	28.2
Debt Due	--	--	--
Other	62.1	139.1	116.1
Current Liab.	85.1	164.0	144.3

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	5.0%	5.5%	*4.0%*
"Cash Flow"	7.0%	11.0%	*3.0%*
Earnings	8.0%	18.5%	*7.0%*
Dividends	4.5%	5.0%	*7.0%*
Book Value	5.5%	8.0%	*7.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	61.1	86.9	112.3	79.4	339.7
2017	69.0	102.1	124.6	93.5	389.2
2018	75.0	99.1	124.9	98.7	397.7
2019	77.7	103.0	114.0	*115*	*410*
2020	*105*	*135*	*170*	*125*	*535*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.16	.82	.92	.67	2.57
2017	.18	.90	.94	.84	2.86
2018	.06	.62	.76	.38	1.82
2019	.21	.47	.33	*.44*	*1.45*
2020	*.20*	*.65*	*.95*	*.65*	*2.45*

Calendar	QUARTERLY DIVIDENDS PAID [BD■] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.2025	.2025	.2025	.2025	.81
2017	.2175	.2175	.2175	.3875	1.04
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020					

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with total population of 450,000 people. Has about 416 employees. Officers and directors own 8.2% of outstanding shares (3/19 proxy). Chairman & CEO: Richard Roth. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

SJW Group completed the purchase of Connecticut Water Service in October of 2019. The $70-per-share all-cash transaction took nearly a year to close after both entities finally received the nod from their respective regulatory agencies. The third-largest investor-owned regulated water and wastewater provider now caters to roughly 1.5 million people across the U.S. Moreover, Connecticut Water is well represented on the board of directors, as three former directors have been given seats on SJW Group's board.

Accordingly, we are lifting our 2020 financial projections to reflect the deal. The company probably ended 2019 on a mixed note. Added revenues from Connecticut operations may be partially offset by a recent ruling on SJW's conservation memorandum account balance. Nevertheless, the stage is set for a promising 2020, in our view. We now look for revenues of $535 million and earnings of $2.45 a share this year.

SJW Group hopes to deploy advanced metering services to its customers over the next several years. Specifically, the company recently filed an application with the California Public Utilities Commission to deploy Advanced Metering Infrastructure, a technology that can provide essential water usage information to customers on an hourly basis rather than once every two months. Near real-time water consumption data, early leak detection, and usage spike notifications ought to help customers meet California's revised state conservation standards (takes effect in 2022), which are vital given that the area is prone to extreme drought conditions. Further, the AMI program will likely be accompanied by additional infrastructure investment (upgrades to water filtration systems, treatment plants, and pipelines) over the pull to 2022-2024.

The issue remains suspended for Timeliness given the recent merger. SJW Group's expanded operational footprint augurs well for long-term business prospects. Also, given that the market continues to print record highs, we think a rotation into noncyclical, defensive assets could develop. Even so, we are not recommending capital commitments at the recently elevated valuation.

Nicholas P. Patrikis *January 10, 2020*

(A) Diluted earnings. Excludes nonrecurring losses: '03, $1.97; '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due early February. Quarterly earnings may not add due to rounding.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for stock splits.
(D) Paid special dividend of $0.17 per share on 11/17.

Company's Financial Strength	B+
Stock's Price Stability	75
Price Growth Persistence	60
Earnings Predictability	45

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YORK WATER NDQ-YORW

RECENT PRICE 46.38 | P/E RATIO 39.3 (Trailing: 40.7 Median: 25.0) | RELATIVE P/E RATIO 2.14 | DIV'D YLD 1.6% | VALUE LINE 1794

TIMELINESS 1 Raised 10/11/19
SAFETY 3 Lowered 7/17/15
TECHNICAL 3 Raised 1/3/20
BETA .70 (1.00 = Market)

18-Month Target Price Range
Low-High: $32-$52 | Midpoint (% to Mid): $42 (-10%)

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(-5%)	1%
Low	30	(-35%)	-7%

Institutional Decisions

	1Q2019	2Q2019	3Q2019
to Buy	33	48	55
to Sell	40	31	30
Hld's(000)	4794	4866	5111

High: 16.5 18.0 18.0 18.1 18.5 22.0 24.3 26.7 39.8 39.9 36.1 47.3
Low: 6.2 9.7 12.8 15.8 16.8 17.6 18.8 19.7 23.8 31.7 27.5 30.3

LEGENDS
1.10 x Dividends p sh divided by Interest Rate
Relative Price Strength
3-for-2 split 9/06
Options: Yes
Shaded area indicates recession

Percent shares traded: 12, 8, 4

Target Price Range 2022 2023 2024: 64, 48, 40, 32, 24, 20, 16, 12, 8, 6

% TOT. RETURN 11/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	36.4	6.5
3 yr.	29.1	24.6
5 yr.	143.9	38.9

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
2.17	2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	*3.95*	*4.05*	Revenues per sh	*5.10*
.65	.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	*1.75*	*1.80*	"Cash Flow" per sh	*2.50*
.47	.49	.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	*1.15*	*1.20*	Earnings per sh A	*1.70*
.37	.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	*.73*	Div'd Decl'd per sh B	*.95*
1.07	2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	1.95	*2.00*	*2.00*	Cap'l Spending per sh	*1.85*
4.06	4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	*10.40*	*11.25*	Book Value per sh	*12.10*
9.63	10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	*13.00*	*12.90*	Common Shs Outst'g C	*12.80*
24.5	25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*22.5*
1.40	1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.63			Relative P/E Ratio	*1.25*
3.2%	3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%			Avg Ann'l Div'd Yield	*2.5%*
37.0	39.0	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	*51.5*	*52.5*	Revenues ($mill)	*65.0*
7.5	8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	*14.9*	*15.5*	Net Profit ($mill)	*21.5*
37.9%	38.5%	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
--	1.2%	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	*2.0%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
45.7%	48.3%	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	*40.0%*	*37.0%*	Long-Term Debt Ratio	*34.0%*
54.3%	51.7%	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	*60.0%*	*63.0%*	Common Equity Ratio	*66.0%*
160.1	176.4	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	*225*	*230*	Total Capital ($mill)	*235*
222.0	228.4	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	*305*	*315*	Net Plant ($mill)	*325*
6.2%	6.5%	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	*7.5%*	*8.0%*	Return on Total Cap'l	*10.5%*
8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	*11.0%*	*10.5%*	Return on Shr. Equity	*14.0%*
8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	*11.0%*	*10.5%*	Return on Com Equity	*14.0%*
1.9%	2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	*4.5%*	*4.0%*	Retained to Com Eq	*6.0%*
78%	72%	73%	74%	74%	64%	62%	67%	63%	64%	*61%*	*61%*	All Div'ds to Net Prof	*56%*

CAPITAL STRUCTURE as of 9/30/19
Total Debt $100.7 mill. Due in 5 Yrs $42.5 mill.
LT Debt $94.2 mill. LT Interest $5.5 mill.
(43% of Cap'l)
Pension Assets 12/18 $40.6 mill.
Oblig. $41.5 mill.
Pfd Stock None
Common Stock 12,984,826 shs.
MARKET CAP: $600 million (Small Cap)

CURRENT POSITION ($MILL.)

	2017	2018	9/30/19
Cash Assets	--	--	--
Accounts Receivable	4.5	4.8	4.5
Inventory (Avg. Cost)	.9	.9	1.0
Other	3.2	3.3	4.4
Current Assets	8.6	9.0	9.9
Accts Payable	3.1	3.0	4.8
Debt Due	--	1.0	6.5
Other	6.0	6.8	5.6
Current Liab.	9.1	10.8	16.9

ANNUAL RATES of change (per sh)

	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.0%	3.0%	*5.5%*
"Cash Flow"	6.0%	6.0%	*9.0%*
Earnings	5.5%	6.5%	*9.5%*
Dividends	3.5%	4.0%	*6.5%*
Book Value	4.5%	4.0%	*4.5%*

QUARTERLY REVENUES ($ mill.)

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	11.3	11.8	12.6	11.9	47.6
2017	11.3	12.3	12.7	12.3	48.6
2018	11.6	12.0	12.7	12.1	48.4
2019	11.8	13.0	13.7	*13.0*	*51.5*
2020	*12.2*	*13.0*	*14.0*	*13.3*	*52.5*

EARNINGS PER SHARE A

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.19	.23	.27	.23	.92
2017	.20	.23	.31	.27	1.01
2018	.20	.26	.29	.29	1.04
2019	.22	.28	.35	*.30*	*1.15*
2020	*.23*	*.30*	*.35*	*.32*	*1.20*

QUARTERLY DIVIDENDS PAID B

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1555	.1555	.1555	.1602	.627
2017	.1602	.1602	.1602	.1666	.647
2018	.1666	.1666	.1666	.1733	.673
2019	.1733	.1733	.1733	.1802	.70
2020					

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2018, the company's average daily availability was 35.4 million gallons and its service territory had an estimated population of 199,000. Has more than 69,000 customers. Residential customers accounted for 65% of 2018 revenues; commercial and industrial (28%); other (7%). It also provides sewer billing services. Incorporated: PA. York had 109 full-time employees at 12/31/18. President/CEO: Jeffrey R. Hines. Officers/directors own 1.2% of the common stock (3/19 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

York Water Company posted good results for the September period. Notably, revenues of $13.7 million rose nearly 8% year over year, easily topping our $13.2 million call. A number of drivers underpinned the outperformance, including increased rates (most recent base rate hike was March 1, 2019), solid customer growth, as well as higher per capita consumption. These tailwinds outweighed weaker contributions from improvement charges. On the earnings front, the company delivered net income of $0.35 a share, or 21% better than the previous-year tally. Greater revenues and lower taxes owing to higher allowed deductions from the IRS tangible property regulations helped mitigate a modest rise in operation and maintenance expenses.

The company likely closed out the year earning $1.15 a share from $51.5 million in revenues. Given the recent showing, we have added $1 million and $0.05 a share to our current-year top- and bottom-line estimates, respectively.

Infrastructure upgrades are on track. For 2019, York likely spent upwards of $18.0 million, excluding acquisitions, on dam construction, pipe and valve replacements, and other improvements. As we move deeper into this decade, it's probable that leadership will continue to focus on upgrades to ensure safe wastewater management and reliable water delivery to its expanding customer base.

The stock remains in favor among the investment community. Indeed, York shareholders have enjoyed a fruitful 2019 thus far, as the stock is up almost 50% in price year to date. Over the past three months, shares have appreciated approximately 7% in value, etching a fresh high-water mark along the way. We continue to recommend subscribers with a short-term view have a look here, as this timely (1: Highest) issue may still have some room to run over the coming six to 12 months.

But those with an eye toward the long pull should hold off at this juncture. As a result of the recent share-price ascent, capital appreciation potential three to five years hence is unappealing. Further, despite annual payout hikes, the dividend yield has struggled to keep pace with historical averages.

Nicholas P. Patrikis *January 10, 2020*

Company's Financial Strength	B+
Stock's Price Stability	60
Price Growth Persistence	70
Earnings Predictability	95

(A) Diluted earnings. Next earnings report due late January.
(B) Dividends historically paid in late February, June, September, and December.
(C) In millions, adjusted for split.

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★★ Rank 1 (Highest) for Timeliness.
★ Rank 2 (Above Average).

ESPECIALLY NOTEWORTHY:

*This week, we welcome **Alamo Group**, a leading maker of specialized equipment for infrastructure maintenance and farming & landscaping, to The Value Line Investment Survey. Turn to page 1703 to learn more.*

*On February 20th, **Morgan Stanley** entered into a definitive agreement to acquire **E*TRADE**, a leader in the online brokerage industry, in an all-stock transaction valued at about $13 billion. Read more on the pending transaction on page 1809.*

*Meanwhile, **TD Ameritrade** accepted a buyout offer from **Charles Schwab** in November of last year. The all-stock transaction is valued at $26 billion, but is not yet a fait accompli. Please turn to pages 1803 and 1804 for updates.*

*The separation of **United Technologies** into three separate stand-alone entities was set to be completed as this Issue went to press. Shortly thereafter, the buyout of Raytheon should commence. Turn to page 1780 to learn more.*

In three parts: Part 1 is the Summary & Index. Part 2 is Selection & Opinion. This is Part 3, Ratings & Reports. Volume LXXV, No. 35

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See back cover for important disclosures.

The Water Utility Industry consists of eight investor-owned utilities. These companies are very much like electric or gas utilities, but operate in a much smaller universe because the overwhelming amount of water services in the United States are provided by municipally run entities.

These companies have much less exposure to the economic turmoil related to the coronavirus than other industries we follow. Water is essential and its usage doesn't change substantially during an economic expansion or a contraction.

Following years of underinvestment, almost every member of this group is involved in a major construction program aimed at replacing large quantities of old pipelines.

Finances in this group are just average as modernizing the nation's aging water infrastructure is not cheap. Utilities often have taken on decent amounts of debt to fund the construction programs.

One of the biggest influences on how any utility performs is the treatment it receives from regulators. For the most part, the relationship between water companies and state authorities has been constructive.

Coronavirus And Water Utilities

Certain industries are cyclical and very dependent on the state of the general economy. The demand for water is relatively inelastic and people's usage of it is fairly constant. During difficult periods households will cut back on all expenses, including water. However, due to it being such a necessity, demand does not change significantly. So, even though COVID-19 has caused economic uncertainty on a global basis, this sector ought to remain fine. Only should the pandemic become much worse would it have an impact. Ratepayers are citizens that vote, and should a sharp recession or depression take place, regulators would be reluctant to pass along increased operating costs incurred by a utility in the form of higher water bills, no matter how justified the expenses.

Large Construction Programs

Until the past decade, or so, both municipal and investor-owned utilities didn't sufficiently invest in keeping pipelines and other assets in proper condition. As a result, the average age of pipelines in the U.S. is estimated to be between 50 and 75 years. Utilities and regulators have realized that more funds would have to be allocated to replacing and modernizing large portions of the nation's water infrastructure. That's why this group's construction budget is large, though manageable. Authorities also realize that water bills were kept artificially low for years, especially in relation to other vital utility services, and have to be gradually raised.

Average Finances

Although domestic water utilities are very stable, their balance sheets reflect the industry's hefty capital budget. Still, these companies are not overleveraged, with the average Financial Strength rating for the group being a B+. As an increased amount of money is used to replace pipes, we think the overall financial health of the industry ought to remain unchanged.

INDUSTRY TIMELINESS: 5 (of 95)

Regulation

Probably the prime reason for water utilities stocks performing so well over the past five years has been due to constructive regulation. Unlike, electric utilities, for example, both sides are basically in agreement that upgrades are required and ratepayers bills will have to raised. Investors should be aware of what can happen when authorities and utilities do not work as partners (i.e. the Electric Utility Industry). As of now, we see no signs of rifts between the water group and regulators.

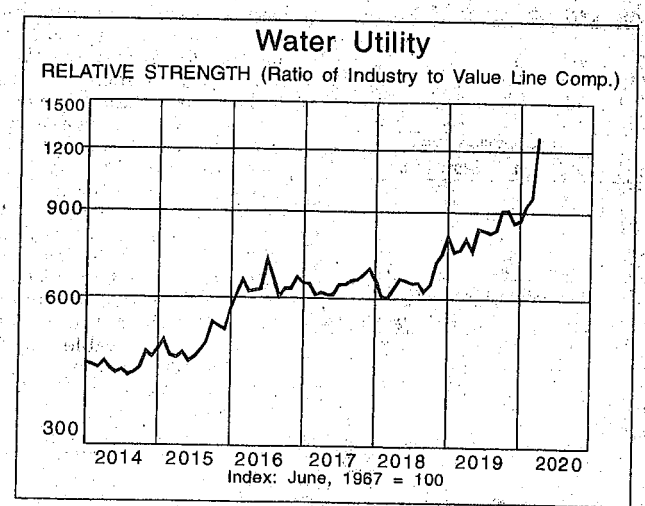
Untraditional Behavior

As we mentioned earlier, these equities were historically purchased by conservative investors looking for income. Over the past several years, the profile of the stocks has changed. Indeed, no longer are the yields on these shares high. In fact, the average water equity has a much lower dividend yield than the typical stock in the *Value Line* universe. Moreover, utility stocks typically underperformed during bull markets and outperformed in bear markets. Over the past five years, however, many in this group posted higher total returns than the S&P 500 Index. We attribute this to two factors: the scarcity of stocks in this sector, and the low interest rate environment. For example, only two of these equities have a market capitalization of over $5 billion. Professional money managers looking to diversify there holdings in the utility segment (electric, gas, and water) have very few options here. Therefore, a premium has to be paid to own these stocks. Furthermore, since these equities are often seen as alternative to bonds by income-investors, near-zero interest rates make them look more attractive to fixed-income accounts.

Conclusion

Despite the industry's high rank, we advise subscribers to exercise caution when investing here. While there is very little operational risk, these equities often have well below average long-term total return potential.

James A. Flood



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AMER. STATES WATER NYSE-AWR

RECENT PRICE 84.60 | P/E RATIO 37.6 (Trailing: 37.1 / Median: 22.0) | RELATIVE P/E RATIO 2.85 | DIV'D YLD 1.5% | VALUE LINE 1785

TIMELINESS 2 Lowered 3/20/20
SAFETY 2 Raised 7/20/12
TECHNICAL 3 Raised 3/6/20
BETA .60 (1.00 = Market)

18-Month Target Price Range

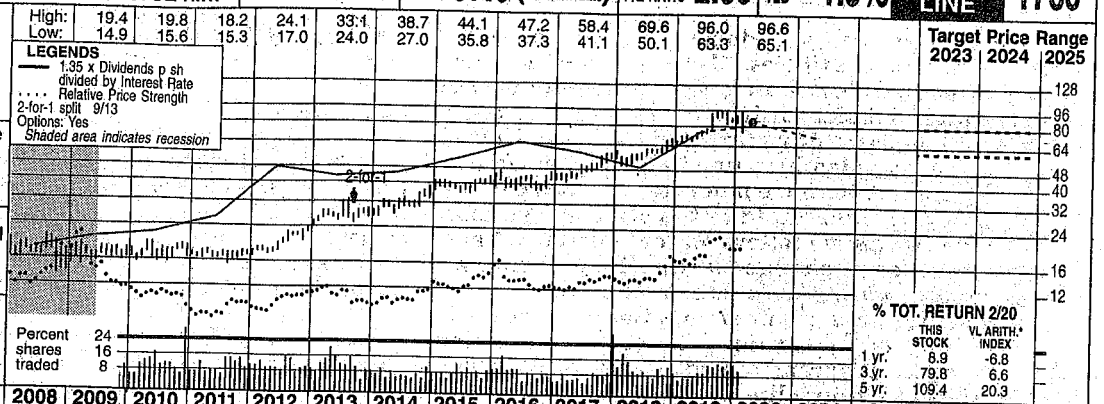
Low-High	Midpoint (% to Mid)
$68-$116	$92 (10%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	80	(-5%)	1%
Low	60	(-30%)	-6%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	139	149	137
to Sell	109	124	145
Hld's(000)	26893	27173	26734



2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.86	12.95	13.30	Revenues per sh	16.40
1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.26	3.25	3.55	"Cash Flow" per sh	4.50
.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.28	2.25	2.40	Earnings per sh A	2.90
.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.25	1.35	Div'd Decl'd per sh B■	1.85
2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	4.12	3.50	3.50	Cap'l Spending per sh	3.75
7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.33	17.15	18.10	Book Value per sh D	21.35
33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.85	37.00	37.25	Common Shs Outst'g C	37.50
23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	34.4	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	23.5
1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.84	1.87			Relative P/E Ratio	1.30
3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	1.5%			Avg Ann'l Div'd Yield	2.6%
398.9	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	480	495							Revenues ($mill)	615
41.4	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	83.0	90.0							Net Profit ($mill)	110
43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	23.0%	23.0%							Income Tax Rate	23.0%
5.8%	2.0%	2.5%	--	--	--	--	--	2.5%	--	1.0%	1.0%							AFUDC % to Net Profit	1.0%
44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	46.0%	47.0%							Long-Term Debt Ratio	49.5%
55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	54.0%	53.0%							Common Equity Ratio	51.5%
677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1180	1275							Total Capital ($mill)	1565
855.0	896.5	917.8	981.5	1003.5	1060.8	1160.9	1205.0	1296.3	1415.7	1485	1590							Net Plant ($mill)	1780
7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.0%							Return on Total Cap'l	8.5%
11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.0%	13.5%							Return on Shr. Equity	14.0%
11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.0%	13.5%							Return on Com Equity	14.0%
5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.0%	6.0%							Retained to Com Eq	5.0%
47%	49%	45%	47%	53%	54%	56%	52%	61%	51%	56%	56%							All Div'ds to Net Prof	64%

CAPITAL STRUCTURE as of 12/31/19
Total Debt $286.3 mill. **Due in 5 Yrs** $6.9 mill.
LT Debt $281.0 mill. **LT Interest** $24.5 mill. (32% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.7 mill.
Pension Assets-12/19 $192.5 mill.
Oblig. $231.9 mill.
Pfd Stock None

Common Stock 36,859,505 shs. as of 2/20/20

MARKET CAP: $3.1 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	.2	7.1	1.3
Accts Receivable	26.1	23.4	20.9
Other	129.2	101.0	100.3
Current Assets	155.5	131.5	122.5
Accts Payable	51.0	59.5	55.6
Debt Due	59.3	40.3	5.3
Other	46.4	46.8	55.1
Current Liab.	156.7	146.6	116.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	3.0%	--	5.0%
"Cash Flow"	6.0%	3.0%	7.0%
Earnings	9.5%	5.0%	6.5%
Dividends	8.0%	7.5%	9.5%
Book Value	5.5%	4.0%	5.5%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	98.8	113.2	124.4	104.2	440.6
2018	94.7	106.9	124.2	111.0	436.8
2019	101.7	124.7	134.5	113.0	473.9
2020	105	120	140	115	480
2021	107	123	145	120	495

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.34	.62	.57	.35	1.88
2018	.29	.44	.62	.37	1.72
2019	.35	.72	.76	.45	2.28
2020	.40	.68	.72	.50	2.25
2021	.43	.72	.75	.55	2.40

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.224	.224	.224	.242	.91
2017	.242	.242	.255	.255	.99
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020	.305				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 260,708 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,420 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS subsidiary. Sold Chaparral City Wtr. of AZ. (6/11). Employs 841. BlackRock, Inc. owns 15.1% of out. shares; Vanguard, 11.5%; off. & dir. 1.2%. (4/19 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc: CA. Address: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

The stock of American States Water has performed better than most equities during the latest disruption in the financial markets. The utility provides a service that is essential. So, whether the economy is booming or experiencing problems, people's usage of water will not change significantly. Hence, American States' income stream is much better defined than the typical corporation. This has been reflected in AWR's year-to-date price performance, as the equity has declined less than 7%, versus the approximately 19% decrease posted by the broader market averages.

Earnings in 2020 will most likely not be able to match last year's impressive showing. The company's stronger-than-expected fourth quarter of 2019 will make year-over-year comparisons difficult. Still, a combination of rate relief, cost control improvements, and a greater contribution from ASUS (more below), could enable share net to reach $2.25. These same factors, along with growth in the rate base, ought to result in an increase in earnings per share to $2.40, a 6% rise, in 2021.

The nonregulated business should remain a key growth driver. Through its ASUS subsidiary, American States provides water services to U.S. Army bases. As more water services at military installations are privatized, we expect ASUS to continue to increase, or at least maintain, its market share. The typical contract is for 50 years, and unlike its other operations, income is not regulated by state authorities. In 2019, profits increased here by 12%, and represented $0.47 of the company's total share net.

Dividend growth prospects are bright. The board usually announces a new annual increase in the payout in mid-August. While we do not think that 2019's 11% hike will be equaled, the new dividend per share should be somewhere between $0.325 and $0.33. This would still represent a percentage increase that is higher than the group norm. Moreover, the trend should continue to mid-decade.

These shares are timely. Investors may want to note that like most members of this group, the stock's total return potential to 2023-2025 is well below average.

James A. Flood *April 10, 2020*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due mid-May.

(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.

(C) In millions, adjusted for split.

(D) Includes intangibles. As of 12/31/19; $28.6 million/$0.78. a share.

Company's Financial Strength	A
Stock's Price Stability	85
Price Growth Persistence	95
Earnings Predictability	85

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AMERICAN WATER NYSE-AWK

RECENT PRICE 126.72 | P/E RATIO 36.0 (Trailing: 36.9) (Median: 22.0) | RELATIVE P/E RATIO 2.73 | DIV'D YLD 1.7% | VALUE LINE 1786

TIMELINESS 3 Lowered 4/3/20
SAFETY 3 New 7/25/08
TECHNICAL 3 Raised 4/10/20
BETA .50 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$119-$173	$146 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	140	(+10%)	5%
Low	90	(-30%)	-6%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	360	385	393
to Sell	331	322	361
Hld's(000)	155051	153329	155435

	High:	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	92.4	98.2	129.9	141.7
	Low:	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0	92.0

LEGENDS
1.10 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
Options: Yes
Shaded area indicates recession

Target Price Range 2023 2024 2025

	Percent shares traded
	21
	14
	7

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	23.3	-6.8
3 yr.	67.3	6.6
5 yr.	152.2	20.3

2004	2005	2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
--	--	13.08	13.84	14.61	13.98	15.49	15.16	16.25	16.28	16.78	17.72	18.54	18.81	19.04	19.97	*20.90*	*21.85*	Revenues per sh	*24.75*
--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.65	*8.00*	*8.15*	"Cash Flow" per sh	*8.75*
--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.43	*3.70*	*4.00*	Earnings per sh A	*4.90*
--	--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	*2.10*	*2.25*	Div'd Decl'd per sh B■	*2.90*
--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	9.15	*8.70*	*9.20*	Cap'l Spending per sh	*9.00*
--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	33.83	*35.35*	*36.95*	Book Value per sh D	*42.50*
--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	180.81	*181.00*	*182.00*	Common Shs Outst'g C	*189.00*
--	--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	32.9	*Bold figures are*		Avg Ann'l P/E Ratio	*23.5*
--	--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	1.79	*Value Line*		Relative P/E Ratio	*1.30*
--	--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	1.7%	*estimates*		Avg Ann'l Div'd Yield	*2.5%*
2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	*3785*	*3975*	Revenues ($mill)	*4675*						
267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	*670*	*730*	Net Profit ($mill)	*925*						
40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*						
--	--	6.2%	5.1%	--	--	--	--	5.1%	4.0%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*						
56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	*58.5%*	*59.0%*	Long-Term Debt Ratio	*59.0%*						
43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	*41.5%*	*41.0%*	Common Equity Ratio	*41.0%*						
9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	14760	*15400*	*16325*	Total Capital ($mill)	*20000*						
11059	11021	11739	12391	12900	13933	14992	16246	17409	18232	*19100*	*19900*	Net Plant ($mill)	*22200*						
4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	*5.5%*	*6.0%*	Return on Total Cap'l	*6.0%*						
6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	*10.5%*	*11.0%*	Return on Shr. Equity	*11.5%*						
6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	*10.5%*	*11.0%*	Return on Com Equity	*11.5%*						
2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	*4.5%*	*4.5%*	Retained to Com Eq	*4.5%*						
56%	52%	57%	40%	50%	50%	56%	68%	56%	57%	*57%*	*56%*	All Div'ds to Net Prof	*59%*						

CAPITAL STRUCTURE as of 12/31/19
Total Debt $9453.0 mil. **Due in 5 Yrs** $1773.0 mil.
LT Debt $8639.0 mil. **LT Interest** $354.0 mil. (59% of Cap'l)

Leases, Uncapitalized: Annual rentals $14.0 mil.
Pension Assets12/19 $1747.0 mill
Oblig. $2161.0 mil.
Pfd Stock $5.0 mil. **Pfd Div'd** $.4 mill

Common Stock 180,974,719 shares as of 2/13/20

MARKET CAP: $22.9 billion (Large Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	82	158	91
Accts Receivable	272	301	294
Other	366	322	900
Current Assets	720	781	1285
Accts Payable	195	175	203
Debt Due	1227	1035	814
Other	903	884	1028
Current Liab.	2325	2094	2045

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	3.0%	3.0%	*4.5%*
"Cash Flow"	13.0%	6.0%	*6.5%*
Earnings	45.5%	6.5%	*8.5%*
Dividends	16.0%	10.5%	*8.5%*
Book Value	2.5%	4.0%	*5.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	756.0	844.0	936.0	821.0	3357.0
2018	761.0	853.0	976.0	850.0	3440.0
2019	813.0	882.0	1013.0	902.0	3610.0
2020	*835*	*920*	*1080*	*950*	*3785*
2021	*885*	*970*	*1120*	*1000*	*3975*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.52	.73	1.12	.01	2.38
2018	.59	.91	1.03	.62	3.15
2019	.62	.94	1.33	.54	3.43
2020	*.66*	*.97*	*1.35*	*.72*	*3.70*
2021	*.73*	*1.05*	*1.45*	*.77*	*4.00*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.34	.375	.375	.375	1.47
2017	.375	.415	.415	.415	1.62
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020	.50				

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 15 million people in 46 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2019 revenues. New Jersey is its largest market accounting for 24.6% of regulated revenues; Pennsylvania, 22.3%; Missouri, 10.5%. Has 6,800 employees. The Vanguard Grp, owns 11.0% of outstanding shares; BlackRock, Inc., 7.9%; officers & directors, less than 1.0%. (3/19 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

Shares of American Water Works have been a safe haven for investors during the recent turmoil caused by the coronavirus. Year to date, the price of the stock has increased nearly 3%. By comparison, the S&P 500 Index has declined about 19% over the same time period. Indeed, both long- and short-term investors have done well holding this equity, as it has outpaced bull markets, as well as outperformed most stocks during the downturns.

What's the reason behind American Water's success? There are a few basic principles behind the company's consistent positive performance. The first is to expand the asset base on which it earns a return. That's one of the reasons for the large construction program. (Domestic pipelines are in desperate need of repair.) The second is the an ongoing acquisition program. Third, is a focus on cost controls.

Earnings and dividend growth prospects are bright through mid-decade. American Water is perhaps the biggest beneficiary of the consolidation taking place in the domestic water market. As the largest water utility, it is able to continually acquire smaller water districts and merge them into its existing operations. Unlike many other industries, synergies are easily achievable in the water business. The company is able to increase its ratebase, and simultaneously make the acquired assets more efficient. This is one of the reasons that management has a constructive relationship with regulators in states where it operates.

Finances are only average. The combination of the aggressive construction program, together with an aversion to selling new equity has resulted in American Water having the highest debt-to-total capital ratio of all the water utilities we follow, by a wide margin. Over the past decade, shares outstanding have risen just 3.5%. Thus, now would seem to be a good time to have an equity offering.

Despite all of the company's positive attributes, the stock does not stand out at this time. Our ranking system pegs AWK to mirror the market in the year ahead. Moreover, like most water utilities, AWK has unattractive long-term total return potential.

James A. Flood *April 10, 2020*

(A) Diluted earnings. Excludes nonrecur. losses: '08, $4.62; '09, $2.63; '11, $0.07. Disc. oper.: '06, ($0.04); '11, $0.03; '12, ($0.10); '13,($0.01). GAAP used as of 2014. Next earnings report due mid-May. Quarterly earnings do not sum in '16 due to rounding.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. (D) Includes intangibles. On 12/31/19: $1.568 billion, $8.67/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B+
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	80

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CALIFORNIA WATER NYSE-CWT

RECENT PRICE 52.32 | P/E RATIO 35.8 (Trailing: 39.9 / Median: 23.0) | RELATIVE P/E RATIO 2.71 | DIV'D YLD 1.6% | VALUE LINE 1787

TIMELINESS 3 Lowered 3/6/20
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Raised 4/10/20
BETA .60 (1.00 = Market)

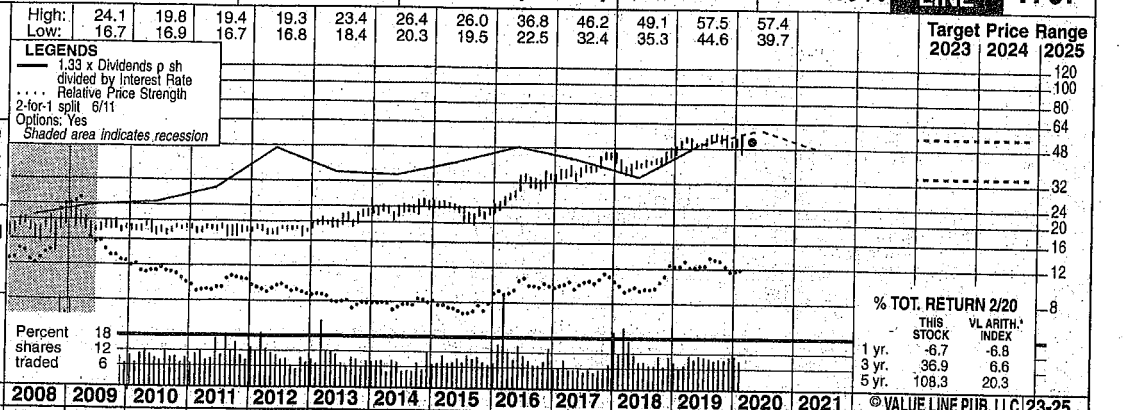
18-Month Target Price Range
Low-High Midpoint (% to Mid)
$47-$75 $61 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+5%)	3%
Low	35	(-35%)	-7%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	120	118	115
to Sell	102	94	101
Hld's(000)	36947	36133	36624



2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	14.72	*14.80*	*15.20*	Revenues per sh	*15.00*
1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	3.14	*3.15*	*3.20*	"Cash Flow" per sh	*3.50*
.73	.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	*1.55*	*1.65*	Earnings per sh A	*2.00*
.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	*.82*	*.86*	Div'd Decl'd per sh B ■	*1.05*
1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	5.64	*4.50*	*4.25*	Cap'l Spending per sh	*3.75*
7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	16.07	*15.70*	*15.90*	Book Value per sh C	*16.05*
36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	48.53	*50.00*	*51.00*	Common Shs Outst'g D	*53.00*
20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	39.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.0*
1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64	2.13			Relative P/E Ratio	*1.25*
3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	1.5%			Avg Ann'l Div'd Yield	*2.3%*
460.4	501.8	560.0	584.1	597.5	588.4	609.4	666.9	698.2	714.6	*740*	*775*	Revenues ($mill) E	*795*
37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	65.6	63.1	*78.0*	*85.0*	Net Profit ($mill)	*105*
39.5%	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
52.4%	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	*49.0%*	*47.0%*	Long-Term Debt Ratio	*43.5%*
47.6%	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	*51.0%*	*53.0%*	Common Equity Ratio	*56.5%*
914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	*1535*	*1525*	Total Capital ($mill)	*1500*
1294.3	1381.1	1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	*2425*	*2450*	Net Plant ($mill)	*2500*
5.5%	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	*6.0%*	*6.5%*	Return on Total Cap'l	*8.0%*
8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	*10.0%*	*10.5%*	Return on Shr. Equity	*12.5%*
8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	*10.0%*	*10.5%*	Return on Com Equity	*12.5%*
3.0%	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	*4.5%*	*5.0%*	Retained to Com Eq	*6.0%*
66%	71%	62%	56%	55%	71%	68%	51%	55%	60%	*53%*	*52%*	All Div'ds to Net Prof	*53%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $983.8 mill. Due in 5 Yrs $229.0 mill.
LT Debt $786.8 mill. LT Interest $40.0 mill.
(Total interest coverage: 4.2x) (50% of Cap'l)

Pension Assets-12/18 $573.6 mill.
Oblig. $812.0 mill.

Pfd Stock None

Common Stock 48,532,000 shs.

MARKET CAP: $2.5 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	94.8	47.2	42.7
Other	133.1	141.5	142.0
Current Assets	227.9	188.7	184.7
Accts Payable	94.0	95.6	108.5
Debt Due	291.0	170.0	197.0
Other	106.0	55.6	53.2
Current Liab.	491.0	321.2	358.7

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 489,600 customers in 100 communities in the state of California. Accounts for over 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '19: residential, 67%; business, 20%; industrial, 5%; public authorities, 5%; other 3%. Off. and dir. own 1% of common stock (4/19 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	4.0%	2.5%	*.5%*
"Cash Flow"	5.5%	5.5%	*2.0%*
Earnings	4.5%	4.5%	*6.5%*
Dividends	2.5%	3.5%	*5.5%*
Book Value	4.5%	4.5%	*1.0%*

Calendar	QUARTERLY REVENUES ($ mill.) E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	122.1	171.1	211.7	162.0	666.9
2018	134.6	174.9	221.3	167.4	698.2
2019	126.1	179.0	232.6	176.9	714.6
2020	*140*	*185*	*237*	*178*	*740*
2021	*147*	*195*	*248*	*185*	*775*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.02	.39	.70	.29	1.40
2018	d.02	.31	.75	.32	1.36
2019	d.16	.35	.88	.24	1.31
2020	*.03*	*.39*	*.80*	*.33*	*1.55*
2021	*.05*	*.42*	*.82*	*.36*	*1.65*

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1725	.1725	.1725	.1725	.69
2017	.18	.18	.18	.18	.72
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020	.2125				

California Water Service Group hopes to invest more than $800 million in infrastructure-related projects over the pull to 2021. At this time, its currently running general rate case with the California Public Utilities Commission was granted a settlement extension to July 1, 2020. The agreement covers various topics including, most importantly, CWT's long-term infrastructure investment plan and associated rate increases. The company already accumulated an approximate $275 million tab last year, completing several notable upgrades, including water main replacements, new treatment facilities, the installation of backup generators, and pump station replacements. Through 2020 and 2021, it is likely that capital expenditures will range between $550 million to $600 million, and cover a similar scope of improvement projects. Finally, we are optimistic that regulators will eventually rule favorably.

California Water should be a consistent performer even amidst a difficult economic backdrop. Notably, California has been one of the major domestic hot spots for the fast-spreading coronavirus, which has severely impacted business and consumer activity. That said, with many residents urged to stay at home, increased hand washing and general utility use ought to translate into greater water usage. Thus, we are keeping intact our current-year revenue call, at $740 million. On the other hand, a number of factors, namely rising operating costs, lower income tax benefits, as well as potential equity dilution, have spurred us to trim our share-net forecast from $1.70 to $1.55. Lastly, we are introducing our preliminary 2021 top- and bottom-line estimates of $775 million and $1.65 a share, respectively.

From an investment perspective, California Water stock leaves much to be desired. The shares have slipped one notch on our Timeliness Ranking scale, to 3 (Average). Moreover, total return potential over the 3- to 5-year stretch is considerably below the *Value Line* median. While the stock may have held up relatively well during recent broader market volatility, we think more-attractive options can be found elsewhere, at this juncture.

Nicholas P. Patrikis *April 10, 2020*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early May.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '19 : $24.9 mill., $0.51/sh.
(D) In millions, adjusted for split.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	60
Earnings Predictability	65

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CONSOL. WATER CO. NDQ-CWCO

RECENT PRICE 15.93 | P/E RATIO 27.0 (Trailing: 29.0 / Median: 23.0) | RELATIVE P/E RATIO 2.05 | DIV'D YLD 2.1% | VALUE LINE 1788

TIMELINESS 2 Raised 3/27/20
SAFETY 3 New 1/17/14
TECHNICAL 3 Lowered 3/20/20
BETA .85 (1.00 = Market)

18-Month Target Price Range

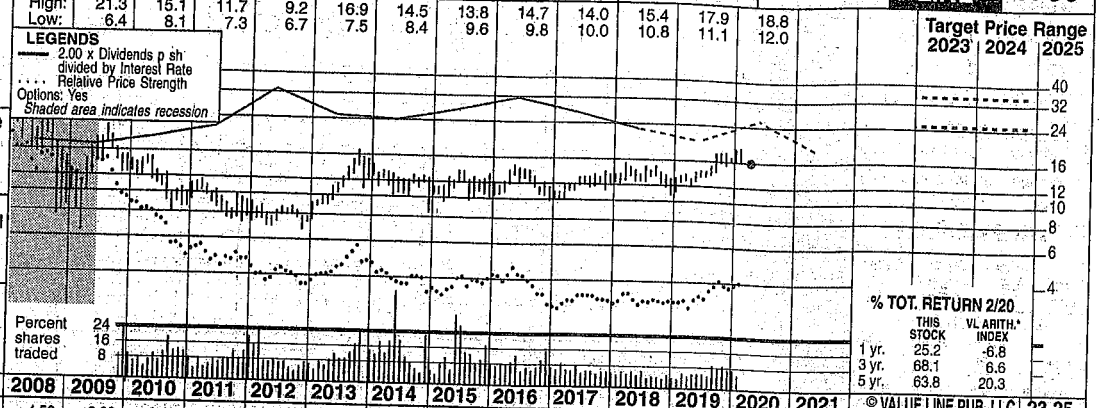
Low-High	Midpoint (% to Mid)
$10-$20	$15 (-5%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	35	(+120%)	23%
Low	25	(+55%)	14%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	34	44	44
to Sell	44	32	40
Hld's(000)	8148	8224	8376



% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	25.2	-6.8
3 yr.	68.1	6.6
5 yr.	63.8	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
2.02	1.12	2.71	3.41	4.52	3.99	3.49	3.79	4.49	4.35	4.46	3.86	3.89	4.18	4.39	4.57	*4.60*	*4.75*	Revenues per sh	*8.75*
.77	.37	.87	1.20	.95	1.18	.86	.83	1.17	.96	.80	.89	.95	1.12	1.15	*1.05*	*1.05*	*1.15*	"Cash Flow" per sh	*1.95*
.49	.23	.59	.79	.50	.74	.43	.42	.64	.58	.42	.51	.27	.41	.68	.56	*.60*	*.70*	Earnings per sh A	*1.40*
.23	.12	.24	.20	.33	.28	.30	.30	.30	.30	.30	.30	.30	.31	.34	.34	*.34*	*.34*	Div'd Decl'd per sh B■	*.75*
.24	.77	1.83	.54	.46	.18	.09	.96	.31	.29	.32	.21	.23	.31	1.08	*.25*	*.25*	*.30*	Cap'l Spending per sh	*.50*
4.20	2.54	7.49	8.21	8.36	8.53	8.69	8.83	9.20	9.44	9.58	9.81	9.79	9.91	10.34	10.88	*11.20*	*11.35*	Book Value per sh D	*12.20*
11.51	23.46	14.13	14.40	14.53	14.54	14.55	14.57	14.59	14.69	14.72	14.78	14.87	14.92	14.98	15.05	*15.20*	*15.40*	Common Shs Outst'g C	*16.00*
23.1	80.0	43.0	35.4	37.8	19.0	26.9	22.4	12.4	20.0	28.3	22.7	44.8	29.0	19.4	25.7	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*22.0*
1.22	4.26	2.32	1.86	2.27	1.27	1.71	1.41	.79	1.12	1.49	1.14	2.35	1.46	1.05	1.40			Relative P/E Ratio	*1.20*
2.0%	.7%	.9%	.7%	1.7%	2.0%	2.6%	3.2%	3.8%	2.6%	2.5%	2.6%	2.5%	2.6%	2.6%	2.4%			Avg Ann'l Div'd Yield	*2.5%*
						50.7	55.2	65.5	63.8	65.6	57.1	57.9	62.3	65.7	68.8	*70.0*	*73.0*	Revenues ($mill)	*140*
						6.3	6.1	9.3	8.6	6.3	7.5	4.0	6.1	10.2	8.6	*9.0*	*11.0*	Net Profit ($mill)	*22.0*
						--	--	--	--	--	--	--	--	--	--	*NMF*	*NMF*	Income Tax Rate	*NMF*
						--	--	--	--	--	--	--	--	--	--	*NMF*	*NMF*	AFUDC % to Net Profit	*NMF*
						11.8%	5.1%	3.7%	--	--	--	--	--	--	--	*Nil*	*Nil*	Long-Term Debt Ratio	*Nil*
						88.2%	94.9%	96.3%	99.8%	99.8%	100.0%	100.0%	100.0%	100.0%	100.0%	*100%*	*100%*	Common Equity Ratio	*100%*
						143.3	135.6	139.4	138.9	141.2	145.0	145.6	147.9	155.0	163.8	*170*	*175*	Total Capital ($mill)	*200*
						56.2	64.3	61.6	58.6	56.4	53.7	53.1	50.5	64.9	61.3	*60.0*	*60.0*	Net Plant ($mill)	*85.0*
						4.9%	5.0%	7.0%	6.2%	4.4%	5.2%	2.7%	4.2%	6.6%	5.3%	*5.5%*	*6.5%*	Return on Total Cap'l	*11.0%*
						5.0%	4.7%	6.9%	6.2%	4.4%	5.2%	2.7%	4.2%	6.6%	5.3%	*5.5%*	*6.5%*	Return on Shr. Equity	*11.0%*
						5.0%	4.7%	6.9%	6.2%	4.4%	5.2%	2.7%	4.1%	6.6%	5.3%	*5.5%*	*6.5%*	Return on Com Equity	*11.0%*
						1.5%	1.0%	3.6%	3.0%	1.2%	2.1%	NMF	1.1%	3.3%	1.7%	*2.0%*	*2.5%*	Retained to Com Eq	*5.0%*
						69%	79%	48%	51%	73%	59%	112%	73%	50%	61%	*57%*	*49%*	All Div'ds to Net Prof	*54%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $0.1 Due in 5 Yrs $0.1
LT Debt $0.1 LT Interest NMF

Leases, Uncapitalized: Annual rentals $.9 mill.

No Defined Benefit Pension Plan

Pfd Stock NMF (34,796 shares out.)
Div'd NMF

Common Stock 15,078,499 shs.
as of 3/6/20

MARKET CAP: $250 million (Small Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	47.2	31.3	42.9
Accts Receivable	15.0	24.2	23.2
Other	4.5	6.9	7.3
Current Assets	66.7	62.4	73.4
Accts Payable	5.7	4.6	3.7
Debt Due	.7	--	--
Other	1.2	3.3	4.6
Current Liab.	7.6	7.9	8.2

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '23-'25
Revenues	5.0%	.5%	*11.0%*
"Cash Flow"	2.0%	.5%	*9.0%*
Earnings	-3.0%	-4.5%	*17.5%*
Dividends	5.0%	--	*13.0%*
Book Value	5.0%	2.0%	*3.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	15.6	15.3	16.6	14.8	62.3
2018	14.3	15.9	18.8	16.7	65.7
2019	17.0	18.3	15.9	17.6	68.8
2020	*17.0*	*18.0*	*16.5*	*18.5*	*70.0*
2021	*18.0*	*19.0*	*17.0*	*19.0*	*73.0*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.18	.11	.08	.04	.41
2018	.14	.14	.30	.10	.68
2019	.17	.16	.11	.12	.56
2020	*.16*	*.16*	*.15*	*.13*	*.60*
2021	*.18*	*.18*	*.18*	*.16*	*.70*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.075	.075	.075	.075	.30
2017	.075	.075	.075	.075	.30
2018	.085	.085	.085	.085	.34
2019	.085	.085	.085	.085	.34
2020	.085				

BUSINESS: Consolidated Water Co. Ltd. develops and operates desalination plants and water distribution systems in areas where naturally occurring supplies of water are scarce. It provides water in the Cayman Islands, the Bahamas, and the British Virgin Islands. At 12/31/19, it operated 12 plants with a capacity of 25.6 million gallons per day. Sold Bali operations and divested Belize assets in '19. Also manufactures products for the industry through Aerex sub. Inc.: Cayman Islands. Employs 105. Pres. & CEO : F. McTaggart. Offs./Dirs. own 4.8% of stock; Amundi Asset Mgt.; 7.7%; BlackRock, 5.6% (4/19 proxy). Addr.: Regatta Off. Pk. Windward Three, 4th Floor, West Bay Road, P.O. Box 1114 Grand Cayman, KYI-1102, Cayman Islands. Tel.: (345) 945-4277. Int.: www.cwco.com.

Consolidated Water's stock has done better than most of late. Indeed, since our last report three months ago, the value of the equity has fallen about 8%, versus the broader market decline of about 19%. **The company's low exposure to the coronavirus is most likely the primary reason for the better-than-average showing.** Consolidated builds, operates, and manufactures products used in desalination plants that provide water to regions where the commodity is scarce. Its main facilities are located in the Cayman Islands, the Bahamas, and the British Virgin Islands. So far, these countries have not been impacted by the pandemic.

Should COVID-19 spread, however, Consolidated is more at risk than others in the water industry. Of the seven other companies in this group, all are based in the United States. And while the virus is causing havoc in financial markets, water utilities located here are less vulnerable to economic downturns than most other corporations. Water is essential, and though some people may reduce consumption, the decrease would probably be marginal. Being located in countries that do not have the wealth of America, could be a problem. Specifically, Consolidated has had past difficulties with account receivables in the Bahamas.

The major Mexico project remains on track. Since 2016, the company has been heavily involved in planning the construction of the Rosarito desalination facility that would be built in Mexico and service a region that includes Tijuana. The plant would purify 50 million gallons of water a day to this desert area. Consolidated will not construct the facility, but will operate it in a joint venture. Management has indicated in the latest 10-K report that it would look to sell parts of its interest at some point. In any case, many hurdles have been overcome, but some small ones remain. Completion of Rosarito is still years away, however.

These shares are ranked to outperform the market averages in the year ahead. The stock is not suitable for the typical water utility investors, as its earnings streams are not nearly as well-defined as utilities operating in America.

James A. Flood *April 10, 2020*

(A) Fully diluted earnings. Excludes gains from discontinued operations: '17, $0.07 a share; '18, $0.07 a share; '19, $0.24 a share. Next earnings report due early June.

(B) Dividends historically paid in late January, April, July, and October. ■ Dividend reinvestment plan available.

(C) In millions, adjusted for stock split.

(D) Includes intangibles. As of 12/31/19, $13.3 million/$0.88 a share.

Company's Financial Strength	B+
Stock's Price Stability	50
Price Growth Persistence	30
Earnings Predictability	40

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ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE 43.05 | P/E RATIO 32.4 (Trailing: 43.1) (Median: 23.0) | RELATIVE P/E RATIO 2.45 | DIV'D YLD 2.3% | VALUE LINE 1789

TIMELINESS 1 Raised 12/20/19
SAFETY 2 Raised 4/20/12
TECHNICAL 3 Raised 3/6/20
BETA .60 (1.00 = Market)

18-Month Target Price Range
Low-High Midpoint (% to Mid)
$35-$68 $52 (20%)

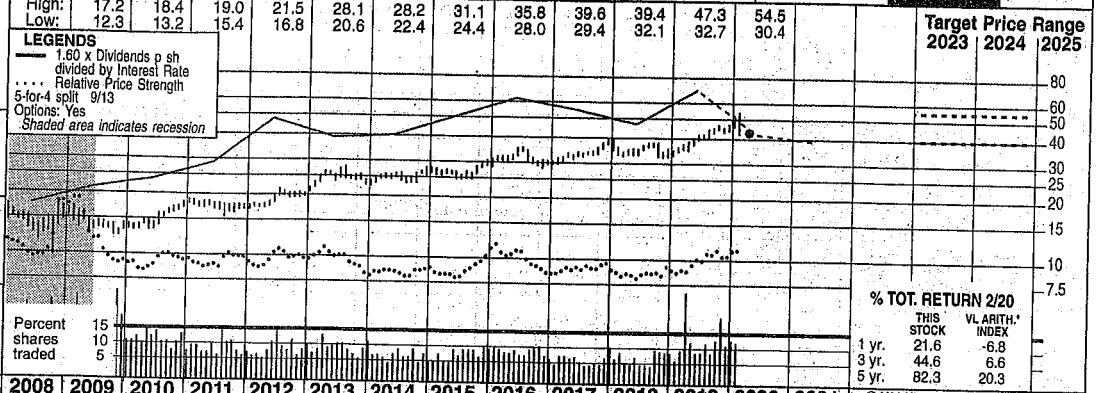
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+30%)	9%
Low	40	(-5%)	1%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	280	248	274
to Sell	167	210	242
Hld's(000)	140358	143792	149836

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
	2.78	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	4.03	*6.50*	*7.70*	Revenues per sh	*8.70*
	.87	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	1.73	*2.40*	*2.65*	"Cash Flow" per sh	*3.50*
	.51	.57	.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	*1.45*	*1.55*	Earnings per sh A	*2.05*
	.29	.32	.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	*.97*	*1.05*	Div'd Decl'd per sh B■	*1.30*
	1.23	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	2.49	*3.75*	*4.45*	Cap'l Spending per sh	*4.75*
	4.71	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	17.58	*17.35*	*17.60*	Book Value per sh	*19.55*
	158.97	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	220.76	*225.00*	*227.00*	Common Shs Outst'g C	*230.00*
	25.1	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	39.1	*Bold figures are*		Avg Ann'l P/E Ratio	*24.0*
	1.33	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76	2.12	*Value Line*		Relative P/E Ratio	*1.35*
	2.3%	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%	2.2%	*estimates*		Avg Ann'l Div'd Yield	*2.6%*
							726.1	712.0	757.8	768.6	779.9	814.2	819.9	809.5	838.1	889.7	*1460*	*1750*	Revenues ($mill)	*2000*
							124.0	144.8	153.1	205.0	213.9	201.8	234.2	239.7	192.0	224.5	*325*	*350*	Net Profit ($mill)	*470*
							39.2%	32.9%	39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	6.6%	6.6%	*7.0%*	*7.5%*	Income Tax Rate	*9.0%*
							--	--	--	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	*7.0%*	*7.0%*	AFUDC % to Net Profit	*8.0%*
							56.6%	52.7%	52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	*49.0%*	*51.0%*	Long-Term Debt Ratio	*55.0%*
							43.4%	47.3%	47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	*51.0%*	*49.0%*	Common Equity Ratio	*45.0%*
							2706.2	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	*7600*	*8000*	Total Capital ($mill)	*9800*
							3469.3	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	*8200*	*8350*	Net Plant ($mill)	*10900*
							5.9%	6.9%	6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	*6.5%*	*5.5%*	Return on Total Cap'l	*7.0%*
							10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	*8.5%*	*9.0%*	Return on Shr. Equity	*10.5%*
							10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	*8.5%*	*9.0%*	Return on Com Equity	*10.5%*
							3.7%	4.6%	4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	*2.5%*	*3.0%*	Retained to Com Eq	*4.0%*
							65%	60%	61%	50%	52%	60%	56%	59%	79%	84%	*67%*	*68%*	All Div'ds to Net Prof	*63%*



CAPITAL STRUCTURE as of 12/31/19
Total Debt $3074.1 mill. **Due in 5 Yrs** $252.0 mill.
LT Debt $2943.3 mill. **LT Interest** $123.5 mill. (43% of Cap'l)

Pension Assets-12/19 $266.4 mill. **Oblig.** $310.5 mill.

Pfd Stock None

Common Stock 222,781,536 shares as of 2/19/20

MARKET CAP: $9.6 billion (Large Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	4.2	3.6	1868.9
Receivables	98.6	101.2	67.1
Inventory (AvgCst)	14.4	15.8	18.4
Other	14.0	26.6	58.3
Current Assets	131.2	147.2	2012.7
Accts Payable	59.2	77.3	74.9
Debt Due	117.4	160.0	130.8
Other	107.9	161.7	113.1
Current Liab.	284.5	399.0	318.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	1.5%	.5%	*12.0%*
"Cash Flow"	5.0%	2.0%	*10.5%*
Earnings	7.0%	1.5%	*10.0%*
Dividends	7.5%	8.0%	*7.5%*
Book Value	8.0%	9.0%	*6.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	187.8	203.4	215.0	203.3	809.5
2018	194.3	211.9	226.2	205.7	838.1
2019	201.1	218.9	243.6	226.1	889.7
2020	*215*	*385*	*410*	*450*	*1460*
2021	*390*	*410*	*450*	*500*	*1750*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.28	.34	.43	.30	1.35
2018	.29	.37	.44	d.02	1.08
2019	.09	.25	.38	.28	1.04
2020	*.25*	*.35*	*.45*	*.40*	*1.45*
2021	*.28*	*.40*	*.45*	*.42*	*1.55*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.178	.178	.1913	.1913	.74
2017	.1913	.1913	.2047	.2047	.79
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020	.2343				

BUSINESS: Essential Utilities, Inc. became the new name for Aqua America on Feb. 3, 2020, to reflect the acquisition of Peoples, a natural gas utility, which occurred in 3/20. In 2019, Aqua Amer. provided water and wastewater services to about three million people in PA, OH, TX, IL, NC, NJ, IN, and VA. Employed 1,583. Acquired AquaSource, 7/13; North Maine Utilities, 7/15; and others. Water supply revenues 2019: residential, 58%; commercial, 16%; industrial, wastewater & other, 26%. Off. & dir. own less than 1% of the common stock; BlackRock, Inc. 10.5%; Vanguard Grp., 10.4%; State St. Capital, 5.0% (3/20 Pre 14A). Pres. & CEO: Christopher H. Franklin. Inc.: PA Address: 762 West Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Internet: www.essential.co.

Essential Utilities is the new name for Aqua America. The water company officially made the change in February, six weeks before the completion of the acquisition of Peoples, a Pittsburgh-based natural gas utility. The cost of the transaction was $4.275 billion in cash, including the assumption of $1.1 billion of debt. In connection with the deal, Essential closed on the previously announced $750 million investment from the Canadian Pension Plan, which received 21.7 million shares of newly issued stock. The equity is also trading with a new ticker: WTRG.

The coronavirus will most likely have only a minor impact on the company. People are going to be using water and gas no matter what the economic conditions. Should unemployment rise or a recession occurs, customers will obviously try to cut back on all of their expenditures, but the usage of these vital resources is required. Hence, demand for Essential's services will not take as large a hit as the typical corporation should this pandemic worsen.

The regulatory climate in Pennsylvania will have a major impact on earnings. Nearly two-thirds of the new company's customer base is now in the Keystone state. Since Aqua had done business there for a long time, we assume that management was very aware of what the expectations are from the state's regulators. (It has promised to replace 3,000 miles of old gas lines over the next 15-year period.)

Our initial estimates for the new entity are tentative. Not much guidance on Essential's operating and financial outlook has been made public. The utility's rate base will be $2.3 billion larger, but as far as the amount of the capital budget and what revenues may total, have not been discussed. As for the bottom line, much will depend on acquisition costs. Peoples is in a different business, so we don't look for much overlap, except in dealing with regulators. Moreover, since the purchase was only just approved, we won't have a good idea about quarterly earnings until after the June period, though the March interim balance sheet should provide some insight.

This stock is timely. However, like most members of this industry, long-term total return potential is unappealing.

James A Flood *April 10, 2020*

(A) Diluted egs. Excl. nonrec. gains: '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. Quarterly EPS do not add in '19 due to a large change in the number of shares outstanding in the Dec. period. Next earnings report due mid-May. (B) Dividends historically paid in early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available (5% discount). (C) In millions, adjusted for stock splits. (D) Includes intangibles: 12/31/19, $63.8 mill./$0.29 a share.

Company's Financial Strength	A
Stock's Price Stability	95
Price Growth Persistence	75
Earnings Predictability	55

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MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 61.47 | P/E RATIO 29.4 (Trailing: 30.6 Median: 21.0) | RELATIVE P/E RATIO 2.23 | DIV'D YLD 1.7% | VALUE LINE 1790

TIMELINESS 3 Lowered 5/24/19
SAFETY 2 New 10/21/11
TECHNICAL 3 Lowered 2/7/20
BETA .70 (1.00 = Market)

18-Month Target Price Range

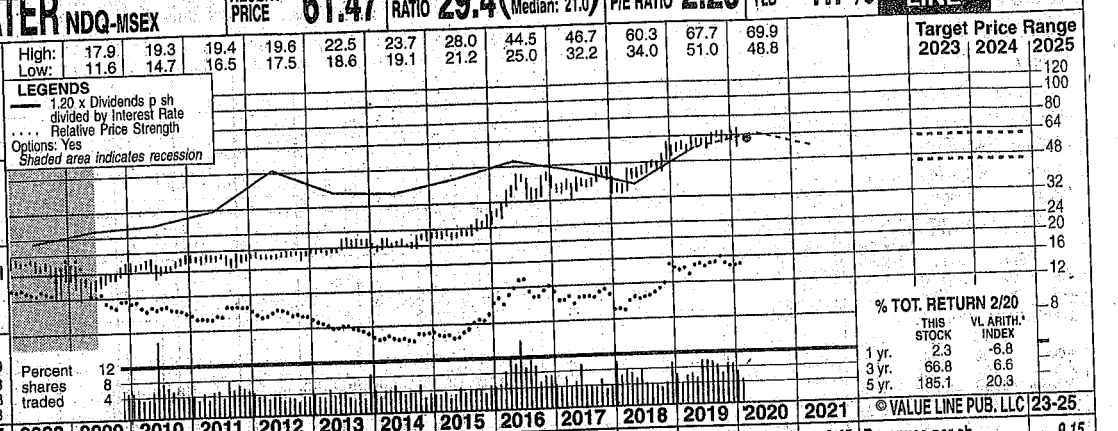
Low-High	Midpoint (% to Mid)
$57-$94	$76 (25%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	60	(Nil)	2%
Low	45	(-25%)	-5%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	79	56	68
to Sell	58	67	68
Hld's(000)	9432	9915	10433



2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.72	*8.20*	*8.45*	Revenues per sh	*9.15*
1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.90	*2.95*	*3.10*	"Cash Flow" per sh	*3.50*
.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	*2.10*	*2.20*	Earnings per sh [A]	*2.50*
.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	*1.04*	*1.10*	Div'd Decl'd per sh [B■]	*1.25*
2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	5.11	*3.50*	*3.50*	Cap'l Spending per sh	*3.50*
8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	18.57	*16.15*	*16.50*	Book Value per sh	*17.35*
11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.43	*17.65*	*17.75*	Common Shs Outst'g [C]	*18.00*
26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	29.7	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*21.0*
1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.61			Relative P/E Ratio	*1.15*
3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	1.6%			Avg Ann'l Div'd Yield	*2.4%*
						102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	*145*	*150*	Revenues ($mill)	*165*
						14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	*37.0*	*39.0*	Net Profit ($mill)	*45.0*
						32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	2.8%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
						6.8%	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	*2.0%*	*2.0%*	AFUDC % to Net Profit	*2.5%*
						43.1%	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	*42.5%*	*41.5%*	Long-Term Debt Ratio	*39.0%*
						55.8%	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	*57.0%*	*58.0%*	Common Equity Ratio	*60.5%*
						310.5	312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	*500*	*505*	Total Capital ($mill)	*515*
						405.9	422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	*720*	*735*	Net Plant ($mill)	*775*
						5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	*8.0%*	*8.5%*	Return on Total Cap'l	*9.5%*
						8.1%	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	*13.0%*	*13.0%*	Return on Shr. Equity	*14.5%*
						8.2%	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	*13.0%*	*13.5%*	Return on Com Equity	*14.5%*
						2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	*6.5%*	*6.5%*	Retained to Com Eq	*7.5%*
						75%	87%	83%	73%	67%	63%	58%	62%	46%	48%	*49%*	*50%*	All Div'ds to Net Prof	*50%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $258.0 mill. **Due in 5 Yrs** $33.3 mill.
LT Debt $230.8 mill. **LT Interest** $7.2 mill.
(Total interest coverage: 7.3x)
(42% of Cap'l)

Pension Assets-12/18 $80.4 mill.
Oblig. $100.9 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 17,434,000 shs.

MARKET CAP: $1.1 billion (Mid-Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	4.9	3.7	2.2
Other	24.3	27.1	26.9
Current Assets	29.2	30.8	29.1
Accts Payable	13.9	19.3	23.3
Debt Due	34.9	55.8	27.2
Other	15.7	19.3	14.5
Current Liab.	64.5	94.4	65.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	2.0%	2.5%	*2.0%*
"Cash Flow"	6.0%	9.5%	*4.5%*
Earnings	8.0%	12.0%	*6.0%*
Dividends	2.5%	4.0%	*5.5%*
Book Value	4.5%	6.0%	*1.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	30.1	33.0	36.2	31.5	130.8
2018	31.2	34.9	38.7	33.3	138.1
2019	30.7	33.4	37.8	32.7	134.6
2020	*32.0*	*36.0*	*42.0*	*35.0*	*145*
2021	*33.0*	*37.0*	*44.0*	*36.0*	*150*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.27	.33	.46	.32	1.38
2018	.27	.52	.74	.43	1.96
2019	.39	.49	.66	.46	2.01
2020	*.40*	*.53*	*.70*	*.47*	*2.10*
2021	*.42*	*.55*	*.73*	*.50*	*2.20*

Calendar	QUARTERLY DIVIDENDS PAID [B■] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.19875	.19875	.19875	.21125	.81
2017	.21125	.21125	.21125	.22375	.86
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020	.2562				

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 61,000 retail customers, primarily in Middlesex County, New Jersey. In 2019, the Middlesex System accounted for 60% of operating revenues. At 12/31/19, the company had 352 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.5% of the com. stock; BlackRock Inst. Trust Co., 6.8% (4/19 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Middlesex Water Company is well positioned to handle the currently ambiguous economic climate. Indeed, impacts from the sweeping coronavirus are still largely unknown, but will likely take a major toll on consumer spending and domestic business activity in the near term. However, taking into consideration that water is one of our most basic necessities, it is highly unlikely that service will undergo even the slightest pause or consumer disruption. Additionally, health-conscious actions, such as more frequent hand washing, as well as a greater number of residents presently staying in their homes, may well drive increased water usage. Meanwhile, the company recently raised some capital via an equity issuance, which should provide financial flexibility.

The stock has held up decently since our last report. Middlesex shares etched fresh highs in mid-February before crumbling market indices resulted in the capitulation of some gains. On balance, the stock is down only about 10% in value over the past three months.

We are introducing our preliminary 2021 top- and bottom-line forecasts at $150 million and $2.20 a share, respectively. This represents modest single-digit growth over our current-year projections.

Infrastructure spending is likely to ramp up considerably over the pull to mid-decade. To start, an $11.2 million drinking water project is already under way in New Jersey. The company plans to replace more than 20,000 linear feet of water mains, as well as upgrade service lines. Moreover, through 2021, MSEX's Water for Tomorrow program sports a budget of nearly $300 million, which ought to strengthen the company's distribution infrastructure. Beyond that, we think additional investment spending is probably in the cards.

We are not presently recommending Middlesex stock. The water utility might be a conservative option amidst volatile market conditions, but the issue is just an Average selection for the year ahead. On top of that, the yield is rather unenticing, and capital appreciation potential three to five years hence is well below the *Value Line* median. Thus, we suggest investors take a pass, for now.

Nicholas P. Patrikis *April 10, 2020*

Company's Financial Strength	B++
Stock's Price Stability	65
Price Growth Persistence	55
Earnings Predictability	75

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(A) Diluted earnings. Next earnings report due late April.
(B) Dividends historically paid in mid-Feb., May, Aug., and November. ■ Div'd reinvestment plan available.
(C) In millions.

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SJW GROUP NYSE-SJW

RECENT PRICE 59.78 | P/E RATIO 28.6 (Trailing: 14.6 Median: 21.0) | RELATIVE P/E RATIO 2.17 | DIV'D YLD 2.1% | VALUE LINE 1791

TIMELINESS — E
SAFETY 3 New 4/22/11
TECHNICAL — E
BETA .60 (1.00 = Market)

18-Month Target Price Range
Low-High Midpoint (% to Mid)
$52-$85 $69 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+60%)	14%
Low	65	(+10%)	4%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	91	94	93
to Sell	62	69	76
Hld's(000)	19526	19354	19650

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
High:	30.4	28.2	26.8	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0								
Low:	18.2	21.6	20.9	22.6	24.5	25.5	27.5	28.6	45.4	51.3	53.9	45.6								
	9.14	9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	18.97	14.00	14.78	*18.80*	*19.85*	Revenues per sh	*21.65*
	1.89	2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	5.24	3.29	3.11	*4.10*	*4.40*	"Cash Flow" per sh	*5.30*
	.87	1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	1.35	*2.35*	*2.70*	Earnings per sh A	*3.65*
	.51	.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	*1.28*	*1.36*	Div'd Decl'd per sh B■	*1.58*
	2.31	2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	7.26	5.08	*5.00*	*5.25*	*5.25*	Cap'l Spending per sh	*5.50*
	10.11	10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	22.57	31.31	31.27	*33.30*	*35.60*	Book Value per sh	*39.15*
	18.27	18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	20.52	28.40	28.46	*29.00*	*29.50*	Common Shs Outst'g C	*30.00*
	19.6	19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	47.8	*Bold figures are*		Avg Ann'l P/E Ratio	*22.0*
	1.04	1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	2.60	*Value Line*		Relative P/E Ratio	*1.20*
	3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	1.9%	1.9%	1.9%	*estimates*		Avg Ann'l Div'd Yield	*2.0%*
							215.6	239.0	261.5	276.9	319.7	305.1	339.7	389.2	397.7	420.5	*545*	*585*	Revenues ($mill)	*650*
							15.8	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	38.5	*68.0*	*80.0*	Net Profit ($mill)	*110*
							38.8%	41.1%	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	*21.0%*	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
							--	--	--	--	--	--	--	--	2.0%	*1.5%*	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
							53.7%	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.0%	*51.0%*	*41.5%*	Long-Term Debt Ratio	*35.5%*
							46.3%	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	41.0%	*49.0%*	*58.5%*	Common Equity Ratio	*64.5%*
							550.7	607.9	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	2173.0	*1465*	*1800*	Total Capital ($mill)	*1825*
							785.5	756.2	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	*2300*	*2450*	Net Plant ($mill)	*2775*
							4.3%	4.9%	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	2.3%	*4.5%*	*5.0%*	Return on Total Cap'l	*6.5%*
							6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	*7.5%*	*7.5%*	Return on Shr. Equity	*9.5%*
							6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	*7.5%*	*7.5%*	Return on Com Equity	*9.5%*
							1.2%	3.1%	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	.5%	*3.5%*	*4.0%*	Retained to Com Eq	*5.5%*
							80%	61%	59%	62%	29%	42%	31%	36%	60%	89%	*52%*	*50%*	All Div'ds to Net Prof	*43%*

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	1.4	-6.8
3 yr.	32.5	6.6
5 yr.	102.4	20.3

CAPITAL STRUCTURE as of 12/31/19
Total Debt $1305.9 mill. Due in 5 Yrs $.0 mill.
LT Debt $1283.6 mill. LT Interest $35.0 mill.
(LT Interest Coverage: 3.8x)
(59% of Cap'l)

Pension Assets-12/19 $243.5 mill.
Oblig. $338.2 mill.
Pfd Stock None.
Common Stock 28,456,508 shs.

MARKET CAP: $1.7 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	7.8	420.7	17.9
Accts Receivable	17.3	19.2	36.3
Other	41.8	62.8	67.8
Current Assets	66.9	502.7	122.0
Accts Payable	23.0	24.9	34.9
Debt Due	--	--	22.9
Other	62.1	139.1	177.4
Current Liab.	85.1	164.0	234.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'19 to '23-'25
Revenues	5.0%	5.5%	*4.0%*
"Cash Flow"	7.0%	11.0%	*2.5%*
Earnings	8.0%	18.5%	*6.0%*
Dividends	4.5%	5.0%	*7.0%*
Book Value	5.5%	8.0%	*6.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	69.0	102.1	124.6	93.5	389.2
2018	75.0	99.1	124.9	98.7	397.7
2019	77.7	103.0	114.0	126.0	420.5
2020	*105*	*135*	*170*	*135*	*545*
2021	*115*	*145*	*180*	*145*	*585*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.18	.90	.94	.84	2.86
2018	.06	.62	.76	.38	1.82
2019	.21	.47	.33	.34	1.35
2020	*.20*	*.65*	*.90*	*.60*	*2.35*
2021	*.30*	*.70*	*1.00*	*.70*	*2.70*

Calendar	QUARTERLY DIVIDENDS PAID BD■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.2025	.2025	.2025	.2025	.81
2017	.2175	.2175	.2175	.3875	1.04
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020	.32				

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with a total population of 450,000 people. Has 361 employees. Officers and directors own 8.3% of outstanding shares (3/20 proxy). Chairman & CEO: Richard Roth. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

We are lowering our current-year share-net estimate for SJW Group by a dime, to $2.35. This is largely to reflect management's recent guidance, as well as to factor in lingering integration costs from the CTWS merger (completed in October, 2019). Indeed, we look for a substantial bottom-line recovery this year, as SJW incurred an additional profit hit in 2019 in the form of a nonrecurring charge related to the denial of its subsidiary's Water Conservation Memorandum Account. Although the near-term economic outlook, especially in hard-hit California, is a bit dire, given recent health concerns, we think SJW is well positioned to operate on a fairly normal basis. In fact, a rise in household water consumption, due to increased hand washing and more people staying at home of late, may be a net positive for the company.

Long-term, we like SJW Group's business prospects. First, the recently combined company now serves more than 1.5 million people on both coasts, and the scale and scope of its operations, once the integration is in the rearview mirror, ought to support further growth. In addition, an expanding customer base and periodic rate hikes should help drive top-line results. Second, we think aggressive infrastructure investment spending is likely over the next several years. Alongside traditional upgrades, such as water main repairs and improvements to its filtration systems and treatment plants, SJW aims to roll out advanced metering technology (in an effort to achieve upcoming water standards) that can provide nearly real-time water consumption information.

The stock price has declined notably since our previous review. Over the past three months, SJW stock has lost about 20% in value, largely a consequence of broader market turbulence stemming from weakening economic concerns. Over the past five years, shares of SJW have appreciated handsomely and, even with the recent selloff, total return potential three to five years out is still subpar when compared to the *Value Line* median.

Adding it all up, given the equity's limited investment appeal, subscribers would be wise to look elsewhere at this juncture.

Nicholas P. Patrikis *April 10, 2020*

(A) Diluted earnings. Excludes nonrecurring losses: '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due early May. Quarterly egs. may not add due to rounding. (B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available. (C) In millions, adjusted for stock splits. (D) Paid special dividend of $0.17 per share on 11/17. (E) Suspended due to recent CTWS merger.

Company's Financial Strength	B+
Stock's Price Stability	70
Price Growth Persistence	55
Earnings Predictability	45

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YORK WATER NDQ-YORW

RECENT PRICE 46.77 | P/E RATIO 42.1 (Trailing: 42.1 Median: 25.0) | RELATIVE P/E RATIO 3.19 | DIV'D YLD 1.5% | VALUE LINE 1792

TIMELINESS 2 Lowered 3/20/20
SAFETY 3 Lowered 7/17/15
TECHNICAL 3 Lowered 3/20/20
BETA .65 (1.00 = Market)

18-Month Target Price Range

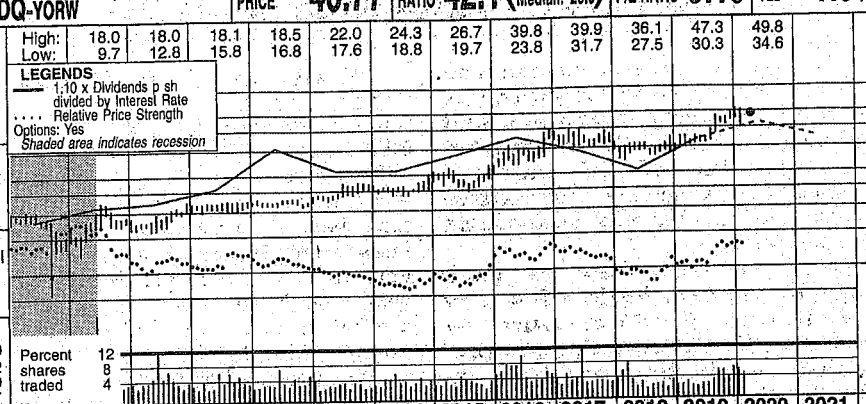
Low-High	Midpoint (% to Mid)
$31-$53	$42 (-10%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(-5%)	1%
Low	30	(-35%)	-8%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	48	55	52
to Sell	31	30	39
Hld's(000)	4866	5111	5387



Target Price Range 2023 | 2024 | 2025
64
48
40
32
24
20
16
12
8
6

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	18.0	-6.8
3 yr.	24.4	6.6
5 yr.	97.7	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	3.96	*4.05*	*4.20*	Revenues per sh	*5.10*
.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	1.71	*1.75*	*1.80*	"Cash Flow" per sh	*2.40*
.49	.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	1.11	*1.15*	*1.20*	Earnings per sh [A]	*1.60*
.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	*.73*	*.78*	Div'd Decl'd per sh [B]	*.95*
2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	1.95	*2.00*	*2.00*	*1.95*	Cap'l Spending per sh	*1.85*
4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	10.32	*11.20*	*11.65*	Book Value per sh	*12.50*
10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	13.01	*12.95*	*12.90*	Common Shs Outst'g [C]	*12.80*
25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	33.7	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*22.5*
1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.64	1.83			Relative P/E Ratio	*1.25*
3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%	1.9%			Avg Ann'l Div'd Yield	*2.5%*
						39.0	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	51.5	*52.5*	*54.0*	Revenues ($mill)	*65.0*
						8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	14.5	*15.0*	*15.5*	Net Profit ($mill)	*20.5*
						38.5%	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	*21.0%*	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
						1.2%	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	*2.0%*	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
						48.3%	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	41.3%	*38.5%*	*37.5%*	Long-Term Debt Ratio	*36.0%*
						51.7%	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	58.7%	*61.5%*	*62.5%*	Common Equity Ratio	*64.0%*
						176.4	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	228.7	*235*	*240*	Total Capital ($mill)	*250*
						228.4	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	313.2	*315*	*320*	Net Plant ($mill)	*335*
						6.5%	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	7.4%	*7.5%*	*7.5%*	Return on Total Cap'l	*9.0%*
						9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.8%	*10.5%*	*10.5%*	Return on Shr. Equity	*13.0%*
						9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.8%	*10.5%*	*10.5%*	Return on Com Equity	*13.0%*
						2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	4.0%	*4.0%*	*3.5%*	Retained to Com Eq	*5.0%*
						72%	73%	74%	74%	64%	62%	67%	63%	64%	63%	*63%*	*65%*	All Div'ds to Net Prof	*59%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $101.0 mill. **Due in 5 Yrs** $42.5 mill.
LT Debt $94.5 mill. **LT Interest** $5.5 mill.
(41% of Cap'l)

Pension Assets12/19 $49.3 mill.
Oblig. $47.3 mill.

Pfd Stock None

Common Stock 13,014,898 shs.

MARKET CAP: $600 million (Small Cap)

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	--	--	--
Accounts Receivable	4.5	4.8	4.4
Inventory (Avg. Cost)	.9	.9	1.0
Other	3.2	3.3	4.0
Current Assets	8.6	9.0	9.4
Accts Payable	3.1	3.0	3.4
Debt Due	--	1.0	6.5
Other	6.0	6.8	5.3
Current Liab.	9.1	10.8	15.2

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '23-'25
Revenues	3.0%	3.0%	*4.5%*
"Cash Flow"	6.0%	6.0%	*7.0%*
Earnings	5.5%	6.5%	*7.0%*
Dividends	3.5%	4.0%	*5.5%*
Book Value	4.5%	4.0%	*4.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	11.3	12.3	12.7	12.3	48.6
2018	11.6	12.0	12.7	12.1	48.4
2019	11.8	13.0	13.7	13.0	51.5
2020	*12.2*	*13.0*	*14.0*	*13.3*	*52.5*
2021	*12.5*	*13.3*	*14.5*	*13.7*	*54.0*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.20	.23	.31	.27	1.01
2018	.20	.26	.29	.29	1.04
2019	.22	.28	.35	.26	1.11
2020	*.22*	*.28*	*.35*	*.30*	*1.15*
2021	*.23*	*.30*	*.36*	*.31*	*1.20*

Calendar	QUARTERLY DIVIDENDS PAID [B] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1555	.1555	.1555	.1602	.627
2017	.1602	.1602	.1602	.1666	.647
2018	.1666	.1666	.1666	.1733	.673
2019	.1733	.1733	.1733	.1802	.70
2020	.1802				

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2019, the company's average daily availability was 35.4 million gallons and its service territory had an estimated population of 201,000. Has more than 71,400 customers. Residential customers accounted for 65% of 2019 revenues; commercial and industrial (28%); other (7%). It also provides sewer billing services. Incorporated: PA. York had 106 full-time employees at 12/31/19. President/CEO: Jeffrey R. Hines. Officers/directors own 1.2% of the common stock (3/19 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

York Water Company is apt to post modest top- and bottom-line gains this year and next. Although the current economic climate is far from ideal, York's operations are likely to move forward on a relatively normal basis. In fact, given an abundance of hand washing spurred by the recent health crisis, coupled with a growing number of residents urged to stay at home by government officials, the company may experience a near-term uptick in water consumption. All things considered, we continue to envision low single-digit revenue and share-net growth for 2020 and 2021.

The stock is a favorable selection for the coming six- to 12-month stretch. Based on our Timeliness Ranking scale, York is ranked 2 (Above Average) for relative year-ahead price performance. What's more, in comparison to the beaten-up broader market indices, shares of the regulated water utility have fared markedly better over the past six weeks of trading. Indeed, conservative investors may well continue to rebalance their portfolios, specifically by increasing exposure to companies with more stable year-ahead business prospects.

Investment spending over the pull to mid-decade ought to continue as planned. Leadership's recent commentary suggests capital investments of about $30 million are on the table this year, which will likely be followed up by an additional $27 million worth of spending in 2021. Funds will probably be allocated to dam construction and repair; waste water treatment plant expansion; and pipe, service line, and facility improvements. In our view, factoring in the company's aging infrastructure, as well as its expanding customer base, York is not likely to take its foot off the gas beyond 2021 in terms of investment spending.

At the recent quotation, long-term investment appeal is lacking. York shares have been on a steady ascent for the better part of the last decade. And even with the moderate pullback of late, total return potential three to five years hence is well below average. All told, despite the stock's defensive qualities, we think buy-and-hold accounts can find more-attractive options elsewhere at this juncture.

Nicholas P. Patrikis *April 10, 2020*

(A) Diluted earnings. Next earnings report due late April.
(B) Dividends historically paid in late February, June, September, and December.
(C) In millions, adjusted for split.

Company's Financial Strength	B+
Stock's Price Stability	65
Price Growth Persistence	65
Earnings Predictability	95

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Pennsylvania American Water Company

Upper Pottsgrove Township's Wastewater System

Appraisal Work Papers
As of April 28, 2020

Upper Pottsgrove Township
Financials 2013 through 2019

AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
Office Telephone: 414-529-5755
J. Weinert's Cell: 414-698-8371
J. Weinert's E-Mail: weinertj@auswest.net

Upper Pottsgrove Township'd Financials 2013-2019

Upper Pottsgrove Township

Statement of Revenues, Expenditures and Changes in Net Position - Modified Cash Basis - Proprietary Fund, Sewer

	Year Ended December 31, 2013
Operating Revenues	
Charges for services, sewer charges	$ 1,155,675
Connection fees	15,917
Total Operating Revenues	1,171,592
Operating Expenditures	
Wastewater collections and treatment	1,112,873
Debt service:	
Principal	1,676,719
Interest	224,573
Debt issuance costs	29,106
Total Operating Expenditures	3,043,271
Operating Loss	(1,871,679)
Nonoperating Revenues	
Interest income	500
Refund of prior year expenditures	12,027
Total Nonoperating Revenues	12,527
Other Financing Sources (Uses)	
Proceeds from bond issuance and bond premium	1,193,267
Transfer in	9,511
Transfer out	(198,197)
Total Other Financing Sources (Uses)	1,004,581
Change in Net Position	(854,571)
Net Position at Beginning of Year	997,123
Net Position at End of Year	$ 142,552

See accompanying notes.

TOWNSHIP OF UPPER POTTSGROVE

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN
NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2014

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,242,942
Connection fees	4,104
TOTAL OPERATING REVENUES	1,247,046
OPERATING EXPENSES	
Wastewater collections and treatment	246,157
OPERATING INCOME	1,000,889
NONOPERATING REVENUES (EXPENSES)	
Investment income	77
Debt service	
Principal expense	(525,313)
Interest expense	(205,765)
TOTAL NONOPERATING REVENUES (EXPENSES)	(731,001)
INCOME BEFORE INTERFUND TRANSFERS	269,888
INTERFUND TRANSFERS	
Transfers out	(137,000)
CHANGE IN NET POSITION	132,888
NET POSITION AT BEGINNING OF YEAR	142,552
NET POSITION AT END OF YEAR	$ 275,440

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2014

	Sewer Fund
ASSETS	
CURRENT ASSETS	
Cash	$ 412,765
Due from Escrow Fund	375
TOTAL CURRENT ASSETS	413,140
LIABILITIES	
CURRENT LIABILITIES	
Due to other funds	137,700
NET POSITION	
Unrestricted	$ 275,440

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2015

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,313,298
Connection fees	24,735
TOTAL OPERATING REVENUES	1,338,033
OPERATING EXPENSES	
Wastewater collections and treatment	230,134
OPERATING INCOME	1,107,899
NONOPERATING REVENUES (EXPENSES)	
Investment income	642
Debt service	
Principal expense	(527,754)
Interest expense	(187,976)
TOTAL NONOPERATING REVENUES (EXPENSES)	(715,088)
INCOME BEFORE INTERFUND TRANSFERS	392,811
INTERFUND TRANSFERS	
Transfers out	(137,000)
CHANGE IN NET POSITION	255,811
NET POSITION AT BEGINNING OF YEAR	275,440
NET POSITION AT END OF YEAR	$ 531,251

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2015

	Sewer Fund
ASSETS	
CURRENT ASSETS	
Cash	$ 668,576
Due from Escrow Fund	375
TOTAL CURRENT ASSETS	668,951
LIABILITIES	
CURRENT LIABILITIES	
Due to other funds	137,700
NET POSITION	
Unrestricted	$ 531,251

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

ANNUAL FINANCIAL REPORT

Year Ended December 31, 2016

Maillie®

Expertise Beyond The Numbers®

Certified Public Accountants and Business Consultants

TOWNSHIP OF UPPER POTTSGROVE

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2016

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,319,318
Connection fees	4,408
TOTAL OPERATING REVENUES	1,323,726
OPERATING EXPENSES	
Wastewater collections and treatment	347,490
OPERATING INCOME	976,236
NONOPERATING REVENUES (EXPENSES)	
Investment income	2,328
Miscellaneous expense	(1,000)
Debt service	
Principal expense	(540,080)
Interest expense	(190,493)
TOTAL NONOPERATING REVENUES (EXPENSES)	(729,245)
CHANGE IN NET POSITION	246,991
NET POSITION AT BEGINNING OF YEAR	531,251
NET POSITION AT END OF YEAR	$ 778,242

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2016

	Sewer Fund
ASSETS	
CURRENT ASSETS	
Cash	$ 915,567
Due from Escrow Fund	375
TOTAL CURRENT ASSETS	915,942
LIABILITIES	
CURRENT LIABILITIES	
Due to other funds	137,700
NET POSITION	
Unrestricted	$ 778,242

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

ANNUAL FINANCIAL REPORT

Year Ended December 31, 2017

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TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2017

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,312,039
Connection fees	86,705
TOTAL OPERATING REVENUES	1,398,744
OPERATING EXPENSES	
Wastewater collections and treatment	595,002
OPERATING INCOME	803,742
NONOPERATING REVENUES (EXPENSES)	
Investment income	9,477
Miscellaneous expense	(1,000)
Debt service	
Principal expense	(564,698)
Interest expense	(177,935)
TOTAL NONOPERATING REVENUES (EXPENSES)	(734,156)
CHANGE IN NET POSITION	69,586
NET POSITION AT BEGINNING OF YEAR	778,242
NET POSITION AT END OF YEAR	$ 847,828

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2017

	Sewer Fund
ASSETS	
CURRENT ASSETS	
Cash	$ 985,153
Due from Escrow Fund	375
TOTAL CURRENT ASSETS	985,528
LIABILITIES	
CURRENT LIABILITIES	
Due to other funds	137,700
NET POSITION	
Unrestricted	$ 847,828

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

ANNUAL FINANCIAL REPORT

Year Ended December 31, 2018

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TOWNSHIP OF UPPER POTTSGROVE

STATEMENT OF REVENUES, EXPENSES AND CHANGES IN
NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2018

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,362,072
Connection fees	26,512
TOTAL OPERATING REVENUES	1,388,584
OPERATING EXPENSES	
Wastewater collections and treatment	425,021
OPERATING INCOME	963,563
NONOPERATING REVENUES (EXPENSES)	
Investment income	10,727
Intergovernmental	78,810
Debt service	
Principal expense	(594,464)
Interest expense	(163,230)
TOTAL NONOPERATING REVENUES (EXPENSES)	(668,157)
INCOME BEFORE INTERFUND TRANSFERS	295,406
INTERFUND TRANSFERS	
Transfers out	(270,000)
CHANGE IN NET POSITION	25,406
NET POSITION AT BEGINNING OF YEAR	847,828
NET POSITION AT END OF YEAR	$ 873,234

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2018

	Sewer Fund
ASSETS	
CURRENT ASSETS	
Cash	$ 881,403
CURRENT LIABILITIES	
Due to other funds	8,169
NET POSITION	
Unrestricted	$ 873,234

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE

FINANCIAL STATEMENTS AND SUPPLEMENTARY INFORMATION

Year Ended December 31, 2019

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TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
YEAR ENDED DECEMBER 31, 2019

	Sewer Fund
OPERATING REVENUES	
Charges for services, sewer charges	$ 1,374,115
Connection fees	93,113
Refund of prior year expenses	6,127
TOTAL OPERATING REVENUES	1,473,355
OPERATING EXPENSES	
Wastewater collections and treatment	354,533
OPERATING INCOME	1,118,822
NONOPERATING REVENUES (EXPENSES)	
Investment income	17,095
Debt service	
Principal expense	(610,383)
Interest expense	(145,775)
TOTAL NONOPERATING REVENUES (EXPENSES)	(739,063)
INCOME BEFORE INTERFUND TRANSFERS	379,759
INTERFUND TRANSFERS	
Transfers out	(175,000)
CHANGE IN NET POSITION	204,759
NET POSITION AT BEGINNING OF YEAR	873,234
NET POSITION AT END OF YEAR	$ 1,077,993

See accompanying notes to the basic financial statements.

TOWNSHIP OF UPPER POTTSGROVE
STATEMENT OF NET POSITION--MODIFIED CASH BASIS
PROPRIETARY FUNDS
DECEMBER 31, 2019

	Sewer Fund
ASSETS	
Cash	$ 1,077,993
NET POSITION	
Unrestricted	$ 1,077,993

See accompanying notes to the basic financial statements.

12/17/2018

Upper Pottsgrove Township Sewer Fund
Final Budget 2019

	2019
Revenue	
341.100 · Interest Earnings	7,000.00
354.040 · Water and Sewer Grants	200,000.00
364.000 · Sanitation	
364.110 · Tapping/Connection Fees	283,244.00
364.120 · User Fees	1,390,620.00
Total 364.000 · Sanitation	1,673,864.00
364.900 · PBA Reimbursement	
Total Income	1,880,864.00
Expense	
403.390 · Bank Service Charges/Fees	
404.310 · Solicitor Fees	5,000.00
429.000 · Waste Water Collect/Treatment	
429.240 · General Admin Expenses	500.00
429.251 · Supplies	500.00
429.313 · Engineering	45,000.00
429.321 · Telephone	2,000.00
429.361 · Electric - Pump Stations	15,000.00
429.375 · Repairs and Maintenance	35,000.00
429.376 · I & I Repairs	25,000.00
429.380 · Meter Lease	43,000.00
429.460 · Continuing Education	1,500.00
429.470 · Misc. Expenses	500.00
429.530 · PMA Purchase of EDUs	0.00
429.531 · PMA - Current Year	132,530.00
429.532 · Pottstown MA Prior Year Rec,	5,000.00
429.533 · PMA - Capital, Planned	130,000.00
429.534 · Pottstown MA Cap. Repair (Res)	10,000.00
429.535 · LPT Porter House Pump Station	12,000.00
429.600 · Capital Construction	
429.610 · Regal Oaks Phase 2 A	495,000.00
429.600 · Gilbertsville Road	100,000.00
Total 426.429 · Sanitation - Public Works	1,052,530.00
439.000 · Highway Construction and Repair	
471 · Debt Principal	
471.300 · 2005 DVRFA GO Principal	208,000.00
471.500 · 2009 Pennvest	157,383.00
471.600 · 2012 GO Bond Principal	220,000.00
471.700 · 2013 GO Bond Principal	25,000.00
Total 471 · Debt Principal	610,383.00
472 · Debt Service Interest	
472.300 · 2005 DVRFA GO Interest	22,644.00
472.500 · 2009 Pennvest	68,471.00
472.600 · 2012 GO Bond	50,640.00

12/17/2018

Upper Pottsgrove Township Sewer Fund
Final Budget 2019

	2019
472.700 · 2013 GO Bond	7,520.00
Total 472 · Debt Service Interest	149,275.00
492.001 · Transfers to General Fund	175,000.00
Total Expense	1,992,188.00
Net Income	-111,324.00
Beginning Balance:	811,054.63
Total Revenue	1,880,864.00
Total Expense	1,992,188.00
Net Income	-111,324.00
Ending Balance:	699,730.63
Project Reserve	450,000.00
Fund Reserve	249,500.00
Ending Balance w/o fund reserve:	230.63

Engineering Assessment Study

of

Upper Pottsgrove Township's

Wastewater System Assets

By

Chris Pelka,

LTL Consultants

and

David A. Sheffer, Principal

AUS CONSULTANTS

3601 North Progress Ave., Suite 202

Harrisburg, PA 17110

717.763.9890

dsheffer@ausconsultants.com

Upper Pottsgrove Township

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SECTION 1

Executive Summary

In May 2020, AUS Consultants (AUS) and LTL Consultants (LTL) were authorized by Pennsylvania American Water Company (PAWC) and Upper Pottsgrove Township (Township), located in Montgomery County, to prepare an Act 12 (HB1329) Engineers Assessment Study for purchase of the Township's Wastewater System Assets by PAWC. The assessment of tangible assets of the facilities and equipment to be purchased, was prepared following the guideline of Pennsylvania Act 12 of 2016, amended Chapter 13 of the Pennsylvania Public Utility Code and the Final Implementation Order entered by Public Utility Commission at Docket No. M-2016-2543193 ("Act 12") by adding section §1329 Valuation of acquired water and wastewater system. Information for this assessment and to prepare the report was derived from various sources including, but not limited to, system maps, site visit, discussions with Township staff and engineer(s), Township asset listing, contracts, institutional escrow payment statements and other sources to provide an inventory and listing. A complete list of the assets, organized by National Association of Regulatory Utility Commissions (NARUC) system of accounts, showing the original cost and year of installation is included in Section 1 of this report.

System Description

The wastewater system owned by the Township to be acquired by PAWC, provides wastewater collection services to over 1,400 commercial, public and residential customers throughout the Township of Upper Pottsgrove. Upper Pottsgrove Township, Montgomery County covers approximately an area of 5 square miles with a population of

approximately 5,500. The system is comprised of four lift stations and forced sewer and gravity collection mains of approximately 118,000 feet. Gravity collection mains make up much of the system with the majority consisting of 8" PVC pipe. The four lift stations are Pine Ford Road, Regal Oaks, Hollyberry Court and Evans Road. The sewage flows to an interceptor for treatment at the Pottstown Borough Authority Sewage Treatment Plant for which the Township has purchased capacity.

The assets to be acquired in the sale total $15,295,347 as notated in Section 2.

Methodology

The purpose of this report is to "conduct an assessment of tangible assets of the selling utility". AUS and LTL obtained and reviewed Township records such as asset list, depreciation schedules, contracts and developer escrow payment summaries. In addition, AUS and LTL conducted a site visit to verify assets listed of the Township and met with Township personnel. A summary of assets has been developed, which includes used and useful utility system assets and any system held for future use that is to be part of the asset sale. The assets were categorized by NARUC system of accounts for class A wastewater systems. A list of the property of the Township's wastewater assets is contained in Section 2 of this report.

The development of the assets' summary began by obtaining the Township's asset list. The cost and age of the assets were verified by analyzing escrow payment summaries and/or construction contracts, where possible. For contracts that did not include engineering and legal costs, an estimate was developed and allocated to the assets in those contracts. Overhead costs contained in the contracts and escrow payment

summaries, such as trenching, paving, seeding, etc., have been allocated across the major components The buyer and seller both agree the grinder pumps will not be part of the sale.

A system map of the collection system is contained in Section 3 of this report. Contained in Section 4 are photographs of the above ground facilities, including the four lift stations.

SECTION 2

Township of Upper Pottsgrove

Summary of Original Cost of Assets in Service
as of August 31, 2020

Acct. No.	Account Description		Cost
	Non-Depreciable System		
353.00	Land and Land Rights	$	8,865.00
	Depreciable System		
354.00	Structures & Improvements - Lift Stations		1,612,326.02
355.00	Power Generating Equipment		47,512.12
360.00	Collection Sewers - Force		647,820.95
361.00	Collection Sewers- Gravity		8,122,057.07
363.00	Services Laterals		1,731,293.99
380.00	Treatment and Disposal		3,125,472.00
	TOTAL Depreciable System	$	15,286,482.15
	TOTAL - Assets in Services	$	15,295,347.15

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	409 Evans Road	Lot	FAW II	n/a	$ -
353.00	256 Mickletz Road	Lot	FAW II	n/a	-
353.00	1764 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1760 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1637 Kummerer Road	Lot	FAW II	n/a	-
353.00	1714 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1710 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1702 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1698 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1696 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1693 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1688 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1682 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1674 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1664 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1505 Kummerer Road	Lot	FAW II	n/a	-
353.00	1717 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1569 Farmington Ave.	Lot	FAW	n/a	-
353.00	1577 Farmington Ave.	Lot	FAW	n/a	-
353.00	1387 Chestnut Grove Rd	Lot	Greengate	n/a	-
353.00	1382 Chestnut Grove Rd	Lot	Greengate	n/a	-
353.00	Renovations By Design	Lot	FAW	n/a	-
353.00	149 Pine Ford Road	Lot	FAW	n/a	-
353.00	Pine Ford Road PS	Lot		n/a	$ 8,865.00
353.00	1371 N. State Street	Lot	Greengate	n/a	-
353.00	1369 N. State Street	Lot	Greengate	n/a	-
353.00	1407 Heather Place	Lot	Greengate	n/a	-
353.00	1413 Heather Place	Lot	Greengate	n/a	-
353.00	1419 Heather Place	Lot	Greengate	n/a	-
353.00	1429 Heather Place	Lot	Greengate	n/a	-
353.00	120 Primrose Lane	Lot	Greengate	n/a	-
353.00	Pine Ford Rd SG HOA	Lot	Summer Grove	n/a	-
353.00	Chestnut Grove Rd SG HOA	Lot	Summer Grove	n/a	-
353.00	Chestnut Grove Rd UPT	Lot	Summer Grove	n/a	-
353.00	Fallbrook and Cloverhill	Lot	Chestnut Grove/UPT	n/a	-
353.00	Fallbrook and Heather Place	Lot	Chestnut Grove/UPT	n/a	-
353.00	Gravity to PFRPS	Lot	Chestnut Grove/Greengate	n/a	-
353.00	Laura Land UPT	Lot	Cherry Tree	n/a	-
353.00	1804 Joanne Circle	Lot	Cherry Tree	n/a	-
353.00	1811 Joanne Circle	Lot	Cherry Tree	n/a	-
353.00	10 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	18 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	24 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	64 Maple Leaf	Lot	ROPS	n/a	-
353.00	70 Maple Leaf	Lot	ROPS	n/a	-
353.00	76 Maple Leaf	Lot	ROPS	n/a	-
353.00	80 Maple Leaf	Lot	ROPS	n/a	-
353.00	111 Snyder Road	Lot	ROPS	n/a	-
353.00	2019 Mimosa Lane	Lot	ROPS	n/a	-

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	2136 Hollyberry Ct	Lot	Regal Oaks	n/a	-
353.00	2133 Hollyberry Ct	Lot	Regal Oaks	n/a	-
353.00	221 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	215 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	209 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	203 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	200 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	207 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	188 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	182 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	176 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	170 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	164 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	156 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	140 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	138 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	132 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	124 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	116 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	102 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	145 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	139 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	135 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	127 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	121 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	113 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	109 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	105 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	99 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	95 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	91 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	85 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	82 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	87 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	93 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	101 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	107 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	63 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	2160 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2146 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2126 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	94 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	98 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	2019 Mimosa Lane	Lot	Regal Oaks	n/a	-
353.00	2038 Mimosa Lane	Lot	Regal Oaks	n/a	-
353.00	150 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	156 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	155 Boxwood Ct	Lot	Regal Oaks	n/a	-
353.00	161 Boxwood Ct	Lot	Regal Oaks	n/a	-

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	2093 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2101 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	2115 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	2131 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	256 W. Moyer	Lot	Sprogels Run	n/a	-
353.00	1608 Gilbertsville Road	Lot	Maugers Mill	n/a	-
353.00	1614 Gilbertsville Road	Lot	Maugers Mill	n/a	-
353.00	64 Irwin Place	Lot	Gary Heights	n/a	-
353.00	56 Irwin Place	Lot	Gary Heights	n/a	-
353.00	1275 Whitespire Circle	Lot	Turnberry	n/a	-
353.00	1266 N Hanover	Lot	Turnberry	n/a	-
353.00	Glendale Ave	Lot	Turnberry	n/a	-
353.00	1537 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1533 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1518 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1522 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1456 Sweetwater Way	Lot	Turnberry	n/a	-
353.00	1460 Sweetwater Way	Lot	Turnberry	n/a	-
353.00	1412 Meadwview Drive	Lot	Turnberry	n/a	-
353.00	218 Deerfield Way	Lot	Turnberry	n/a	-
353.00	220 Deerfield Way	Lot	Turnberry	n/a	-
	Total Account 353.00 Land and Land Rights				$ 8,865.00

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 354.00 - Structures and Improvements - Lift Stations

Acct. No.		Unit	Description	Year		Amount
354.00	Evan Rd	Lot	Evan Rd. Chopper Pump Station	2010	$	83,360.28
354.00	Evan Rd	Lot	Evan Rd. Lift Station	2010		21,936.92
354.00	Evan Rd	Lot	Transducers	2010		2,000.54
354.00	Evan Rd	Lot	Power Supply	2011		8,651.69
354.00	Evan Rd	Lot	Electrical Connections & Appurtenances	2011		8,273.17
354.00	Evan Rd	Lot	Pump Level Control	2011		9,733.15
354.00	Evan Rd	Lot	Auto Dialer	2011		2,162.92
354.00	Evan Rd	Lot	PECO Utility Ext	2011		13,249.44
			Total Evan Road		$	149,368.11
354.00	Pine Ford Rd.	Lot	Pine Ford PS Complete in Place	1998		157,559.75
354.00	Pine Ford Rd.	Lot	Fencing	1998		14,022.82
354.00	Pine Ford Rd.	Lot	15Kv Duct	1998		29,300.77
354.00	Pine Ford Rd.	Lot	15Kv Cable	1998		11,538.80
354.00	Pine Ford Rd.	Lot	Secondary Service	1998		4,148.78
354.00	Pine Ford Rd.	Lot	Main Breaker & Cabinet	1998		9,334.76
354.00	Pine Ford Rd.	Lot	ATS Panel PP and Cabinet	1998		16,335.83
354.00	Pine Ford Rd.	Lot	Phone Conduit and TVSS	1998		1,037.20
354.00	Pine Ford Rd.	Lot	Service Entrance TVSS	1998		1,944.74
354.00	Pine Ford Rd.	Lot	Connections	1998		2,852.29
354.00	Pine Ford Rd.	Lot	Pump Control Conduit & Cable	1998		4,019.13
354.00	Pine Ford Rd.	Lot	Site Lighting	1998		3,267.17
354.00	Pine Ford Rd.	Lot	Equipment Pads	1998		3,889.48
354.00	Pine Ford Rd.	Lot	Demolition of Existing 40 HP Pumps	2011		3,676.97
354.00	Pine Ford Rd.	Lot	Electric Connections to 50HP Pumps	2011		5,407.30
354.00	Pine Ford Rd.	Lot	Upgrade of Existing Electric System	2011		1,948.79
354.00	Pine Ford Rd.	Lot	Pine Ford Rd. Lift Station Upgrade	2010		182,345.49
			Total Pine Ford		$	452,630.06
354.00	Hollyberry	Lot	Hollyberry PS & Wetwell	1986		36,000.00
			Total Hollyberry		$	36,000.00

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 354.00 - Structures and Improvements - Lift Stations

Acct. No.		Unit	Description	Year	Amount
354.00	Regal Oaks	Lot	Regal Oaks Pump Station	2010	381,360.79
354.00	Regal Oaks	Lot	Regal Oaks Station Site Work	2010	322,245.50
354.00	Regal Oaks	Lot	Cherry Tree Pump Station Site Work	2010	42,503.11
354.00	Regal Oaks	Lot	Transformer Pad	2011	5,989.16
354.00	Regal Oaks	Lot	Concrete Pad	2011	4,728.28
354.00	Regal Oaks	Lot	Equipment Stand	2011	1,576.09
354.00	Regal Oaks	Lot	ATS	2011	9,456.57
354.00	Regal Oaks	Lot	Main Circuit Breaker	2011	1,576.09
354.00	Regal Oaks	Lot	Light Standard	2011	7,250.03
354.00	Regal Oaks	Lot	PVC Pipe	2011	9,456.57
354.00	Regal Oaks	Lot	Copper Wire	2011	7,880.47
354.00	Regal Oaks	Lot	Copper Wire	2011	11,032.66
354.00	Regal Oaks	Lot	Wet Well Work	2011	8,510.91
354.00	Regal Oaks	Lot	Metropolitan Edison Utility Work	2011	160,761.62
			Total Regal Oaks		$ 974,327.85
	Total Account 354				$ 1,612,326.02

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 355.00 - Power Generating Equipment

Acct. No.		Unit	Description	Year		Amount
355.00	Pine Ford Road PS-Electı	Lot	Emergency Generator	1998	$	36,479.46
355.00	Regal Oaks PS	Lot	Cherry PumpStation / Generator	2011	$	11,032.66
	Total Account 355 Power Generation Equipment				$	47,512.12

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 360.00 - Collection Sewer - Force

Acct. No.		Unit	Footage/ Count	Year	Amount
360.10	4" and Under Force Collection Sewers	Ft.	1,120	1986	$ 26,880.00
		Ft.	600	1990	21,123.01
		Ft.	3,072	2007	32,560.00
		Ft.	170	2008	6,192.90
		Ft.	3,313	2010	97,577.06
		Ft.	530	2020	11,780.63
	TOTAL Account 360.10 4" and Under Force Collection Sewer		8,805		$ 196,113.60
360.20	6" - 8" Force Collection Sewer	Ft.	1,754	1998	81,861.75
		Ft.	882	2007	41,952.46
		Ft.	6,660	2010	315,959.58
	TOTAL Account 360.11 6" - 8" Force Collection Sewer		9,296		$ 439,773.78
360.90	Air Release - Force Sewer	Ea.	1	2010	11,933.57
	TOTAL Account 360 - Force Collection Sewer				$ 647,820.95

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 361.00 - Collection Sewer - Gravity

Acct. No.		Unit	Footage/ Count	Description	Year	Amount
361.11	6" - 8" Gravity Collection Sewer	Ft.	3,523		1984	$ 170,612.28
		Ft.	8,873		1986	356,488.70
		Ft.	2,560		1990	66,275.83
		Ft.	7,891		1995	203,239.58
		Ft.	2,817		1996	39,880.78
		Ft.	7,804		1998	229,712.25
		Ft.	7,304		1999	155,043.85
		Ft.	1,398		2000	72,274.84
		Ft.	3,151		2001	90,076.13
		Ft.	5,075		2003	158,426.82
		Ft.	6,150		2005	127,473.99
		Ft.	1,200		2007	803,420.32
		Ft.	8,505		2008	663,040.63
		Ft.	9,901		2010	533,744.91
		Ft.	1,316		2017	188,286.56
		Ft.	7,320		2018	288,464.65
		Ft.	1,125		2019	45,150.72
		Ft.	1,629		2020	254,093.54
TOTAL Account 361.11 - 6" - 8" Collection Sewer			87,542			$ 4,445,706.39
361.13	10" - 12" Gravity Collection Sewer	Ft.	4,838		1995	377,721.52
		Ft.	4,092		2007	474,784.52
		Ft.	2,602		2010	234,556.68
TOTAL Account 361.12 - 10" - 12" Collection Sewer			11,532			$ 1,087,062.72
361.13	18" and Over - Gravity Collection Sewer	Ft.	2,088		2007	611,556.01
		Ft.	1,090		2010	129,076.81
TOTAL Account 361.13 - 18" and Over Gravity Collection Sewer			3,178			$ 740,632.82
361.98	Manholes	Ea.	12		1984	32,609.52
		Ea.	30		1986	84,124.42
		Ea.	26		1990	49,462.45
		Ea.	49		1995	104,746.14
		Ea.	8		1996	12,366.13
		Ea.	11		1998	18,567.53
		Ea.	40		1999	69,013.73
		Ea.	11		2000	19,939.67
		Ea.	34		2001	23,963.62
		Ea.	33		2003	79,106.13
		Ea.	37		2005	76,013.39
		Ea.	41		2007	168,796.46
		Ea.	42		2008	201,119.41
		Ea.	98		2010	410,712.52
		Ea.	7		2017	28,720.38
		Ea.	32		2018	90,877.44
		Ea.	14		2019	33,712.54
		Ea.	9		2020	82,832.58
Total Account 361.98 - Manholes			534			$ 1,586,684.06

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 361.00 - Collection Sewer - Gravity

Acct. No.		Unit	Footage/ Count	Description	Year	Amount
361.99	Miscellaneous	Lot		Meter station	1995	12,604.82
		Lot		Install Liners	2003	61,978.00
		Lot		Stream Xings	2008	5,312.53
		Lot		Stream Crossing	2010	5,045.49
		Lot		Regal Oaks Lining	2010	88,878.23
		Lot		Gilbertsville Rd Crossing	2010	2,354.02
		Lot		Pipe Lining - 8" CIPP	2017	82,620.00
		Lot		Stream Crossing	2018	3,177.98
TOTAL Account 361.99 - Miscellaneous						$ 261,971.08
	TOTAL ACCOUNT 361.00 - Gravity Collection Sewer					$ 8,122,057.07

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 363.00 - Service Laterals

Acct. No.		Unit	Count	Year	Amount
363.00	Service - Laterals	Ea.	95	1986	$ 43,786.68
		Ea.	19	1990	10,876.01
		Ea.	84	1995	237,347.44
		Ea.	19	1996	21,199.09
		Ea.	44	1998	16,014.95
		Ea.	145	1999	74,731.02
		Ea.	71	2000	29,417.49
		Ea.	64	2001	57,110.25
		Ea.	113	2003	77,263.05
		Ea.	84	2005	106,617.79
		Ea.	93	2007	78,257.99
		Ea.	262	2008	522,841.43
		Ea.	227	2010	261,404.53
		Ea.	9	2017	21,274.36
		Ea.	77	2018	54,387.92
		Ea.	36	2019	18,996.75
		Ea.	24	2020	99,767.24
	TOTAL ACCOUNT 363.00 - Service Latera		1,466		$ 1,731,293.99

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 380.00 - Treatment

Acct. No.		Unit	Description	Year	Amount
380.00	Treatment	Lot	Purchased Treatment Capacity (350,000GPD)	1990	$ 1,001,717.00
		Lot	Purchased Conveyance thru Lower(192,000 GPD)	1994	350,000.00
		Lot	Purchased Treatment Capacity (188,400 GPD)	2005	604,764.00
		Lot	Purchased Treatment Capacity (53,700 GPD)	2010	234,132.00
		Lot	Treatment Plant Expansion (CAPEX)	2010	502,465.00
		Lot	Purchased Treatment Capacity (4,500 GPD)	2011	19,755.00
		Lot	Purchased Treatment Capacity (6,000 GPD)	2013	28,267.00
		Lot	Purchased Treatment Capacity (6,000 GPD)	2018	32,592.00
		Lot	Purchased Treatment Capacity (43,500 GPD) Pending	2020	248,820.00
		Lot	Purchased Treatment Capacity (18,000 GPD)	2020	102,960.00
	TOTAL Account 380.00 - Treatment				$ 3,125,472.00

SECTION 3

SANITARY SEWER INDEX

UPPER POTTSGROVE TOWNSHIP
MONTGOMERY COUNTY, PA

LOCATOR MAP
MONTGOMERY COUNTY

LEGEND

- County Boundary
- Municipal Boundaries
- Road Centerlines
- Parcel Boundaries

SEWER SYSTEM

- PUMP STATIONS
- MANHOLES

MAINS

- 18" GRAVITY MAIN
- 12" GRAVITY MAIN
- 10" GRAVITY MAIN
- 8" GRAVITY MAIN
- FORCE MAINS
- LOW PRESSURE FORCE MAIN

3-1

MAP SCALE
1 "=500 '

0 250 500 1,000 1,500 2,000

Feet

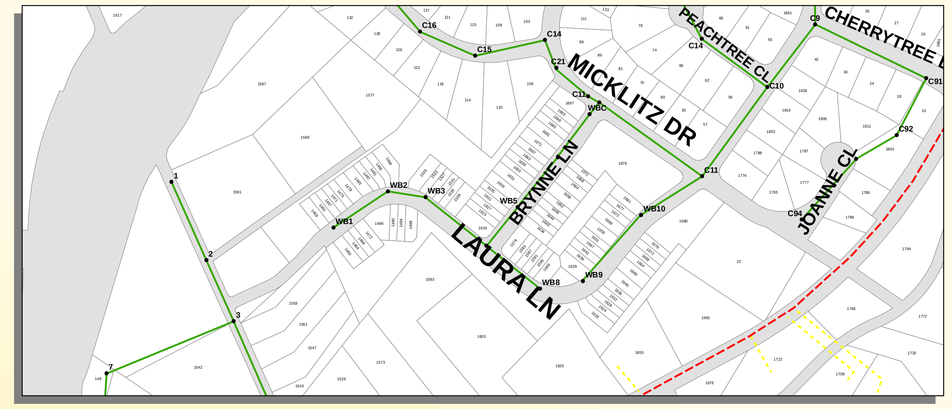
NOTES:

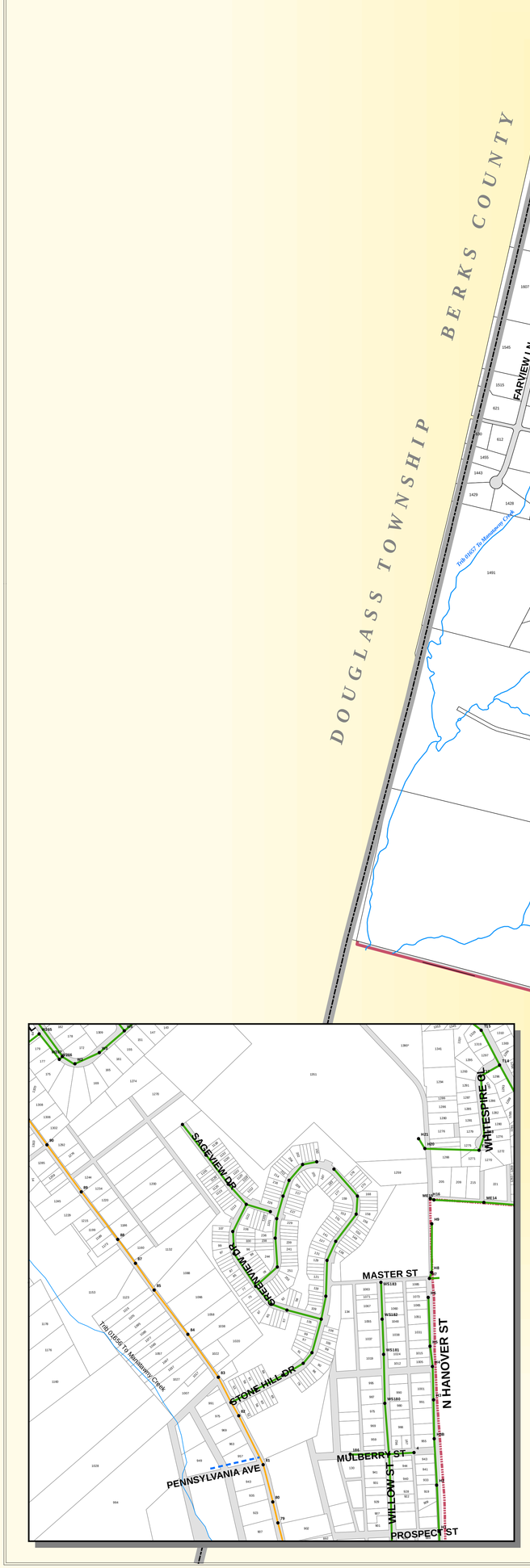
1.This map was digitally compiled for internal use by Upper Pottsgrove Township, Pennsylvania to provide reference information to Municipal Departments.
2. Parcel lines do not represent actual field surveys of premises. LTL Consultants, Ltd makes no claims as to the completedness, accuracy or content of data contained herein.
3. No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by means except as expressly permitted by LTL Consultants, Ltd.

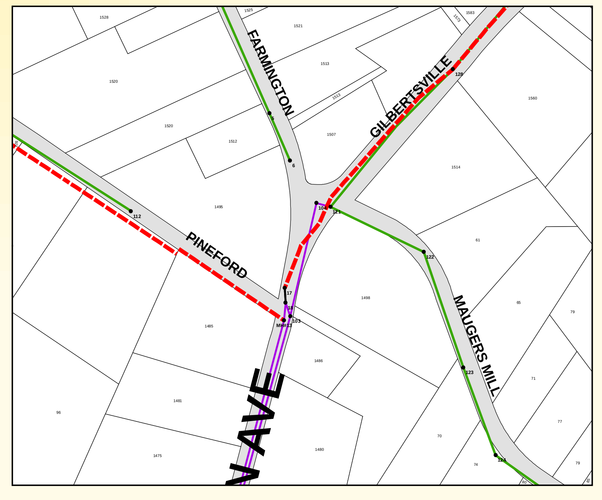
DATA SOURCE INFORMATION:

1. Parcel and road centerline datasets provided in ESRI Arc GIS Shapefile format by Montgomery County IT&S Department, Pottsville PA, 2007.
2. Municipal Boundary Datasets provided in ESRI Arc GIS Shapefile format by Montgomery County IT&S Department, Pottsville PA, 2006.
3. Water Body Dataset Provided by LTL Consultants, Ltd., Oley, PA 2004.
4. Sewer System data devived from UPT Sewer Project As Built Drawings, GPS Field Data Collection, and Transcription from Paper Media (2005-2010) by LTL Consultants, Ltd. Last amended April, 2018.

5. All data is projected in North American Datum 1983, State Plane Coordinate System, South FIPS 3702.







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SECTION 4

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Hollyberry Court Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Evan Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Evan Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Pine Ford Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Pine Ford Road Lift Station

Engineering Assessment Study

of

Upper Pottsgrove Township's

Wastewater System Assets

By

Chris Pelka,

LTL Consultants

and

David A. Sheffer, Principal

AUS CONSULTANTS

3601 North Progress Ave., Suite 202

Harrisburg, PA 17110

717.763.9890

dsheffer@ausconsultants.com

Upper Pottsgrove Township

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SECTION 1

Executive Summary

In May 2020, AUS Consultants (AUS) and LTL Consultants (LTL) were authorized by Pennsylvania American Water Company (PAWC) and Upper Pottsgrove Township (Township), located in Montgomery County, to prepare an Act 12 (HB1329) Engineers Assessment Study for purchase of the Township's Wastewater System Assets by PAWC. The assessment of tangible assets of the facilities and equipment to be purchased, was prepared following the guideline of Pennsylvania Act 12 of 2016, amended Chapter 13 of the Pennsylvania Public Utility Code and the Final Implementation Order entered by Public Utility Commission at Docket No. M-2016-2543193 ("Act 12") by adding section §1329 Valuation of acquired water and wastewater system. Information for this assessment and to prepare the report was derived from various sources including, but not limited to, system maps, site visit, discussions with Township staff and engineer(s), Township asset listing, contracts, institutional escrow payment statements and other sources to provide an inventory and listing. A complete list of the assets, organized by National Association of Regulatory Utility Commissions (NARUC) system of accounts, showing the original cost and year of installation is included in Section 1 of this report.

System Description

The wastewater system owned by the Township to be acquired by PAWC, provides wastewater collection services to over 1,400 commercial, public and residential customers throughout the Township of Upper Pottsgrove. Upper Pottsgrove Township, Montgomery County covers approximately an area of 5 square miles with a population of

approximately 5,500. The system is comprised of four lift stations and forced sewer and gravity collection mains of approximately 118,000 feet. Gravity collection mains make up much of the system with the majority consisting of 8" PVC pipe. The four lift stations are Pine Ford Road, Regal Oaks, Hollyberry Court and Evans Road. The sewage flows to an interceptor for treatment at the Pottstown Borough Authority Sewage Treatment Plant for which the Township has purchased capacity.

The assets to be acquired in the sale total $15,295,347 as notated in Section 2.

Methodology

The purpose of this report is to "conduct an assessment of tangible assets of the selling utility". AUS and LTL obtained and reviewed Township records such as asset list, depreciation schedules, contracts and developer escrow payment summaries. In addition, AUS and LTL conducted a site visit to verify assets listed of the Township and met with Township personnel. A summary of assets has been developed, which includes used and useful utility system assets and any system held for future use that is to be part of the asset sale. The assets were categorized by NARUC system of accounts for class A wastewater systems. A list of the property of the Township's wastewater assets is contained in Section 2 of this report.

The development of the assets' summary began by obtaining the Township's asset list. The cost and age of the assets were verified by analyzing escrow payment summaries and/or construction contracts, where possible. For contracts that did not include engineering and legal costs, an estimate was developed and allocated to the assets in those contracts. Overhead costs contained in the contracts and escrow payment

summaries, such as trenching, paving, seeding, etc., have been allocated across the major components The buyer and seller both agree the grinder pumps will not be part of the sale.

A system map of the collection system is contained in Section 3 of this report. Contained in Section 4 are photographs of the above ground facilities, including the four lift stations.

SECTION 2

Township of Upper Pottsgrove

Summary of Original Cost of Assets in Service
as of August 31, 2020

Acct. No.	Account Description		Cost
	Non-Depreciable System		
353.00	Land and Land Rights	$	8,865.00
	Depreciable System		
354.00	Structures & Improvements - Lift Stations		1,612,326.02
355.00	Power Generating Equipment		47,512.12
360.00	Collection Sewers - Force		647,820.95
361.00	Collection Sewers- Gravity		8,122,057.07
363.00	Services Laterals		1,731,293.99
380.00	Treatment and Disposal		3,125,472.00
	TOTAL Depreciable System	$	15,286,482.15
	TOTAL - Assets in Services	$	15,295,347.15

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	409 Evans Road	Lot	FAW II	n/a	$ -
353.00	256 Mickletz Road	Lot	FAW II	n/a	-
353.00	1764 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1760 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1637 Kummerer Road	Lot	FAW II	n/a	-
353.00	1714 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1710 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1702 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1698 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1696 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1693 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1688 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1682 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1674 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1664 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1505 Kummerer Road	Lot	FAW II	n/a	-
353.00	1717 Farmington Ave.	Lot	FAW II	n/a	-
353.00	1569 Farmington Ave.	Lot	FAW	n/a	-
353.00	1577 Farmington Ave.	Lot	FAW	n/a	-
353.00	1387 Chestnut Grove Rd	Lot	Greengate	n/a	-
353.00	1382 Chestnut Grove Rd	Lot	Greengate	n/a	-
353.00	Renovations By Design	Lot	FAW	n/a	-
353.00	149 Pine Ford Road	Lot	FAW	n/a	-
353.00	Pine Ford Road PS	Lot		n/a	$ 8,865.00
353.00	1371 N. State Street	Lot	Greengate	n/a	-
353.00	1369 N. State Street	Lot	Greengate	n/a	-
353.00	1407 Heather Place	Lot	Greengate	n/a	-
353.00	1413 Heather Place	Lot	Greengate	n/a	-
353.00	1419 Heather Place	Lot	Greengate	n/a	-
353.00	1429 Heather Place	Lot	Greengate	n/a	-
353.00	120 Primrose Lane	Lot	Greengate	n/a	-
353.00	Pine Ford Rd SG HOA	Lot	Summer Grove	n/a	-
353.00	Chestnut Grove Rd SG HOA	Lot	Summer Grove	n/a	-
353.00	Chestnut Grove Rd UPT	Lot	Summer Grove	n/a	-
353.00	Fallbrook and Cloverhill	Lot	Chestnut Grove/UPT	n/a	-
353.00	Fallbrook and Heather Place	Lot	Chestnut Grove/UPT	n/a	-
353.00	Gravity to PFRPS	Lot	Chestnut Grove/Greengate	n/a	-
353.00	Laura Land UPT	Lot	Cherry Tree	n/a	-
353.00	1804 Joanne Circle	Lot	Cherry Tree	n/a	-
353.00	1811 Joanne Circle	Lot	Cherry Tree	n/a	-
353.00	10 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	18 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	24 Cherrytree Lane	Lot	Cherry Tree	n/a	-
353.00	64 Maple Leaf	Lot	ROPS	n/a	-
353.00	70 Maple Leaf	Lot	ROPS	n/a	-
353.00	76 Maple Leaf	Lot	ROPS	n/a	-
353.00	80 Maple Leaf	Lot	ROPS	n/a	-
353.00	111 Snyder Road	Lot	ROPS	n/a	-
353.00	2019 Mimosa Lane	Lot	ROPS	n/a	-

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	2136 Hollyberry Ct	Lot	Regal Oaks	n/a	-
353.00	2133 Hollyberry Ct	Lot	Regal Oaks	n/a	-
353.00	221 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	215 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	209 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	203 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	200 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	207 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	188 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	182 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	176 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	170 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	164 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	156 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	140 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	138 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	132 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	124 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	116 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	102 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	145 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	139 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	135 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	127 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	121 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	113 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	109 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	105 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	99 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	95 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	91 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	85 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	82 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	87 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	93 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	101 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	107 Rose Valley Road	Lot	Regal Oaks	n/a	-
353.00	63 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	2160 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2146 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2126 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	94 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	98 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	2019 Mimosa Lane	Lot	Regal Oaks	n/a	-
353.00	2038 Mimosa Lane	Lot	Regal Oaks	n/a	-
353.00	150 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	156 Maple Leaf	Lot	Regal Oaks	n/a	-
353.00	155 Boxwood Ct	Lot	Regal Oaks	n/a	-
353.00	161 Boxwood Ct	Lot	Regal Oaks	n/a	-

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 353.00 - Land and Land Rights

Acct. No.	Address	Unit	Description	Year	Amount
353.00	2093 Gilbertsville Road	Lot	Regal Oaks	n/a	-
353.00	2101 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	2115 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	2131 Gilbertsville Road	Lot	ROIIA	n/a	-
353.00	256 W. Moyer	Lot	Sprogels Run	n/a	-
353.00	1608 Gilbertsville Road	Lot	Maugers Mill	n/a	-
353.00	1614 Gilbertsville Road	Lot	Maugers Mill	n/a	-
353.00	64 Irwin Place	Lot	Gary Heights	n/a	-
353.00	56 Irwin Place	Lot	Gary Heights	n/a	-
353.00	1275 Whitespire Circle	Lot	Turnberry	n/a	-
353.00	1266 N Hanover	Lot	Turnberry	n/a	-
353.00	Glendale Ave	Lot	Turnberry	n/a	-
353.00	1537 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1533 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1518 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1522 Meadowview Drive	Lot	Turnberry	n/a	-
353.00	1456 Sweetwater Way	Lot	Turnberry	n/a	-
353.00	1460 Sweetwater Way	Lot	Turnberry	n/a	-
353.00	1412 Meadwview Drive	Lot	Turnberry	n/a	-
353.00	218 Deerfield Way	Lot	Turnberry	n/a	-
353.00	220 Deerfield Way	Lot	Turnberry	n/a	-
	Total Account 353.00 Land and Land Rights				$ 8,865.00

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 354.00 - Structures and Improvements - Lift Stations

Acct. No.		Unit	Description	Year		Amount
354.00	Evan Rd	Lot	Evan Rd. Chopper Pump Station	2010	$	83,360.28
354.00	Evan Rd	Lot	Evan Rd. Lift Station	2010		21,936.92
354.00	Evan Rd	Lot	Transducers	2010		2,000.54
354.00	Evan Rd	Lot	Power Supply	2011		8,651.69
354.00	Evan Rd	Lot	Electrical Connections & Appurtenances	2011		8,273.17
354.00	Evan Rd	Lot	Pump Level Control	2011		9,733.15
354.00	Evan Rd	Lot	Auto Dialer	2011		2,162.92
354.00	Evan Rd	Lot	PECO Utility Ext	2011		13,249.44
			Total Evan Road		$	149,368.11
354.00	Pine Ford Rd.	Lot	Pine Ford PS Complete in Place	1998		157,559.75
354.00	Pine Ford Rd.	Lot	Fencing	1998		14,022.82
354.00	Pine Ford Rd.	Lot	15Kv Duct	1998		29,300.77
354.00	Pine Ford Rd.	Lot	15Kv Cable	1998		11,538.80
354.00	Pine Ford Rd.	Lot	Secondary Service	1998		4,148.78
354.00	Pine Ford Rd.	Lot	Main Breaker & Cabinet	1998		9,334.76
354.00	Pine Ford Rd.	Lot	ATS Panel PP and Cabinet	1998		16,335.83
354.00	Pine Ford Rd.	Lot	Phone Conduit and TVSS	1998		1,037.20
354.00	Pine Ford Rd.	Lot	Service Entrance TVSS	1998		1,944.74
354.00	Pine Ford Rd.	Lot	Connections	1998		2,852.29
354.00	Pine Ford Rd.	Lot	Pump Control Conduit & Cable	1998		4,019.13
354.00	Pine Ford Rd.	Lot	Site Lighting	1998		3,267.17
354.00	Pine Ford Rd.	Lot	Equipment Pads	1998		3,889.48
354.00	Pine Ford Rd.	Lot	Demolition of Existing 40 HP Pumps	2011		3,676.97
354.00	Pine Ford Rd.	Lot	Electric Connections to 50HP Pumps	2011		5,407.30
354.00	Pine Ford Rd.	Lot	Upgrade of Existing Electric System	2011		1,948.79
354.00	Pine Ford Rd.	Lot	Pine Ford Rd. Lift Station Upgrade	2010		182,345.49
			Total Pine Ford		$	452,630.06
354.00	Hollyberry	Lot	Hollyberry PS & Wetwell	1986		36,000.00
			Total Hollyberry		$	36,000.00

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 354.00 - Structures and Improvements - Lift Stations

Acct. No.		Unit	Description	Year	Amount
354.00	Regal Oaks	Lot	Regal Oaks Pump Station	2010	381,360.79
354.00	Regal Oaks	Lot	Regal Oaks Station Site Work	2010	322,245.50
354.00	Regal Oaks	Lot	Cherry Tree Pump Station Site Work	2010	42,503.11
354.00	Regal Oaks	Lot	Transformer Pad	2011	5,989.16
354.00	Regal Oaks	Lot	Concrete Pad	2011	4,728.28
354.00	Regal Oaks	Lot	Equipment Stand	2011	1,576.09
354.00	Regal Oaks	Lot	ATS	2011	9,456.57
354.00	Regal Oaks	Lot	Main Circuit Breaker	2011	1,576.09
354.00	Regal Oaks	Lot	Light Standard	2011	7,250.03
354.00	Regal Oaks	Lot	PVC Pipe	2011	9,456.57
354.00	Regal Oaks	Lot	Copper Wire	2011	7,880.47
354.00	Regal Oaks	Lot	Copper Wire	2011	11,032.66
354.00	Regal Oaks	Lot	Wet Well Work	2011	8,510.91
354.00	Regal Oaks	Lot	Metropolitan Edison Utility Work	2011	160,761.62
			Total Regal Oaks		$ 974,327.85
	Total Account 354				$ 1,612,326.02

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 355.00 - Power Generating Equipment

Acct. No.		Unit	Description	Year		Amount
355.00	Pine Ford Road PS-Electı	Lot	Emergency Generator	1998	$	36,479.46
355.00	Regal Oaks PS	Lot	Cherry PumpStation / Generator	2011	$	11,032.66
	Total Account 355 Power Generation Equipment				$	47,512.12

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 360.00 - Collection Sewer - Force

Acct. No.		Unit	Footage/ Count	Year	Amount
360.10	4" and Under Force Collection Sewers	Ft.	1,120	1986	$ 26,880.00
		Ft.	600	1990	21,123.01
		Ft.	3,072	2007	32,560.00
		Ft.	170	2008	6,192.90
		Ft.	3,313	2010	97,577.06
		Ft.	530	2020	11,780.63
	TOTAL Account 360.10 4" and Under Force Collection Sewer		8,805		$ 196,113.60
360.20	6" - 8" Force Collection Sewer	Ft.	1,754	1998	81,861.75
		Ft.	882	2007	41,952.46
		Ft.	6,660	2010	315,959.58
	TOTAL Account 360.11 6" - 8" Force Collection Sewer		9,296		$ 439,773.78
360.90	Air Release - Force Sewer	Ea.	1	2010	11,933.57
	TOTAL Account 360 - Force Collection Sewer				$ 647,820.95

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 361.00 - Collection Sewer - Gravity

Acct. No.		Unit	Footage/ Count	Description	Year	Amount
361.11	6" - 8" Gravity Collection Sewer	Ft.	3,523		1984	$ 170,612.28
		Ft.	8,873		1986	356,488.70
		Ft.	2,560		1990	66,275.83
		Ft.	7,891		1995	203,239.58
		Ft.	2,817		1996	39,880.78
		Ft.	7,804		1998	229,712.25
		Ft.	7,304		1999	155,043.85
		Ft.	1,398		2000	72,274.84
		Ft.	3,151		2001	90,076.13
		Ft.	5,075		2003	158,426.82
		Ft.	6,150		2005	127,473.99
		Ft.	1,200		2007	803,420.32
		Ft.	8,505		2008	663,040.63
		Ft.	9,901		2010	533,744.91
		Ft.	1,316		2017	188,286.56
		Ft.	7,320		2018	288,464.65
		Ft.	1,125		2019	45,150.72
		Ft.	1,629		2020	254,093.54
TOTAL Account 361.11 - 6" - 8" Collection Sewer			87,542			$ 4,445,706.39
361.13	10" - 12" Gravity Collection Sewer	Ft.	4,838		1995	377,721.52
		Ft.	4,092		2007	474,784.52
		Ft.	2,602		2010	234,556.68
TOTAL Account 361.12 - 10" - 12" Collection Sewer			11,532			$ 1,087,062.72
361.13	18" and Over - Gravity Collection Sewer	Ft.	2,088		2007	611,556.01
		Ft.	1,090		2010	129,076.81
TOTAL Account 361.13 - 18" and Over Gravity Collection Sewer			3,178			$ 740,632.82
361.98	Manholes	Ea.	12		1984	32,609.52
		Ea.	30		1986	84,124.42
		Ea.	26		1990	49,462.45
		Ea.	49		1995	104,746.14
		Ea.	8		1996	12,366.13
		Ea.	11		1998	18,567.53
		Ea.	40		1999	69,013.73
		Ea.	11		2000	19,939.67
		Ea.	34		2001	23,963.62
		Ea.	33		2003	79,106.13
		Ea.	37		2005	76,013.39
		Ea.	41		2007	168,796.46
		Ea.	42		2008	201,119.41
		Ea.	98		2010	410,712.52
		Ea.	7		2017	28,720.38
		Ea.	32		2018	90,877.44
		Ea.	14		2019	33,712.54
		Ea.	9		2020	82,832.58
Total Account 361.98 - Manholes			534			$ 1,586,684.06

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 361.00 - Collection Sewer - Gravity

Acct. No.		Unit	Footage/ Count	Description	Year	Amount
361.99	Miscellaneous	Lot		Meter station	1995	12,604.82
		Lot		Install Liners	2003	61,978.00
		Lot		Stream Xings	2008	5,312.53
		Lot		Stream Crossing	2010	5,045.49
		Lot		Regal Oaks Lining	2010	88,878.23
		Lot		Gilbertsville Rd Crossing	2010	2,354.02
		Lot		Pipe Lining - 8" CIPP	2017	82,620.00
		Lot		Stream Crossing	2018	3,177.98
TOTAL Account 361.99 - Miscellaneous						$ 261,971.08
	TOTAL ACCOUNT 361.00 - Gravity Collection Sewer					$ 8,122,057.07

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 363.00 - Service Laterals

Acct. No.		Unit	Count	Year	Amount
363.00	Service - Laterals	Ea.	95	1986	$ 43,786.68
		Ea.	19	1990	10,876.01
		Ea.	84	1995	237,347.44
		Ea.	19	1996	21,199.09
		Ea.	44	1998	16,014.95
		Ea.	145	1999	74,731.02
		Ea.	71	2000	29,417.49
		Ea.	64	2001	57,110.25
		Ea.	113	2003	77,263.05
		Ea.	84	2005	106,617.79
		Ea.	93	2007	78,257.99
		Ea.	262	2008	522,841.43
		Ea.	227	2010	261,404.53
		Ea.	9	2017	21,274.36
		Ea.	77	2018	54,387.92
		Ea.	36	2019	18,996.75
		Ea.	24	2020	99,767.24
	TOTAL ACCOUNT 363.00 - Service Latera		1,466		$ 1,731,293.99

Upper Pottsgrove Township

Original Cost of Wastewater Collection System
as of August 31, 2020

Account 380.00 - Treatment

Acct. No.		Unit	Description	Year	Amount
380.00	Treatment	Lot	Purchased Treatment Capacity (350,000GPD)	1990	$ 1,001,717.00
		Lot	Purchased Conveyance thru Lower(192,000 GPD)	1994	350,000.00
		Lot	Purchased Treatment Capacity (188,400 GPD)	2005	604,764.00
		Lot	Purchased Treatment Capacity (53,700 GPD)	2010	234,132.00
		Lot	Treatment Plant Expansion (CAPEX)	2010	502,465.00
		Lot	Purchased Treatment Capacity (4,500 GPD)	2011	19,755.00
		Lot	Purchased Treatment Capacity (6,000 GPD)	2013	28,267.00
		Lot	Purchased Treatment Capacity (6,000 GPD)	2018	32,592.00
		Lot	Purchased Treatment Capacity (43,500 GPD) Pending	2020	248,820.00
		Lot	Purchased Treatment Capacity (18,000 GPD)	2020	102,960.00
	TOTAL Account 380.00 - Treatment				$ 3,125,472.00

SECTION 3

SANITARY SEWER INDEX

UPPER POTTSGROVE TOWNSHIP
MONTGOMERY COUNTY, PA

LOCATOR MAP
MONTGOMERY COUNTY

LEGEND

- County Boundary
- Municipal Boundaries
- Road Centerlines
- Parcel Boundaries

SEWER SYSTEM

- PUMP STATIONS
- MANHOLES

MAINS

- 18" GRAVITY MAIN
- 12" GRAVITY MAIN
- 10" GRAVITY MAIN
- 8" GRAVITY MAIN
- FORCE MAINS
- LOW PRESSURE FORCE MAIN

3-1

MAP SCALE
1 "=500 '

0 250 500 1,000 1,500 2,000

Feet

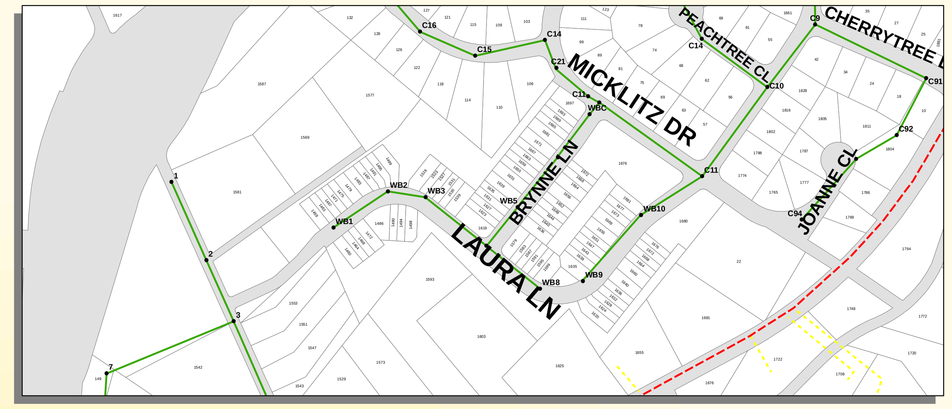
NOTES:

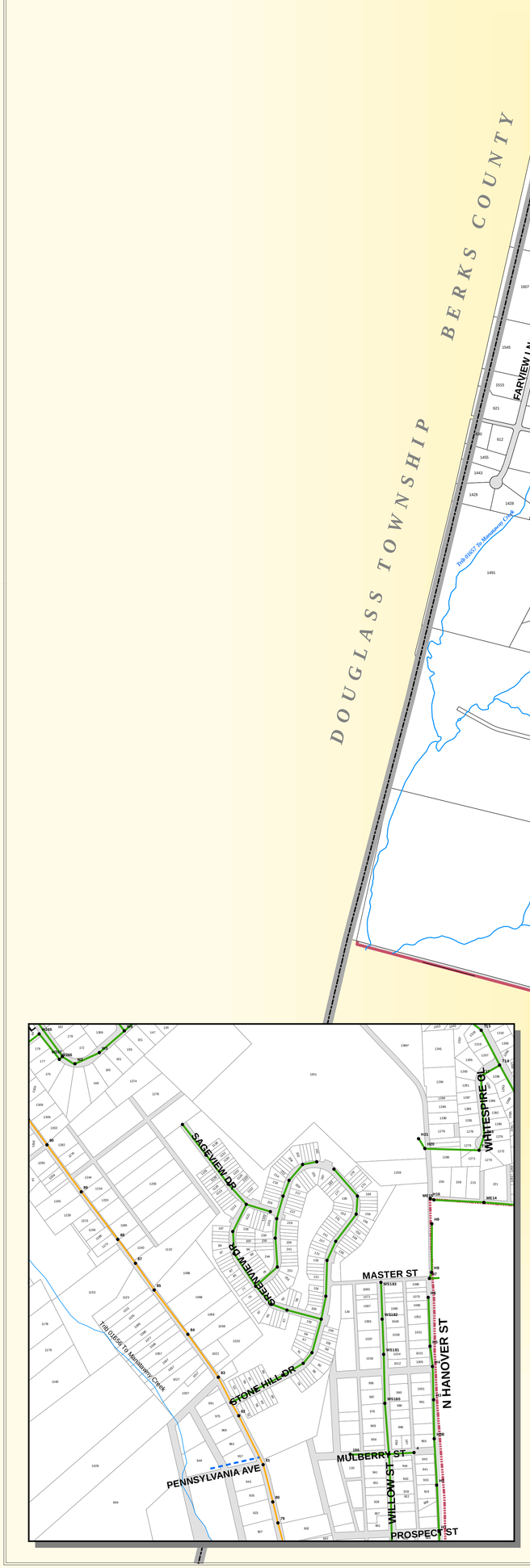
1.This map was digitally compiled for internal use by Upper Pottsgrove Township, Pennsylvania to provide reference information to Municipal Departments.
2. Parcel lines do not represent actual field surveys of premises. LTL Consultants, Ltd makes no claims as to the completedness, accuracy or content of data contained herein.
3. No part of this document may be reproduced, stored in a retrieval system or transmitted in any form or by means except as expressly permitted by LTL Consultants, Ltd.

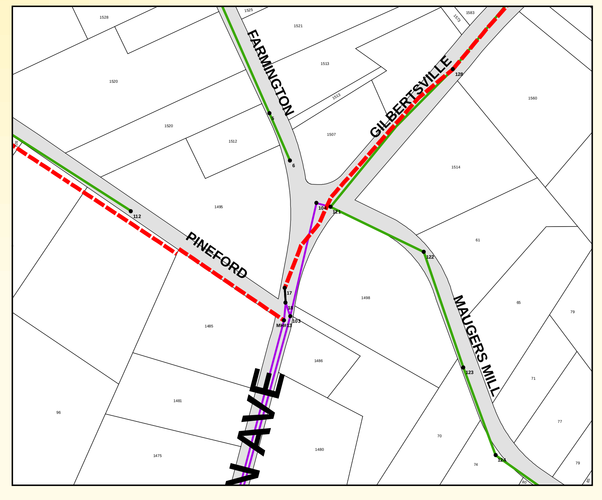
DATA SOURCE INFORMATION:

1. Parcel and road centerline datasets provided in ESRI Arc GIS Shapefile format by Montgomery County IT&S Department, Pottsville PA, 2007.
2. Municipal Boundary Datasets provided in ESRI Arc GIS Shapefile format by Montgomery County IT&S Department, Pottsville PA, 2006.
3. Water Body Dataset Provided by LTL Consultants, Ltd., Oley, PA 2004.
4. Sewer System data devived from UPT Sewer Project As Built Drawings, GPS Field Data Collection, and Transcription from Paper Media (2005-2010) by LTL Consultants, Ltd. Last amended April, 2018.

5. All data is projected in North American Datum 1983, State Plane Coordinate System, South FIPS 3702.







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SECTION 4

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Regal Oak Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Hollyberry Court Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Evan Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Evan Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Pine Ford Road Lift Station

PAWC – Upper Pottsgrove Township

Site Visit – July 22, 2020

Engineer - Chris Pelka (LTL Consultants)

Pine Ford Road Lift Station

Execution Version

SANITARY SEWER

ASSET PURCHASE AGREEMENT

By and Between

Upper Pottsgrove Township, Montgomery Connty

As Seller

and

Pennsylvania-American Water Company

As Buyer

Dated as of April 28, 2020

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ASSET PURCHASE AGREEMENT

THIS ASSET PURCHASE AGREEMENT ("Agreement"), dated as of April 28, 2020 (the "Effective Date"), is made and entered into by and between Upper Pottsgrove Township, Montgomery County, a body corporate and politic, organized and existing under the laws of the Commonwealth of Pennsylvania (the "Seller"), and Pennsylvania-American Water Company (the "Buyer"), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania.

RECITALS:

WHEREAS, Seller, acting by and through the Board of Supervisors of Upper Pottsgrove Township, Montgomery County (the "Township Board") owns and operates a sanitary wastewater collection and conveyance system (the "System") that provides sanitary wastewater service to various customers in Upper Pottsgrove Township and to two customers in Douglass Township (Berks County) immediately adjacent to the Seller (the "Service Area"); and

WHEREAS, Buyer is a regulated public utility organized and existing under the laws of the Commonwealth of Pennsylvania that furnishes wastewater service to the public in several counties, including Montgomery County, Pennsylvania; and

WHEREAS, Buyer, in reliance upon the representations, warranties and covenants of Seller herein, desires to purchase and acquire from Seller, and Seller, in reliance upon the representations, warranties and covenants of Buyer herein, desires to sell, transfer and convey to Buyer all of the assets of the System (other than the Excluded Assets), and in connection therewith, Buyer has agreed to assume certain ongoing obligations and liabilities of Seller related to the acquired assets, all on the terms and conditions set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual representations, warranties, covenants, and agreements stated in this Agreement, the receipt and sufficiency of which hereby are acknowledged, intending to be legally bound, the Parties agree as follows:

ARTICLE I.
DEFINITIONS

In addition to the capitalized terms defined elsewhere in this Agreement, the following terms, as used in this Agreement (unless otherwise specified herein), have the meanings set forth in this Article I:

"**Acquired Assets**" has the meaning specified in Section 2.01.

"**Affiliate**" means, when used to indicate a relationship with a specified Person, a Person that, directly or indirectly, through one or more intermediaries, has a 10% or more voting or economic interest in such specified Person or controls, is controlled by or is under common control with (which includes, with respect to a managed fund or trust, the right to direct or cause the direction of the management and policies of such managed fund or trust as manager, advisor, supervisor, sponsor or trustee pursuant to relevant contractual arrangements) such specified Person, and a Person is deemed to be controlled by another Person if controlled in any manner

whatsoever that results in control in fact by that other Person (or that other Person and any Person or Persons with whom that other Person is acting jointly or in concert), whether directly or indirectly and whether through share ownership, a trust, a contract or otherwise (and for purposes of this definition, a managed fund or trust is deemed to be an Affiliate of the Person managing, supervising, sponsoring or advising such fund or trust and a limited partner in a managed fund or trust is deemed to be an Affiliate of such fund or trust and of the Person managing, supervising, sponsoring or advising such fund or trust).

"**Agreement**" has the meaning ascribed to it in the Preamble to this Agreement (and includes all Schedules and Exhibits referred to herein), as amended, modified and supplemented from time to time in accordance with the terms hereof.

Allocated or Reserved Capacity" has the meaning as set forth in the Treatment Service Agreement and as of the Effective Date of this Agreement is 776,400 gallons per day at the Pottstown Borough Authority's wastewater treatment plant.

"**Assigned Contracts**" has the meaning specified in Section 2.01(c).

"**Assignment and Assumption Agreement**" has the meaning specified in Section 13.02(c).

"**Assnmed Liabilities**" has the meaning specified in 2.04.

"**Authorizations and Permits**" mean all licenses, permits, franchises, authorizations, certificates, registrations, consents, orders, adjudications, variances, waivers and approvals currently in effect issued or granted by Governmental Authorities, including without limitation, environmental permits, operating permits and approvals that are held by Seller that primarily relate directly or indirectly to the operation of the System, including those described in Schedule 4.12.

"**Business Day**" means any day that is neither a Saturday, Sunday nor a day observed as a holiday by either the Commonwealth of Pennsylvania or the United States government.

"**Buyer**" has the meaning specified in the Preamble of this Agreement.

"**Buyer Fundamental Representations**" has the meaning specified in Section 8.01.

"**Buyer Indemnified Persons**" has the meaning specified in Section 8.02.

"**CERCLA**" means the Comprehensive Environmental Response Compensation and Liability Act of 1980, 42 U.S.C. §9601 et seq., as amended.

"**Closing**" means the consummation of the sale and purchase of the Acquired Assets and assumption of the Assumed Liabilities, the release/waiver of liabilities and the other transactions contemplated by this Agreement, all in accordance with the terms and conditions of this Agreement and as provided for in Article XIII.

"**Closing Date**" has the meaning specified in Section 13.01.

"**Closing Effective Time**" has the meaning specified in Section 13.01.

"**Code**" means the Internal Revenue Code of 1986, as amended.

"**Confidential Information**" means any information about Buyer, Seller or the System related to the transactions contemplated by this Agreement, except that such term does not include information which the receiving Party can demonstrate (a) is generally available to or known by the public other than as a result of improper disclosure by the receiving Party, (b) is obtained by the receiving Party from a source other than the disclosing Party, and that source was not bound by a duty of confidentiality to the disclosing Party with respect to such information, or (c) is legally in the public domain.

"Corrective Action Plan" has the meaning as set forth in the Treatment Service Agreement.

"**Customer Service Line**" has the meaning specified in Section 2.02(k).

"**Direct Claim**" has the meaning specified in Section 8.04(c).

"**Easements**" means all easements, rights of way, licenses, use agreements, occupancy agreements, leases and other agreements and appurtenances for and over the real property of third parties that are necessary for or used in connection with the operation of the System or to provide continuous and unimpeded rights of way for the Acquired Assets (including access thereto).

"**EDU**" means equivalent dwelling unit and under the Township of Upper Pottsgrove's Code (§275-29), for purposes of daily usage and sewer rental fees, is defined as 250 gallons per day.

"**Effective Date**" has the meaning specified in the Preamble.

"**Environment**" means soil, surface waters, ground waters, land, stream sediments, flora, fauna, surface or subsurface strata and ambient air.

"**Environmental Claims**" means all notices of investigations, warnings, notice letters, notices of violations, Liens, orders, claims, demands, suits or administrative or judicial actions for any injunctive relief, fines, penalties, third party claims, or other claims asserting violations of Environmental Requirements or responsibility for Environmental Liabilities.

"**Environmental Conditions**" means the Release of Hazardous Materials or the presence of Hazardous Materials on, in, under or within any property (including the presence in the Environment), other than the presence of Hazardous Materials in locations and at concentrations that are naturally occurring.

"**Environmental Liabilities**" means any legal obligation or liability arising under Environmental Requirements or related to or arising out of any Environmental Condition, including those consisting of or relating to any (a) duty imposed by, breach of or noncompliance with any Environmental Requirements; (b) environmental, health or safety matters or conditions

(including on-site or off-site contamination, occupational safety and health and regulation of Hazardous Materials); (c) Remedial Action undertaken by any Person; (d) bodily injury (including illness, disability and death, and regardless of when any such bodily injury occurred, was incurred or manifested itself), property damage (including trespass, nuisance, wrongful eviction and deprivation of the use of real or personal property), or other losses or damages incurred by any other Person (including any employee or former employee of such Person); (e) any injury to, destruction of, or loss of natural resources, or costs of any natural resource damage assessments; (f) exposure of any Person to any Hazardous Materials; and (g) the presence or Release of any Hazardous Materials.

"**Environmental Requirements**" mean all present Laws (including common law), regulations, legally binding or otherwise enforceable requirements and Authorizations and Permits relating to human health, pollution, or protection of the Environment (including ambient air, surface water, ground water, land surface or surface strata), including (i) those relating to emissions, discharges, Releases, or threatened Releases of Hazardous Materials, and (ii) those relating to the identification, generation, manufacture, processing, distribution, use, treatment, storage, disposal, release, recovery, transport or other handling of Hazardous Materials. Without limiting the previous, the term "Environmental Requirements" includes (1) CERCLA; the Superfund Amendments and Reauthorization Act, Public Law 99-499, 100 Stat. 1613; the Emergency Planning and Community Right to Know Act, 42 U.S.C. Sections 11001-11050; the Resource Conservation and Recovery Act, 42 U.S.C. Sections 6901-6992k ("RCRA"); the Safe Drinking Water Act, 42 U.S.C. Sections 300f to 300j-26; the Toxic Substances Control Act, 15 U.S.C. Sections 2601-2692; the Hazardous Materials Transportation Act, 49 U.S.C. Sections 5101-5127; the Federal Water Pollution Control Act, 33 U.S.C. Sections 1251-1387; the Oil Pollution Act of 1990, 33 U.S.C. Sections 2701--2761; the Clean Air Act, 42 U.S.C. Sections 7401-7671q; the Atomic Energy Act of 1954, as amended, 42 U.S.C. Sections 2011 et seq.; the Low Level Radioactive Waste Policy Act, as amended, 42 U.S.C. Section 2021b et seq.; the Occupational Safety and Health Act, 29 U.S.C. Sections 651-678, and the regulations promulgated pursuant to the above-listed federal statutes, and (2) counterpart Laws and regulations promulgated or issued by any state or local Governmental Authority, specifically including the Pennsylvania Storage Tank and Spill Prevention Act of 1989 (35 Pa. C.S.A. § 6021.101 et. seq.).

"**EPA**" means the United States Environmental Protection Agency, or a successor Governmental Authority with substantially similar power and authority thereto.

"**Equipment and Machinery**" means (i) all the equipment, tangible personal property, machinery, office furniture and equipment, fixtures, tooling, spare maintenance or replacement parts, environmental testing equipment, and vehicles owned or leased by Seller (including all leases of such property), which are primarily used in the operation of the System, (ii) any rights of Seller to warranties applicable to the foregoing (to the extent assignable), and licenses received from manufacturers and Seller of any such item, and (iii) any related claims, credits, and rights of recovery with respect thereto, as listed in Schedule 4.10.

"**Excluded Assets**" has the meaning specified in Section 2.02.

"**Excluded Liability**" or "**Excluded Liabilities**" means all liabilities other than Assumed Liabilities.

"**Files and Records**" means all files and records of Seller primarily relating to the System and the Acquired Assets, whether in hard copy, digital, or magnetic or other format including data, geographic information system data, plans, contracts and recorded knowledge relating to the Acquired Assets (including property records, related to the foregoing), customer and supplier records, customer lists (both current and prospective), records of sales calls, manuals, books, files, records, engineering data, procedures, systems, instructions, drawings, blueprints, plans, designs, specifications, equipment lists, parts lists, equipment maintenance records, equipment warranty information, plant plans, specifications and drawings, sales and advertising material, and computer software, whether stored on site or off site.

"**Final Order**" means a Governmental Approval by a Governmental Authority as to which (a) no request for stay of the action is pending, no such stay is in effect and if any time period is permitted by statute or regulation for filing any request for such stay, such time period has passed, (b) no petition for rehearing, reargument, reconsideration, clarification, rescission, amendment, or supersedes of the action is pending and the time for filing any such petition has passed, (c) such Governmental Authority does not have action under consideration on its own motion and (d) no appeal to a court or administrative tribunal or a request for stay by a court or administrative tribunal of the Government Authority's action is pending or in effect and the deadline for filing any such appeal or request for stay has passed.

"**Governmental Approval**" means any consent, approval, authorization, notice, filing, registration, submission, reporting, order, adjudication or similar item of, to or with any Governmental Authority.

"**Governmental Authority**" or "Governmental Authorities" means any court, department, commission, board, bureau, municipality, municipal authority (established pursuant to the Municipal Authorities Act of the Commonwealth of Pennsylvania), agency or instrumentality of the United States, any state, county, city or political subdivision thereof, or any foreign governmental body, including without limitation, the PaPUC, the EPA, PaDEP and the Township Board.

"**Hazardous Materials**" means any solid, liquid, gas, odor, heat, sound, vibration, radiation or other substance or emission which is a contaminant, pollutant, dangerous substance, toxic substance, hazardous waste, residual waste, solid waste, hazardous material or hazardous substance which is or becomes regulated by applicable Environmental Laws or which is classified as hazardous or toxic under applicable Environmental Laws (including gasoline, diesel fuel or other petroleum hydrocarbons, polychlorinated biphenyls, asbestos and urea formaldehyde foam insulation).

"**Indemnified Party**" means any Buyer Indemnified Persons or Seller Indemnified Persons, as applicable, entitled to indemnification pursuant to Article VIII.

"**Indemnifying Party**" means a Party which is obligated to indemnify the Buyer Indemnified Persons or the Seller Indemnified Persons, as applicable, pursuant to Article VIII.

"**Knowledge**" means either (i) the actual knowledge of a Representative of Buyer and the knowledge that each such person would reasonably be expected to obtain in the course of diligently performing his or her duties for Buyer or (ii) the actual knowledge of a Representative of Seller, the Township Board and the Township Senior Staff, and, in the case of the Township Senior Staff, the knowledge that each such person would reasonably be expected to obtain in the course of diligently performing his or her duties for Seller, as applicable based on the context in which the term is used.

"**Land Development Agreement** / Financial Security Agreement" means any agreement between Seller and an applicant for subdivision and/or land development approval pursuant to the Pennsylvania Municipalities Planning Code, pursuant to which applicant is required to construct public improvements and required to post financial security, for the benefit of Seller, to secure applicant's obligations under such agreement.

"**Law**" means any applicable law, statute, regulation, ordinance, rule, order, judicial, administrative and regulatory decree, judgment, adjudication, consent decree, settlement agreement or governmental requirement enacted, promulgated, entered into, agreed or imposed by any Governmental Authority, as may be in effect at the relevant time or times in the context in which the term is used.

"**Liability Cap**" has the meaning specified in Section 8.05(c).

"**Lien**" means any lien in a fixed and ascertainable monetary sum, or any pledge, mortgage, deed of trust or security interest securing a fixed and ascertainable monetary sum, or any charge or claim in a fixed and ascertainable monetary sum. In addition, in connection with Real Property, any item otherwise falling within the definition of a "Lien" must be filed of record by the responsible Party in accordance with the terms of this Agreement.

"**Loss**" means any and all losses, liabilities, obligations, damages, penalties, interest, Taxes, claims, actions, demands, causes of action, judgments, reasonable attorneys', consultants' and other professional fees, and all other reasonable costs and expenses sustained or incurred in investigating, preparing or defending or otherwise incident to any such claim, action, demand, cause of action or judgment or the enforcement of a Party's rights under Article VIII; provided, however, that "**Losses**" shall not include punitive, incidental, consequential, special or indirect damages, including loss of future revenue or income, loss of business reputation or opportunity relating to the breach or alleged breach of this Agreement, or diminution of value or any damages based on any type of multiple, except in the case of fraud or to the extent actually awarded to a Governmental Authority or other third party in respect of a Third Party Claim.

"**Material Adverse Effect**" means any result, occurrence, fact, change, event or effect that has a materially adverse effect on the business, financial condition or results of operations of the System, except that no effect arising out of or in connection with or resulting from any of the following is deemed, either alone or in combination, to constitute or contribute to a Material Adverse Effect: (i) general economic conditions or changes in those conditions; (ii) financial, banking, currency or capital markets fluctuations or conditions (either in the United States or any international market and including changes in interest rates); (iii) conditions affecting the real estate, financial services, construction, water utility or sewer utility industries generally; (iv) any

existing event, circumstance, condition or occurrence of which Buyer has Knowledge as of the Effective Date; (v) any action, omission, change, effect, circumstance or condition contemplated by this Agreement or attributable to the execution, performance or announcement of this Agreement or the transactions contemplated hereby; and (vi) negligence, intentional misconduct or bad faith of Buyer or its Representatives.

"**Missing Easements**" means, as of any particular date, each material Easement that is for or used in connection with the operation of the System or to provide continuous and unimpeded rights of way for the Acquired Assets (including access thereto) that either (a) has not been obtained by Seller as of such date or (b) if such Easement has been obtained by Seller as of such date, such Easement is unrecorded or such Easement is not sufficient to operate the System as currently conducted.

"**MS4 System**" or "**Municipal Separate Storm Sewer System**" means the current and any future assets and facilities, built, operated or maintained, or real property ("**MS4 System Real Property**") and Stormwater System Assets owned by Seller and used for the purpose of capturing, conveying and discharging stormwater separate from the System.

"**NPDES**" means National Pollutant Discharge Elimination System.

"**Outside Date**" means 365 days after the date the application to the PaPUC is accepted as complete by the PaPUC and the statutory 6-month consideration period is initiated.

"Paid Capacity" means the total quantity of the Allocated or Reserved Capacity purchased and noted in the Purchase Agreement, dated October 16, 2018, between the Borough of Pottstown, Pottstown Borough Authority and Township of Upper Pottsgrove and as of the signing of this Agreement is 608,600 gallons per day at the Pottstown Borough Authority's wastewater treatment plant.

"**PaDEP**" means the Pennsylvania Department of Environmental Protection, or any successor Governmental Authority with substantially similar powers thereto.

"**PaPUC**" means the Pennsylvania Public Utility Commission, or any successor Governmental Authority with substantially similar powers thereto.

"**Party**" means Buyer or Seller and the term "Parties" means collectively Buyer and Seller.

"**PCB Eqnipment**" means PCB equipment as defined in 40 C.F.R. Part 761.

"**Pending Development Plan**" means any subdivision or land development plan that has been submitted to Seller for approval pursuant to the Pennsylvania Municipal Planning Code.

"**Permitted Liens**" means (a) Liens for Taxes not yet due and payable or being contested in good faith by appropriate procedures; (b) easements, rights of way, zoning ordinances and other similar encumbrances affecting Real Property and Easements as disclosed on Schedule 4.09; (c) other than with respect to Real Property owned by Seller, Liens arising under original purchase price conditional sales contracts and equipment leases with third parties entered into in

the ordinary course of business; and (d) other imperfections of title or Liens, if any, that have not had, and would not have, a Material Adverse Effect.

"**Person**" means any individual (including, the heirs, beneficiaries, executors, legal representatives or administrators thereof), corporation, partnership, joint venture, trust, limited liability company, limited partnership, joint stock company, unincorporated association or other entity or a Governmental Authority.

"**Purchase Price**" has the meaning specified in Section 3.01.

"**Real Property**" means those certain parcels of land, with the buildings, improvements, and Equipment and Machinery thereon or therein, that are part of the System and fee simple title to which is to be conveyed by Seller to Buyer as part of the Acquired Assets.

"**Regulated Asbestos Containing Material**" means regulated asbestos containing material as defined by 40 C.F.R. § 61.141.

"**Release**" means any actual or threatened spilling, leaking, pumping, pouring, injecting, emptying, discharging, emitting, escaping, leaching, dumping, disposal, or release or migration of Hazardous Materials into the Environment, including the abandonment or discarding of barrels, containers and other receptacles containing any Hazardous Materials.

"**Remedial Action**" means any and all actions to (a) investigate, clean up, remediate, remove, treat, contain or in any other way address any Hazardous Materials in the Environment, (b) prevent the Release or threat of Release or minimize the further Release of any Hazardous Materials so it does not migrate or endanger public health or welfare or the indoor or outdoor Environment, and (c) perform pre-remedial studies and investigations and post-remedial monitoring, maintenance and care. The term "**Remedial Action**" includes any action which constitutes (i) a "removal", "remedial action" or "response" as defined by Section 101 of CERCLA, 42 U.S.C. §§ 9601(23), (24), and (25); (ii) a "corrective action" as defined in RCRA, 42 U.S.C. § 6901 et seq.; or (iii) a "response" or "interim response" as defined in the Pennsylvania Hazardous Sites Cleanup Act, 35 P.S. §6020.103.

"**Represeutative**" means, with respect to any Person, any director, officer, employee, official, partner, member, owner, agent, lawyer, accountant, auditor, professional advisor, consultant, engineer, contractor, other Person for whom such Person is at law responsible or other representative of such Person and any professional advisor, consultant or engineer designated by such Person as its "Representative."

"**Schedules**" means the disclosure schedules delivered by Seller and Buyer, respectively, concurrently with the execution and delivery of this Agreement, and as may be supplemented and updated pursuant to Sections 9.03 and 10.04. Any disclosure set forth on any particular Schedule is deemed disclosure in reference to all Schedules comprising the Schedules to which such disclosure is reasonably apparent.

"**Seller**" has the meaning specified in the Preamble of this Agreement.

"**Seller Fundamental Represeutations**" has the meaning specified in Section 8.01.

"**Seller Indemnified Persons**" has the meaning specified in Section 8.03.

"**Seller WQM Permits**" means the Water Quality Management Permits set forth on Schedule 4.12, each issued by PaDEP to Seller with respect to the System, including any revisions or amendments thereto. This definition shall not include any NPDES permit(s) issued and related to the Stormwater System Assets.

"**Service Area**" has the meaning set forth in the recitals to this Agreement.

"**Stormwater System Assets**" means all assets owned by Seller, and used exclusively in the operation or maintenance of the MS4 System, including (i) drains, pipes and collection basins and all other stormwater drainage assets used exclusively for stormwater collection, conveyance and discharge; (ii) catch basins, inlets, pipes and all other stormwater lateral facilities (the "Stormwater Lateral Facilities") that connect surface stormwater drains to storm conveyances which discharge to surface waters; (iii) interest in real estate directly associated with (i) and (ii); and (iv) any related permits.

"**Supplies**" means all lubricants, spare parts, fuel, chemicals, raw materials, and other supplies and inventory, and all rights to warranties received from suppliers with respect to the foregoing, and related claims, credits, and rights of recovery with respect thereto.

"**System**" has the meaning specified in the recitals to this Agreement and shall include the Acquired Assets and exclude the Excluded Assets.

"**Taxes**" means any federal, state, local or foreign income, gross receipts, license, payroll, employment, excise, severance, stamp, occupation, premium, windfall profits, environmental, customs duties, permit fees, capital stock, franchise, profits, withholding, social security, unemployment, disability, real property, personal property, parking, sales, use, transfer, registration, value added, alternative or add-on minimum, estimated or other tax, levy, impost, stamp tax, duty, fee, withholding or similar imposition of any kind payable, levied, collected, withheld or assessed at any time, including any interest, penalty or addition thereto, whether disputed or not.

"**Third Party Claim**" has the meaning specified in Section 8.05(a).

"**Threshold Amount**" has the meaning specified in Section 8.05(a).

"**Title Commitment**" has the meaning specified in Section 6.01.

"**Title Company**" has the meaning specified in Section 6.01.

"**Title Policy**" has the meaning specified in Section 2.03.

"**Township Board**" the meaning specified in the Preamble of this Agreement.

"**Township Senior Staff**" means the Township Manager and the Township Engineer.

"Treatment Service Agreement" means the Sewage Treatment Service Agreement, dated September 13, 2004, between Borough of Pottstown, Pottstown Borough Authority and Township of Upper Pottsgrove and any amendments thereto.

"**UCC Search**" has the meaning specified in Section 6.04.

"**Unscheduled Real Property**" has the meaning specified in Section 6.06.

"**Utility Valuation Expert**" means an expert that has applied and has been approved by the PaPUC and is currently, at the time of this Agreement, on the list of approved appraisers maintained by the PaPUC.

ARTICLE II.
TERMS OF PURCHASE AND ASSUMPTION OF LIABILITIES

Section 2.01. Purchase and Sale of Acquired Assets.

Subject to the terms and conditions set forth in this Agreement, at Closing, Buyer shall purchase from Seller and Seller shall sell, transfer, assign and deliver to Buyer, free and clear of all Liens except for Permitted Liens, all of Seller's right, title and interest in and to all assets, facilities, business, goodwill, properties and rights of Seller of every kind and description, whether tangible or intangible, real, personal or mixed, wherever situated, in each case used in, held for use in, or acquired or developed for use in, the System, or otherwise related to, or arising out of the operation or conduct of the System (whether or not any such assets have any value for accounting purposes or are carried or reflected on the books or financial records of Seller), including any of the foregoing in which Seller is entitled to acquire rights in the future pursuant to Pending Development Plans (other than the rights of Seller pursuant to Section 2.02(d)) or development plans approved pursuant to this Agreement, but in all cases other than the Excluded Assets (collectively referred to as the "Acquired Assets"), including:

(a) all real property and appurtenant interests used in the operation of the System, including without limitation (i) good and marketable fee simple title to the Real Property described and identified on Schedule 4.09 hereof, and (ii) all Easements, including without limitation those identified on Schedule 4.09;

(b) all sanitary wastewater related collection and conveyance facilities, including all collection system mains (whether gravity or force mains), laterals ((i) from the collection system main to the public right-of-way line when there is no clean out, or (ii) when there is a clean out that is located near the right of way line to the clean out but not including the clean out itself, or (iii) when there is a curb stop from a low pressure line, to the curb stop but not including the curb stop itself, or (iv) when there is an easement where the collection facilities are located within private property, to the edge of the easement), pumping stations, generators, manholes, and other related appurtenances and any billing and collections related assets necessary to run the System;

(c) all contracts, licenses, and leases to which Seller is a party, including without limitation, all construction contracts, surety bonds, operation and maintenance agreements, management agreements, reserved capacity agreements, architect agreements

and consultant agreements, and agreements relating to vehicles and other items of personal property as set forth on Schedule 4.13 (the "Assigned Contracts");

(d) all Supplies;

(e) all personal property and fixed assets, including all Equipment and Machinery, auxiliary equipment and plant equipment, including without limitation those items listed on Schedule 4.10 hereof;

(f) all expenses prepaid by Seller and security deposits paid by Seller;

(g) all Files and Records;

(h) all Authorizations and Permits of or held by Seller (to the extent transferrable to Buyer under Law), including all Authorizations and Permits which are environmental permits, other than those NPDES permits that relate to the Stormwater System Assets, Seller WQM Permits, other operating permits and those items listed or described on Schedule 4.12; and

(i) all goodwill of the System.

SELLER MAKES NO EXPRESS OR IMPLIED REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER REGARDING THE VALUE OF ANY OF THE ACQUIRED ASSETS OR THE SYSTEM, OR THE FUTURE PROFITABILITY OR FUTURE EARNINGS PERFORMANCE OF THE ACQUIRED ASSETS OR THE SYSTEM OR ANY FUTURE RATEMAKING THAT MAY BE ALLOWED BY THE PAPUC FOR ANY OF THE ACQUIRED ASSETS.

Section 2.02. Excluded Assets.

Notwithstanding anything herein to the contrary, the Acquired Assets shall not include the following (the "Excluded Assets"):

(a) the Stormwater System Assets, including any related NPDES permits;

(b) all contracts, licenses and leases that are not Assigned Contracts;

(c) the seals, organizational documents, minute books, Tax Returns, books of account or other records having to do with the organization of Seller;

(d) cash and cash equivalents, including (i) accounts receivable and amounts earned by Seller but not yet billed attributable to services rendered by Seller as of or before the Closing Date and (ii) EDU fees owed to Seller at or before the Closing Date for any Pending Development Plan but not yet paid to Seller;

(e) all insurance policies of Seller and all rights to applicable claims and proceeds thereunder;

(f) all rights to any outstanding lien related to non-payment by a System customer existing at or before the Closing Date and all actions, suits or claims of any nature available to or being pursued by Seller, whether arising by way of counterclaim or otherwise;

(g) all assets, properties and rights used by Seller other than those which primarily relate to the operations of the System;

(h) the assets, properties and rights specifically set forth on Schedule 2.02(h);

(i) the MS4 System Real Property; and

(j) the rights which accrue or will accrue to Seller under this Agreement and any related agreement, exhibit or schedule; and

(k) any and all connecting facilities (i) beginning at the public right-of-way when there is no clean out, or (ii) when there is a clean out that is located near the right of way line, beginning at and including the clean out, or (iii) when there is curb stop from a low pressure line, beginning at and including the curb stop, or (iv) beginning at the edge of the easement where the collection facilities are located within private property, to and throughout the customer's property (the "Customer Service Line").

Section 2.03. Sale Free of Liens.

After Buyer fulfills its obligations pursuant to Section 3.01(a), on the Closing Date, the Acquired Assets will be free and clear of all Liens other than Permitted Liens. Seller shall convey the Acquired Assets by appropriate special warranty or other deed (subject to Section 6.02(c)), bills of sale, endorsements, assignments and other instruments of transfer or conveyance described herein, and if not expressly described herein, then by transfer documents satisfactory in form and substance reasonably acceptable to Buyer and Seller and their counsel in their reasonable, good faith discretion. At Closing, title to the Real Property shall be good and marketable and insured by the Title Company, at the Title Company's filed rates, as a good and marketable title, free and clear of all Liens and exceptions to coverage, except for the Permitted Liens, pursuant to an owner's policy of title insurance on the American Land Title Association's ("ALTA") Owner's Form 2006, subject to the terms of Section 6.02 (the "Title Policy").

Section 2.04. Assumption of Liabilities.

(a) On the terms and conditions set forth in this Agreement and excluding the Excluded Liabilities, Buyer shall assume and pay, perform and discharge when due any and all liabilities and obligations of Seller both (1) arising under Seller WQM Permits (arising from, related to, or based on events or circumstances occurring on or after the Closing Date), and (2) arising out of or relating to the System or the Acquired Assets on or after the Closing, including the following:

(i) all liabilities and obligations under the Assigned Contracts and Authorizations and Permits resulting from events that occur or conditions that arise on or after the Closing;

(ii) liabilities and obligations of Seller related to or arising out of its Act 537 Plan as provided in Section 7.11;

(iii) any litigation initiated against Seller related to the System or the Acquired Assets resulting from events that occur on or after Closing or conditions that arise on or after the Closing;

(iv) all liabilities and obligations for Taxes relating to the System, its operation, the Acquired Assets and the Assumed Liabilities attributable to the period after the Closing Date; and

(v) all other liabilities and obligations arising out of or relating to Buyer's ownership or operation of the System and the Acquired Assets on or after the Closing (all of the aforementioned liabilities in this Section 2.04(a) are referred to as the "Assumed Liabilities").

(b) At the Closing, to the extent Seller is not released therefrom, Buyer shall indemnify Seller against any Loss relating to the Assumed Liabilities in accordance with Section 8.03.

(c) Buyer shall not assume or be liable to pay any liabilities or obligations relating to the Excluded Liabilities or any other liabilities or obligations that are not Assumed Liabilities.

Section 2.05. Further Assurances.

At any time and from time to time after the Closing Date, Seller shall, upon the request of Buyer, and Buyer shall, upon the request of Seller, at the cost of requesting Party, promptly execute, acknowledge and deliver, or cause to be executed, acknowledged and delivered, such other instruments of conveyance and transfer and other documents, and perform or cause to be performed such further acts, as may be reasonably required to evidence or effectuate, or more fully evidence or effectuate, (a) the sale, conveyance, transfer, assignment and delivery hereunder of the Acquired Assets to Buyer, (b) the assumption by Buyer of any of the Assumed Liabilities, (c) performance by the Parties of any of their other respective obligations under this Agreement, (d) the vesting in Buyer of all right, title and interest in the Acquired Assets and the System as provided herein, and (e) any other matters reasonably requested by a Party to carry out the provisions, purposes and intent of this Agreement.

Section 2.06. Certain Transfers; Assignment of Contracts.

Notwithstanding anything to the contrary in this Agreement, and subject to the provisions of this and Section 2.06(a), to the extent that the sale, transfer, assignment, conveyance and delivery, or attempted sale, transfer, assignment, conveyance and delivery, to Buyer of any Assigned Contract or other Acquired Asset would result in a violation of Law, or would require the consent, authorization, approval or waiver of any Person (other than the Parties), including any Governmental Authority, and such consent, authorization, approval or waiver shall not have been obtained before the Closing, this Agreement shall not constitute a sale, transfer, assignment, conveyance and delivery, or an attempted sale, transfer, assignment, conveyance and delivery,

thereof (any such Acquired Asset, a "Nonassignable Asset"). Following the Closing, Seller and Buyer shall use its commercially reasonable efforts (at the cost and expense of the Party that is responsible for compliance with such Law or obtaining such consent, authorization, approval or waiver), and shall cooperate with each other, to obtain any such required consent, authorization, approval or waiver, or any release, substitution, novation or amendment required to sell, transfer, assign, convey and deliver any such Nonassignable Asset to Buyer and in no event will Buyer be required to pay any consideration therefor. Once such consent, authorization, approval, waiver, release, substitution or amendment is obtained, Seller shall sell, transfer, assign, convey and deliver to Buyer the relevant Acquired Asset to which such consent, authorization, approval, waiver, release, substitution or amendment relates for no additional consideration. Any applicable sales, transfer and other similar Taxes in connection with such sale, transfer, assignment, conveyance and delivery shall be paid fifty percent (50%) by Buyer and fifty percent (50%) by Seller.

(a) Until such time as a Nonassignable Asset is transferred to Buyer pursuant to this Article II, Buyer and Seller shall cooperate in any commercially reasonable and economically feasible arrangements (such as subleasing, sublicensing or subcontracting) to provide to the Parties the economic and, to the extent permitted under Law, operational equivalent of the transfer of such Nonassignable Asset to Buyer at the Closing and the performance by Buyer of its obligations with respect thereto, and so long as Seller transfers and turns over all economic and beneficial rights with respect to each such Nonassignable Asset, Buyer shall, to the extent permitted under Law and the terms of any applicable contract that is a Nonassignable Asset, as agent or subcontractor for Seller, pay, perform and discharge the liabilities and obligations of Seller thereunder from and after the Closing Date, but only to the extent that such liabilities and obligations would be Assumed Liabilities if the applicable consent or approval had been obtained on or before the Closing Date and such Nonassignable Asset had been assigned to Buyer at Closing. To the extent permitted under Law, Seller shall hold in trust for and pay to Buyer promptly upon receipt thereof, such Nonassignable Asset and all income, proceeds and other monies received by Seller with respect to such Nonassignable Asset in connection with the arrangements under this Article II.

(b) If, following the Effective Date and before the Closing, Buyer identifies any contract to which Seller is a party which is not set forth on Schedule 4.13, and Buyer reasonably determines such contract is necessary or useful to the operation of the System, Buyer shall notify Seller of such determination and Seller shall, promptly following receipt of such notice, deliver to Buyer an updated Schedule 4.13 reflecting the addition of such contract, and such contract will be an "Assigned Contract" for all purposes hereunder.

(c) If during the twelve (12) month period following the Closing, Buyer identifies any contract to which Seller was a party as of the Closing and which (i) was not set forth on Schedule 4.13 (as may be updated pursuant to (b)) and (ii) Buyer reasonably believes is necessary or useful to the operation of the System, Seller shall, promptly following Buyer's written request therefor, execute, acknowledge and deliver, or cause to be executed, acknowledged and delivered, such other instruments of conveyance and transfer and other documents, and perform or cause to be performed such further acts, as may be reasonably required to evidence or effectuate, or more fully evidence or

effectuate the assignment of such contract to Buyer for no additional consideration, and upon such assignment, such contract is deemed an Assigned Contract for all purposes hereunder.

ARTICLE III.
PURCHASE PRICE AND ADDITIONAL PURCHASE PRICE

Section 3.01. Purchase Price.

The purchase price for the Acquired Assets is Thirteen Million Seven Hundred Fifty Thousand Dollars ($13,750,000) (the "Purchase Price") which Buyer shall pay as follows at Closing:

(a) Buyer shall pay, subject to any adjustment pursuant to Section 3.01(b), to Seller by wire transfer of immediately available funds the Purchase Price less (i) debt repayments, if any, required to release any Liens on Acquired Assets, (ii) the deposit as provided in Section 3.01(c), and (iii) Seller's share of Transfer Taxes payable upon recording of real estate, if any, as provided in Section 3.03, to one or more accounts that Seller designates and provides to Buyer at least three (3) Business Days before the Closing Date; and

(b) Final Billing: The Buyer is entitled to all customer billings with respect to sanitary wastewater customers' services for the period on or after the Closing Effective Time, and Seller is entitled to all such billings for the period before the Closing Effective Time. The Parties shall cooperate to calculate an agreed upon proration of billing amounts and to the extent that either Party collects billings that are attributable to service provided by the other Party, the Party holding the other Party's billing collections shall pay such amount to the other Party.

(c) The Buyer shall pay a deposit of Ninety Thousand Dollars ($90,000) within ten (10) days of the Effective Date to the Seller to be used for Seller's incurred engineering and legal fees related to this transaction. At the successful closing of the transaction, the deposit will be deducted from the Purchase Price at settlement. In the event that the transaction does not successfully close, the amount of the deposit that has not been spent on engineering and legal fees will be refunded to the Buyer. The amount of such refund will be calculated as of the date of a termination under Section 14.01 based on the Seller's expenditures and accrued expenses as of such date of termination. Any engineering and legal fees incurred by the Seller related to this transaction that exceed the $90,000 deposit shall be the sole responsibility of the Seller.

Section 3.02. Fair Consideration.

The consideration provided for in this Article III represents fair consideration and reasonable equivalent value for the sale and transfer of the Acquired Assets and the transactions, covenants and agreements set forth in this Agreement, which consideration was agreed upon as the result of arm's length good faith negotiations between the Parties and their respective Representatives.

Section 3.03. Transfer Taxes.

Any and all deed stamps or transfer Taxes which may be due the Commonwealth of Pennsylvania or any political subdivision in connection with the sale, transfer, assignment, conveyance and delivery hereunder of the Acquired Assets to Buyer (collectively, "Transfer Taxes"), shall be paid fifty percent (50%) by Buyer and fifty percent (50%) by Seller. The terms hereof survive Closing.

ARTICLE IV.
REPRESENTATIONS AND WARRANTIES OF SELLER

Seller makes only the representations and warranties which are set forth in this Article IV.

As a material inducement to Buyer to enter into this Agreement and to consummate the transactions contemplated by this Agreement, Seller represents and warrants, as of the Effective Date and as of the Closing Date (except to the extent any of the following representations and warranties specifically apply to or relate to another date, in which event such representations and warranties shall be true and correct as of such other date), as follows:

Section 4.01. Organization.

Seller is a body corporate and politic, organized and existing under the First Class Township Code of the Commonwealth of Pennsylvania.

Section 4.02. Power and Authority.

Seller has (i) duly adopted an authorizing ordinance authorizing the transactions contemplated herein, which remains in full force and effect, (ii) duly authorized and approved the execution and delivery of this Agreement and (iii) duly authorized and approved the performance by Seller of its obligations contained in this Agreement. Seller has all requisite power and authority to own, lease and operate the Acquired Assets and the System and has the power and authority to enter into this Agreement and to do all acts and things and execute and deliver all other documents as are required hereunder to be done, observed or performed by it in accordance with the terms hereof.

Section 4.03. Enforceability.

This Agreement has been duly authorized, executed and delivered by Seller and is a valid and legally binding obligation of Seller, enforceable against Seller in accordance with the terms hereof, subject only to applicable bankruptcy, insolvency and similar laws affecting the enforceability of the rights of creditors generally and to general principles of equity.

Section 4.04. No Conflict or Violation.

The execution and delivery of this Agreement by Seller, the consummation of the transactions contemplated by this Agreement and the performance by Seller of the terms, conditions and provisions hereof has not and will not contravene or violate or result in a breach of (with or without the giving of notice or lapse of time, or both) or acceleration of any material

obligations of Seller under (i) any Law or (ii) any agreement, instrument or document to which Seller is a party or by which it is bound.

Section 4.05. Consents and Approvals.

Schedule 4.05 sets forth a list of each consent, waiver, authorization or approval of any Governmental Authority, or of any other Person, and each declaration to or filing or registration with any Governmental Authority required in connection with the execution and delivery of this Agreement by Seller or the performance by Seller of its obligations hereunder.

Section 4.06. Undisclosed Liabilities

Except as set forth in Schedule 4.06, there are no liabilities or obligations of Seller, either accrued, absolute, contingent or otherwise, relating to the Acquired Assets, other than liabilities incurred in the ordinary course, which could reasonably be expected to have a Material Adverse Effect on Buyer. All of the outstanding indebtedness of Seller that would be required to be satisfied in order to permit Seller to comply with its obligations hereunder can be repaid or defeased by Seller and any security interest granted by Seller and/or the Municipality to secure its obligations pursuant thereto can be extinguished or terminated at or before the Closing pursuant to the contractual terms applicable to such debt.

Section 4.07. Absence of Certain Changes or Events.

Except as set forth on Schedule 4.07, there has not been any transaction or occurrence that has resulted or is reasonably likely to result in a Material Adverse Effect and Seller has operated and maintained the System since that date in the ordinary course.

Section 4.08. Tax Matters.

Except as set forth in Schedule 4.08 or as would not have a Material Adverse Effect, (i) Seller has timely paid all Taxes that may have been or may be due and payable by Seller on or before the Closing Date, arising from the ownership or operation of the Acquired Assets or the System on or before the Closing Date (ii) no taxing authority has asserted any claim against the Seller for the assessment of any additional tax liability or initiated any action or proceeding which could result in such an assertion; and (iii) the Seller has made all withholding of Taxes required to be made under all Laws and regulations, including without limitation, withholding with respect to compensation paid to employees, and the amounts withheld have been properly paid over to the appropriate taxing authorities.

Section 4.09. Real Property and Easements.

Schedule 4.09 identifies all of Seller's rights in and to real property, including fee interests, Easements, or other interests (collectively, "Real Property") of Seller which Seller owns and uses in the operation of the System and separately identifies all Easements. Seller does not lease (as lessee) any real property that is used in the operation of the System. There are no pending condemnation proceedings relating to any of the Real Property or Easements nor has Seller actually received any written threats of any condemnation proceedings and, to the Knowledge of Seller, no such proceedings are threatened. Seller has not received any written

notices of any violations of any Law from any Governmental Authority with respect to the Real Property or the Easements which has not been cured in all material respects and, to Seller's Knowledge, no such violations of Law exist. With respect to the Real Property, (i) there are no leases, options, rights of reversions or other rights of use or rights to acquire the Real Property held by third parties, (ii) Seller is in sole possession of the Real Property, and (iii) to Seller's Knowledge there are no encroachments either way across the boundary of the Real Property, nor any dispute with adjacent property owners over the location of boundaries or potential claims adverse to title.

Section 4.10. Equipment and Machinery.

All Equipment and Machinery included in the Acquired Assets is set forth and otherwise described on Schedule 4.10. Except as set forth in Schedule 4.10, Seller has good title, free and clear of all Liens (other than the Permitted Liens and Liens that will be released on or before Closing) to the Equipment and Machinery owned by Seller. Except as specifically disclosed on Schedule 4.10, all the Equipment and Machinery is owned by Seller, and none is leased or used under any conditional sales, title-retention, lease, license or similar arrangement.

Section 4.11. Environmental Compliance.

Except as set forth in Schedule 4.11

(a) The System as currently operated by Seller and to the best of the Seller's knowledge, all operations and activities conducted by Seller with respect to the System are in compliance in all material respects with all applicable Environmental Requirements.

(b) To the best of the Seller's knowledge, Seller has generated, used, handled, treated, stored and disposed of all Hazardous Materials in (i) compliance in all material respects with all applicable Environmental Requirements and (ii) a manner that has not given, and could not reasonably be anticipated to give, rise to Environmental Liabilities.

(c) Seller has not received notice of any Environmental Claims related to the System that have not been fully and finally resolved, and to the Knowledge of Seller no claims of Environmental Liabilities have been threatened allegedly arising from or relating to the System that have not been fully and finally resolved.

(d) To the best of the Seller's knowledge, hazardous Materials are not present at or on the System or Acquired Assets, there has been no Release of Hazardous Materials at, on or from any part of the System or the Acquired Assets, in each case in a manner that violates any Environmental Requirements or has resulted in, or could reasonably be anticipated to give rise to, Environmental Liabilities.

(e) No Lien or activity use limitation or institutional control has been recorded affecting any Acquired Assets by any Governmental Authority due to either the presence of any Hazardous Material on or off the Acquired Assets or a violation of any Environmental Requirement.

(f) To the best of the Seller's knowledge, there are no underground storage tanks on or at any of the Acquired Assets. Any underground storage tanks previously located at the Acquired Assets have been removed or otherwise closed, plugged and abandoned in compliance with applicable Environmental Requirements in effect at the time of such closure.

(g) To the best of the Seller's knowledge, no PCB Equipment is on or at any of the Acquired Assets. Any PCB Equipment that previously existed at the Acquired Assets has been flushed of polychlorinated byphenyls or has been removed and properly disposed of, in compliance with applicable Environmental Requirements, and any remaining PCB Equipment is labeled to the extent required under applicable Environmental Requirements and being managed in compliance with applicable Environmental Requirements.

(h) To the best of the Seller's knowledge, no Regulated Asbestos Containing Material exists in or on the Acquired Assets in an aggregate amount that would reasonably be expected to result in an Environmental Liability; and any Regulated Asbestos Containing Material is being managed in compliance with all applicable Environmental Requirements.

(i) To the best of the Seller's knowledge, Seller has delivered to Buyer (1) all material environmental site assessments or reasonable and accurate summaries thereof pertaining to the System, (2) all material compliance audits or compliance assurance reviews prepared within the previous five (5) years or reasonable and accurate summaries thereof relating to compliance with Environmental Requirements by the System, and (3) reasonable and accurate summaries of, or all material documents pertaining to, any known and unresolved Environmental Liabilities incurred in relation to the System, to the extent possessed by or under the reasonable control of Seller.

Section 4.12. Authorizations and Permits.

(i) Schedule 4.12 lists or describes the Authorizations and Permits of Seller that are currently in full force and effect; (ii) Seller has made true and complete copies of all Authorizations and Permits available to Buyer; and (iii) except as set forth on Schedule 4.12, Seller is in compliance with all material terms, conditions and requirements of all Authorizations and Permits, except in each case where such violation or failure, individually or in the aggregate, would not have a Material Adverse Effect, and no proceeding is pending or, to the Knowledge of Seller threatened relating to the revocation or limitation of any of the Authorizations or Permits, other than those revocations or limitations which do not individually or in the aggregate have a Material Adverse Effect.

Section 4.13. System Contracts.

(a) Schedule 4.13 contains a complete and accurate list of all the Assigned Contracts, subject to any exceptions to assignment as may be set forth on such schedule.

(b) Seller has made available to Buyer true and complete copies of all of the Assigned Contracts.

(c) All of the Assigned Contracts specified in Schedule 4.13 are in full force and effect. Seller has not, nor to the Knowledge of Seller has any other party thereto, breached any material provision of or defaulted under the material terms of, nor does any condition exist which, with notice or lapse of time, or both, would cause Seller, or to the Knowledge of Seller, any other party, to be in default under any Assigned Contract.

Section 4.14. Compliance with Law; Litigation.

(a) Seller has operated and is operating the System in compliance, in all material respects, with all Laws, Authorizations and Permits and is not in breach of any Law, Authorization or Permit that would have a Material Adverse Effect on the operations of the System or on Buyer. There are no Authorizations or Permits from any Governmental Authority necessary for the operation of the System as currently being operated except for those Authorizations and Permits listed in Schedule 4.12.

(b) Except at set forth on Schedule 4.14, there are no facts, circumstances, conditions or occurrences regarding the System that could reasonably be expected to give rise to any environmental claims or governmental enforcement actions that could reasonably be expected to have a Material Adverse Effect, and there are no past, pending or threatened environmental claims or governmental enforcement actions against Seller that individually or in the aggregate could reasonably be expected to have a Material Adverse Effect.

(c) Except at set forth on Schedule 4.14, no action, suit or proceeding, at law or in equity, or before or by any Governmental Authority, is pending nor, to the Knowledge of Seller, threatened against Seller before or at the time of Closing that could reasonably be expected to have a Material Adverse Effect on the operations of the System. As of the Effective Date, no action, suit or proceeding, at Law or in equity, or before or by any Governmental Authority, is pending nor, to the Knowledge of Seller, threatened against Seller which could materially affect the validity or enforceability of this Agreement.

Section 4.15. Broker's and Finder's Fees.

No broker, finder, or Person is entitled to any commission or finder's fee by reason of any agreement or action of Seller in connection with this Agreement or the transactions contemplated by this Agreement. Seller shall pay when due the fees and expenses of their financial and technical advisors. Seller has employed PFM Financial Advisors LLC, as municipal advisor to provide transaction structuring advice and to provide Seller with municipal advice relating to the sale of the System. Seller shall pay all fees owed to PFM Financial Advisors LLC in connection with the transactions contemplated by this Agreement.

Section 4.16. Title to the Acquired Assets; Sufficiency.

(a) Except as set forth on Schedule 4.16(a), Seller has good and marketable title to, all Real Property, and valid leasehold interest in or valid licenses or Easements to use and access, all of the Acquired Assets, free and clear of all Liens, other than Permitted Liens and Liens which will be fully and unconditionally released at or before Closing. The use

of the Acquired Assets is not subject to any Liens, other than Permitted Liens, and such use does not encroach on the property or the rights of any Person.

(b) Except as set forth on Schedule 4.16(b), the Acquired Assets are sufficient for, and constitute all the assets, properties, business, goodwill and rights of every kind and description, and services required for, the continued conduct and operation of the System by Buyer in substantially the same manner as currently conducted and operated by Seller. Except for the Excluded Assets and except as set forth on Schedule 4.16(b), (i) the Acquired Assets, taken as a whole, comprise all the assets, properties, business, goodwill and rights of every kind and description used or held for use in, or useful or necessary to the operation of the System as currently operated by Seller, and (ii) there are no assets, properties, business, goodwill, rights or services used in the conduct or operation of the System that are owned by any Person other than Seller that will not be licensed or leased to Buyer under valid, current license arrangements or leases. None of the Excluded Assets are material to the System.

Section 4.17. Pending Development Plans.

Schedule 4.17 sets forth a full and complete list of all Pending Development Plans as of the Effective Date. Each Pending Development Plan, if consummated could result in the expansion of the Service Area. Seller provides no assurances whatsoever that any development or expansion of the Service Area associated with any Pending Development Plan will actually be undertaken or completed. The Parties expect that Schedule 4.17 will change from time to time between the Effective Date and Closing, and the Seller shall provide updates to Schedule 4.17 pursuant to Section 9.03. Furthermore, no third party shall have any right to rely on Schedule 4.17 as confirmation that any development plan listed thereon will be implemented.

Section 4.18. Land Development Agreements/Financial Security Agreements

Schedule 4.18 sets forth a list of all Land Development / Financial Security Agreements existing as of the Effective Date between Seller and any third party.

ARTICLE V.
REPRESENTATIONS AND WARRANTIES OF BUYER

Buyer makes only the representations and warranties which are set forth in this Article V. As a material inducement to Seller to enter into this Agreement and to consummate the transactions contemplated by this Agreement, Buyer represents and warrants to Seller, as of the Effective Date and as of the Closing Date (except to the extent any of the following representations and warranties specifically apply or relate to another date, in which event such representations and warranties shall be true and correct as of such other date), as follows:

Section 5.01. Organization.

Buyer is duly organized, validly existing and in good standing under the laws of the state.

Section 5.02. Authorization and Validity of Agreement.

Buyer has the power and authority to enter into this Agreement and to do all acts and things and execute and deliver all other documents as are required hereunder to be done, observed or performed by it in accordance with the terms hereof. This Agreement has been duly authorized, executed and delivered by Buyer and is a valid and legally binding obligation of Buyer, enforceable against it in accordance with the terms hereof, subject only to applicable bankruptcy, insolvency and similar laws affecting the enforceability of the rights of creditors generally and to general principles of equity.

Section 5.03. No Conflict or Violation.

The execution and delivery of this Agreement by Buyer, the consummation of the transactions contemplated hereby and the performance by Buyer of the terms, conditions and provisions hereof has not and will not contravene or violate or result in a material breach of (with or without the giving of notice or lapse of time, or both) or acceleration of any material obligations of Buyer under (i) any Law, (ii) any material agreement, instrument or document to which Buyer is a party or by which it is bound or (iii) the articles, bylaws or governing documents of Buyer.

Section 5.04. Consents and Approvals.

Schedule 5.04, sets forth a list of each consent, waiver, authorization or approval of any Governmental Authority, or of any other Person, and each declaration to or filing or registration with any Governmental Authority required in connection with the execution and delivery of this Agreement by Buyer or the performance by Buyer of its obligations hereunder.

Section 5.05. Broker's and Finder's Fees.

No broker, finder or third party is entitled to any commission or finder's fee in connection with this Agreement or the transactions contemplated by this Agreement.

Section 5.06. Financial Wherewithal.

Upon Closing, and after giving effect to the consummation of the transactions contemplated hereby and the incurrence of any indebtedness in connection therewith, Buyer shall have the financial ability and will have sufficient working capital for its needs and anticipated needs to operate the System as a certificated public utility system regulated by the PaPUC, authorized, among things, to provide wastewater utility services to retail residential, commercial and industrial customers in the System.

Section 5.07. Sufficient Funds.

Buyer shall have sufficient funds available at Closing to consummate the transactions contemplated by this Agreement, to pay the Purchase Price in accordance with Article III and expenses related to the transactions contemplated by this Agreement, and on and after Closing, to generally provide ownership, operation and capital for the operations and capital needs of the System following the Closing, and assuring that the customers of the System will receive safe, adequate and reliable wastewater service equal to or better than such customers would have

received without the transactions contemplated by this Agreement and at all times consistent with the provisions of the Pennsylvania Public Utility Code, 66 Pa. C. S. § 101 et seq, and Law.

Section 5.08. Independent Decision.

Except as expressly set forth in this Agreement, or any of the related agreements, Buyer acknowledges that (a) neither Seller nor any other Person has made any representation or warranty, express or implied, as to the accuracy or completeness of the System or information provided to Buyer, and (b) neither Seller nor any other Person shall have or be subject to any liability to Buyer or any other Person resulting from the distribution to Buyer, or Buyer use of, any information regarding the System or Acquired Assets that has been furnished or made available to Buyer and its Representatives. Buyer acknowledges that other than as expressly set forth in this Agreement or any related agreement, Seller expressly disclaims any warranty of income potential, operating expenses, costs of operation, or uses or fitness for a particular purpose of any Acquired Assets or the System.

Section 5.09. Scheduled Matters.

Buyer acknowledges that: (a) the inclusion of any matter on any Schedule shall not be deemed an admission by Seller that such listed matter is material or that such listed matter has or could have a material adverse effect or constitutes a material liability with respect to the Acquired Assets; (b) matters reflected in the Schedules are not necessarily limited to matters required by this Agreement to be reflected in such Schedules; and (c) such additional matters are set forth for informational purposes only and do not necessarily include other matters of a similar nature.

Section 5.10. Independent Investigation.

Buyer acknowledges that it has conducted an independent investigation of the financial condition, assets, liabilities, properties and projected capital needs and operations of the System in making its determination as to the propriety of the transaction contemplated by this Agreement and, in entering into this Agreement and related agreements, has relied solely on the results of its investigation and on the representations and warranties of Seller expressly contained in Article IV of this Agreement.

Section 5.11. Litigation.

Buyer is not in breach of any Law that could have a material adverse effect on the operations of the System or Buyer. Neither Buyer nor any Affiliate of Buyer is listed on any of the following lists maintained by the Office of Foreign Assets Control of the United States Department of the Treasury, the Bureau of Industry and Security of the United States Department of Commerce or their successors, or on any other list of Persons with which Seller may not do business under Law: the Specially Designated Nationals List, the Denied Persons List, the Unverified List, the Entity List and the Debarred List. Except as set forth on Schedule 5.11, no action, suit or proceeding, at law or in equity, or before or by any Governmental Authority, is pending nor, to the Knowledge of Buyer, threatened against Buyer before or at the time of Closing, which will have a material adverse effect on (i) the transactions contemplated by this Agreement or (ii) the validity or enforceability of this Agreement.

ARTICLE VI.
TITLE TO REAL PROPERTY; EASEMENTS

Section 6.01. Evidence of Title.

Subject to Section 6.06, with respect to all Real Property, Buyer shall obtain at its sole cost and expense a commitment for a Title Policy (the "Title Commitment"), issued by a title insurance company selected by Buyer and licensed to insure title to real property by the Commonwealth of Pennsylvania (the "Title Company"). Promptly following the Effective Date, Buyer shall order the Title Commitment from the Title Company and shall provide Seller evidence of the order. Notwithstanding anything to the contrary in Section 6.02(a), a purported Objection Notice is void with respect to any parcel of Real Property if, within thirty (30) Business Days after the Effective Date, Buyer has not ordered the Title Commitment from the Title Company for such parcel of Real Property and provided Seller with evidence of the order.

Section 6.02. Objections to Title.

(a) Notice of Objections. Within thirty (30) Business Days of Buyer's receipt of the Title Commitment for any of the parcels of Real Property, Buyer shall deliver to Seller a true, correct and complete copy of the Title Commitment and true, correct, complete and legible copies of all exception documents listed in the Title Commitment, along with Buyer's notice to Seller of any exceptions to title set forth on Schedule B of the Title Commitment to which Buyer objects (the "Objection Notice"). The exceptions listed in the Title Objection Notice are referred to as the "Title Objection Items." None of the following are Title Objection Items: (a) Permitted Liens, (b) items that pertain to Buyer or any requirements, conditions or obligations of Buyer, (c) matters of record that are set forth in the Title Commitment and adversely restrict or prevent the use of the Real Property in the operation of the System and (d) standard Title Company exceptions (such as the "survey" exception). Any Objection Notice which does not include a true, correct and complete copy of the Title Commitment and true, correct, complete and legible copies of any and all exception documents listed in the Title Commitment is void. If Buyer provides Seller with an Objection Notice, Seller shall use its commercially reasonable efforts to have all of the Title Objection Items cured, satisfied or released of record, or insured over, by the Title Company ("Cure" or "Cured") before or as of the Closing. At or before the Closing, Seller shall deliver written evidence to Buyer, in form and substance reasonably satisfactory to Buyer and at Seller's cost and expense, evidencing that Seller has Cured all Title Objection Items.

(b) Liens. Without limiting Seller's obligations pursuant to Section 6.02(a), before or as of the Closing, Seller shall, at its sole cost and expense, Cure any Lien encumbering the Real Property which can be Cured by the payment of money (other than Permitted Liens).

(c) Title Endorsements/Survey. Buyer shall pay for any endorsements required by Buyer or any mortgagee of Buyer to Buyer's Title Policy. If any survey is required by Buyer or its mortgagee, either as a condition to any endorsement or otherwise, Buyer shall pay to obtain the survey and all related costs and expenses. If Buyer obtains a survey of any

Real Property and wants the deed to contain the legal description based on a survey, if the same is not identical to the legal description contained in Seller's deed of record, Seller is not obligated to include the same in the deed to Buyer unless the survey is certified to Seller and such description is included in the deed on a "quitclaim" basis only and without warranty of title.

(d) License at Closing. Seller and Municipality shall provide Buyer with a license agreement granting Buyer a license in all of Seller's rights to access such Real Property in order to allow Buyer to operate and maintain the System until such time as Buyer is provided title to such Real Property as provided for in this Agreement. For the avoidance of doubt, Seller or Municipality shall provide such title as soon as reasonably practicable in accordance with Section 6.01.

(e) Insurable Claims. To the extent any Claim for Losses under Article VIII is an Insurable Claim, Buyer shall assert and pursue with reasonable diligence the Insurable Claim against the Title Company (which includes commencing litigation and diligently prosecuting the Insurable Claim to judgment) before pursuing a Claim for Losses under Article VIII. Following a non-favorable judgment that substantially denies the relief sought by Buyer from the Title Company in connection with the Insurable Claim (each a "Non-Favorable Judgment"), Buyer may, following such Non-Favorable Judgment, pursue Seller with a Claim for Losses under Article VIII (any Claim against Seller following an attempted Insurable Claim against the Title Company is a "Residual Title Claim"). Notwithstanding anything to the contrary in Article VIII, Buyer must assert a Claim for Losses based upon a Residual Title Claim within sixty (60) day of the Non-Favorable Judgment. For purposes of this Section 6.02(d), an "Insurable Claim" means a Claim that: (i) arises out of Buyer's discovery of a title defect or encumbrance with respect to any of the Real Property following the Closing Date that materially restricts or prevents the use of such Real Property in the operation of the System; and (ii) is a claim against the Title Company under the Title Policy. Buyer acknowledges that any Claims that it could otherwise bring as a breach of a covenant of title under the special warranty deed to the Real Property is included within the Claim for Losses under Article VIII and is subject to the terms of this Section 6.02(d) of first pursuing the same as an Insurable Claim.

Section 6.03. Title Expenses.

Irrespective of whether Closing occurs, Buyer shall pay all costs and expenses for obtaining the Title Commitment, Title Policy and any survey. Seller shall pay for all expenses to release, satisfy or bond over any Liens, and to effect the Cure of any Title Objection Items that Seller undertakes to Cure, including the cost of any title endorsement to insure Buyer against any adverse effect of such Title Objection Items.

Section 6.04. UCC Search; Releases.

Not later than ninety (90) Business Days after the Effective Date, Buyer shall obtain at its sole cost and expense a Uniform Commercial Code search against Seller covering any of the personal property or fixtures included among the Acquired Assets from the Office of the

Secretary of the Commonwealth of Pennsylvania and the Recorder of Montgomery County, Pennsylvania (the "UCC Search"). On or before the Closing, Seller shall obtain at its sole cost and expense releases of any and all security interests in any of the Acquired Assets which are not Permitted Liens. Seller shall provide the form of the releases of any security interests to Buyer on or before the Closing Date.

Section 6.05. Easements.

(a) Promptly after the Effective Date and before the Closing, Seller shall, at its sole cost and expense, cause an abstractor selected by Seller and reasonably acceptable to Buyer and the Title Company (the "Abstractor"), to perform a search of the public land records of Montgomery County, based on Seller's records and plans of the System (and such other sources of information as are reasonably related thereto), by means of searching the grantee index in the names of Seller and such other searches as the Abstractor may reasonably make, to (i) identify and provide Buyer with title information on all recorded Easements, and (ii) together with Seller, identify all Missing Easements. During this process, as the Abstractor provides written search results to Seller (including updated versions of the Abstractor search result chart), Seller will promptly provide the same to Buyer for its review, and Seller shall, or shall cause the Abstractor to, provide Buyer with periodic updates (which shall occur no less frequently than bi-weekly) on the status of the activities set forth in the previous sentence.

(b) Notice of Objections. Within forty five (45) days of Buyer's receipt from the Seller (or the Abstractor) of the information described in subsection (a) above, Buyer shall deliver to Seller written notice identifying the encumbrances on the Easements that, in Buyer's reasonable opinion, could materially and adversely restrict or prevent the use of the Easements in the operation of the System, (an "Easement Objection Notice"). Buyer shall not be permitted to include in its Easement Objection Notice any encumbrances that: (a) are Permitted Liens, (b) pertain to the Buyer or any requirements, conditions or obligations of the Buyer, or (c) are matters of record and set forth in the Abstractor's search results that do not, in Buyer's reasonable opinion, materially and adversely restrict or prevent the use of the Easements in the operation of the System (specifically including mortgages or other instruments securing indebtedness incurred by the owner of the land burdened by the Easement) (such exceptions objected to in the Objection Notice, the "Easement Objection Items." In the event that Buyer provides the Seller with an Easement Objection Notice, the Seller shall use commercially reasonable efforts to have the Easement Objection Items Cured, prior to or as of the Closing.

(c) If during the process of Abstractor's review and investigation of the Montgomery County land records, Seller determines, based on the Abstractor's investigation, that there is a Missing Easement, Seller shall take any and all actions (including the use of its power of condemnation) to obtain any Missing Easements so that the same may be sold, assigned, transferred and conveyed to Buyer at the Closing pursuant to the terms and conditions of this Agreement. All costs and expenses incurred in connection with obtaining each Missing Easement (including any payment to a landowner in connection with condemnation, in lieu of condemnation or otherwise) shall be paid by Seller and no additional consideration shall be payable by Buyer for any Missing Easement. If Seller

has not obtained all Missing Easements by the date that is sixty (60) Business Days after the date that Abstractor has completed its review of the County land records and delivered the last results to Seller (the "Abstract Completion Date"), then, no later than thirty (30) Business Days after the Abstract Completion Date (but in any event no later than fifteen (15) days before the Closing), Seller shall, unless waived or otherwise agreed to by Buyer, commence and file in the Court of Common Pleas, Montgomery County, a condemnation or eminent domain proceeding to obtain any and all such Missing Easements. For the purposes of clarity, upon obtaining each Missing Easement (including upon the final resolution of a condemnation proceeding), each Missing Easement that has been acquired or obtained by Seller will be considered an Easement.

Section 6.06. Unscheduled Property.

The Parties acknowledge that Seller may own interests in or have the legal right to use or occupy the Real Property and Easements that is necessary or essential to the operation of the System and that is not specifically identified in Schedule 4.09 (the "Unscheduled Real Property"). If the Parties discover before or after the Closing Date, one or more parcels of Unscheduled Real Property, the discovering Party shall notify the non-discovering Party of the discovery. In addition to its obligations in Section 2.03, Seller shall convey, assign or otherwise transfer any rights to each parcel of Unscheduled Real Property, without additional consideration payable by Buyer, in such a manner as to provide Buyer with reasonable assurances that Buyer may use or occupy the Unscheduled Real Property as it was used by Seller as of the Effective Date.

ARTICLE VII.
OTHER AGREEMENTS

Section 7.01. Taxes.

Seller shall pay any and all Taxes, if any, arising out of the ownership of the Acquired Assets and out of the operation of the System before the Closing.

Section 7.02. Cooperation on Tax Matters.

Seller shall furnish or cause to be furnished to Buyer, as promptly as practicable, whether before or after the Closing Date, such information and assistance relating to the System as is reasonably necessary for the preparation and filing by Buyer of any filings relating to any Tax matters.

Section 7.03. Rates.

Rates. At least sixty (60) days prior to Closing, Seller shall adopt rates as set forth on Schedule 7.03(a) (the "Base Rate") as Seller's effective sanitary wastewater rate, and such rates shall become effective by a date not later than the Closing Date. Buyer shall implement such Seller's sanitary wastewater rates then in effect at Closing. Buyer may bill customers on a monthly basis instead of annual or quarterly billing, which Buyer will prorate accordingly. Buyer (i) acknowledges that most Seller customers will pay the flat rate, as set forth on Schedule 7.03(a) and (ii) absent an order to the contrary from a Governmental Authority, Buyer shall, from

time to time continue to charge such customers the flat rate then in effect (whether it is the flat rate as set forth on Schedule 7.03(a) or a flat rate as approved by the PaPUC). There are two exceptions to the flat rates charged to customers as set forth on Schedule 7.03(a). Those two customers have water meters that are read quarterly. Based on those readings, these customers' respective EDU counts are adjusted and each customer is charged a flat rate per EDU as set forth on Schedule 7.03(a).

(a) Buyer shall apply, at and after Closing, its then-existing miscellaneous fees and charges, rules and regulations (excluding adjustments for Tax Cuts & Jobs Act) for wastewater service as set forth in Buyer's Tariff within Seller's Service Area.

(b) PaPUC Approval. The Buyer shall include the rate provisions of this Section 7.03(a) in its requested PaPUC Governmental Approval.

Section 7.04. Buyer Taxpayer.

From and after the Closing Date, Buyer acknowledges that, upon conveyance of the Acquired Assets to Buyer, Buyer will be subject to, among other Taxes, real estate Taxes, which Buyer shall pay when due.

Section 7.05. PaPUC Approval.

(a) Promptly after the Effective Date, Buyer shall timely initiate and faithfully prosecute the necessary proceedings to obtain from the PaPUC (i) the issuance of certificates of public convenience to Buyer to provide wastewater services in the Service Area and (ii) the approval of the acquisition of the System by Buyer under terms and conditions that are reasonably acceptable to Seller and Buyer. Seller shall cooperate with and assist Buyer in proceedings before the PaPUC.

(b) Buyer and Seller hereby agree that the procedures for determining fair market value of the System and Acquired Assets outlined in subsection (a) of Section 1329 of Title 66 of the Pennsylvania Consolidated Statutes ("Section 1329") shall be utilized and filed with the PaPUC as contemplated by Section 1329.

(c) The fees and expenses related to engaging the licensed engineer for such Section 1329 determination shall be paid fifty percent (50%) by Buyer and fifty percent (50%) by Seller.

Section 7.06. Remedies for Breach of Article VII Agreements.

If Buyer breaches of any of the covenants and agreements set forth in this Article VII following Closing, in addition to all other rights and remedies available at law or in equity, including specific performance and/or injunctive relief, Seller may commence proceedings before the PaPUC seeking enforcement of such covenants and agreements.

Section 7.07. Operation and Maintenance of the MS4 System.

Subject to Law, Seller, shall at all times maintain ownership of its MS4 System and Stormwater System Assets. Seller will maintain any NPDES permits related to the Stormwater System Assets.

Section 7.08. Utility Valuation Experts.

Buyer and Seller shall each be responsible for the costs associated with their respective Utility Valuation Expert for the preparation and completion of their respective Utility Valuation Expert's appraisal report and any additional work by their respective Utility Valuation Expert necessary to assist in the processing and prosecution of the application to the PaPUC in regard to this transaction under Section 1329.

Section 7.09. Pending Development Plans.

(a) Buyer and Seller acknowledge that from the time of the Effective Date, the Seller shall continue to administer, and perform its duties and responsibilities with respect to the Pending Development Plans set forth on Schedule 4.17. For the avoidance of doubt, after the Closing Date, the Seller shall not seek to collect any EDU-related fees.

(b) Following the Effective Date, Seller shall not enter into any contract with a third party that contemplates the construction of new sanitary wastewater facilities, including, without limitation, pumping stations, force mains, manholes, or pipelines for service to future customers related to Pending Development Plans (collectively, "New System Assets") without providing a draft of such contracts to Buyer for its review and approval as to the design and specifications prior to execution by the parties to such contracts. Buyer shall have fifteen (15) Business Days to review and approve such contracts, and Buyer's failure to object in writing to any terms of such contracts within such fifteen (15) Business Day review period shall be deemed an approval of the same by Buyer.

Section 7.10. EDU Allocations.

In connection with EDU allocations, Buyer shall at all times act in compliance with Seller's ordinances, including those with respect to zoning and land use, the Seller's Act 537 plan and the Seller's comprehensive plans.

Section 7.11. Act 537 Plan.

(a) Buyer acknowledges that Seller previously drafted and committed to an Act 537 Plan under the Pennsylvania Sewage Facilities Act (the "Plan"), which has been made available to Buyer and which may be amended pursuant to Section 12.08 hereunder. Buyer understands that the Plan contains obligations and commitments, as more fully set forth in the Plan to complete certain improvements and upgrades to the System (the "System Improvements"). Buyer shall accept and complete at its own cost the System Improvements which Seller had agreed to complete under the Plan with respect to the projects listed on Schedule 7.11(a). Prior to Closing, Seller shall have adopted an ordinance for buildings within 150 feet of a main sewer line constructed by either Seller or Buyer mandating connections.

(b) Buyer acknowledges the Municipality has jurisdiction over sewage facilities planning and sewer service through the Plan and its Act 537 planning program, zoning, subdivision and land development ordinances and comprehensive land use planning policies. Buyer and Municipality shall cooperate with respect to current and future sewage facilities planning and sewer service consistent with the provisions of this Section 7.11.

(c) Subject to PaPUC approval of the Service Area as provided in Section 7.05 and 7.11(e), Buyer shall extend sewer lines and provided sewage collection and treatment services to properties within the Service Area in a manner consistent with the Plan and the Buyer's Tariff. Pursuant to Section 12.08, Municipality will confer with Buyer concerning any amendment to the Plan that would affect the provision of sewage collection and treatment services within the Service Area. Municipality shall not propose or adopt any amendment to the Plan that would reduce the Service Area or divert wastewater flows generated from properties located within the Service Area from being served by the System without the approval of Buyer.

(d) Buyer will not request, pursue, or implement expansions of the System beyond the current Service Area (that would trigger a Plan amendment) without the prior written approval of Municipality and the PaDEP. Seller shall promptly notify and confer with Buyer, and consider Buyer's comments, concerning any proposed Plan amendment (including any sewage facilities planning module) that would involve the provision of sewage collection and treatment services by the System to area or properties outside of the Service Area. With respect to any such potential Plan amendment, Seller and Buyer shall cooperate in evaluating alternatives for provision of sewage services to such areas consistent with the requirements of 25 Pa Code Ch. 71, including consideration of the technical feasibility, economic feasibility and cost effectiveness, consistency with the objectives and policies of plans and requirements of 25 Pa. Code Ch. 71.21(a)(5), consistency with municipal land use plans and ordinances, subdivision ordinances and other ordinances and plans for controlling land use and development, technically and administratively able to be implemented, and other factors required under Act 537 or under Buyer's Tariff.

(e) If Seller and Buyer each determine that the provision of sewage collection and treatment services by the System to certain areas or properties outside of the Service Area is technically feasible, economically feasible and cost effective, and meets all of the requirements set forth in Act 537 and 25 Pa. Code Ch. 71, the Seller shall amend the Plan to include such identified areas and properties in the Service Area. If Seller amends the Plan pursuant to this subsection and such amendment is approved by PaDEP, (i) Buyer shall request that the modified Service Area be approved by PaPUC; and (ii) subject to PaPUC approval of the inclusion of such modified Service Area, Buyer shall extend sewer lines and provide sewage collection services to properties within such Service Area in a manner consistent with the Plan and Buyer's Tariff. Seller's Allocated Capacity and Paid Capacity, including number of EDUs, as of the Effective Date of this Agreement, is set forth on Schedule 7.11(e).

Section 7.12. Compliance and Operational Reports.

After the Effective Date and through the Closing Date, Seller agrees to provide Buyer with a monthly report, due by the fifth day of each month to the person designed by Buyer, disclosing any and all compliance or operational deficiencies of any kind during the previous month.

ARTICLE VIII.
INDEMNIFICATION

Section 8.01. Survival.

All representations and warranties contained in this Agreement shall survive until twelve (12) months following the Closing Date, except that (a) the representations and warranties of Seller set forth in Section 4.01 (Organization), Section 4.02 (Power and Authority), Section 4.03 (Enforceability) and Section 4.15 (Brokers' and Finders' Fees) (collectively, the "Seller Fundamental Representations") shall survive the Closing indefinitely or until the latest date permitted by Law, and (b) the representations and warranties of Buyer set forth in Section 5.01 (Organization), Section 5.02 (Authorization and Validity of Agreement), and Section 5.05 (Brokers' and Finders' Fees) (collectively, the "Buyer Fundamental Representations") shall survive the Closing indefinitely or until the latest date permitted by Law. The covenants and agreements of the Parties contained in this Agreement survive the Closing indefinitely or for the shorter period explicitly specified therein, except that for those covenants and agreements that survive for a shorter period, breaches thereof survive indefinitely or until the latest date permitted by Law. Notwithstanding the preceding sentences, (x) any breach of representation, warranty, covenant or agreement in respect of which indemnity may be sought under this Agreement shall survive the time at which it would otherwise terminate pursuant to the preceding sentences, if notice of the inaccuracy or breach thereof giving rise to such right of indemnity shall have been given to the Party against whom such indemnity may be sought before such time, and (y) nothing contained in this Section 8.01 shall limit in any way any rights a Party may have to bring claims grounded in fraud, intentional misrepresentation or willful misconduct, which rights shall survive the Closing indefinitely.

Section 8.02. Indemnification by Seller.

To the maximum extent permitted by Law and subject to the terms and conditions of this Article VIII, Seller shall indemnify, defend and hold harmless, Buyer and its successors and Affiliates and their respective employees, officers, directors, trustees and agents (the "Buyer Indemnified Persons"), from and against any and all claims for Losses arising from or relating to: (a) any misrepresentation as to, or any material inaccuracy in, any of the representations and warranties of Seller contained in this Agreement or in any exhibit, schedule, certificate or other instrument or document furnished or to be furnished by Seller before the Closing pursuant to this Agreement (without regard to any materiality, Material Adverse Effect or related qualifications in the relevant representation or warranty (except where such provision requires disclosure of lists of items of a material nature or above a specified threshold)); (b) any breach or nonfulfillment of any of the covenants or agreements of Seller contained in this Agreement or in any exhibit, schedule, certificate or other instrument or document furnished or to be furnished by Seller before the Closing pursuant to this Agreement; or (c) any Excluded Liability or Excluded Asset.

Section 8.03. Indemnification by Buyer.

To the maximum extent permitted by Law and subject to the terms and conditions of this Article VIII, Buyer shall defend, indemnify and hold harmless Seller and its successors and Affiliates and each of their respective employees, officers, directors and agents (the "Seller Indemnified Persons") from and against any and all claims for Losses arising from or relating to: (a) any material misrepresentation as to, or any material inaccuracy in, any of the representations and warranties of Buyer contained in this Agreement or in any exhibit, schedule, certificate or other instrument or document furnished or to be furnished by Buyer pursuant to this Agreement; (b) any material breach of any of the covenants or agreements of Buyer contained in this Agreement or in any exhibit, schedule certificate or other instrument or document furnished or to be furnished by Buyer pursuant to this Agreement; (c) any Assumed Liability as and when payment and performance is due, including without limitation any liability related to any claims by any Governmental Authority; (d) Buyer's actions involving Environmental Laws, Hazardous Materials or environmental claims from and after the Closing Date; or (e) the ownership, operation or control of the Acquired Assets or the System from and after the Closing Date.

Section 8.04. Indemnification Procedure.

(a) Third Party Claims. If any Indemnified Party receives notice of the assertion or commencement of any action, suit, claim or other legal proceeding made or brought by any Person who is not a party to this Agreement or an Affiliate of a party to this Agreement or a representative of the foregoing (a "Third Party Claim") against such Indemnified Party with respect to which the Indemnifying Party may be obligated to provide indemnification under this Agreement, the Indemnified Party shall promptly notify the Indemnifying Party thereof. The failure to give such prompt notice shall not, however, relieve the Indemnifying Party of its indemnification obligations, except and only to the extent that the Indemnifying Party forfeits material rights or material defenses by reason of such failure. Such notice by the Indemnified Party shall describe the Third Party Claim in reasonable detail and shall indicate the estimated amount, if reasonably practicable, of the Loss that has been or may be sustained by the Indemnified Party. The Indemnifying Party may participate in, or by giving notice to the Indemnified Party (and subject to the other requirements herein) to assume the defense of any Third Party Claim at the Indemnifying Party's expense and by the Indemnifying Party's own counsel (which counsel shall be reasonably acceptable to the Indemnified Party), so long as (i) the Indemnifying Party notifies the Indemnified Party, within ten (10) Business Days after the Indemnified Party has given notice of the Third Party Claim to the Indemnifying Party (or by such earlier date as may be necessary under applicable procedural rules in order to file a timely appearance and response) that the Indemnifying Party is assuming the defense of such Third Party Claim, provided, that if the Indemnifying Party assumes control of such defense it must first agree and acknowledge in such notice that the Indemnifying Party is fully responsible (with no reservation of any rights other than the right to be subrogated to the rights of the Indemnified Party) for all Losses relating to such Third Party Claim, (ii) the Indemnifying Party conducts the defense of the Third Party Claim actively and diligently and at its own cost and expense, and (iii) the Third Party Claim (A) does not involve injunctive relief, specific performance or other similar equitable relief, any claim in respect of Taxes, any Governmental Authority, any criminal

allegations, or any potential damage to the goodwill, reputation or overriding commercial interests of Buyer or its Affiliates, (B) is not one in which the Indemnifying Party is also a party and joint representation would be inappropriate or there may be legal defenses available to the Indemnified Party which are different from or additional to those available to the Indemnifying Party, or (C) does not involve a claim which, upon petition by the Indemnified Party, the appropriate court rules that the Indemnifying Party failed or is failing to vigorously prosecute or defend. The Indemnified Party shall reasonably cooperate in good faith in such defense. If the Indemnifying Party assumes the defense of any Third Party Claim, subject to Section 8.04(b), it may take such action as it deems necessary to avoid, dispute, defend, appeal or make counterclaims pertaining to any such Third Party Claim in the name and on behalf of the Indemnified Party. The Indemnified Party may, at its own cost and expense, participate in the defense of any Third Party Claim with counsel selected by it subject to the Indemnifying Party's right to control the defense thereof. If the Indemnifying Party elects not to compromise or defend such Third Party Claim or fails to promptly notify the Indemnified Party in writing of its election to defend as provided in this Agreement, the Indemnified Party may, subject to Section 8.04(b), pay, compromise, defend such Third Party Claim and seek indemnification for any and all Losses based upon, arising from or relating to such Third Party Claim. Seller and Buyer shall reasonably and in good faith cooperate with each other in all reasonable respects in connection with the defense of any Third Party Claim, including making available records relating to such Third Party Claim and furnishing, without expense (other than reimbursement of actual out-of-pocket expenses) to the defending party, management employees of the non-defending party as may be reasonably necessary for the preparation of the defense of such Third Party Claim.

(b) Settlement of Third Party Claims. Notwithstanding any other provision of this Agreement, the Indemnifying Party shall not enter into settlement of any Third Party Claim without the prior written consent of the Indemnified Party (which consent shall not be unreasonably withheld or delayed), except as provided in this Section 8.04(b). If a firm offer is made to settle a Third Party Claim without leading to liability or the creation of a financial or other obligation on the part of the Indemnified Party and provides, in customary form, for the unconditional release of each Indemnified Party from all liabilities and obligations in connection with such Third Party Claim and the Indemnifying Party desires to accept and agree to such offer, the Indemnifying Party shall promptly notify the Indemnified Party. If the Indemnified Party fails to consent to such firm offer within fifteen (15) days after its receipt of such notice, the Indemnified Party may continue to contest or defend such Third Party Claim and in such event, the maximum liability of the Indemnifying Party as to such Third Party Claim shall not exceed the amount of such settlement offer. If the Indemnified Party fails to consent to such firm offer and also fails to assume defense of such Third Party Claim, the Indemnifying Party may settle the Third Party Claim upon the terms set forth in such firm offer to settle such Third Party Claim. If the Indemnified Party has assumed the defense pursuant to Section 8.04(a), it shall not agree to any settlement without the written consent of the Indemnifying Party (which consent shall not be unreasonably withheld or delayed).

(c) Direct Claims. Any claim by an Indemnified Party with respect to any Loss which does not arise or result from a Third Party Claim (a "Direct Claim") shall be asserted by the Indemnified Party giving the Indemnifying Party prompt notice thereof. The failure to give such prompt notice shall not, however, relieve the Indemnifying Party of its indemnification obligations, except and only to the extent that the Indemnifying Party forfeits material rights or material defenses by reason of such failure. Such notice by the Indemnified Party shall describe the Direct Claim in reasonable detail and shall indicate the estimated amount, if reasonably practicable, of the Losses that have been or may be sustained by the Indemnified Party. The Indemnifying Party shall have thirty (30) days after its receipt of such notice to respond in writing to such Direct Claim. During such thirty (30) day period, the Indemnified Party shall reasonably cooperate and assist the Indemnifying Party in determining the validity and amount of such Direct Claim. If the Indemnifying Party does not so respond within such thirty (30) day period, by delivery of notice disputing the basis or amount of the Direct Claim, the Indemnifying Party shall be deemed to have rejected such claim, in which case the Indemnified Party shall be free to pursue such remedies as may be available to the Indemnified Party on the terms and subject to the provisions of this Agreement. If the Indemnifying Party has timely disputed its indemnity obligation for any Losses with respect to such Direct Claim, the Parties shall proceed in good faith to negotiate a resolution of such dispute and, if not resolved through negotiations, such dispute may be resolved by litigation in an appropriate court of jurisdiction determined pursuant to this Agreement.

Section 8.05. Limitations on Indemnification Obligations.

(a) Subject to the other limitations contained in this Section 8.05, neither Buyer nor Buyer Indemnified Persons shall seek indemnification pursuant to Section 8.02(a) (other than for an intentional breach of any agreement or covenant contained in this Agreement or for breach of Seller's Fundamental Representations) unless the aggregate amount of Losses incurred by Buyer and Buyer Indemnified Persons under this Agreement exceeds $500,000 in the aggregate (the "Threshold Amount"), in which case Seller will then be liable only for Losses in excess of the Threshold Amount, except that the limitations contained in this Section 8.05(a) shall not apply to any claims for indemnification based on fraud, intentional misrepresentation or willful misconduct.

(b) Subject to the other limitations contained in this Section 8.05 neither Seller nor the Seller Indemnified Persons shall seek indemnification pursuant to Section 8.03(a) (other than for an intentional breach of any agreement or covenant contained in this Agreement) unless the aggregate amount of Losses incurred by Seller and Seller Indemnified Persons under this Agreement exceeds the Threshold Amount, in which case Buyer will then be liable only for Losses in excess of the Threshold Amount, except that the limitations contained in this Section 8.05(a) shall not apply to any claims for indemnification based on fraud, intentional misrepresentation or willful misconduct.

(c) Except in the case of fraud, intentional misrepresentation or willful misconduct (for which all applicable legal and equitable remedies will be available to Buyer), the Buyer Indemnified Parties shall only be entitled to assert claims under Section 8.02(a) (other than claims with respect to breaches of any of the Seller Fundamental Representations,

which shall not be limited by this Section 8.05(c)) up to the aggregate amount of 5% of Purchase Price (the "Liability Cap"), which shall represent the sole and exclusive remedy of Buyer and the other Buyer Indemnified Parties for any such claims under Section 8.02(a) (other than claims with respect to breaches of any of the Seller Fundamental Representations or in the case of fraud, intentional misrepresentation or willful misconduct which shall not be subject to the Liability Cap, but shall be capped at the Purchase Price).

(d) Payments by an Indemnifying Party pursuant to Section 8.02 or Section 8.03 in respect of any Loss shall be limited to the amount of any liability or damage that remains after deducting therefrom any insurance proceeds and any indemnity, contribution or other similar payment received or reasonably expected to be received by the Indemnified Party in respect of any such claim. The Indemnified Party shall use its commercially reasonable efforts to recover under insurance policies or indemnity, contribution or other similar agreements for any Losses before seeking indemnification under this Agreement.

(e) Payments by an Indemnifying Party pursuant to Section 8.02 or Section 8.03 in respect of any Loss shall be reduced by an amount equal to any Tax benefit realized or reasonably expected to be realized as a result of such Loss by the Indemnified Party.

(f) Each Indemnified Party shall take, and cause its Affiliates to take, all reasonable steps to mitigate any Loss upon becoming aware of any event or circumstance that would be reasonably expected to, or does, give rise thereto, including incurring costs only to the minimum extent necessary to remedy the breach that gives rise to such Loss.

(g) Subject to the provisions of Sections 3.01, 7.06, 15.11 and any other provisions for equitable relief and/or specific performance, the Parties' sole and exclusive remedy with respect to any and all claims for any breach of any representation, warranty, covenant, agreement or obligation set forth herein or otherwise relating to the subject matter of this Agreement, shall be pursuant to the indemnification provisions set forth in this Article VIII. Each Party hereby waives, to the fullest extent permitted under Law, any and all rights, claims and causes of action for any breach of any representation, warranty, covenant, agreement or obligation set forth herein or otherwise relating to the subject matter of this Agreement it may have against the other Party and their Affiliates and each of their respective representatives arising under or based upon any Law, except pursuant to the indemnification provisions set forth in this Article VIII. Nothing in this Section 8.05(g) shall limit any Person's right to seek and obtain any equitable relief and/or specific performance pursuant to this Agreement.

Section 8.06. Knowledge of Breach.

Neither Party shall be liable for any Losses based upon or arising out of any inaccuracy in or breach of any representations or warranties of such Party contained in this Agreement if the Party claiming such Losses had Knowledge of such inaccuracy or breach before the Closing.

ARTICLE IX.
PRE CLOSING COVENANTS OF SELLER

Section 9.01. Operation of the System.

Except as otherwise expressly permitted by this Agreement, as required by Law or with the prior written consent of Buyer (which consent shall not be unreasonably withheld, delayed or conditioned), from the Effective Date until the Closing, Seller shall (i) operate and manage the System only in the ordinary course of business in accordance with past practices and procedures, (ii) collect accounts receivable and pay accounts payable in the ordinary course and in a manner consistent with its past practices, (iii) comply in all material respects with all Laws and Authorizations and Permits, and (iv) use its commercially reasonable efforts to maintain and preserve intact the business and assets of the System and preserve the rights, franchises, goodwill and relationships of Seller and the System and its customers, lenders, suppliers, regulators, the Authority and others having business relationships with Seller and the System.

Section 9.02. Cooperation.

Seller shall reasonably cooperate with Buyer and its employees, attorneys, accountants and other agents and, generally, act in reasonably good faith to timely effectuate the purposes of this Agreement and the consummation of the transactions contemplated by this Agreement.

Section 9.03. Supplements and Updates.

Seller shall promptly deliver to Buyer on a monthly basis any supplemental information and reports updating the information set forth in the representations and warranties set forth in Article IV of this Agreement so that such representations and warranties as supplemented by such information will be true and correct at all times between the Effective Date and the Closing Date (or such other date as provided in such representations and warranties) as if then made. Following the Effective Date, Seller shall promptly (but in no event later than the earlier of: twenty (20) days following Seller's Knowledge of the same; and (2) twenty (20) days prior to Closing) advise Buyer of any facts which would be a breach of a representation or warranty as of the date made or a default in a covenant contained herein.

Section 9.04. Consents and Approvals.

Promptly after the execution of this Agreement, or as required by Law, except as otherwise expressly provided herein, Seller shall file all applications and reports that are required to be filed by Seller with any Governmental Authority necessary to undertake and consummate the transactions contemplated by this Agreement, and as identified on Schedule 4.05. Seller shall also promptly provide all information that any Governmental Authority may require in connection with any such application or report. Seller shall use its commercially reasonable efforts to obtain each consent, waiver, authorization or approval of any kind from any Person in connection with the transactions contemplated by this Agreement. All authorizations of any Governmental Authority necessary to consummate the transactions contemplated by this Agreement will be in form and content reasonably satisfactory to Buyer and Seller before Closing and shall be final and non-appealable. If a party to the PaPUC proceeding appeals

PaPUC authorization of the transaction, Buyer and Seller may mutually agree to proceed to consummate the transaction.

Section 9.05. Pending Development Plan Agreements / Future Developments.

Seller shall enforce all of its rights and the counterparties' obligations under any agreements relating to Pending Development Plans in existence as of the Effective Date, which shall not be amended without notice to and the consent of Buyer, which consent shall not be unreasonably withheld and Buyer shall provide such consent to Seller within fifteen (15) days of notice from Seller or this consent requirement is deemed waived by Buyer after such date. After the Effective Date, Seller shall not enter into any new agreements (including Land Development Agreements and Financial Security Agreements) with landowners regarding the construction of any sewer facilities which, upon completion of construction, will be transferred to Buyer pursuant to Section 2.01 hereof without notice to and the consent of Buyer, which consent shall not be unreasonably withheld and Buyer shall provide such consent to Seller within fifteen (15) days of notice from Seller or this consent requirement is deemed waived by Buyer after such date. For the avoidance of doubt, any attempt by Buyer to withhold consent for entry into any amendment or new agreement by Seller pursuant to this Section 9.05 that is, in the opinion of Seller's solicitor, required pursuant to the Pennsylvania Municipal Planning Code is deemed unreasonable unless the rules and regulations of the PAPUC and/or Buyer's Tariff allow or require Buyer to withhold consent.

Section 9.06. Prior to Closing.

Seller shall complete all obligations under its Act 537 Plan that are not being assumed by Buyer as provided in Section 2.04(a)(ii) and Section 7.11, including but not limited to completion of the projects as set forth in Schedule 9.06 and purchase of any additional capacity from Pottstown Borough Authority necessitated by those projects.

ARTICLE X.
PRE CLOSING COVENANTS OF BUYER

Section 10.01. Actions Before the Closing Date.

Buyer shall not take any action which shall cause it to be in breach of any representation, warranty, covenant or agreement contained in this Agreement or cause it to be unable to perform in any material respect its obligations hereunder, and Buyer shall use its commercially reasonable efforts (subject to any conditions set forth in this Agreement) to perform and satisfy all conditions to Closing to be performed or satisfied by Buyer under this Agreement, including action necessary to obtain all consents and approvals from any Person required to be obtained by Buyer to effect the transactions contemplated by this Agreement.

Section 10.02. Governmental Approvals.

Promptly after the execution of this Agreement, or as required by Law, except as otherwise expressly provided herein, Buyer shall file all applications and reports that are required to be filed by Buyer with any Governmental Authority as set forth on Schedule 5.04. Buyer shall

also promptly provide all information that any Governmental Authority may reasonably require in connection with any such application or report.

Section 10.03. Cooperation.

Buyer shall reasonably cooperate with Seller and their employees, attorneys, accountants and other agents and, generally, do such other acts and things in good faith as may be reasonable to timely effectuate the purposes of this Agreement and the consummation of the transactions contemplated in accordance with the provisions of this Agreement.

Section 10.04. Supplements and Updates.

Buyer shall promptly deliver to Seller any supplemental information updating the information set forth in the representations and warranties set forth in Article V of this Agreement so that such representations and warranties as supplemented by such information will be true and correct as of the Closing Date (or such other date as provided in such representations and warranties) as if then made. At least three (3) Business Days before the Closing Date, Buyer shall advise Seller of any facts which would be a breach of a representation or warranty as of the date made or a default in a covenant contained herein.

ARTICLE XI.
CONDITIONS PRECEDENT TO OBLIGATIONS OF SELLER

The obligation of Seller to consummate the transactions provided for in this Agreement is subject to the satisfaction, at or before the Closing, of the following conditions, any one or more of which may be waived in writing by Seller in its sole discretion:

Section 11.01. Consents and Approvals.

Receipt of all required material, consents, waiver, authorizations or approvals of any Governmental Authority, or of any other Person and any other approvals necessary to consummate the transactions contemplated by this Agreement set forth in Schedule 5.04, including without limitation all required EPA and PaDEP approvals and all such Authorizations and Permits and Governmental Approvals must be final (and not subject to any appeal and any applicable appeal period having expired).

Section 11.02. Representations and Warranties of Buyer.

The representations and warranties made by Buyer in Article V which are (a) not qualified by materiality must be true and correct in all material respects on and as of the Closing Date (except for representations or warranties that speak of a specific date or time other than the Closing Date which must be true and correct in all material respects as of such specified date) and (b) qualified by materiality must be true and correct in all respects on and as of the Closing Date (except for representations or warranties that speak of a specific date or time other than the Closing Date which must be true and correct in all respects as of such specified date), and Seller must have received a certificate to that effect from a duly authorized officer of Buyer dated as of the Closing Date.

Section 11.03. PaPUC Approval.

PaPUC must have issued a Final Order approving the acquisition of the System under terms and conditions that are reasonably acceptable to Seller and Buyer. If a party to the PaPUC proceeding appeals or files a petition for reconsideration of PaPUC authorization of the transaction, Buyer and Seller may nevertheless mutually agree to proceed to consummate the transaction.

Section 11.04. No Injnnctions.

Neither Seller nor Buyer are subject to any injunction, preliminary restraining order or other similar decree of a court of competent jurisdiction prohibiting the consummation of the transactions contemplated by this Agreement.

Section 11.05. Performance of the Obligations of Buyer.

Buyer must have performed in all material respects all obligations required under this Agreement to be performed by Buyer on or before the Closing Date, and Seller must have received a certificate to that effect from Buyer dated the Closing Date.

Section 11.06. Deliveries by Buyer.

Buyer must have made delivery to Seller of the documents and items specified in Section 13.03 herein.

Section 11.07. No Material Adverse Effect.

There shall not have occurred any event or condition which gives rise to a Material Adverse Effect with respect to the Acquired Assets or the System.

ARTICLE XII.
CONDITIONS PRECEDENT TO OBLIGATIONS OF BUYER

The obligation of Buyer to consummate the transactions provided for in this Agreement is subject to the satisfaction, at or before the Closing, of the following conditions, any one or more of which may be waived in writing by Buyer in its sole discretion:

Section 12.01. Consents and Approvals.

(a) Receipt of all required material, consents, waivers, authorizations or approvals of any Governmental Authority, or of any other Person and any other approvals necessary to consummate the transactions contemplated by this Agreement set forth in Schedule 4.05, including without limitation all required EPA and PaDEP approvals and all such Authorizations and Permits and Governmental Approvals must be final (and not subject to any appeal and any applicable appeal period having expired).

(b) Approval by the Seller for: (i)(A) defeasance and redemption of any outstanding bonds issued by the Seller secured by the System, if any, and any Acquired Assets, and

(B) discharge of any other outstanding debt issued by the Seller and payable to any current lender which is required to be repaid as a result of the consummation of the transaction contemplated by this Agreement and (ii) applying any funds related funds held in any construction fund or account under any indenture(s) being held by the Seller or any lender to the Seller on any outstanding debt (it being understood that any debt service funds or debt service reserve funds will be applied to the defeasance, redemption and discharge of outstanding debt).

Section 12.02. Representations and Warranties of Seller.

The representations and warranties made by Seller in Article IV this Agreement (disregarding all "materiality" and "Material Adverse Effect" or similar qualifications contained therein) must be true and correct on and as of the Closing Date (except for representations and warranties expressly stated to relate to a specific date, in which case each such representation and warranty must be true and correct as of such earlier date), with only such exceptions as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect, and Buyer must have received a certificate to that effect from Seller dated as of the Closing Date.

Section 12.03. PaPUC Approval.

PaPUC must have issued a Final Order approving the acquisition of the System under terms and conditions that are reasonably acceptable to Seller and Buyer. If a party to the PaPUC proceeding appeals PaPUC authorization of the transaction, Buyer and Seller may mutually agree to proceed to consummate the transaction.

Section 12.04. No Injunctions.

Neither Seller or Buyer are subject to any injunction, preliminary restraining order or other similar decree of a court of competent jurisdiction prohibiting the consummation of the transactions contemplated by this Agreement.

Section 12.05. No Material Adverse Effect.

There shall not have occurred any event or condition which gives rise to a Material Adverse Effect with respect to the Acquired Assets or the System.

Section 12.06. Deliveries by Seller.

Seller must have made delivery to Buyer of the documents and items specified in Section 13.02 herein.

Section 12.07. Performance of the Obligations of Seller.

Seller must have performed in all material respects all obligations required under this Agreement to be performed by Seller on or before the Closing Date, and Buyer must have received a certificate to that effect from Seller dated the Closing Date.

Section 12.08. Act 537 Plan.

The Municipality shall have approved and obtained PADEP approval of all act 537 plan revisions or updates (i) required by PADEP in order to allow acquisition of the system by Buyer or (ii) otherwise required to address other outstanding deficiencies with respect to existing act 537 plans, upon terms and conditions satisfactory to Buyer in its sole and absolute discretion. Buyer shall be responsible for the preparation, cost and submission of any necessary revisions to the act 537 plans required to allow acquisition of the system by Buyer. Seller and municipality shall be responsible for obtaining adoption of the amended act 537 plans and cooperating with Buyer regarding the submission and PADEP approval process.

ARTICLE XIII.
CLOSING

Section 13.01. Closing Date.

The Closing shall take place at a place in Pennsylvania that is mutually agreed upon by the Parties, at 10:00 a.m. prevailing Philadelphia time on the earliest agreed upon date or within twenty (20) Business Days after the date upon which all the conditions precedent to Closing described in this Agreement have been fulfilled or waived and Buyer and Seller receive the last of the required consents, waivers, authorizations and approvals from the Governmental Authorities, in each case, for the transactions contemplated by this Agreement, or at such other place and time, by such other method, or on such other date, as may be mutually agreed to by the Parties (the "Closing Date"). The Closing will be effective at 12:01 a.m., Upper Pottsgrove Township, PA time, on the Closing Date (the "Closing Effective Time").

Section 13.02. Deliveries by Seller.

At the Closing, Seller shall deliver or cause to be delivered to Buyer executed copies of the following agreements, documents and other items:

(a) A Bill of Sale transferring all of the Acquired Assets comprising personal property, in the form attached as Exhibit A;

(b) Possession of the Acquired Assets, including without limitation, the Real Property, including Easements;

(c) A duly executed counterpart to an Assignment and Assumption Agreement with respect to the Assumed Liabilities (the "Assignment and Assumption Agreement"), in the form attached as Exhibit B;

(d) The consents to transfer all of the Assigned Contracts and Authorizations and Permits (including environmental Authorizations and Permits), to the extent required hereunder;

(e) One or more special warranty or other deeds in recordable form reasonably acceptable to Buyer transferring fee simple title of Real Property;

(f) Copies or originals of all Files and Records, materials, documents and records in possession of Seller relating to the Real Property or the Assigned Contracts;

(g) Certificate of Seller pursuant to Section 12.02 of this Agreement;

(h) Certificate of Seller pursuant to Section 12.07 of this Agreement;

(i) Any documents duly executed by Seller required by the Title Company to issue final owner's title policies in accordance with the provisions of Article VI; and

(j) All such other instruments of conveyance or other documents as shall, in the reasonable opinion of Buyer and its counsel, be necessary to transfer to Buyer the Acquired Assets in accordance with this Agreement or to carry out the terms of this Agreement, duly executed and acknowledged by Seller, if necessary, and in a recordable form.

(k) A written Opinion of Seller's counsel, dated as of the Closing Date and addressed to Buyer, in substantially the form set forth in Schedule 13.02(k), along with a copy of the Ordinance, certified by their proper representatives, approving the execution, delivery and performance of this Agreement by Seller, together with the certificate of its proper representatives that said Ordinance is in full force and effect and was duly adopted.

Section 13.03. Deliveries by Buyer.

At the Closing, Buyer shall deliver or caused to be delivered to Seller the following agreements, documents and other items:

(a) Payment in full of the Purchase Price;

(b) A duly executed counterpart to the Assignment and Assumption Agreement;

(c) Certificate of Buyer pursuant to Section 11.02 of this Agreement;

(d) Certificate of Buyer pursuant to Section 11.05 of this Agreement;

(e) Evidence of PaPUC approval as provided in Section 12.03; and

(f) All such other instruments of assumption as shall, in the reasonable opinion of Seller and its counsel, be necessary for Buyer to assume the Assumed Liabilities in accordance with this Agreement.

ARTICLE XIV.
TERMINATION

Section 14.01. Events of Termination.

This Agreement may be terminated and abandoned at any time before the Closing:

(a) By the mutual consent of Seller and Buyer;

(b) By either Seller or Buyer, upon notice, if:

(i) the Closing does not occurred on or before the Outside Date, except Buyer has the one-time right, upon notice to Seller, to extend the Outside Date for up to ninety (90) days if, in the Buyer's sole discretion, any such amount of time up to ninety (90) days is necessary to obtain a required Governmental Approval; or

(ii) any Governmental Authority issues an order, decree or ruling or taken any other action, in each case permanently restraining, enjoining or otherwise prohibiting the material transactions contemplated by this Agreement and such order, decree, ruling or other action becomes final and non-appealable, if the Party seeking termination pursuant to this clause (b)(ii) is not then in material breach of any of its representations, warranties, covenants or agreements contained in this Agreement;

(c) By Seller (if Seller is not then in material breach of any provision of this Agreement) if a material breach of any covenant or agreement to be performed or complied with by Buyer pursuant to the terms of this Agreement or of any representation or warranty of Buyer contained in this Agreement, which breach (i) has continued without cure for a period of sixty (60) days following notice thereof by Seller to Buyer or if such breach cannot be cured and (ii) would result in a condition to Closing set forth in Article XI of this Agreement not being satisfied (which condition has not been waived by Seller in writing); or

(d) By Buyer (if Buyer is not then in material breach of any provision of this Agreement) if a material breach of any covenant or agreement to be performed or complied with by Seller pursuant to the terms of this Agreement or of any representation or warranty of Seller contained in this Agreement, which breach (i) has continued without cure for a period of sixty (60) days following notice thereof by Buyer to Seller or if such breach cannot be cured and (ii) would result in a condition to Closing set forth in Article XII of this Agreement not being satisfied (which condition has not been waived by Buyer in writing).

This Agreement may not be terminated after the Closing.

Section 14.02. Effect of Termination.

If this Agreement is terminated by Seller or Buyer pursuant to Section 14.01, notice thereof will be given promptly to the other and all further obligations of the Parties terminate without further action by either Party and, except as set forth in Section 3.01 herein, without liability or other obligation of either Party to the other Party hereunder, except that no Party will be released from liability hereunder if this Agreement is terminated and the transactions abandoned by reason of any willful breach of this Agreement.

Section 14.03. Damages for Willful Breach.

If this Agreement is terminated as a result of willful breach by either Party as described in Section 14.02, the Party who willfully breached the Agreement is liable for Losses incurred by the non-breaching Party as a result of the breach in accordance with Article VIII hereof.

ARTICLE XV.
MISCELLANEOUS

Section 15.01. Confidentiality.

Except as and to the extent required by Law (including but not limited to the Pennsylvania Right-To-Know Act at 65 Pa § 67.101) or pursuant to an order of a court of competent jurisdiction and as required hereunder to obtain any and all required Governmental Approvals, neither Party shall, directly or indirectly, disclose or use (and no Party shall permit its Representatives to disclose or use) any Confidential Information with respect to the other Party furnished, or to be furnished, by such other Party or its shareholders, directors, officers, agents, or representatives to the other Party or its employees, directors, officers, agents or representatives in connection herewith at any time or in any manner other than in connection with the completion of the transactions contemplated by this Agreement and related transactions.

Section 15.02. Public Announcements.

Subject to Law or listing rules of an exchange on which Buyer's parent corporation's stock is listed, and except as otherwise set forth herein, the initial public announcement relating to the transactions contemplated herein will be mutually agreed upon and jointly made by the Parties. Subsequent public announcements related to the sale of the System by one Party shall be provided to the other Party as soon as reasonably practicable before issuance.

Section 15.03. Notices.

All notices, other communications and approvals required or permitted by this Agreement shall be in writing, shall state specifically that they are being given pursuant to this Agreement and shall be addressed as follows:

in the case of Seller:

Upper Pottsgrove Township
1409 Farmington Avenue
Pottstown, Pennsylvania 19464-1829
Attention: Township Manager
Attention: Township Solicitor

in the case of Buyer:

Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055
Attention: General Counsel

or such other persons or addresses as a Party may from time to time designate by notice to the other Party. A notice, other communication or approval is deemed to have been sent and received (i) on the day it is delivered, or if such day is not a Business Day or if the notice is received after ordinary office hours (time or place of receipt), the notice, other communication or

approval is deemed to have been sent and received on the next Business Day, or (ii) on the fourth Business Day after mailing if sent by United States registered or certified mail.

Section 15.04. Headings.

The article, section and paragraph headings in this Agreement are for reference purposes only and do not affect the meaning or interpretation of this Agreement.

Section 15.05. Severability.

If any term, provision, covenant or restriction contained in this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions contained in this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

Section 15.06. Entire Agreement.

This Agreement is the entire agreement between the Parties pertaining to the subject matter hereof and supersedes all prior agreements, negotiations, discussions and understandings, written or oral, between the Parties. There are no representations, warranties, conditions or other agreements, whether direct or collateral, or express or implied, that form part of or affect this Agreement, or that induced any Party to enter into this Agreement or on which reliance is placed by any Party, except as specifically set forth in this Agreement. The Parties acknowledge and agree that (i) each has substantial business experience and is fully acquainted with the provisions of this Agreement, (ii) the provisions and language of this Agreement have been fully negotiated and (iii) no provision of this Agreement shall be construed in favor of any Party or against any Party by reason of such provision of this Agreement having been drafted on behalf of one Party rather than the other Party.

Section 15.07. Amendments; Waivers.

The Parties may amend this Agreement only by the Parties' written agreement that identifies itself as an amendment to this Agreement. Any waiver of, or consent to depart from, the requirements of any provision of this Agreement will be effective only if it is in writing and signed by the Party giving it, and only in the specific instance and for the specific purpose for which it has been given. No failure on the part of any Party to exercise, and no delay in exercising, any right under this Agreement will operate as a waiver of such right. No single or partial exercise of any such right will preclude any other or further exercise of such right or the exercise of any other right.

Section 15.08. Parties in Interest; Third Party Beneficiary.

Except as hereinafter provided, this Agreement is not intended to and shall not be construed to create upon any Person other than the Parties any rights or remedies hereunder.

Section 15.09. Successors and Assigns.

Neither Party to this Agreement may assign any right or delegate any performance under this Agreement without the prior written consent of the other Party. A purported assignment or purported delegation without prior written consent is void.

Section 15.10. Governing Law; Jurisdiction.

The laws of the Commonwealth of Pennsylvania (without giving effect to its conflicts of law principles) govern all matters arising and relating to this Agreement, including torts. The Parties irrevocably agree and consent to the jurisdiction of the United States District Court for the Eastern District of Pennsylvania and the Court of Common Pleas of Montgomery County, Pennsylvania, for the adjudication of any matters arising under or in connection with this Agreement. Any action initiated in court shall be filed and litigated (including all discovery proceedings) exclusively in the United States District Court for the Eastern District of Pennsylvania and the Court of Common Pleas of Montgomery County, Pennsylvania, and each Party irrevocably submits to the exclusive jurisdiction of such courts in any such suit, action or proceeding. Service of process, summons, notice or other document by mail to such Party's address set forth herein shall be effective service of process for any suit, action or other proceeding brought in any such court. EACH PARTY ACKNOWLEDGES AND AGREES THAT ANY CONTROVERSY WHICH MAY ARISE UNDER THIS AGREEMENT OR THE OTHER TRANSACTION DOCUMENTS IS LIKELY TO INVOLVE COMPLICATED AND DIFFICULT ISSUES AND, THEREFORE, EACH SUCH PARTY IRREVOCABLY AND UNCONDITIONALLY WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY LEGAL ACTION ARISING OUT OF OR RELATING TO THIS AGREEMENT, THE OTHER TRANSACTION DOCUMENTS OR THE TRANSACTIONS CONTEMPLATED HEREBY OR THEREBY. EACH PARTY TO THIS AGREEMENT CERTIFIES AND ACKNOWLEDGES THAT (A) NO REPRESENTATIVE OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT SEEK TO ENFORCE THE FOREGOING WAIVER IN THE EVENT OF A LEGAL ACTION, (B) SUCH PARTY HAS CONSIDERED THE IMPLICATIONS OF THIS WAIVER, (C) SUCH PARTY MAKES THIS WAIVER VOLUNTARILY, AND (D) SUCH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION.

Section 15.11. Specific Performance.

Irreparable damage would occur if any provision of this Agreement were not performed in accordance with the terms hereof and that the Parties may seek specific performance of the terms hereof, in addition to any other remedy to which they are entitled at law or in equity if the other Party has performed in accordance with the terms hereof.

Section 15.12. Counterparts; Facsimile Execution.

This Agreement may be executed in any number of counterparts which, taken together, is one and the same agreement. This Agreement becomes effective when it has been executed by each Party and delivered to both Parties. To evidence the fact that it has executed this Agreement, a Party may send a copy of its executed counterpart to the other Party by facsimile transmission. Such Party is deemed to have executed and delivered this Agreement on the date it

sent such facsimile transmission. In such event, such Party shall forthwith deliver to the other Party an original counterpart of this Agreement executed by such Party.

[THIS SPACE INTENTIONALLY LEFT BLANK;

SIGNATURES NEXT PAGE]

IN WITNESS WHEREOF, the Parties have executed, or caused to be executed by their duly authorized Representatives, this Agreement as of the Effective Date.

UPPER POTTSGROVE TOWNSHIP, MONTGOMERY COUNTY

By: _____

Printed: Paul H. Sunkel III

Its: President

ATTEST:

By: Jeanne DiSante

Printed: Jeannie DiSante

Title: Township Secretary

PENNSYLVANIA-AMERICAN WATER COMPANY

By: _____

Printed: F. Michael Dowan

Its: President

ATTEST:

By: _____

Printed: Andrew L. Sunge

Title: General Counsel

BILL OF SALE

This BILL OF SALE (this "**Bill of Sale**") is dated as of _____ __, 202_ by and between **UPPER POTTSTOWN TOWNSHIP, MONTGOMERY COUNTY**, a body corporate and politic, duly organized under the laws of the Commonwealth of Pennsylvania ("**Seller**") and Pennsylvania-American Water Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania ("**Buyer**").

RECITALS:

WHEREAS, pursuant to that certain Asset Purchase Agreement by and between Seller and Buyer dated April 28, 2020 (the "**APA**"), Seller has agreed to sell and Buyer has agreed to purchase, certain assets of Seller as more particularly described in Section 2.01 of the APA (the "**Acquired Assets**") owned and used in connection with that certain sanitary wastewater collection system (the "**System**") that provides sanitary wastewater service to various customers in the Township of Upper Pottstown, Pennsylvania, and to two customers in Douglass Township (Berks County) immediately adjacent to the Seller (the "**Service Area**"); and

WHEREAS, the use, maintenance and right of access to the Acquired Assets constituting interests in real property are being transferred on the date hereof by Seller to Buyer by deeds, assignments and/or a license; and

WHEREAS, Seller intends to convey the Acquired Assets not constituting interests in real property as more particularly described in **Exhibit "A"** attached hereto as of the date hereof.

NOW THEREFORE, in consideration of the mutual covenants and agreements herein set forth and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, Seller and Buyer agree as follows:

1. **Recitals; Capitalized Terms**. The Recitals of this Bill of Sale are incorporated herein as if set forth in full. Capitalized terms not otherwise defined herein shall have the meanings ascribed to such terms in the APA.

2. **Transfer of Acquired Assets**. Seller hereby sells, assigns, conveys, transfers, and grants to Buyer all of Seller's right, title and interest in and to the Acquired Assets.

3. **Further Assurances**. Promptly upon request of the other party, Buyer and Seller shall each execute and deliver to the others such further assurances and take such further actions as may be reasonably required or appropriate to perfect the transfer of the Acquired Assets and otherwise carry out the intent and purpose of this Bill of Sale.

4. **As Is. THIS BILL OF SALE IS MADE ON AN "AS-IS, WHERE-IS, WITH ALL FAULTS" BASIS, WITHOUT RECOURSE AND WITHOUT ANY REPRESENTATION OR WARRANTY (EXPRESS OR IMPLIED) WHATSOEVER EXCEPT AS MAY EXPRESSLY BE SET FORTH IN THE APA.**

5. **Binding Effect**. All of the terms and provisions of this Bill of Sale shall be binding upon, inure to the benefit of and be enforceable by the legal representatives, successors and assigns of Seller and Buyer.

6. **Law to Govern**. This Bill of Sale shall be governed by and interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania without giving effect to any conflicts of law's provisions.

7. **Headings, Gender, etc**. All section headings contained in this Bill of Sale are for convenience of reference only, do not form a part of this Bill of Sale and shall not affect in any way the meaning or interpretation of this Bill of Sale. Words used herein, regardless of the number and gender specifically used, shall be deemed and construed to include any other number, singular or plural, and any other gender, masculine, feminine or neuter, as the context requires.

8. **Exhibits**. All Exhibits referred to herein are intended to be and hereby are specifically made a part of this Bill of Sale.

9. **Counterparts**. This Bill of Sale may be executed by facsimile, electronically or by exchange of documents in PDF format, and in several counterparts, each of which shall be deemed an original instrument and all of which together shall constitute a single agreement. Any signature page to any counterpart may be detached from such counterpart without impairing the legal effect of the signatures thereon and thereafter attached to another counterpart identical thereto except having attached to it additional signature pages.

(*Signatures appear on following page*)

IN WITNESS WHEREOF, the parties have executed this Bill of Sale under seal as of the date first above written.

SELLER:

ATTEST:

UPPER POTTSTOWN TOWNSHIP

By: _____
Name:
Its:

By: _____
Name:
Its:

BUYER:

ATTEST:

PENNSYLVANIA - AMERICAN WATER COMPANY

By: _____
Name:
Its:

By: _____
Name:
Its:

EXHIBIT "A"

ACQUIRED ASSETS

ASSIGNMENT AND ASSUMPTION AGREEMENT

THIS ASSIGNMENT AND ASSUMPTION AGREEMENT (the "Agreement") is made and entered into to be effective as of the ___ day of _____, 202_, by and between **UPPER POTTSGROVE TOWNSHIP, MONTGOMERY COUNTY**, a body corporate and politic, duly organized under the laws of the Commonwealth of Pennsylvania ("Assignor"), and **PENNSYLVANIA - AMERICAN WATER COMPANY**, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania ("Assignee").

BACKGROUND

This Agreement is made pursuant to the Asset Purchase Agreement (the "Asset Purchase Agreement") dated April 28, 2020 by and between Assignor and Assignee, in which Assignor is concurrently herewith selling, transferring, conveying, assigning and delivering to Assignee the Acquired Assets, as defined in the Asset Purchase Agreement. Capitalized terms used and not defined herein shall have the meanings given to them in the Asset Purchase Agreement.

Pursuant to the Asset Purchase Agreement, as part of the consideration for the Acquired Assets, Assignee is required to assume and agree to perform, pay or discharge, when due, certain Assumed Liabilities, as defined in the Asset Purchase Agreement.

NOW, THEREFORE, in consideration of the premises, the mutual covenants and agreements contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, the parties hereby covenant and agree as follows:

1. Assignor hereby assigns, and Assignee hereby assumes and agrees to pay, perform and discharge, in accordance with their terms, the Assumed Liabilities, including, without limitation Assignor's obligations under the Assigned Contracts which are listed on **"Exhibit A"** hereto.

2. Notwithstanding the foregoing or any other provision of this Agreement, Assignee will not assume or be bound by and shall be deemed not to have assumed, agreed to pay, perform, fulfill or discharge any of the Excluded Liabilities.

3. Assignor hereby assigns, transfers, sets over and grants to Assignee all of its rights and obligations under the Assigned Contracts. Assignee hereby accepts such assignment and transfers and hereby assumes and agrees to perform all obligations and duties of and to make all payments and perform all required actions under the Assigned Contracts. Assignor is hereby released and discharged from all obligations and duties arising from this day forward under, or in respect of, the Assigned Contracts.

4. The assumption by Assignee of the Assumed Liabilities shall not be construed to defeat, impair or limit in any way the rights, claims or remedies of Assignee under the Asset Purchase Agreement.

5. Nothing contained herein shall change, amend, extend or alter (nor shall it be deemed or construed as changing, amending, extending or altering) the terms or conditions of the Asset

Purchase Agreement in any manner whatsoever. This Agreement does not create or establish liabilities or obligations not otherwise created or existing under or pursuant to the Asset Purchase Agreement. In the event of any conflict or other difference between the Asset Purchase Agreement and this Agreement, the provisions of the Asset Purchase Agreement shall control.

6. Nothing contained herein shall confer any rights on any third party or in any way enhance or expand the rights of any third party with respect to any of the Assumed Liabilities, and Assignee reserves any and all defenses, rights of offset, claims and counterclaims that either the Assignor or Assignee may have with respect to any of the Assumed Liabilities.

7. The law of the Commonwealth of Pennsylvania shall govern all questions concerning the construction, validity, interpretation and enforceability of this Agreement, without giving effect to any choice of law or conflict of law rules or provisions (whether of the Commonwealth of Pennsylvania or any other jurisdiction) that would cause the application of the laws of any jurisdiction other than the Commonwealth of Pennsylvania.

8. This Agreement shall be binding upon, and inure to the benefit of, the parties hereto and their respective successors and assigns; provided, however, that no party may assign any of its rights or delegate any of its duties under this Agreement without the prior written consent of the other party hereto.

[*Signature Page Follows*]

IN WITNESS WHEREOF, the undersigned have executed this Assignment and Assumption Agreement as of the day and year first above written.

ASSIGNOR:

UPPER POTTSGROVE TOWNSHIP

By:_____
Name:
Title:

ASSIGNEE:

PENNSYLVANIA-AMERICAN WATER COMPANY

By:_____
Name:
Title:

EXHIBIT A

Name of Contract	Parties to Contract	Date of Contract	Subject
Sewage Treatment Service Agreement	Borough of Pottstown/Pottstown Borough Authority/Upper Pottsgrove Township	9/13/2004	Permitting Upper Pottsgrove Township to send sewage flow to be treated at Pottstown Borough Authority Plant **(Pottstown Borough Authority consented to assignment)**
Lower Pottsgrove Township Agreement	Lower Pottsgrove Township/Upper Pottsgrove Township	3/28/1994	Some flows go through Lower Pottsgrove Township before they get to Pottstown Borough Authority's Treatment Plant. This agreement documents that relationship.
HACH Meter Contract	Upper Pottsgrove Township & Hach Company	10/31/2011	Flow data

5/21/2020

ASSET PURCHASE AGREEMENT

By and Between

Upper Pottsgrove Township, Montgomery County

As Seller

and

Pennsylvania-American Water Company

As Buyer

SCHEDULES AND EXHIBITS

Capitalized terms used in the Schedules which are not otherwise defined herein shall have the respective meanings ascribed to such terms in the Agreement. The Schedules are to be read in their entirety. Nothing in the Schedules is intended to broaden the scope of any representation or warranty in the Agreement. The disclosure of any item, explanation, exception or qualification in any Schedule is disclosure of that item for all purposes for which disclosure is required under the Agreement when it is reasonably apparent from the context that such item, explanation, exception or qualification also relates to another Schedule irrespective of whether any cross reference is made or no Schedule is provided with respect to a representation. Other than as expressly set forth herein or when the Schedules reference agreements or other matters not documented in a separate writing, all descriptions of agreements, written materials or other matters appearing herein, are summary in nature and are qualified by reference to the complete documents, which have been supplied to the Buyer or its counsel.

Schedule 2.02(h)

Excluded Assets

[None]

Schedule 4.05

Required Governmental Consents

1. Pennsylvania Public Utility Commission ("PaPUC") Approval of Transaction

2. PaPUC Approval of Consent to Assignment and Amendment to Wastewater Service Agreements

3. Pennsylvania Department of Environmental Protection Approval of the updated Act 537 Official Sewage Facilities Plan recognizing transfer of wastewater collection system from Seller to Buyer

4. PaDEP Approval of Transfer of WQM Permits

5. Pottstown Borough Authority - Consent to assign Wastewater Service Agreements and approval of Corrective Action plan pursuant to letter dated November 27, 2019

Schedule 4.06

Seller Liabilities

The following list shows the debt associated with the Township's sewer system. This debt will be defeased prior to transfer of the system to the Buyer.

Series	Debt Type	Outstanding Par (as of 12/31/2019) Sewer Fund
Series B of 2005	Del Val Loan	$696,000
Series of 2009	Pennvest Loan	$2,067,505
Series of 2012	GO Bonds	$1,685,000
Series of 2013	GO Bonds	$280,000
Series of 2014	GO Note	$0
Fund Totals		**$4,728,505**

Schedule 4.07

Events Having a Material Adverse Effect

[None]

Schedule 4.08

Tax Matters

[None]

Schedule 4.09

Real Property and Easements; Liens

Seller is endeavoring, with the assistance of its legal counsel, to prepare a schedule of real property related to operation of the sanitary sewer system which property would be conveyed to Buyer in the event of a sale. Below shows the start of that work stream, which will continue through closing.

REAL PROPERTY AND ABOVE-GROUND EASEMENTS (AS OF 1/2/20)

Count	Pump Station	Location	Land Owned or Easement
1	Pine Ford Road Pump Station	Pine Ford Road	Owned
2	Regal Oaks Pump Station	Boxwood Court	Owned
3	Evans Road Pump Station	Evans Road	TBD
4	Hollyberry Pump Station	Hollyberry Court	Easement

BELOW GROUND EASEMENTS (AS OF 1/2/20)

Count	Location	Owner	Project
1	406 Evans Road	Patel	FAW II
2	256 Mickletz Road	Smola	FAW II
3	1764 Farmington Ave	Sarbocca	FAW II
4	1760 Farmington Ave	Stauffer	FAW II
5	1637 Kummerer Road	Beck	FAW II
6	1714 Farmington Ave	Moser	FAW II
7	1710 Farmington Ave	Lupacchini	FAW II
8	1702 Farmington Ave	Baird	FAW II
9	1698 Farmington Ave	Hamlin	FAW II
10	1696 Farmington Ave	Stropko	FAW II
11	1693 Farmington Ave	Leister	FAW II
12	1688 Farmington Ave	Hunsberger	FAW II
13	1682 Farmington Ave	Richards	FAW II
14	1674 Farmington Ave	Klinger	FAW II
15	1670 Farmington Ave	Duncan	FAW II
16	1664 Farmington Ave	Meeker	FAW II
17	1505 Kummerer Road	Kummerer	FAW II
18	1717 Farmington Ave	Litz	FAW II
19	1387 Chestnut Grove Road	Hewitt	Greengate
20	1382 Chestnut Grove Road	??	Greengate
21	Renovations By Design	Mingey	FAW
22	149 Pine Ford Road	Paup	FAW
23	Pine Ford Road PS		??
24	1371 N State Street	??	Greengate

25	1369 N State Street	??	Greengate
26	1407 Heather Place	??	Greengate
27	1413 Heather Place	??	Greengate
28	1419 Heather Place	??	Greengate
29	1429 Heather Place	??	Greengate
30	120 Primrose Lane	??	Greengate
31	1414 Chestnut Grove Road	??	Chestnut Grove Special Study
32	1420 Chestnut Grove Road	??	Chestnut Grove Special Study
33	1424 Chestnut Grove Road	??	Chestnut Grove Special Study
34	Pine Ford Road SG HOA		Summer Grove
35	Chestnut Grove Road SG HOA		Summer Grove
36	Chestnut Grove Road UPT		Summer Grove
37	Fallbrook and Cloverhill		Chestnut Grove/UPT
38	Fallbrook and Heather Place		Chestnut Grove/UPT
39	Gravity to PFRPS		Chestnut Grove/Greengate
40	Laura Lane UPT		Cherry Tree
41	1811 Joanne Circle	??	Cherry Tree
42	18 CherryTree Lane	??	Cherry Tree
43	1941 Gilbertsville Road	Keith Kehl	ROPS
44	Lot 130 Birchwood Terace	O'Neill	ROPS
45	64 Maple Leaf	Byrd	ROPS
46	70 Maple Leaf	Boddy	ROPS
47	76 Maple Leaf	Horter	ROPS
48	80 Maple Leaf	Sutton-Vitabile	ROPS
49	111 Snyder Road	Krause	ROPS
50	2019 Mimosa Lane	Nancy Baker	ROPS
51	2136 Hollyberry Ct	??	Regal Oaks
52	2133 Hollyberry Ct	??	Regal Oaks
53	221 Rose Valley Road	??	Regal Oaks
54	215 Rose Valley Road	??	Regal Oaks
55	209 Rose Valley Road	??	Regal Oaks
56	203 Rose Valley Road	??	Regal Oaks
57	200 Rose Valley Road	??	Regal Oaks
58	207 Maple Leaf	??	Regal Oaks
59	188 Rose Valley Road	??	Regal Oaks
60	182 Rose Valley Road	??	Regal Oaks
61	176 Rose Valley Road	??	Regal Oaks
62	170 Rose Valley Road	??	Regal Oaks
63	164 Rose Valley Road	??	Regal Oaks
64	156 Rose Valley Road	??	Regal Oaks
65	140 Rose Valley Road	??	Regal Oaks
66	138 Rose Valley Road	??	Regal Oaks
67	132 Rose Valley Road	??	Regal Oaks
68	124 Rose Valley Road	??	Regal Oaks
69	116 Rose Valley Road	??	Regal Oaks

70	102 Rose Valley Road	??	Regal Oaks
71	145 Maple Leaf	??	Regal Oaks
72	139 Maple Leaf	??	Regal Oaks
73	135 Maple Leaf	??	Regal Oaks
74	127 Maple Leaf	??	Regal Oaks
75	121 Maple Leaf	??	Regal Oaks
76	113 Maple Leaf	??	Regal Oaks
77	109 Maple Leaf	??	Regal Oaks
78	105 Maple Leaf	??	Regal Oaks
79	99 Maple Leaf	??	Regal Oaks
80	95 Maple Leaf	??	Regal Oaks
81	91 Maple Leaf	??	Regal Oaks
82	85 Maple Leaf	??	Regal Oaks
83	82 Maple Leaf	??	Regal Oaks
84	87 Rose Valley Road	??	Regal Oaks
85	93 Rose Valley Road	??	Regal Oaks
86	101 Rose Valley Road	??	Regal Oaks
87	107 Rose Valley Road	??	Regal Oaks
88	63 Maple Leaf	??	Regal Oaks
89	2160 Gilbertsville Road	??	Regal Oaks
90	2146 Gilbertsville Road	??	Regal Oaks
91	2126 Gilbertsville Road	??	Regal Oaks
92	94 Maple Leaf	??	Regal Oaks
93	98 Maple Leaf	??	Regal Oaks
94	2019 Mimosa Lane	??	Regal Oaks
95	2038 Mimosa Lane	Caulfield	Regal Oaks
96	150 Maple Leaf	Payne	Regal Oaks
97	156 Maple Leaf	Dicriscio	Regal Oaks
98	155 Boxwood Ct	Remelius	Regal Oaks
99	161 Boxwood Ct	UPT	Regal Oaks
100	2093 Gilbertsville Road	Weand	ROIIA
101	2101 Gilbertsville Road	Toth	ROIIA
102	2115 Gilbertsville Road	Trotman	ROIIA
103	2131 Gilbertsville Road	Erwin	ROIIA
104	256 W Moyer		Sprogels Run
105	1608 Gilbertsville Road		Maugers Mill
106	1614 Gilbertsville Road		Maugers Mill
107	??? Gilbertsville Road	Mingey?	Maugers Mill
108	64 Irwin Place		Gary Heights
109	56 Irwin Place		Gary Heights
110	Sage View Drive	THP??	Coddington View
111	1275 Whitespire Circle		Turnberry
112	1266 N Hanover		Turnberry
113	Glendale Ave	UPT?	Turnberry
114	1537 Meadowview Drive		Turnberry
115	1533 Meadowview Drive		Turnberry
116	1518 Meadowview Drive		Turnberry
117	1522 Meadowview Drive		Turnberry

118	1456 Sweetwater Way		Turnberry
119	1460 Sweetwater Way		Turnberry
120	1412 Meadwview Drive		Turnberry
121	218 Deerfield Way		Turnberry
122	220 Deerfield Way		Turnberry

Schedule 4.10

Equipment and Machinery

The following details the machinery and equipment that will be transferred to the Buyer [NOTE: subject to minor changes by the Township as it completes final inventory]:

- There is no other equipment and machinery being transferred other than the pump stations and associated appurtenances.

Schedule 4.11

Environmental Compliance

Noncompliance issues:

Documented Sanitary Sewer Overflows (reported to Department of Environmental Protection but not necessarily resulting in a fine):

Date	Physical Location	Cause
7/18/2019	Autumnview Lane	-Alleged leakage from a low pressure residential sewage system infiltrating into an MS-4 storm drain.

Schedule 4.12

Authorizations, Licenses and Permits

1. The below permits issued by the Commonwealth of Pennsylvania Department of Environmental Protection:

Primary Facility	Location	DEP Permit #
Upper Pottsgrove Township Sewer to Pottstown Borough STP	Regal Oaks Pump Station & Force Main	4609402
Pine Ford Road Area Sewers	Pine Ford Road	4694427
Evans Road Pump Station	Evans Road	
Hollyberry Pump Station	Hollyberry Court	
Farmington Avenue West Sanitary Sewer System & Pumping Station	Pottstown Borough Authority Wastewater Treatment Facility	4606407

2. Pennsylvania Department of Environmental Protection approval of the updated Act 537 Official Sewage Facilities Plan

3. Montgomery County Health Department – Post-closing notice

Schedule 4.13

Assigned Contracts

Agreement	Parties to Agreement	Date of Agreement	Subject
Sewage Treatment Service Agreement	Borough of Pottstown/Pottstown Borough Authority/Upper Pottsgrove Township	9/13/2004	Permitting Upper Pottsgrove Township to send sewage flow to be treated at Pottstown Borough Authority Plant **(Pottstown Borough Authority must consent to assignment)**
Lower Pottsgrove Township Agreement	Lower Pottsgrove Township/Upper Pottsgrove Township	3/28/1994	Some flows go through Lower Pottsgrove Township before they get to Pottstown Borough Authority's Treatment Plant. This agreement documents that relationship.
HACH Meter Contract	Upper Pottsgrove Township & Hach Company	10/31/2011	Flow data

Schedule 4.14

Litigation or Potential Claims

[None]

Schedule 4.16(a)

Exception to Title to Acquired Assets

[None]

Schedule 4.16(b)

Exception to Sufficiency of Acquired Assets

[None]

Schedule 4.17

Pending Development Plans (to be updated as developments progress)

PROPOSED FUTURE DEVELOPMENTS	
Private Developments Under Construction	
Sweetwater / Sprogels Run	**- 58 proposed EDU's** for single family housing, with an expected population of 166 residents.
Private Developments/Subdivisions	
Kummerer Tract	**-402 EDU's** (land development approval given on 144 EDU's, remaining 288 EDU's not yet approved)
Municipal Sewer Projects – Would Require Capital to Connect (from 537 Plan)	
Regal Oaks Phase 2A	**- 26 EDU's** (existing homes) proposed for connection. Expected population is 26 residents. Connections are expected to begin in 2020. Township to complete project.
Regal Oaks Phase 2B	**- 20** to **22 EDU's** (existing homes, maybe two vacant lots) proposed for connection. Expected population is 57 residents. Connections are expected to begin in 2021.
Continental Drive / Old Orchard Drive	**- 69 EDU's** (existing homes) proposed for connection. Expected population is 197 residents. Connections are expected to begin by 2023.
Horseshoe / Bruce Drive	**- 48 to 51 EDU's** (existing homes, maybe 3 or 4 vacant lots) proposed for connection. Expected population is 112 residents. Connections are expected to begin by 2022.
Ming Drive / Moyer Road	**- 29 EDU's** (existing homes) proposed for connection. Expected population is 83 residents. Connections are expected to be completed by 2020. Township to complete project.

Schedule 4.18

Land Development and Financial Security Agreements

[None]

Schedule 5.04

Buyer Consents and Approvals

1. Pennsylvania Public Utility Commission (the "PaPUC") Approval of Transaction

2. PaPUC Approval of Consent to Assignment and Amendment to Sewage Treatment Agreements and Related Amendments

3. Pennsylvania Department of Environmental Protection (the "PaDEP") Approval of Sanitary Sewer Collection and Conveyance System Act 537 Plan recognizing transfer of wastewater collection system from Seller to Buyer

4. PaDEP transfer of WQM Permits

Schedule 5.11

Buyer Litigation

[None]

Schedule 7.03(a)

Rates

As of Closing of this transaction, pursuant to a rate ordinance to be adopted by the Seller prior to Closing, the Seller's rates will be a flat quarterly rate per EDU (regardless of usage) of $195.

[The following two customers are billed based on their water usage. Meters are read on a quarterly basis and EDUs are assigned and adjusted based on such usage. The rate charged for such usage is a flat rate per EDU.] *(Buyer requested flat charge instead of meter reading for these two customers based on the ETUs below. Issue to be reviewed and decided by Board.)*

1. Fujiyama, 1495 Farmington Avenue, Pottstown, PA 19464 ~ 3 EDUs
2. Applebee's Restaurant, 815 N. State Street, Pottstown, PA 19464 ~ 30 EDUs

Schedule 7.11(a)

Act 537 Buyer Projects to Complete Post Closing

1. Regal Oaks 2B - 20 to 22 **EDU's** (existing homes, maybe two vacant lots) proposed for connection. Existing population is 57 residents. Connections are expected to begin in 2021.

2. Continental Drive / Old Orchard Drive - 69 **EDU's** (existing homes) proposed for connection. Existing population is 197 residents. Connections are expected to begin in 2023.

3. Horseshoe/Bruce Drive - 48 to 51 **EDU's** (existing homes, maybe 3 or 4 vacant homes) proposed for connection. Existing population is 197 residents. Connections are expected to begin in 2022.

Schedule 7.11(e)

Seller's Allocated Capacity and Paid Capacity

1. Allocated capacity – 776,400 gallons; ___ EDUs
2. Currently purchased capacity – 608,600 gallons; ___ EDUs
3. Capacity pending purchase – 18,000 gallons; ___EDUs
4. Remaining capacity allocated after purchase – 149,800 gallons; ___EDUs

Schedule 9.06

Act 537 Seller Projects to Complete Pre-Closing

1. Regal Oaks 2A - **26 EDU's** (existing homes) proposed for connection. Expected population is 26 residents. Connections are expected to begin in 2020.

2. Ming Drive/Moyer Road - **29 EDU's** (existing homes) proposed for connection. Expected population is 83 residents. Connections are expected to be completed by 2020.

Schedule 13.02(k)

Form of Opinion of Seller's Counsel – Special Counsel and Solicitor

Exhibit A

Bill of Sale

Exhibit B

Assignment and Assumption Agreement

Agreement to Provide Valuation Consulting Services Between

AUS Consultants

And

Pennsylvania America Water Company
For the Appraisal of

Upper Pottsgrove Authority's Sanitary Sewer System

As of the most recent period (First Quarter 2020)

Agreement for Valuation Consulting Services

This Agreement for Valuation Consulting Services ("Agreement") is by and between AUS Consultants, a New Jersey corporation ("Supplier") and Pennsylvania-American Water Company, a Pennsylvania corporation ("PA-American") and is entered into as of April 1, 2020. In consideration of the covenants hereinafter contained, and intending to be legally bound, the Parties hereto agree to as follows:

Section 1. Description of Services:
Supplier is being engaged to act as a Utility Valuation Expert, as such term is defined in Pennsylvania Act 12 of 2016, amending Chapter 13 of the Pennsylvania Public Utility Code and the First and Second Implementation Orders entered by the Public Utility Commission at Docket No. M-2016-2543193 (collectively, "Act 12"). Supplier is being engaged with respect to the proposed acquisition by PA-American of the sanitary sewer system assets currently owned by Upper Pottsgrove Authority. Upon the issuance of a notice to proceed by PA-American, Supplier shall prepare and produce the following appraisal suitable for the Project, including if requested (collectively, the "Services"):

1. An Appraisal (Valuation study) consistent with the 2020-2021 Uniform Standards of Appraisal Practices (USPAP) as of the date requested by PA-American and consistent with the requirements of Act 12.
2. Provide expert witness testimony and documentation as required by Act 12.
3. Provide the documentation required by Act 12 with respect to the Services and the fees charged by Supplier pursuant to this Agreement.
4. If requested by PA-American, perform such other services as are consistent with Supplier's engagement as a Utility Valuation Expert.

Section 2. Duration:
Unless amended, the Project subject to this Agreement is anticipated to be approximately two years in duration and will be performed for the period beginning upon the issuance of a notice to proceed by PA-American and continuing through April 1, 2022. Supplier acknowledges and agrees that it shall not and shall have no obligation to provide the Services until such time as PA-American has issued a notice to proceed. To the extent Act 12 imposes any requirements with respect to the timing for the completion of the Services, the commencement date for such Services shall not be deemed to be any earlier than the date PA-American issues the notice to proceed.

Section 3. Effective & Expiration Dates:
This Agreement shall be effective as of the date set forth in the first paragraph hereof ("Effective Date") and shall continue until the earlier to completion on the Project or April 1, 2022 ("Expiration Date") unless earlier terminated as set forth in this Agreement.

Proprietary and Confidential
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Section 4. Personnel to Perform the Services:
Jerome C. Weinert, Principal and Director, shall be in charge of the Services on behalf of Supplier. Supplier shall call upon additional experienced professional staff as required. In the event that this Project or Agreement should not continue for any reason, or should PA-American replace the need for Supplier, PA-American shall give notice as soon as feasibly possible for Supplier to re-deploy their resources elsewhere without any penalty to PA-American.

Both parties recognize the importance of maintaining a continuity of Supplier's personnel on this Project. Supplier agrees that any of its employees, staff, professionals, experts, partners, and/or other personnel: (a) identified as the "Project Team" identified in Section 6 of this Agreement, and/or (b) assigned to this Project subsequent to the execution of this Agreement, shall continue to be staffed on this Project throughout the entire length of time Project Services are provided under this Agreement. Further, said personnel shall be used in the same capacities in which they are initially intended as of the execution date of this Agreement, or as of the date they are assigned to the Project subsequent to execution date of this Agreement, so long as they continue to be employed by Supplier, or so long as PA-American continues to desire their services.

Should Supplier terminate its relationship and/or employment with said personnel, or if said personnel terminates the relationship with Supplier and/or resigns from employment with Supplier, to the extent that Supplier, for any reason, enters into non-compete or similar agreement(s) and/or arrangement (s) with any of its employees, staff, professionals, experts, partners, and/or other personnel, Supplier agrees to immediately release said personnel from non-compete or similar agreement(s) and/or arrangement(s) with respect to being able to work for PA-American in any capacity PA-American sees fit.

Should any or all of Suppliers employees, staff, professionals, experts, partners, and/or other personnel staffed on this Project leave the employ of Supplier during the terms of this Agreement, Supplier agrees to immediately notify PA-American and suggest alternative personnel to be staffed on the Project. In no event shall any Supplier employee, staff, professional, expert, partner, and/or other personnel be assigned to this Project (whether identified in this Section 4, or identified elsewhere subsequent to the execution of this Agreement) without the express written permission and approval by PA-American. Further, PA-American reserves the right to terminate the Services of any of Supplier employee, staff, professional, expert, partner, and/or other personnel working on this Project at any time, and for any reason, without penalty.

Section 5. Location:
Supplier's (AUS Consultants') offices in Harrisburg, Pennsylvania, Mt. Laurel, New Jersey, Greenfield, Wisconsin and various PA-American Company's sites as may be required.

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Section 6. Prices:
Supplier fees for the Services are as follows;

	Fees	Expense
Appraisal and Pre filed Direct Testimony	$24,400	$2,200

Valuation Activity performed by AUS Consultants staff following the filing of the PUC Application	Hourly Rates plus expenses
Jerome C. Weinert	$250
David Sheffer	175
David Weiler	175
Michael Diedrich	225
Elizabeth A. Weinert	150
Earl Robinson	200
Susan Macchia	50

The expenses in the above tables are for travel and living, report production and shipping.

Supplier recognizes that its fees for the Project are subject to disclosure pursuant to Act 12 and so that Pa-American can include such fees as part of the transaction and closing costs associated with the proposed acquisition of the Project. Supplier further recognizes that its fees shall not exceed five percent (5%) of the fair market value of the assets to be acquired as part of the Project unless such fees are approved by the Pennsylvania Public Utility Commission ("PUC"). Supplier agrees that its fees shall comply with the requirements of Act 12.

Section 7. Payment:
Payment all undisputed amounts shall be made within 60 days upon PA-American being invoiced each month for all work completed during the prior month, or partial payment upon being invoiced should this appraisal engagement be suspended.

All payment terms are Net 60.

Section 8. Non-Disclosure:

A. The Parties agree as follows:

1. In connection with the Project, PA-American may find it beneficial to disclose to Supplier certain confidential or proprietary information in written, oral or other tangible or intangible forms, which may include, but is not limited to, discoveries, ideas, concepts, know-how, techniques, designs, specifications, drawings, blueprints, tracings, diagrams, models, samples, flow charts, data, computer programs, disks, diskettes, tapes, marketing plans, customer names and other technical, financial or business information (individually and collectively, "Information"). All Information which is disclosed by PA-American to

Supplier, whether provided in tangible or intangible form, including, but not limited to, electronic mail or other electronic communications, shall be deemed to be confidential or proprietary. Further, if Information is provided orally, including Information conveyed to an answering machine, voice mail box or similar medium, it shall too be deemed to be confidential or proprietary.

2. Supplier shall:

    a. Hold such Information in confidence with the same degree of care with which Supplier protects its own confidential or proprietary Information, but no less than reasonably prudent care;

    b. Restrict disclosure of the Information solely to its employees, contractors and agents with a need to know such Information, advise those persons of their obligations hereunder with respect to such Information, and assure that such persons are bound by obligations of confidentiality no less stringent than those imposed in this Agreement;

    c. Use the Information only as needed for the purposes of the Project;

    d. Except for the purposes of the Project, not copy, distribute, or otherwise use such Information or knowingly allow anyone else to copy, distribute, or otherwise use such Information; any and all copies shall bear the same notices or legends, if any, as the originals; and,

    e. Upon request, promptly return to PA-American all Information that is in tangible form; as to Information that was disclosed or is stored in intangible form, including, but not limited to electronic mail or other electronic communications, upon request by the PA-American, Supplier shall certify in writing within five (5) business days to PA-American that all such Information has been destroyed or, if the Information was recorded on an erasable storage medium, that Supplier has used reasonable efforts to erase all such Intangible Information.

3. Except for Customer Information, Supplier shall have no obligation to preserve the confidential or proprietary nature of any Information which:

    a. Was already known to the Supplier free of any obligation to keep it confidential at the time of its disclosure by PA-American as evidenced by Supplier's written records prepared prior to such disclosure; or

    b. is or becomes publicly known through no wrongful act of Supplier; or

    c. is rightfully received from a third person having no direct or indirect secrecy or confidentiality obligation to PA-American with respect to such Information; or

    d. is independently developed by an employee, contractor or agent of Supplier or a third party not associated with the Project and who did not have any direct or indirect access to the Information, as evidenced by the Supplier's written records; or

    e. is approved for release by written authorization by PA-American; or,

    f. it is required to disclose pursuant to a written request or demand of a duly empowered government agency or a court of competent jurisdiction, provided due

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notice and an adequate opportunity to intervene is given to PA-American, unless such notice is prohibited by such written request or demand, in which case, the Supplier shall disclose only such Information as is required and shall use reasonable efforts to obtain confidential treatment for any Information that is so disclosed.

4. Any Information relating to the Project that is disclosed by PA-American to Supplier shall remain confidential for five (5) years from the date of termination of the Agreement. Notwithstanding anything to the contrary herein, Customer Information shall remain confidential indefinitely and shall never be disclosed or used without the prior written approval of an authorized representative of PA-American. "Customer Information" includes, but is not limited to, customer name, address, phone number, information concerning a customer's calling patterns, unlisted customer numbers, any other information associated with a customer or with persons in the household of a customer, and any information available to PA-American and/or its suppliers by virtue of PA-American's relationship with its customers as a provider of telecommunications, Internet, information or other services, including, but not limited to, the quantity, technical configuration, location, type, destination, amount of use of telecommunications or other services subscribed to, and information contained on the telephone bills of PA-American's customers pertaining to telephone exchange service, telephone toll service or other services received by a customer of PA-American.

5. Any disclosed Information by PA-American shall be deemed the property of PA-American, who shall retain exclusively rights to such Information. Nothing contained in this Agreement shall be construed as granting or conferring any patent, copyright, trademark or other proprietary rights by license or otherwise in any such Information to Supplier, except for the right to use such Information in accordance with this Agreement.

6. NOTWITHSTANDING ANYTHING IN THIS AGREEMENT TO THE CONTRARY, PA-AMERICAN MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY NATURE WHATSOEVER WITH RESPECT TO ANY INFORMATION FURNISHED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR WARRANTIES AGAINST INFRINGEMENT.

7. In the event Supplier discloses, disseminates, or releases any confidential or proprietary Information received from PA-American, except as expressly permitted herein, such disclosure, dissemination, or release shall be deemed a material breach of this Agreement. In the event of such breach, PA-American may demand prompt return of all confidential and proprietary Information previously provided to Supplier and terminate this Agreement. The provisions of this Section are in addition to any other legal rights or remedies PA-American may have in law or in equity.

8. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania, irrespective of its choice of law principles. Both Parties agree to comply with all laws, including, but not limited to, laws and regulations regarding the export of information outside the United States. Supplier shall not

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knowingly transmit, directly or indirectly, in whole or in part, any Information of PA-American or export, directly or indirectly, any product or Information in contravention of the laws of the United States or the laws of any other country governing the aforesaid activities. Supplier shall not transfer any Information received hereunder or any product made using such Information to any country prohibited from receiving such data or product by the U.S. Department of Commerce Export Administration Regulations without first obtaining a valid export license. In the event Supplier violates the foregoing, Supplier shall defend, indemnify, and hold harmless PA-American from and against any claim, loss, liability, expense or damage including fines or legal fees, incurred PA-American with respect to the export or re-export activities contrary to the foregoing. Notwithstanding any other provision of this Agreement, this Section shall survive any termination or expiration of this Agreement.

Section 9. Ownership of Paid-For Development, Use and Reservation of Rights:

PA-American shall be the exclusive owner of all right, title, and interest in and to all Paid-For Development (defined below), including, without limitation, all Intellectual Property Rights therein and thereto. Supplier shall assign or have assigned to PA-American and hereby assigns to PA-American all Intellectual Property Rights in and to the Paid-For Development. "Paid-For Development" shall mean any and all Items to the extent produced or developed by or on behalf of Supplier or its employees, agents, or direct or indirect contractors or suppliers (and whether completed or in-progress), or forming part of any deliverable, pursuant to this Agreement (including, without limitation under any statement of work, exhibit, order or other document under, subordinate to, or referencing this Agreement or the Project) (collectively "Agreements") for the development of which PA-American has been charged monies in one or more of the Agreements ("Development Fees"). Paid-For Development shall always exclude all Excluded Materials, but shall include (without limitation) any modifications, alterations or updates of any Excluded Materials ("Enhancements") that otherwise fall within the definition of Paid-For Development ("Paid-For Enhancements"). PA-American's ownership of Paid-For Enhancements shall be subject to Supplier's underlying rights and ownership in Supplier's Excluded Materials.

"Items" shall mean any or all inventions, discoveries, ideas, (whether patentable or not), and all works and materials, including but not limited to products, devices, computer programs, source codes, designs, files, specifications, texts, drawings, processes, data or other information or documentation in preliminary or final form, and all Intellectual Property rights in or to any of the foregoing.

"Excluded Materials" shall mean: i) Supplier's Pre-Existing Materials; ii) Supplier's Independently Developed Materials; and iii) Supplier's Mere Reconfigurations.

"Supplier's Pre-Existing Materials" shall mean those Items owned by Supplier to the extent and in the form that they both existed prior to the date Supplier began any work under this Agreement and were created without any use of any PA-American Items. Supplier's Pre-Existing Materials shall not, however, include Paid-For Enhancements thereto.

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"Supplier's Independently Developed Materials" shall mean those Items that have been developed by Supplier, or on Supplier's behalf, both i) without use of any PA-American Items; and ii) independently of any work performed under any Agreements.

"Supplier's Mere Reconfigurations" means those specific reconfigurations of Supplier's pre-existing software performed by Supplier, or on Supplier's behalf, but only to the extent that such reconfiguration is an alteration to such software which is strictly required to permit Supplier's software to function on PA-American's network or service platform. In no event shall Supplier's Mere Reconfigurations include enhancements, modifications, or updates that are not contained in Supplier's Pre-Existing Materials and that add any features, functionality, or capabilities.

"Intellectual Property Rights" means all patents (including all reissues, divisions, continuations, and extensions thereof) and patent applications, trade names, trademarks, service marks, logos, trade dress, copyrights, trade secrets, mask works, rights in technology, know-how, rights in content (including but not limited to performance and synchronization rights), or other intellectual property rights, protected under the laws of any governmental authority having jurisdiction.

Section 10. Right to Terminate:

PA-American has the right to terminate this Agreement, in its entirety or any portion thereof, at any time without penalty. Should PA-American terminate this Agreement at any time, Supplier shall be entitled to keep and collect all fees billed to PA-American prior to the termination date which are not the subject of a dispute between the parties. Further, Supplier shall be entitled to charge, and PA-American agrees to pay for all properly performed Services as of the termination date in accordance with the rates set forth in Section 6 or, in the case of a fixed fee, a prorata share of the monthly billing during the month in which the Agreement was terminated. Said prorata share shall be calculated by dividing the total number of days worked by Supplier during the month in which the Agreement is terminated, by the total number of calendar days in the month in which the Agreement was terminated.

Section 11. Invoices/Billing Information:

The Supplier agrees to submit invoices in paper and or electronic form with appropriate references to the PA-American Point of Contact identified in Section 12.

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Section 12. Project Manager/Point of Contact/Legal Counsel:

The project manager and/or point of contact of Supplier shall be:

Jerome C. Weinert
Principal and Director
AUS Consultants
Suite 201
8555 West Forest Home Avenue
Greenfield, Wisconsin 53228
E-Mail: weinertj@auswest.net
414-529-5755 (office)
414-529-5750 (fax)
414-698-8371 (cell)

The point of contact for PA-American shall be:

Scott D. Fogelsanger, Senior Business - Development Manager
Pennsylvania-American Water Company
852 Wesley Drive,
Mechanicsburg, PA 17055
717-550-1509 (office)
717-875-2282 (cell)
Email: Scott.Fogelsanger@amwater.com

The Legal Counsel contact for PA-American shall be:

Andrew L. Swope, Vice President, General Counsel
Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055
717-550-1560 (office)
717-574-2691 (cell)
Email: Andrew.Swope@amwater.com

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Section 13. Signatures:

AUS Consultants (Supplier)

Jerome C. Weinert

Jerome C. Weinert
April 1, 2020

Pennsylvania American Water Company

Scott D. Fogelsanger
April 1, 2020

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