15. Plant in Service.

a. Provide an inventory of the used and useful plant assets to be transferred. Identify separately any utility plant that is held for future use.[2]

RESPONSE:

a. See attached the Engineer's Assessment that identifies assets to be transferred as required by 66 Pa. C.S. § 1329(a)(4). Also, see § 4.10 and **Schedule 4.10** of **Appendix A-24-a**.

[2] The inventory is to be developed from available records, maps, work orders, debt issue closing documents funding construction projects, and other sources to ensure an accurate listing of utility plant by utility account.

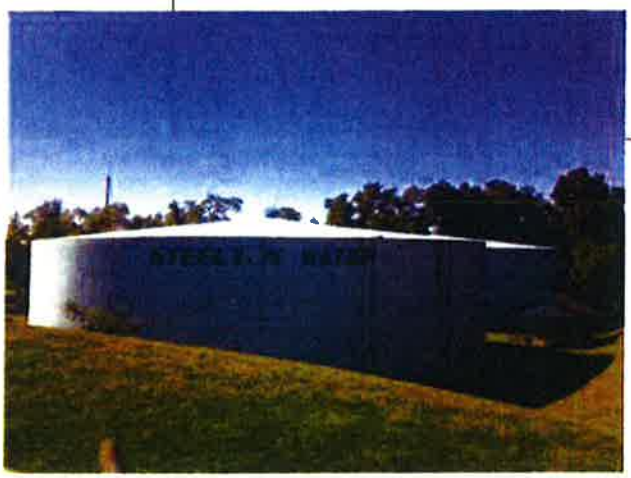
HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

AN EMPLOYEE-OWNED COMPANY

Steelton Borough Authority

Water System
Assessment of Tangible Assets
Pursuant to PUC Code §1329 (A)(4)
Borough of Steelton, Dauphin County, PA

October 2018



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369 East Park Drive • Harrisburg, Pennsylvania 17111 • 717.564.1121 [phone] • 717.564.1158 [fax]

WATER SYSTEM
ASSESSMENT OF TANGIBLE ASSETS

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STEELTON BOROUGH AUTHORITY, DAUPHIN COUNTY, PENNSYLVANIA

1.0 – Executive Summary

As required by PA Act 12 (HB1329) and following the guidelines of the "Uniform System of Accounts for Class A Water Utilities", an assessment of the tangible assets of facilities and equipment for the Steelton Borough Authority (Authority) water treatment, storage and distribution system was prepared. Each facility and class of equipment was coded based on Section 300 of the "Water Utility Plant Accounts" outlined in the Guidelines. The Asset Survey included the Water Treatment Plant (WTP), water booster station, two (2) finished water storage tanks, one (1) interconnect, and approximately 28 miles of water main distribution pipe. Information was derived from various sources including Tapping Fee calculations, record drawings, site visits, discussions with Borough staff, and other sources to provide an inventory and listing.

2.0 – Purpose of Report

The purpose of this report is to "conduct an assessment of tangible assets of the selling utility" per the requirements of PA Act 12 (HB1329). The engineering assessment followed the practices and procedures of the Public Utility Commission and National Association of Regulatory Utility Commissioners (NARUC) Uniform Systems of Accounts. The engineering assessment report documents the approximate age and original costs of the Authority's assets that will be used to develop an appraisal of the system. The engineering assessment does not include vehicles.

This report contains the following:

- Inventory of the used and useful depreciable assets to be transferred, compiled by year and account.
- List of non-depreciable assets such as land and rights-of-way.
- Review of system components, plans and reports of key facilities.
- Assessment of the identified assets, including approximate age.
- Determination and/or establishment of an original cost of construction for each asset.
- Grants and dedicated facilities.
- Known and estimated overhead costs that includes engineering design, permitting, legal, bidding, construction administration and construction observation costs.

3.0 – System Description

The Authority under permit PWSID 7220036 provides water to approximately 6,311 consumers through 2,421 metered service connections. The existing water system consists of two components, the water treatment plant (WTP) and the storage and distribution system.

The Authority's WTP obtains all water from a raw water intake located in the Susquehanna River in Dauphin County. Constructed in 1973, the WTP serves the community of Steelton and some customers in Swatara Township. While the WTP's permitted capacity is 3.0 MGD (2,083 gpm), the WTP maintains a typical daily production rate of 1.6 to 2.4 MGD (1,111 to 1,670 gpm). The WTP is staffed 24 hours per day however, the time of operation is typically 13 to 16 hours per day, 7 days per week. The existing treatment process at the WTP currently consists of potassium permanganate for disinfection by-products (DBP) control, alum for coagulation, flash mixing, two upflow sludge blanket clarifiers for flocculation and sedimentation, four multimedia filters and chlorine

disinfection. A polymer is also added to the flash mixer to aid in clarifier blanket formation. The existing filtration system was manufactured by INFILCO and was originally installed in 1973. Various upgrades to the filtration system have been performed over the years with the most recent upgrades being completed in 2017 (new clearwell, for DBP removal).

Two (2) vertical turbine raw water pumps with variable frequency drives (VFD's) convey the water from the raw water pumping station to the up-flow clarifier rapid mix tank. From there, the water flows by gravity through the treatment process into the existing clearwell. Two (2) centrifugal finished water pumps with VFD's convey the water from the clearwell to the distribution system. Production at the WTP typically ends when the finished water storage tanks have been filled to their maximum operating levels. During the hours when the WTP is not in production, the distribution system is fed from the finished water storage tanks.

The existing Authority distribution system generally consists of a network of water distribution piping including approximately 28 miles of pipe ranging from 4 inch diameter to 20 inch diameter, one water booster station, two – 2 million gallon (MG) finished water storage tanks, and two interconnections with Suez that provide water service to various residential, commercial, institutional, and industrial properties throughout the Borough. The interconnect metering chamber with Suez, located on S. 19th Street, is owned by the Authority. The interconnect pumping station with Suez, located near the finished water storage tanks, is owned by Suez.

Table 3.1 provides a breakdown of the water main distribution pipe by size and Table 3.2 provides a breakdown of the water main distribution pipe by material. The estimated linear foot of water pipe shown was obtained from a WaterCAD model that consists of a GIS map performed in 2003 and information collected between 2003 through 2016 from Steelton Borough Authority staff. HRG can not confirm the accuracy of the information. To the best of HRG knowledge, the approximate lengths are the most accurate data available at the time of preparing this report. The total length does not include abandoned pipe, private pipe, or fire hydrant laterals, etc.

Table 3.1 Water Main Distribution Pipe by Size

Water Main Size (in.)	Approximate Length (ft.)
4	12,080
6	40,514
8	51,779
10	13,017
12	23,142
16	3,445
20	1,511

Table 3.2 Water Main Distribution Pipe by Material

Water Main Material	Approximate Length (ft.)
Cast Iron Pipe	75,659
Ductile Iron Pipe	69,829

APPENDIX A

SUMMARY OF WATER ASSETS

Summary of Water Assets

Category	Original Cost
Construction Cost:	
Original 1973 Construction Cost [1]	$2,527,558
Land Assets	$31,305
Water Treatment Plant [2]	$5,488,926
Distribution System [3]	$8,465,914
Trended Cost Back to 1973 [4]	($717,500)
Total	**$15,796,203**
Estimated and Known Overhead Cost: [5]	
Original 1973 Construction Cost	$606,614
Land Assets	$939
Water Treatment Plant	$1,150,757
Distribution System	$1,305,262
Trended Cost Back to 1973	($147,431)
Total	**$2,916,141**
Grants and Dedications:	
Grant: Power Generator Equipment [6]	$545,102
Dedication: UGIES Water main [7]	$481,665
Total	**$1,026,767**
Total	**$19,739,111**

Footnotes:

[1] The original construction cost of the water treatment plant and water storage facilities built in 1973 was $2,527,558.

[2] Per Note 1 above, the water treatment plant was constructed as part of a larger project. The original cost shown for water treatment plant is the original cost added to the system since 1973.

[3] The estimated linear foot of water pipe shown was obtained from a WaterCAD model that consists of a GIS map performed in 2003 and information collected between 2003 through 2016 from Steelton Borough Authority staff. HRG can not confirm the accuracy of the information. To the best of HRG knowledge, the approximate lengths are the most accurate data available at the time of preparing this report. The total length does not include abandoned pipe, private pipe, or fire hydrant laterals, etc.

[4] Per Notes 1 and 2 above, so that costs are not counted twice, replaced equipment costs were trended back to 1973 and subtracted from the $2,527,558 project cost. The amount shown is the sum of all of the trended cost deductions for replacements. Refer to the detail pages for additional information. The ENR index was used to trend the cost to 1973.

[5] Overhead costs includes engineering design, permitting, legal, construction administration, construction observation and financing.

[6] Item shown in Appendix C under generator with NARUC Code 310.

[7] Item shown in Appendix G under 'Installation Years 2011-2018', Item 3.

APPENDIX B

LAND AND LAND RIGHTS ASSETS

NARUC Code	Asset	Parcel Number	Site Address	Acres	Purchase Date	Original Cost	Overhead Cost	Source [4]	Notes
303	Land and Land Rights	61-013-047	304 Christian Street	0.03	N/A	N/A			[1]
		61-013-048	302 Christian Street	0.03	N/A	N/A			
		61-014-025	Christian Street	0.37	1972	$1		Book A, Vol 59, Page 661	
		61-014-026	262 Christian Street	0.03	1972	$6,700	$201 [5]	Book X, Vol 57, Page 506	
		61-014-027	260 Christian Street	0.03	1972	$8,000	$240 [5]	Book V, Vol 57, Page 646	
		61-014-028	256 Christian Street	0.03	1972	$5,000	$150 [5]	Book M, Vol 58, Page 388	
		61-014-029	254 Christian Street	0.09	1972	$6,500	$195 [5]	Book W, Vol 57, Page 335	
		61-014-030	244 and 246 Christian Street	0.09	1972	$5,100	$153 [5]	Book Y, Vol 57, Page 423	
		63-045-115	Reservoir Road	2.34	1971	$1		Book S, Vol 56, Page 140	[2]
		63-045-126	Kelker Road	1.14	1985	$1		Book 675, Page 421	[3]
303	Right-of-way	57-029-005	Water line right-of-way (southern side of south Front Street between R Street and T Street)	0.56	2001	$1		Book 4002, Page 338	
303	Easement	62-043-051	Water line easement	0.06	2010	$1		Instrument # 20110015567	
Total						**$31,305**	**$939**		

Footnotes:

[1] These parcels are owned by Dauphin County Redevelopment Authority. Components of the water treatment plant are located on these parcels including the water intake, screen, clearwell and grinder.

[2] Two water storage tanks are currently located on this property.

[3] This is an open parcel that is located adjacent to the Reservoir Road parcel discussed in Note 3.

[4] The Authority may have other land assets not shown in the above table.

[5] Estimated at 3% of original cost for legal expenses.

APPENDIX C

WATER TREATMENT PLANT ASSETS

NARUC Code		Description		Original Year Installed	Age	Construction Cost		Overhead Cost	
						Original Cost	Cost Deduction for Trending Back to 1973 [4]	Original Cost	Cost Deduction for Trending Back to 1973 [4]
	Water Treatment Plant								
	Water Treatment Plant Building								
		Building	Main Floor: Approx. 8,470 sq. ft.; Lower Floor: Approx. 5,940 sq. ft.; Chemical Floor: Approx. 2,030 sq. ft.	1973	45	See Footnote 1			
	Raw Water Pumping Station								
306		Water Intake Structure	Concrete	1973	45	See Footnote 1			
309		Water Intake Line	1,160 L.F. - 36" Cast Iron Pipe	1973	45	See Footnote 1			
			382 L.F. - 24" Cast Iron Pipe						
			1 - 24" Gate Valve						
304		Wet Well	17.5'x16'x31' Concrete Structure	1973	45	See Footnote 1			
			17.5'x16'x6' CMU Structure						
			1 - 24"x30" Sluice Gate (Floor Stand, Electric Operator)						
311			2 - Vertical Turbine Pumps w/ VFD's; 40 HP/2100 gpm						
334			1- Flow Meter						
304			2 - 12" Butterfly Valves (Floor Stand with Hand Wheel)						
			1 - 10" Butterfly Valve (Electric Operator)						
			34 V.F. - Aluminum Ladder and Cage with Walkway						
			2 - 12" Check Valve						
320			Hydrodyne Traveling Screen with Compactor	2010[4]	8	See Footnote 2			
304		Building	17.5'x16'x12' CMU Structure	1973	45	See Footnote 1			
			1 - Roof Exhaust	2014[6]	4	$11,000	($2,126)	$880 [9]	($170)
			2 - Roof Domes	1973	45	See Footnote 1			
			2 - Aluminum Windows						
			1 - Single Metal Door						
			Aluminum Stairwell						
			4' Square Aluminum Hatch						
			3' Square Aluminum Hatch						
			Electrical and Ventilation Wiring and Controls						
	Chemical Treatment								
320		Liquefied Gas Chlorine System	4- 150 lb. Cylinder	1973	45	See Footnote 1			
			3 - Gas Chlorinator (Regal Model 220, Capacity 250 lbd)						
			Chemical Feed Lines and Appurtenances						
320		Liquid Alum System	2 - 2,800 Gallon Fiberglass Tanks	1973	45	See Footnote 1			
			1 - Peristaltic Pump (Blue White Flex-Pro)	2016[6]	2	$3,700	($678)	$296 [9]	($54)
			Chemical Feed Lines and Appurtenances	1973	45	See Footnote 1			
320		Non-Ionic Polymer System	1 - Peristaltic Pump (Blue White Flex-Pro)	2017[6]	1	$3,700	($653)	$296 [9]	($52)
			Chemical Feed Lines, tanks and Appurtenances	2015[6]	3	$14,000	($2,644)	$1,120 [9]	($212)
320		Dry Lime System	1 - Volumetric Dry Feeder (OMEGA-BIF, Model 21-02, 250 lbd)	1973	45	See Footnote 1			
			Chemical Feed Lines and Appurtenances						
320		Potassium Permanganate System	1 - Volumetric Dry Feeder (OMEGA-BIF, Model CFX 1000, 250 lbd)	2004[7]	14	$15,000			
			Chemical Feed Lines and Appurtenances						
320		Soda Ash System	1 - Volumetric Dry Feeder (OMEGA-BIF, Model CFX 1000, 250 lbd)	2016[6]	2	$14,724	($2,699)	$1,178 [9]	($216)
			Chemical Feed Lines and Appurtenances	1973	45	See Footnote 1			
	Rapid (Flash) Mixer								
304		Structure	7' x 7.5' x 9.2' Concrete Structure (3,613 Gallon)	1973	45	See Footnote 1			
			2 - 4' x 1.75' Aluminum Hatches						
			2 - 12" Sluice Gate with Floor Stand						
320		Mixer	1 - Vertical Mixer	2018[6]	0	$1,000	($173)	$80 [9]	($14)
	Clarification System								
304		Structure	2 - Circular Clarifiers: 35' Radius x 15' Deep (137,455 Gallon, each)	2010	8	$2,959,000	($637,266)	$621,390 [11][12]	($133,826)
311		Pumps	2 - Sludge Pumps (KSB/100gpm/26 TDH/3HP)	2012	6	$8,000	($1,629)	$640	($130)
334		Meters and Meters Installation	2 - Flow Meters (3" Mag Meter)	2015[7]	3	$6,000			
	Filtration System								
320		WTP Equipment	4 - Dual Media Filters: Anthracite/Sand (138 sq. ft., each)	2010[6]	8	See Footnote 2			
			1 - Filter Control System; Infilco Greenleaf Vacuum System	1973	45	See Footnote 1			
311		Pumps	1- Filter Vacuum Pump (Nash, Single Stage,3HP)	2014[6]	4	$7,600	($1,469)	$608 [9]	($117)
	Clearwell System								
304		Structure	Concrete Baffled Tank (73,617 Gallon, max.)	1973	45	See Footnote 1		$20,457 [11]	
311		Pumps	2- Centrifugal Pumps w/ VFD's (250 HP/2,083gpm)						

NARUC Code	Description		Original Year Installed	Age	Construction Cost		Overhead Cost	
					Original Cost	Cost Deduction for Trending Back to 1973 [8]	Original Cost	Cost Deduction for Trending Back to 1973 [8]
334	Meters and Meters Installation	1- Flow Meter						
	Clearwell Booster System							
304	Structure	1- 40' Diameter Circular Concrete Baffled Tank (260,000 Gallon)	2017[7]	1	$2,104,802		$444,080 [11]	
311	Pumps	2- Centrifugal Pumps w/ VFD's (25 HP/2,083gpm)						
		1- Pump Control System						
334	Meters and Meters Installation	1 - Flow Meter						
309	Piping and Appurtenances	12" Ductile Iron Process Piping, Fittings, and Valves						
		16" Ductile Iron Process Piping, Fittings, and Valves						
339	Other Plant and Miscellaneous Equipment	Electrical and Structural Appurtenances						
	Backwash System							
304	Structure	1 - Backwash Pumping Station Wet Well	1973	45	See Footnote 1			
		4 - Concrete Backwash Tanks (38,000 Gallon, each)						
311	Pumps	2- Submersible Backwash Pumps						
		2- Submersible Sludge Pumps (Flygt,3.8 HP)	2018[6]	0	$4,100	($709)	$328 [9]	($57)
	Generator							
310	Power Generation Equipment	1 - 650 kW Diesel Generator	2015[7]	3	See Footnote 5			
		Electrical and Structural Appurtenances						
	Constellation Energy							
339	Other Plant and Miscellaneous Equipment	Energy Efficiency Upgrades	2009[6]	9	$250,000 [3]	($55,280)	$52,500 [10]	($11,609)
	Elevator							
347	Miscellaneous Equipment	1 - Thyson Krupp Elevator Improvements	2015[5]	3	$56,000 [4]	($10,575)	$4,480 [9]	($846)
	Lab Equipment							
344	Laboratory Equipment	HACH DR 6000 UV Spectrometer	2017[7]	1	$8,600		$688 [9]	
		Chem Trac Lab Charge Analyzer			$13,000		$1,040 [9]	
	Instrumentation/Monitors							
339	Other Plant and Miscellaneous Equipment	6 - HACH Turbidimeters	2015[6]	3	$2,700	($510)	$216 [9]	($41)
		3 - HACH CL 17 Analyzers	2017[6]	1	$3,500	($618)	$280 [9]	($49)
		3 - Rosemount pH Meters	2015[6]	3	$2,500	($472)	$200 [9]	($38)
Total					**$5,488,926**	**($717,500)**	**$1,150,757**	**($147,431)**

Footnotes:

[1] The original construction cost of the water treatment plant, booster station, and finished water storage tanks built in 1973 was $2,527,558. The original construction cost per component is not known.
[2] Component included in the $2,959,000 construction cost of the 2010 water treatment plant improvement project. Work include refurbishing of the clarifier and filter units. This cost is shown in the "Clarification System" category.
[3] Work included new 250 HP VFD's and motors, new 40 HP VFD's and motors, new motor control center (MCC), and new lighting.
[4] New control system added.
[5] The generator equipment was installed in 2015 at a cost of $545,902 and was fully paid for by grant funding. The grant is listed in the 'Summary of Water Assets'.
[6] Original component included in the 1973 water treatment plant construction cost, but has since been replaced.
[7] New construction. Component not part of the 1973 water treatment plant construction.
[8] So that costs are not counted twice, the replacement component costs (identified by footnote 6) were trended back to 1973 and subtracted from the 1973 water treatment plant construction cost of $2,527,558. Refer to the summary page for the deduction total. The ENR index was used to trend the cost to 1973.
[9] Estimated at 8% of original cost for engineering design.
[10] Estimated at 14% of construction cost that consists of 8% for engineering design, 4% for permitting, 2% for bidding, 3% construction administration and 4% for construction observation.
[11] Actual engineering cost.

APPENDIX D

BOOSTER STATION ASSETS

NARUC Code	Description			Original Year Installed	Age	Original Cost
	Booster Pump Station					
304		Building	18' x 16' CMU Structure w/ Brick Facade, with 2'-8" x 7'-4" x 6'-8" Dry Pit	1973	45	See Footnote 1
			1 - Door			
			3 - Windows			
311		Pumps	2 - Centrifugal Pump with VFDs (Aurora, 15HP/480GPM)	1973		See Footnote 1
309		Piping and Appurtenances	8" Cast Iron Piping and Fittings	1973		See Footnote 1
			4" Cast Iron Piping and Fittings			
			2 - 8" Butterfly Valve			
			1 - 8" Check Valve			
			2 - 6" Butterfly Valve			
			2 - 4" Check Valve			
			2 - 4" Butterfly Valve			
348		Other	Electrical and HVAC Wiring and Controls	1973		See Footnote 1

Footnotes:

[1] The original construction cost of the water treatment plant, booster station, and finished water storage tanks built in 1973 was $2,527,558. The original construction cost per component is not known.

APPENDIX E

FINISHED WATER STORAGE TANK ASSETS

NARUC Code	Description			Original Year Installed	Age	Original Cost
	Finished Water Storage Tank					
330		Distribution Reservoirs	2 - 2 MG Steel Tanks (110' Diameter x 28' Height)	1973	45	See Footnote 1
			20" Screened Roof Vent (each)			
			Cage Ladder (each)			
			8" Steel Overflow Pipe (each)			
			24" Roof Hatch (each)			
			24" Shell Hatch (each)			
	Valve Pits					
304		Structure	2 - 10' x 7'-6" x 6'-6" Concrete Valve Pit	1973	45	See Footnote 1
			5' x 2'-6" Double Leaf Hatch (each)			
			12" Ductile Iron Influent/Effluent Piping (each)			
			6" Cast Iron Drain Piping (each)			
			2" Sump			
			1 - 12" Butterfly Valve (each)			
			1 - 6" Butterfly Valve (each)			

Footnotes:

[1] The original construction cost of the water treatment plant, booster station, and finished water storage tanks built in 1973 was $2,527,558. The original construction cost per component is not known.

APPENDIX F

INTERCONNECTION ASSETS

NARUC Code	Description			Original Year Installed	Age	Original Cost
	Interconnection with Suez (S. 19th Street)					
304		Structure	15'-8.5" x 6' x 6' Concrete Metering Chamber	2010	8	See Footnote 1
			1 - 54" x 48" Access Hatch			
309		Piping and Appurtenances	6" Ductile Iron Piping and Fittings			
			2 - 6" Gate Valve			
			1 - 6" Flow Control Valve (Cla-Val; Model 40-01)			
336		Backflow Prevention Devices	1 - 6 " Backflow Preventer (Watts; Model Series 709)			
334		Meters	1 - 6" Flow Meter (Sensus)			
348		Other	Electric Unit Heater			

Footnotes:

[1] Component included in the $2,959,000 construction cost of the water treatment plant improvement project. Work include refurbishing of the clarifier and filter units. This cost is shown in the Water Treatment Plant Assets "Clarification System" category.

APPENDIX G

DISTRIBUTION SYSTEM ASSETS

Distribution System Assets [14]

Installation Years 1903 - 1910 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	1,106	L.F.	$ 383	111	
	2	6" Ductile Iron Pipe	5,798	L.F.	$ 2,261	111	
	3	8" Ductile Iron Pipe	3,720	L.F.	$ 2,095	111	
	4	10" Ductile Iron Pipe	4,523	L.F.	$ 3,528	111	
	5	4" Gate Valve	5	Ea.	$ 50	111	
	6	6" Gate Valve	16	Ea.	$ 218	111	
	7	8" Gate Valve	9	Ea.	$ 193	111	
	8	10" Gate Valve	4	Ea.	$ 139	111	
335	9	Fire Hydrant Assembly	18	Ea.	$ 1,131	111	
354	10	Excavation And Aggregate Backfill	15,147	L.F.	$ 3,938	111	
	11	Surface Restoration	15,147	L.F.	$ 5,513	111	
Total					$ 19,449		$ 1,556 [11]

Installation Years 1911 - 1920 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	374	L.F.	$ 194	102	
	2	6" Ductile Iron Pipe	1,068	L.F.	$ 623	102	
	3	8" Ductile Iron Pipe	733	L.F.	$ 617	102	
	4	12" Ductile Iron Pipe	5,837	L.F.	$ 7,183	102	
	5	4" Gate Valve	3	Ea.	$ 45	102	
	6	6" Gate Valve	6	Ea.	$ 122	102	
	7	8" Gate Valve	1	Ea.	$ 32	102	
	8	12" Gate Valve	16	Ea.	$ 1,145	102	
335	9	Fire Hydrant Assembly	18	Ea.	$ 1,690	102	
354	10	Excavation And Aggregate Backfill	8,012	L.F.	$ 3,113	102	
	11	Surface Restoration	8,012	L.F.	$ 4,359	102	
Total					$ 19,123		$ 1,530 [11]

Installation Years 1921 - 1930 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	6,414	L.F.	$ 4,798	92	
	2	6" Ductile Iron Pipe	6,934	L.F.	$ 5,836	92	
	3	8" Ductile Iron Pipe	2,050	L.F.	$ 2,492	92	
	4	10" Ductile Iron Pipe	420	L.F.	$ 707	92	
	5	12" Ductile Iron Pipe	3,697	L.F.	$ 6,568	92	
	6	4" Gate Valve	26	Ea.	$ 559	92	
	7	6" Gate Valve	28	Ea.	$ 825	92	
	8	8" Gate Valve	10	Ea.	$ 463	92	
	9	10" Gate Valve	3	Ea.	$ 224	92	
	10	12" Gate Valve	10	Ea.	$ 1,033	92	
335	11	Fire Hydrant Assembly	25	Ea.	$ 3,390	92	
354	12	Excavation And Aggregate Backfill	19,515	L.F.	$ 10,949	92	
	13	Surface Restoration	19,515	L.F.	$ 15,329	92	
Total					$ 53,173		$ 4,254 [11]

Distribution System Assets [14]

Installation Years 1941 - 1950 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	1,299	L.F.	$ 1,730	72	
	2	4" Gate Valve	3	Ea.	$ 115	72	
335	3	Fire Hydrant Assembly	1	Ea.	$ 241	72	
354	4	Excavation And Aggregate Backfill	1,299	L.F.	$ 1,298	72	
	5	Surface Restoration	1,299	L.F.	$ 1,817	72	
Total					$ 5,202		$ 416 [11]

Installation Years 1951 - 1960 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	10" Ductile Iron Pipe	618	L.F.	$ 3,460	62	
354	2	Excavation And Aggregate Backfill	618	L.F.	$ 1,153	62	
	3	Surface Restoration	618	L.F.	$ 1,615	62	
Total					$ 6,228		$ 498 [11]

Installation Years 1961 - 1970 [2]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	267	L.F.	$ 1,019	52	
	2	6" Ductile Iron Pipe	258	L.F.	$ 1,108	52	
	3	4" Gate Valve	2	Ea.	$ 219	52	
	4	6" Gate Valve	2	Ea.	$ 301	52	
354	5	Excavation And Aggregate Backfill	525	L.F.	$ 1,503	52	
	6	Surface Restoration	525	L.F.	$ 2,104	52	
Total					$ 6,255		$ 500 [11]

Installation Years 1971 - 1980 [3]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	2,269	L.F.	$ 19,486	42	
	2	6" Ductile Iron Pipe	12,362	L.F.	$ 119,436	42	
	3	8" Ductile Iron Pipe	11,528	L.F.	$ 160,880	42	
	4	10" Ductile Iron Pipe	6,492	L.F.	$ 125,446	42	
	5	12" Ductile Iron Pipe	3,412	L.F.	$ 69,593	42	
	6	16" Ductile Iron Pipe	462	L.F.	$ 11,407	42	
	7	4" Gate Valve	12	Ea.	$ 2,963	42	
	8	6" Gate Valve	41	Ea.	$ 13,864	42	
	9	8" Gate Valve	36	Ea.	$ 19,130	42	
	10	10" Gate Valve	10	Ea.	$ 8,588	42	
	11	12" Gate Valve	3	Ea.	$ 3,559	42	
	12	16" Gate Valve	1	Ea.	$ 3,650	42	
335	13	Fire Hydrant Assembly	38	Ea.	$ 59,150	42	
354	14	Excavation And Aggregate Backfill	36,525	L.F.	$ 235,259	42	
	15	Surface Restoration	36,525	L.F.	$ 329,363	42	
Total					$ 1,181,775		$ 165,449 [12]

Distribution System Assets [14]

Installation Years 1981 - 1990 [4]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	4" Ductile Iron Pipe	351	L.F.	$ 5,441	32	
	2	6" Ductile Iron Pipe	5,398	L.F.	$ 94,135	32	
	3	8" Ductile Iron Pipe	762	L.F.	$ 19,194	32	
	4	12" Ductile Iron Pipe	1,662	L.F.	$ 61,187	32	
	5	16" Ductile Iron Pipe	1,466	L.F.	$ 65,334	32	
	6	4" Gate Valve	4	Ea.	$ 1,783	32	
	7	6" Gate Valve	17	Ea.	$ 10,376	32	
	8	8" Gate Valve	5	Ea.	$ 4,796	32	
	9	12" Gate Valve	8	Ea.	$ 12,401	32	
	10	16" Gate Valve	8	Ea.	$ 52,704	32	
335	11	Fire Hydrant Assembly	13	Ea.	$ 36,525	32	
354	12	Excavation And Aggregate Backfill	9,639	L.F.	$ 112,063	32	
	13	Surface Restoration	9,639	L.F.	$ 156,888	32	
Total					$ 632,827		$ 88,596 [12]

Installation Years 1991 - 2000 [5]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	6" Ductile Iron Pipe	7,301	L.F.	$ 167,085	22	
	2	8" Ductile Iron Pipe	3,867	L.F.	$ 127,829	22	
	3	6" Gate Valve	32	Ea.	$ 25,631	22	
	4	8" Gate Valve	18	Ea.	$ 22,656	22	
335	5	Fire Hydrant Assembly	23	Ea.	$ 84,802	22	
354	6	Excavation And Aggregate Backfill	11,168	L.F.	$ 170,388	22	
	7	Surface Restoration	11,168	L.F.	$ 238,543	22	
Total					$ 836,934		$ 117,171 [12]

Installation Years 2001 - 2010 [6]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Estimated Original Cost [1]	Age	Overhead Costs
331	1	6" Ductile Iron Pipe	555	L.F.	$ 17,269	12	
	2	8" Ductile Iron Pipe	23,914	L.F.	$ 1,074,768	12	
	3	10" Ductile Iron Pipe	964	L.F.	$ 59,989	12	
	4	12" Ductile Iron Pipe	8,534	L.F.	$ 560,564	12	
	5	16" Ductile Iron Pipe	1,517	L.F.	$ 120,624	12	
	6	6" Gate Valve	2	Ea.	$ 2,178	12	
	7	8" Gate Valve	96	Ea.	$ 164,284	12	
	8	10" Gate Valve	2	Ea.	$ 5,531	12	
	9	12" Gate Valve	19	Ea.	$ 52,549	12	
	10	16" Gate Valve	4	Ea.	$ 47,017	12	
335	11	Fire Hydrant Assembly	55	Ea.	$ 275,708	12	
354	13	Excavation And Aggregate Backfill	35,454	L.F.	$ 735,421	12	
	14	Surface Restoration	35,454	L.F.	$ 1,029,589	12	
Total					$ 4,145,491		$ 580,369 [12]

Distribution System Assets [14]

Installation Years 2011 - 2018 [7]							
NARUC Code	Item No.	Description	Est. Qty.	Unit	Actual Costs	Age	Overhead Costs
331	1	2016 Pine/Harrisburg Streets Replacement Project[8]	-	-	$ 1,386,505	2	228,174 [13]
	2	2017 Mulberry/Bessemer Replacement Project[9]	-	-	$ 172,952	1	75,850 [13]
	3	2017 Ugies Water Main Installation Project[10]	-	-	$ -	1	40,900 [13]
Total					$ 1,559,457		344,924
Total					**$ 8,465,914**		**$ 1,305,262**

Footnotes:

[1] Estimated using HRG's projects with known costs or using RSMeans Data. Original cost calculated by determining construction cost in 2018 dollars and using the ENR's historical cost index to adjust the cost to the installation year. Information provided spanned a decade as shown and; therefore, average ENR index for that given decade was used.

[2] New water main construction. Lengths do not include water main pipe that has been replaced.

[3] 33,147 feet of water main was new construction. 3,378 feet of water main was replaced.

[4] 8,833 feet of water main was new construction. 806 feet of water main was replaced.

[5] 1,156 feet of water main was new construction. 10,091 feet of water main was replaced.

[6] 2,898 feet of water main was new construction. 32,586 feet of water main was replaced.

[7] 1,783 feet of water main was new construction. 5,773 feet of water main was replaced.

[8] The 2016 Pine/Harrisburg streets water project included replacing approximately 5,205 feet of 8-inch diameter water main. Majority of the project was performed in PennDOT's right-of-way. Also, approximately $312,630 of water service line replacement was part of this project. The $312,630 is not included in the dollar amount shown in the table because the water service lines are owned by the property owners. This project also included sanitary sewer work but the cost shown in the table is only for the water system work. The costs shown in the table does not include pavement restoration because the paving was performed by PennDOT as part of their paving project.

[9] The 2017 Mulberry/Bessemer water project included replacing approximately 840 feet of 6-inch diameter water main. This project also included sanitary sewer work, but the cost shown in the table is only for the water system work. The cost includes pavement restoration.

[10] The 2017 UGIES project included installing approximately 1,511 feet of 20-inch water main. The actual cost is not known, but it is estimated at $481,665. This project was built and paid for by the developer and dedicated to the Authority.

[11] Estimated at 8% of original cost for engineering design.

[12] Estimated at 14% of original cost that consists of 8% for engineering design, 4% for permitting and 2% for bidding.

[13] Actual engineering expense.

[14] The estimated linear foot of water pipe shown was obtained from a WaterCAD model that consists of a GIS map performed in 2003 and information collected between 2003 through 2016 from Steelton Borough Authority staff. HRG can not confirm the accuracy of the information. To the best of HRG knowledge, the approximate lengths are the most accurate data available at the time of preparing this report. The total length does not include abandoned pipe, private pipe, or fire hydrant laterals, etc.