

# **Chester Housing Authority**

Calendar Year Report

**Guarantee Year 7 of 12**

January 2016 through December 2016



*Helping customers manage energy resources to improve financial performance*

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## **1.0 Overview**

# Program Overview

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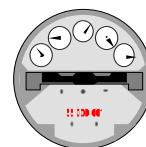
## Measurement & Verification Services

Honeywell is pleased to provide this comprehensive report of your energy consumption. This report was processed using an industry-standard program based on proven and accepted engineering formulas for energy conservation and analysis.

<b>Service Contract Number:</b>	40105934
<b>Baseline Period:</b>	Average of 2004, 2005 & 2006
<b>Guarantee Period:</b>	January 2011 - December 2021
<b>Guarantee Term:</b>	12 Years
<b>Report Preparation By:</b>	Honeywell -Americas M&V Services: Charlie Hanna, M&V Specialist Joel Bruedigam, Energy Analyst
<b>Current Reporting Period:</b>	January 2016 through December 2016



## Locations Included in Report



- PA-61 Ruth L. Bennett
- PA-62 William Penn Housing
- PA-63 Chatham Estates Family

# Methodology

ECM #	ECM Description	Post-Installation Option	Performance Period Option
1,2,3	Retrofit Common, Tenant Area and Exterior Lighting	B	A
4	Water Conservation	B	A (for Chatham Gas), C, for gas/water meters identified in D.1.4.1.1
7	High Limit Thermostats	A	C- for selected gas meters in D.1.4.1.1
8	Hot Water Boiler and Domestic HW Heater Replacement	A	C- for selected gas meters in D.1.4.1.1

Excerpt from Schedule B:

“**Option A**” is a verification approach that is designed for projects in which the potential to perform needs to be verified, but the actual performance can be stipulated based on the results of the “potential to perform and generate Savings” verification and engineering calculations. Option A involves procedures for verifying that:

- Baseline conditions have been properly defined; and
- The equipment and/or systems that were contracted to be installed have been installed; and
- The installed equipment components or systems meet the specifications of the contract in terms of quantity, quality, and rating; and
- The installed equipment is operating and performing in accordance with the specifications in the contract and meeting all functional tests.

“**Option B**” is for projects in which the potential to perform and generate Savings needs to be verified; and actual performance needs to be measured (verified). Option B involves procedures for verifying the same items as Option A plus verifying actual performance of equipment component or system. Performance verification techniques involve engineering calculations with metering and monitoring for verifying that:

- The installed equipment components or systems *at the end of the construction period* meet the specifications of the contract in terms of quantity, quality and rating, and operation and functional performance.

“**Option C**” is also for projects in which the potential to perform needs to be verified and actual performance during the term of the contract needs to be verified. Option C involves procedures for verifying the same items as Option A plus verifying actual achieved energy savings during the term of the contract. Performance verification techniques involve utility whole building meter analysis.

“**Option D**” is a verification technique where calibrated simulations of the baseline energy use and/or calibrated simulations of the post-installation energy consumption are used to measure Savings from the Energy Conservation Measures. Option D can involve measurements of energy use both before and after the Retrofit for specific equipment or energy end use as needed to calibrate the simulation program. Periodic inspections of the equipment may also be warranted. Energy consumption is calculated by developing calibrated hourly simulation models of whole-building energy use, or equipment sub-systems in the baseline mode and in the post-installation mode and comparing the simulated annual differences for either an average year or for conditions that correspond to the specific year during either the baseline or post-installation period.

## **2.0 Summary**

# Executive Summary

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Honeywell is pleased to provide the Chester Housing Authority(CHA) , with this Year One Energy Audit Report. This report was prepared using engineering formulas for energy conservation, analysis, onsite interviews with building operators and documented on-site observations.

The Chester Housing Authority, Energy Conservation Project Phase I, is now being managed in the Service and Measurement and Verification (M&V) phase of the project.

The M&V performance period requirements for this project are consistent with and based upon discussions and agreements between representatives from Honeywell International Inc., HUD, and the Winder Housing Authority.

The Energy Conservation Measures (ECMs) that were a part of this project are the following:

- Common and Tenant Area Lighting
- Exterior Lighting
- Water Conservation
- High Limit Thermostats
- HW and DHW Boiler Replacement

The annual energy savings have been summarized on the following pages. These savings include the amounts guaranteed by Honeywell per Schedule D of the contract that will cover debt service payments and service costs each year. ECMs are funded through the Add-On Subsidy and Tenant Paid Allowances.

# Energy Cost Avoidance Summary

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## January 2016 - December 2016

Water Savings (Option C)	\$222,033
Gas Savings (Option C)	\$25,724
Electric Savings (Option A)	\$27,288
Rolling Base Year Savings (Stipulated)	\$ -
Adjustments	<u>\$10,647</u>
Total Energy Cost Avoidance	\$285,691
Annual Guarantee	\$ 283,948
Rolling Base Year Savings (Stipulated)	<u>\$ -</u>
	\$283,948
Net Results	\$1,743
Percent of Plan	100.6%



## Savings by Utility Type

ECM #	ECM Description	Total Annual Savings	Annual Energy Savings Natural Gas	Annual Energy Savings Electric	Annual Water Sewer Savings
1	Common Area Lighting Retrofit	\$4,324		\$4,323	
2	Tenant Area Lighting Retrofit	\$14,155		\$14,155	
3	Exterior Lighting Retrofit	\$13,677		\$13,677	
4	Water Retrofit	\$149,991	\$40,403	\$0	\$109,589
5	Building Weatherstripping & Caulk				
6	Attic and Crawl Space Insulation				
7	High Limit Thermostats	\$14,408	\$14,408		
8	HW and DHW Boiler Replacement	\$46,473	\$46,473		
		\$243,028	\$101,283	\$32,155	\$109,589

### Year 7

ECM #	ECM Description	Tennant Paid Allowances	Total Annual Savings	Frozen Base Year
1	Common Area Lighting Retrofit		\$4,323	
2	Tenant Area Lighting Retrofit		\$14,155	
3	Exterior Lighting Retrofit		\$13,677	
4	Water Retrofit		\$179,098	
5	Building Weatherstripping & Caulk			
6	Attic and Crawl Space Insulation			
7	High Limit Thermostats		\$17,203	
8	HW and DHW Boiler Replacement		\$55,490	
	Savings w/out Rolling Base Year Savings		\$283,947	
	Rolling Base Year Savings		\$0	
	<b>Year 7 Guaranteed Savings Total:</b>		\$283,947	

# Option C Utility Analysis

## All Water

### Reference

	Jan 2006	Feb 2006	Mar 2006	Apr 2006	May 2006	Jun 2006	Jul 2005	Aug 2005	Sep 2005	Oct 2005	Nov 2005	Dec 2005
Month Use	6,302	6,899	5,939	5,985	6,182	42,985	6,469	6,062	6,747	6,184	5,788	44,674
YTD Use	6,302	13,201	19,140	25,125	31,307	74,292	80,761	86,823	93,570	99,754	105,542	150,216
Month \$	\$11,630	\$12,459	\$10,925	\$10,963	\$11,325	\$125,251	\$11,421	\$11,227	\$12,509	\$11,416	\$10,802	\$130,767
YTD \$	\$11,630	\$24,089	\$35,014	\$45,977	\$57,302	\$182,553	\$193,974	\$205,201	\$217,710	\$229,126	\$239,928	\$370,695

### Baseline

	Jan 2006	Feb 2006	Mar 2006	Apr 2006	May 2006	Jun 2006	Jul 2005	Aug 2005	Sep 2005	Oct 2005	Nov 2005	Dec 2005
Month Use	6,302	6,899	5,939	5,985	6,182	42,985	6,469	6,062	6,747	6,184	5,788	44,674
YTD Use	6,302	13,201	19,140	25,125	31,307	74,292	80,761	86,823	93,570	99,754	105,542	150,216
Month \$	\$16,106	\$18,237	\$15,598	\$15,857	\$16,396	\$176,963	\$17,375	\$16,672	\$17,673	\$16,189	\$15,078	\$185,146
YTD \$	\$16,106	\$34,343	\$49,941	\$65,799	\$82,194	\$259,157	\$276,533	\$293,204	\$310,877	\$327,065	\$342,143	\$527,289

### Average of 2011 - 2012

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Month Use	3,630	3,853	3,520	3,688	4,463	26,253	4,283	3,818	3,808	3,789	4,167	22,964
YTD Use	3,630	7,483	11,003	14,691	19,153	45,406	49,689	53,506	57,314	61,103	65,269	88,233
Month \$	\$9,733	\$10,331	\$9,437	\$9,888	\$11,965	\$107,411	\$11,482	\$10,236	\$10,210	\$10,158	\$11,171	\$93,234
YTD \$	\$9,733	\$20,064	\$29,500	\$39,389	\$51,354	\$158,764	\$170,247	\$180,482	\$190,692	\$200,850	\$212,022	\$305,256

### Use Avoidance

Month Use	2,672	3,046	2,420	2,297	1,720	16,732	2,186	2,245	2,939	2,396	1,622	21,711
YTD Use	2,672	5,718	8,138	10,435	12,154	28,886	31,073	33,317	36,256	38,652	40,273	61,984

### Cost Avoidance

Month Use \$	\$6,373	\$7,907	\$6,162	\$5,969	\$4,431	\$69,552	\$5,893	\$6,436	\$7,463	\$6,031	\$3,906	\$91,912
YTD \$	\$6,373	\$14,279	\$20,441	\$26,410	\$30,841	\$100,393	\$106,286	\$112,722	\$120,185	\$126,215	\$130,122	\$222,033

# Option C Utility Analysis

## All Gas

### Reference

	Jan 2006	Feb 2006	Mar 2006	Apr 2006	May 2006	Jun 2006	Jul 2005	Aug 2005	Sep 2005	Oct 2005	Nov 2005	Dec 2005
Month Use	5,829	5,210	5,316	2,253	705	706	993	209	427	939	2,791	5,624
YTD Use	5,829	11,039	16,355	18,608	19,313	20,019	21,012	21,221	21,648	22,587	25,378	31,002
Month \$	\$68,028	\$60,797	\$62,040	\$26,282	\$8,222	\$8,233	\$11,583	\$2,439	\$4,978	\$10,953	\$32,566	\$65,629
YTD \$	\$68,028	\$128,825	\$190,865	\$217,147	\$225,369	\$233,602	\$245,185	\$247,624	\$252,602	\$263,555	\$296,121	\$361,750

### Baseline

	Jan 2006	Feb 2006	Mar 2006	Apr 2006	May 2006	Jun 2006	Jul 2005	Aug 2005	Sep 2005	Oct 2005	Nov 2005	Dec 2005
Month Use	5,537	5,893	3,186	2,250	1,406	597	513	496	548	732	2,142	5,012
YTD \$	\$77,143	\$159,234	\$203,611	\$234,951	\$254,534	\$262,846	\$269,996	\$276,908	\$284,535	\$294,740	\$324,570	\$394,390

### Average of 2011 - 2012

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Month Use	4,768	4,004	3,421	2,596	1,154	860	778	706	800	1,033	2,677	3,672
YTD Use	4,768	8,771	12,192	14,788	15,942	16,801	17,579	18,284	19,085	20,118	22,794	26,466
Month \$	\$66,412	\$55,769	\$47,648	\$36,162	\$16,075	\$11,973	\$10,831	\$9,828	\$11,151	\$14,390	\$37,284	\$51,144

### Use Avoidance

Month Use	770	1,890	(235)	(346)	252	(263)	(265)	(210)	(252)	(301)	(535)	1,341
YTD Use	770	2,659	2,425	2,079	2,330	2,068	1,803	1,594	1,341	1,040	506	1,846

### Cost Avoidance

Month Use \$	\$10,731	\$26,322	(\$3,271)	(\$4,822)	\$3,508	(\$3,661)	(\$3,681)	(\$2,916)	(\$3,524)	(\$4,185)	(\$7,454)	\$18,676
YTD \$	\$10,731	\$37,053	\$33,783	\$28,960	\$32,468	\$28,807	\$25,126	\$22,211	\$18,687	\$14,502	\$7,048	\$25,724

# Guarantee Table

## I. Schedule of Savings

The total cost avoidance over the Term of the contract is equal to or greater than \$3,785,620 as defined in the table below (comprised of energy and rolling base year cost avoidance): This table reflects Honeywell's annual guarantee, which will provide the Customer the amount needed to cover the principal amount to be paid to a financial institution, the interest amount to be paid to a financial institution, and on going M&V costs to be paid to Honeywell, for each performance year. The total shown is the cost of the project over the 12 year term (see projected cash flow at end of this schedule D.1.a).

Project: Chester Housing Authority				Annual Guarantee Summary						Honeywell		
Phase 1 Price	\$	2,761,582										
Buyout Penalty												
Phase 1B Price	\$	-										
Const. Fin.	\$	-										
(Construction interest included in first payment on Susquehanna Bank Amortization schedule)												
RBV Buy Down	\$	-										
Total Financed	\$	2,761,582										
Term		12 Years										
Rate		4.05%										
Overall Guarantee %		87.02%										
60.05% RBV dollars used to fund project.												
Escalation Over Term	Savings			Service			Amortization			P+I+Service = Honeywell Guarantee	Savings %  Guaranteed by HW	
	Energy 15.9%	RBV 0.0%	Total	MECH Services Variable	M&V 3.0%	Total	Interest	Principal	Balance			
0 Year 1	\$ 243,028	\$ 140,994	\$ 384,021	\$ -	\$ 13,306	\$ 13,306	\$ 217,769	\$ 152,945	\$ 2,608,637	\$ 384,020	72.68%	
1 Year 2	\$ 249,354	\$ 130,738	\$ 380,092	\$ -	\$ 13,705	\$ 13,705	\$ 101,769	\$ 264,617	\$ 2,344,021	\$ 380,091	80.14%	
2 Year 3	\$ 255,870	\$ 89,436	\$ 345,306	\$ -	\$ 14,116	\$ 14,116	\$ 91,409	\$ 239,790	\$ 2,104,240	\$ 345,305	82.77%	
3 Year 4	\$ 262,581	\$ 45,891	\$ 308,472	\$ -	\$ 14,540	\$ 14,540	\$ 82,122	\$ 211,810	\$ 1,892,431	\$ 308,472	86.46%	
4 Year 5	\$ 269,494	\$ -	\$ 269,494	\$ -	\$ 14,976	\$ 14,976	\$ 74,042	\$ 180,475	\$ 1,711,956	\$ 269,493	92.00%	
5 Year 6	\$ 276,614	\$ -	\$ 276,614	\$ -	\$ 15,425	\$ 15,425	\$ 66,394	\$ 194,794	\$ 1,517,162	\$ 276,613	92.00%	
6 Year 7	\$ 283,948	\$ -	\$ 283,948	\$ -	\$ 15,888	\$ 15,888	\$ 58,146	\$ 209,913	\$ 1,307,249	\$ 283,947	92.00%	
7 Year 8	\$ 291,502	\$ -	\$ 291,502	\$ -	\$ 16,365	\$ 16,365	\$ 49,264	\$ 225,872	\$ 1,081,377	\$ 291,501	92.00%	
8 Year 9	\$ 299,282	\$ -	\$ 299,282	\$ -	\$ 16,856	\$ 16,856	\$ 39,712	\$ 242,714	\$ 838,663	\$ 299,282	92.00%	
9 Year 10	\$ 307,296	\$ -	\$ 307,296	\$ -	\$ 17,361	\$ 17,361	\$ 29,454	\$ 260,490	\$ 578,193	\$ 307,295	92.00%	
10 Year 11	\$ 315,550	\$ -	\$ 315,550	\$ -	\$ 17,882	\$ 17,882	\$ 18,452	\$ 279,215	\$ 298,968	\$ 315,549	92.00%	
11 Year 12	\$ 324,052	\$ -	\$ 324,052	\$ -	\$ 18,419	\$ 18,419	\$ 6,665	\$ 298,968	\$ -	\$ 324,052	92.00%	
<b>Total</b>	<b>\$ 3,378,571</b>	<b>\$ 407,050</b>	<b>\$ 3,785,631</b>	<b>\$ -</b>	<b>\$ 188,830</b>	<b>\$ 188,830</b>	<b>\$ 835,199</b>	<b>\$ 2,761,582</b>	<b>\$ -</b>	<b>\$ 3,785,620</b>	<b>87.02%</b>	

# Option A Savings

	Gas		Electric		Water & Sewer		Total Savings
	\$	MCF	\$	kWh	\$	Mgal	
Common Lighting			\$8,627	88,301			\$8,627
Tenant Lighting			\$12,352	126,425			\$12,352
Exterior lighting			\$6,309	64,575			\$6,309
Kitchen Aerators							\$0
Bathroom Aerators							\$0
Showerheads							\$0
Water Closets							\$0
High Limit Thermostats							\$0
Replace Boilers in Rhodes & Eisenhower							\$0
<b>TOTAL</b>	<b>\$0</b>	<b>0</b>	<b>\$27,288</b>	<b>279,301</b>	<b>\$0</b>	<b>0</b>	<b>\$27,288</b>

# Site Observations

Project: Chester Housing Authority

Inspection Date: 06/02/2016

## ECM: Water Conservation & Lighting

	Site	Unit	Lighting (Tenant, Common areas, & Site)	Kitchen	Bathroom	Shower	WC
				1.5 GPM	0.5 GPM	2.0 GPM	1.6 GPF
1	Bennett Homes	1406	x	2.2	1.5	x	x
2	Bennett Homes	1113	x	x	x	x	x
3	Bennett Homes	1007	x	x	x	x	x
4	Bennett Homes	1310	x	1.8	1.2	x	x
5	Bennett Homes	1419	x	x	x	x	x
6	Bennett Homes	1425	x	x	x	x	x
7	Bennett Homes	1436	x	2.2	x	x	x
8	William Penn	303	x	2.2	1.5	x	x
9	William Penn	315	x	2.2	x	x	x
10	William Penn	405	x	2.2	x	x	x
11	William Penn	408	x	x	x	x	Note 2
12	William Penn	516	x	x	x	x	x
13	William Penn	518	x	x	x	x	x
14	William Penn	301	x	2.2	x	x	x
15	William Penn	417	x	x	x	x	x
16	William Penn	520	x	2.2	1.5	x	x

**Notes:**

1- x - Proper fixture is in place and functional.

2- The tub fixture had been running for weeks.

# Site Observations

Project: Chester Housing Authority

Inspection Date: 06/02/2016

## ECM: Limiting Thermostats

	Site	Unit #	Occ Heat	limit Heat
1	William Penn	303	75	74
2	William Penn	315	76	74
3	William Penn	405	75	74
4	William Penn	408	71	74
5	William Penn	516	76	74
6	William Penn	518	72	74
7	William Penn	301	75	74
8	William Penn	417	72	74
9	William Penn	520	76	74
10	William Penn	522	75	74
11	William Penn	309	75	74

**Notes:**

**1- No issues were reported by the residents.**

## ECM: Miscellaneous

ECM Description	Notes
Boilers, Pumps, and Hot Water Heaters	No issues were reported. All in place and functional.

## **3.0 Review Detail**



# ECM 1,2,3 - Lighting

ECM	Annual kWh Energy Saved	Annual Savings Using Blended Rate
Common Area	88,301	\$8,627
Tenant Area	126,425	\$12,352
Exterior Lighting	64,575	\$6,309
		<b>\$27,288</b>

## Common Area Lighting

Retrofit existing fluorescent lighting fixtures with T-8 lamps and electronic ballasts. Replace incandescent bulbs (where feasible) with screw-in compact fluorescent lamps. Replace incandescent fixtures (where practical) with fluorescent fixtures. Company will properly dispose of all lamps and fixtures in accordance with all EPA requirements and standards for "hazardous materials." Company's cost does not cover replacing any cracked or yellowed lenses of the fixtures that are to be retrofitted with new bulbs and ballasts.

Site #	Site Name	Electric Blended Rate	kW Demand Saved	Annual kWh Energy Saved	Average Annual Operating Hours	Annual Savings Using Blended Rate
PA-61	Ruth L. Bennett	\$ 0.0977	6.7	58,517	8760	\$5,717
PA-62	William Penn Housing	\$ 0.0977	3.4	29,784	8760	\$2,910

## Tenant Area Lighting

Retrofit existing fluorescent lighting fixtures with T-8 lamps and electronic ballasts. Replace incandescent bulbs (where feasible) with screw-in compact fluorescent lamps. Replace incandescent fixtures (where practical) with fluorescent fixtures. Company will properly dispose of all lamps and fixtures in accordance with all EPA requirements and standards for "hazardous materials." Company's cost does not cover replacing any cracked or yellowed lenses of the fixtures that are to be retrofitted with new bulbs and ballasts.

Site #	Site Name	Electric Blended Rate	kW Demand Saved	Average Annual Operating Hours	Annual kWh Energy Saved at 100% occupancy	Annual Savings Using Blended Rate at Actual occupancy
PA-61	Ruth L. Bennett	\$ 0.0977	86.9	1500	130,335	\$12,352

## Exterior Lighting

Replace existing incandescent, metal halide, and high pressure sodium outdoor fixtures that are owned by the housing authority with new fixtures using compact fluorescent or T5 lamps. All retrofits are to maintain or increase existing lighting levels.

Site #	Site Name	Electric Blended Rate	kW Demand Saved	Average Annual Operating Hours	Annual kWh Energy Saved at 100% occupancy	Annual Savings Using Blended Rate at Actual occupancy
PA-61	Ruth L. Bennett	\$ 0.0977	16.9	4015	67,974	\$6,309

# ECM 4 - Water Conservation

ECM	Gas	Electric	Water
Faucet Aerator	\$19,752		\$59,794
Showerheads	\$12,813		\$35,417
Water Closets	\$7,838		\$14,377
	<b>\$40,403</b>		<b>\$109,589</b>

## Faucet Aerators

Replace all aerators in Bathrooms with new 0.5 gpm and Kitchens with new 1.5 gpm low flow type.

## Showerheads/Wands

Replace all showerheads and hand held shower wands in all bathrooms that have these items presently with new 2.0 gpm low flow type.

## Water Closets

Replace 3.5 gpf and 1.6 gpf water closets with new 1.0 gpf pressure assisted water closets to save water consumption.

## Savings Calc's for Kitchen Aerators

Site #	Site Name	Existing Quantity	New Quantity	Existing GPM	New GPM	Minutes per Day	Max # of Residents	% of Occupancy	1000 gallons Water Saved	DHW Eff	Annual Savings		
											Gas	Electric	Water
PA-61	Ruth L. Bennett	269	269	2.20	1.50	10.00	735	97.00%	1,723.59	80.0%	\$ 4,686		\$ 11,429
PA-63	Chatham Estates	110	110	2.20	1.50	10.00	302	97.00%	348.46	80.0%	\$ -		\$ 2,311
PA-62	William Penn Housing	160	160	2.20	1.50	10.00	416	97.00%	828.89	80.0%	\$ 2,254		\$ 5,496
									<b>2,900.94</b>		<b>\$ 6,940</b>		<b>\$ 19,236</b>

% of cold water that is heated: 37%

## Savings Calc's for Bathroom Aerators

Site #	Site Name	Existing Quantity	New Quantity	Existing GPM	New GPM	Minutes per Day	Max # of Residents	% of Occupancy	1000 gallons Water Saved	DHW Eff	Annual Savings		
											Gas	Electric	Water
PA-61	Ruth L. Bennett	299	299	2.00	0.50	10.00	735	97.00%	2,803.30	80.0%	\$ 7,622		\$ 18,589
PA-63	Chatham Estates	154	154	2.00	0.50	10.00	302	97.00%	1,403.85	80.0%			\$ 9,309
PA-62	William Penn Housing	218	218	2.00	0.50	10.00	416	97.00%	1,909.27	80.0%	\$ 5,191		\$ 12,660
									<b>6,116.42</b>		<b>\$ 12,813</b>		<b>\$ 40,558</b>

## Savings Calc's for Showerheads

Site #	Site Name	Existing Quantity	New Quantity	Existing GPM	New GPM	Minutes per Day	Max # of Residents	% of Occupancy	1000 gallons Water Saved	DHW Eff	Annual Savings		
											Gas	Electric	Water
PA-61	Ruth L. Bennett	299	299	3.50	2.00	10.00	735	97.00%	2,803.30	80.0%	\$ 5,545		\$ 18,589
PA-63	Chatham Estates	122	122	3.00	2.00	10.00	302	97.00%	1,069.23	80.0%			\$ 7,090
PA-62	William Penn Housing	177	177	3.00	2.00	10.00	416	97.00%	1,468.68	80.0%	\$ 2,293		\$ 9,739
									<b>5,341.21</b>		<b>\$ 7,838</b>		<b>\$ 35,417</b>

## Savings Calc's for Water Closets

Site #	Site Name	Existing Quantity	New Quantity	Existing GPM	New GPM	Minutes per Day	Max # of Residents	% of Occupancy	1000 gallons Water Saved	DHW Eff	Annual Savings		
											Gas	Electric	Water
PA-61	Ruth L. Bennett	299	299	1.90	1.00	6.00	736	97.00%	1,207.14				\$ 8,005
PA-63	Chatham Estates	154	154	1.90	1.00	6.00	302	97.00%	377.38				\$ 2,502
PA-62	William Penn Housing	218	218	2.00	1.00	6.00	416	97.00%	583.71				\$ 3,871
									<b>2,168.23</b>				<b>\$ 14,377</b>

# ECM 7 - High Limit Thermostats

ECM	Gas	Electric	Water
High Limit Thermostats	\$14,408		

Replace existing wall mounted room thermostats with new temperature limiting thermostats compatible with the heating and cooling systems at each site.

## PA-9-03

### PA-9-04

#### Savings Calculations and Cost Estimates

Existing estimated average winter room temperature: **79**

Proposed maximum room temperature: **75**

**Building:** All Buildings Listed Below

% of original room temperature: **94.94%**

**ECM:** Install Thermostats to Limit High Temperature Setting to 75 degrees

Site #	Site Name	# of Living Units	Bldg Sq. Feet	Gas Cost \$/MCF	% of Units Occupied	Present Gas Heating Costs		Annual Gas Savings
							Heating	
PA-9-17	Scattered Sites	0	0	\$11.67	95.0%		\$232,663	\$11,191
	William Penn Housing	0	0	\$11.67	95.0%		\$66,869	\$3,216
	<b>Total</b>	<b>0</b>	<b>0</b>				<b>\$299,532</b>	<b>\$14,408</b>

# ECM 8 - Replace Boilers in Ruth L. Bennett

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ECM	Gas	Electric	Water
Replace Boilers in Ruth L. Bennett	\$46,473		

Install one (1) new high efficiency (87% minimum) gas-fired hot water boiler (or approved equal). The boiler shall be 300 Boiler HP with a heating output capacity of 10,000 MBH capable of producing 180 °F to 200°F hot water. The boiler shall have a turndown ratio of 4:1 that will modulate the boiler's output down to twenty-five (25) percent of full output capacity.

Keep one of the existing 400 HP Kewanee gas-fired steam boilers. Recondition the burner. Provide new operating and safety controls. The boiler to be used for standby.

Install two (2) new 1,400 gpm hot water circulating pumps with 40 hp high efficiency electric motors. Select pumps to meet the proper head.

**Sites: Ruth L. Bennett**

**ECM: Replace Heating and Domestic Hot Water Boilers**

**Savings Calculation:**

	Existing Heating cost	Existing efficiency	Proposed efficiency	Occupancy rate	Annual Gas Savings
Ruth L. Bennett	\$ 237,831	70%	87%	Bldg 100% htd	\$46,473

## **4.0 Adjustments**

# Adjustment Summary

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<b>Site #</b>	<b>Site Name</b>	<b>Water/Sewer</b>	<b>Gas</b>	<b>T-Stats</b>	<b>Total</b>
PA-61	Ruth L. Bennett		(\$410)	\$8,139.19	\$7,729
PA-63	Chatham Estates Family		-	-	\$0
PA-62	William Penn Housing	\$1,687	\$1,231	-	\$2,918
			<b>Total Adjustments</b>		<b>\$10,647</b>

# Water, Sewer & Gas Adjustments

## Ruth L. Bennett - Water

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	1,549	2,009	1,526	1,499	2,235	1,639	1,407	1,749	1,807	1,749	2,193	2,193	21,555
2012	2,193	2,143	2,143	2,143	2,960	2,960	2,960	1,768	1,768	1,768	1,767	1,767	26,340
Average	1,871	2,076	1,835	1,821	2,598	2,300	2,184	1,759	1,788	1,759	1,980	1,980	23,948

## Ruth L. Bennett - Sewer

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	0	0	0	0	0	13,097	0	0	0	0	0	9,800	22,897
2012	0	0	0	0	0	12,073	0	0	0	0	0	6,580	18,653
Average	0	0	0	0	0	12,585	0	0	0	0	0	8,190	20,775

## Ruth L. Bennett - Gas

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	3,587	2,905	2,465	2,203	565	482	457	409	513	576	2,020	2,245	18,427
2012	3,034	2,518	2,266	1,776	1,082	754	717	634	639	841	2,017	2,737	19,015
Average	3,311	2,712	2,366	1,990	824	618	587	522	576	709	2,019	2,491	18,721

## Chatham Estates Family - Water

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	664	734	604	550	628	587	676	627	702	512	594	713	7,591
2012	1,022	561	608	748	931	1,052	1,121	1,502	1,335	1,576	1,725	1,701	13,882
Average	843	648	606	649	780	820	899	1,065	1,019	1,044	1,160	1,207	10,737

## Chatham Estates Family - Sewer

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	0	0	0	0	0	3,165	0	0	0	0	0	3,480	6,645
2012	0	0	0	0	0	3,715	0	0	0	0	0	4,835	8,550
Average	0	0	0	0	0	3,440	0	0	0	0	0	4,158	7,598

## William Penn - Water

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2011	830	896	795	1,073	697	951	927	958	973	941	1,023	1,023	11,087
2012	1,002	1,363	1,363	1,363	1,474	1,474	1,474	1,031	1,031	1,031	1,031	1,031	14,668
Average	916	1,130	1,079	1,218	1,086	1,212	1,201	995	1,002	986	1,027	1,027	12,878

# Water & Sewer Adjustments

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## Occupancy

Site #	Site Name	Baseline Occupancy %	2016 Occupancy %	Baseline Use (kgal)	Adjusted Use (kgal)	Adjustment (kgal)	Water (\$/kgal)	Sewer (\$/kgal)	Total
PA-61	Ruth L. Bennett	97.0	96.87	30,732	30,691	(41)	\$2.52	\$4.37	(\$282)
PA-63	Chatham Estates Family	97.0	99.55	9,400	9,647	247	\$2.97	\$4.37	\$1,810
PA-62	William Penn Housing	97.0	97.97	24,113	24,354	241	\$2.64	\$4.37	\$1,687
<b>Total Water &amp; Sewer Adjustment</b>									<b>\$3,215</b>



# Gas Adjustments

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Site #	Site Name	Baseline Occupancy %	2016 Occupancy %	Baseline Use (MCF)	Adjusted Use (MCF)	Adjustment (MCF)	\$/MCF	Total
PA-61	Ruth L. Bennett	97.0	96.87	22,151	22,122	(29)	\$13.93	(\$410)
PA-62	William Penn Housing	97.0	97.97	8,846	8,934	88	\$13.93	\$1,231
<b>Total Gas Adjustment</b>								<b>\$820</b>

## **5.0 Appendix**

**Chester Housing Authority**  
Chester, Pennsylvania

**Final Baseline Utilities**

**Total Utilities for Entire Authority**

Site #	Site Name	PECO			PECO			Delcora			Total
		Natural Gas			Electric			Water			
		MCF/yr.	Cost/yr.	\$ per MCF	kWh/yr.	Cost/yr.	\$ per kWh	1000 Gal/yr.	Cost/yr.	\$ per 1000 Gallons	Cost/yr.
PA-9-01	Ruth L. Bennett	22,151	\$ 258,514	\$11.67	3,259,400	\$ 318,460	\$ 0.0977	30,732	\$ 177,322	\$5.77	\$ 754,296
PA-9-02	Chatham Estates Family	-	\$ -	\$11.67	-	\$ -	\$ 0.0977	9,400	\$ 54,240	\$5.77	\$ 54,240
PA-9-03	William Penn Housing	8,846	\$ 103,238	\$11.67	1,502,624	\$ 146,814	\$ 0.0977	24,113	\$ 139,131	\$5.77	\$ 389,183
		<b>30,997.0</b>	<b>\$ 361,752</b>	<b>\$11.67</b>	<b>4,762,024</b>	<b>\$ 465,274</b>	<b>\$ 0.0977</b>	<b>64,245</b>	<b>\$ 370,694</b>	<b>\$5.77</b>	<b>\$ 1,197,719</b>

From 52722A 2006 subsidy request: 30,997.0 \$ 361,752 \$ 11.6705 4,762,024 \$ 465,274 \$ 0.0977 64,245 \$ 1,667,929 \$ 25.9620

Summary of Final Utility Rates:

	FYE 3 31 2004	FYE 3 31 2005	FYE 3 31 2006	FYE 3 31 2007
Gas	\$ 11.2189	\$ 12.3482	\$ 11.5950	\$ 11.6705 per MCF
Electric	\$ 0.0608	\$ 0.0640	\$ 0.0629	\$ 0.0977 per kWh
Water & Sewer	\$ 4.9678	\$ 6.7663	\$ 6.7221	\$ 25.9620 per 1000 Gallons

Current Subsidy Request

**Utilities Usage Types**

Site #	Site Name	Heating by	Cooling by	DHW by	Cooking by	Washers by	Dryers by	Space Heating Efficiency	DHW Heating Efficiency
PA-9-01	Ruth L. Bennett	Gas	Electric	Gas	Electric	Electric	Electric	70.0%	80.0%
PA-9-02	Chatham Estates Family	Gas	Electric	Gas	Electric	Electric	Electric	80.0%	80.0%
PA-9-03	William Penn Housing	Gas	Electric	Gas	Electric	Electric	Electric	80.0%	80.0%
PA-9-04		Gas	Electric	Gas	Electric	Electric	Electric	77.0%	77.0%
PA-9-05		Gas	Electric	Gas	Electric	Electric	Electric	77.0%	77.0%
PA-9-06		Gas	Electric	Gas	Electric	Electric	Electric	80.0%	80.0%
PA-9-08		Gas	Electric	Gas	Electric	Electric	Electric	80.0%	80.0%
PA-9-10		Gas	Electric	Gas	Electric	Electric	Electric	75.0%	75.0%

**Annual Utility Costs by Category**

Site #	Site Name	Natural Gas				Electric					
		Heating	DHW	Cooking	Total	Heating	Cooling	DHW	Cooking	Misc	Total
PA-9-01	Ruth L. Bennett	\$ 232,663	\$ 25,851	\$ -	\$ 258,514	\$ -	\$ 127,384	\$ -	\$ 15,923	\$ 175,153	\$ 318,460
PA-9-02	Chatham Estates Family	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PA-9-03	William Penn Housing	\$ 92,914	\$ 10,324	\$ -	\$ 103,238	\$ -	\$ 58,726	\$ -	\$ 7,341	\$ 80,748	\$ 146,814
PA-9-04		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PA-9-05		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PA-9-06		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PA-9-08		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PA-9-10		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		<b>\$ 325,576</b>	<b>\$ 36,175</b>	<b>\$ -</b>	<b>\$ 361,752</b>	<b>\$ -</b>	<b>\$ 186,110</b>	<b>\$ -</b>	<b>\$ 23,264</b>	<b>\$ 255,901</b>	<b>\$ 465,274</b>

**Average Utility Costs & Consumption per Unit (Apartment)**

Site #	Site Name	# of Units	Natural Gas				Electric				Water				
			MCF/yr.	Cost/yr.	MCF per Unit per month	\$ per Unit per month	kWh/yr.	Cost/yr.	kWh per Unit per month	\$ per Unit per month	1000 Gal/yr.	Cost/yr.	Gallons per Day per unit	\$ per Unit per year	
PA-9-01	Ruth L. Bennett	400	22,151.0	\$ 258,514	4.61	\$ 53.86	3,259,400	\$ 318,460	679.04	\$ 66.35	30,731.8	\$ 177,322	210.5	\$ 443.31	\$ 1,885.74
PA-9-02	Chatham Estates Family	102	-	\$ -	-	\$ -	-	\$ -	-	\$ -	9,400.3	\$ 54,240	252.5	\$ 531.76	\$ 531.76
PA-9-03	William Penn Housing	526	8,846.0	\$ 103,238	1.40	\$ 16.36	1,502,624	\$ 146,814	238.06	\$ 23.26	24,112.9	\$ 139,131	125.6	\$ 264.51	\$ 739.89
PA-9-04		48	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ -
PA-9-05		145	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ -
PA-9-06		156	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ -
PA-9-08		156	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ -
PA-9-10		70	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	\$ -
		<b>1,603</b>	<b>30,997.0</b>	<b>\$ 361,752</b>	<b>1.61</b>	<b>\$ 18.81</b>	<b>4,762,024</b>	<b>\$ 465,274</b>	<b>248</b>	<b>\$ 24.19</b>	<b>64,245</b>	<b>\$ 370,694</b>	<b>109.8</b>	<b>\$ 231.25</b>	<b>\$ 747.17</b>

**Average Annual Utility Costs per Square Foot**

Site #	Site Name	sq. ft.	Natural Gas			Electric			Water		
			MCF/yr.	Cost/yr.	\$ per Sq. Ft.	kWh/yr.	Cost/yr.	\$ per Sq. Ft.	1000 Gal/yr.	Cost/yr.	\$ per Sq. Ft.
PA-9-01	Ruth L. Bennett	165,448	22,151	\$ 258,514	\$ 1.5625	3,259,400	\$ 318,460	\$ 1.9248	30,732	\$ 177,322	\$ 1.0718
PA-9-02	Chatham Estates Family	50,967	-	\$ -	\$ -	-	\$ -	\$ -	9,400	\$ 54,240	\$ 1.0642
PA-9-03	William Penn Housing	256,042	8,846	\$ 103,238	\$ 0.4032	1,502,624	\$ 146,814	\$ 0.5734	24,113	\$ 139,131	\$ 0.5434
PA-9-04		25,361	-	\$ -	\$ -	-	\$ -	\$ -	-	\$ -	\$ -
PA-9-05		72,030	-	\$ -	\$ -	-	\$ -	\$ -	-	\$ -	\$ -
PA-9-06		76,225	-	\$ -	\$ -	-	\$ -	\$ -	-	\$ -	\$ -
PA-9-08		76,225	-	\$ -	\$ -	-	\$ -	\$ -	-	\$ -	\$ -
PA-9-10		34,006	-	\$ -	\$ -	-	\$ -	\$ -	-	\$ -	\$ -
		<b>756,304</b>	<b>30,997</b>	<b>\$ 361,752</b>	<b>\$ 0.4783</b>	<b>4,762,024</b>	<b>\$ 465,274</b>	<b>\$ 0.6152</b>	<b>64,245</b>	<b>\$ 370,694</b>	<b>\$ 0.4901</b>

# Occupancy Data Summary

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	Total Units	Baseline Occupancy %	2016 Occupancy %
<b>William Penn</b>	160	97.0	97.97
<b>Chatham Estates</b>	110	97.0	99.55
<b>Ruth L. Bennett</b>	261	97.0	96.87

# Occupancy Data Details

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<b>Vacant</b>	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total Units
<b>William Penn</b>	2	2	2	2	3	4	4	6	4	4	3	3	160
<b>Chatham Estates</b>	1	0	0	2	0	0	0	2	0	0	0	1	110
<b>Ruth L. Bennett</b>	10	10	8	6	8	7	10	8	9	8	7	7	261

<b>Occupancy %</b>	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total Units
<b>William Penn</b>	98.75	98.75	98.75	98.75	98.13	97.50	97.50	96.25	97.50	97.50	98.13	98.13	97.97
<b>Chatham Estates</b>	99.09	100.00	100.00	98.18	100.00	100.00	100.00	98.18	100.00	100.00	100.00	99.09	99.55
<b>Ruth L. Bennett</b>	96.17	96.17	96.93	97.70	96.93	97.32	96.17	96.93	96.55	96.93	97.32	97.32	96.87

**Chester Housing Authority**  
**Chester, Pennsylvania**

**Building Data**

	Site Name	Address	Building Type	Common Area Sq ft	Total Sq. Ft.	Year Built	# of Floors	# of Units	# of Bldgs	Number of Bedrooms							Tot. BR's
										Eff	1	2	3	4	5	6	
PA-7-11	Ruth L. Bennett	1350 W. 9th Street	Family	14,908	247,642	1980	2	269	35	-	63	92	84	27	3	-	622
PA-7-13	Chatham Estates Family	1701 W. 7th Street	Elderly	2,127	130,631	1960	2	110	22	-	14	54	32	8	2	-	260
PA-7-10	William Penn Housing	514 W. Union Street	Family	18,442	142,600	1960	3	160	19	-	43	59	41	11	6	-	358
					<b>520,873</b>			<b>539</b>	<b>76</b>	-	<b>120</b>	<b>205</b>	<b>157</b>	<b>46</b>	<b>11</b>	-	<b>1,240</b>

Estimated # of Residents: 1 1 2 4 5 6

**Additional Buildings:**

Site  
**Ruth L. Bennett**

**Additional Buildings**

Boiler Plant  
 Community Bldg  
 Central Admin Offices

**Chester, PA Weather Data**

Annual Heating Degree Days: **5555**  
 Indoor Heating Design Temp: **72**  
 Outdoor Heating Design Temp: **9**  
 Heating Design Delta T: **63**  
 Annual Cooling Degree Days: **1104**  
 Indoor Cooling Design Temp: **75**  
 Outdoor Cooling Design db Temp: **92**  
 Outdoor Cooling Design wb Temp: **73**  
 Cooling Design Delta T: **17**

# Meter Detail Report

## Meter: Chatham Sewer

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	0	0	0	0	0	4,500	0	0	0	0	0	5,355
YTD Use	0	0	0	0	0	4,500	4,500	4,500	4,500	4,500	4,500	9,855
Month \$	\$0	\$0	\$0	\$0	\$0	\$13,729	\$0	\$0	\$0	\$0	\$0	\$16,667
YTD \$	\$0	\$0	\$0	\$0	\$0	\$13,729	\$13,729	\$13,729	\$13,729	\$13,729	\$13,729	\$30,396
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.05	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.11
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.05	\$3.05	\$3.05	\$3.05	\$3.05	\$3.05	\$3.08

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	4,500	0	0	0	0	0	5,355
YTD Use	0	0	0	0	0	4,500	4,500	4,500	4,500	4,500	4,500	9,855
Applicable Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
Month \$	\$0	\$0	\$0	\$0	\$0	\$19,665	\$0	\$0	\$0	\$0	\$0	\$23,401
YTD \$	\$0	\$0	\$0	\$0	\$0	\$19,665	\$19,665	\$19,665	\$19,665	\$19,665	\$19,665	\$43,066

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	9,735	0	0	0	0	0	9,700
YTD Use	0	0	0	0	0	9,735	9,735	9,735	9,735	9,735	9,735	19,435
Month \$	\$0	\$0	\$0	\$0	\$0	\$42,542	\$0	\$0	\$0	\$0	\$0	\$42,389
YTD \$	\$0	\$0	\$0	\$0	\$0	\$42,542	\$42,542	\$42,542	\$42,542	\$42,542	\$42,542	\$84,931
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37

### Use Avoidance

Month Use	0	0	0	0	0	(5,235)	0	0	0	0	0	(4,345)
YTD Use	0	0	0	0	0	(5,235)	(5,235)	(5,235)	(5,235)	(5,235)	(5,235)	(9,580)

### Cost Avoidance

Month \$	\$0	\$0	\$0	\$0	\$0	(\$22,877)	\$0	\$0	\$0	\$0	\$0	(\$18,988)
YTD \$	\$0	\$0	\$0	\$0	\$0	(\$22,877)	(\$22,877)	(\$22,877)	(\$22,877)	(\$22,877)	(\$22,877)	(\$41,865)

# Meter Detail Report

## Meter: Chatham Water

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	805	847	717	808	788	813	720	800	878	773	687	738
YTD Use	805	1,652	2,369	3,177	3,965	4,778	5,498	6,298	7,176	7,949	8,636	9,374
Month \$	\$1,822	\$1,900	\$1,689	\$1,823	\$1,806	\$3,004	\$1,606	\$1,832	\$1,966	\$1,787	\$1,645	\$2,965
YTD \$	\$1,822	\$3,722	\$5,411	\$7,234	\$9,040	\$12,044	\$13,650	\$15,482	\$17,448	\$19,235	\$20,880	\$23,845
Month Rate	\$2.26	\$2.24	\$2.36	\$2.26	\$2.29	\$3.69	\$2.23	\$2.29	\$2.24	\$2.31	\$2.39	\$4.02
YTD Rate	\$2.26	\$2.25	\$2.28	\$2.28	\$2.28	\$2.52	\$2.48	\$2.46	\$2.43	\$2.42	\$2.42	\$2.54

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	805	847	717	808	788	813	720	800	878	773	687	738
YTD Use	805	1,652	2,369	3,177	3,965	4,778	5,498	6,298	7,176	7,949	8,636	9,374
Applicable Rate	\$2.95	\$3.06	\$2.95	\$3.01	\$3.05	\$3.69	\$2.95	\$2.90	\$2.86	\$2.96	\$2.95	\$4.02
Month \$	\$2,376	\$2,595	\$2,118	\$2,435	\$2,406	\$3,004	\$2,125	\$2,317	\$2,515	\$2,286	\$2,027	\$2,965
YTD \$	\$2,376	\$4,972	\$7,090	\$9,525	\$11,931	\$14,935	\$17,060	\$19,377	\$21,892	\$24,177	\$26,204	\$29,169

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	1,664	1,415	1,672	1,518	1,450	1,822	1,671	1,862	1,940	1,710	1,703	1,512
YTD Use	1,664	3,079	4,751	6,269	7,719	9,541	11,212	13,074	15,014	16,724	18,427	19,939
Month \$	\$4,912	\$4,336	\$4,940	\$4,574	\$4,428	\$5,295	\$4,931	\$5,393	\$5,557	\$5,056	\$5,024	\$4,574
YTD \$	\$4,912	\$9,248	\$14,188	\$18,762	\$23,190	\$28,485	\$33,416	\$38,809	\$44,366	\$49,422	\$54,446	\$59,020
Month Rate	\$2.95	\$3.06	\$2.95	\$3.01	\$3.05	\$2.91	\$2.95	\$2.90	\$2.86	\$2.96	\$2.95	\$3.03
YTD Rate	\$2.95	\$3.00	\$2.99	\$2.99	\$3.00	\$2.99	\$2.98	\$2.97	\$2.95	\$2.96	\$2.95	\$2.96

### Use Avoidance

Month Use	(859)	(568)	(955)	(710)	(662)	(1,009)	(951)	(1,062)	(1,062)	(937)	(1,016)	(774)
YTD Use	(859)	(1,427)	(2,382)	(3,092)	(3,754)	(4,763)	(5,714)	(6,776)	(7,838)	(8,775)	(9,791)	(10,565)

### Cost Avoidance

Month \$	(\$2,536)	(\$1,741)	(\$2,822)	(\$2,139)	(\$2,022)	(\$2,291)	(\$2,806)	(\$3,076)	(\$3,042)	(\$2,770)	(\$2,997)	(\$1,609)
YTD \$	(\$2,536)	(\$4,276)	(\$7,098)	(\$9,237)	(\$11,259)	(\$13,550)	(\$16,356)	(\$19,432)	(\$22,474)	(\$25,245)	(\$28,242)	(\$29,851)

# Meter Detail Report

## Meter: Ruth L. Bennett Sewer

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	0	0	0	0	0	17,977	0	0	0	0	0	18,878
YTD Use	0	0	0	0	0	17,977	17,977	17,977	17,977	17,977	17,977	36,855
Month \$	\$0	\$0	\$0	\$0	\$0	\$54,934	\$0	\$0	\$0	\$0	\$0	\$58,745
YTD \$	\$0	\$0	\$0	\$0	\$0	\$54,934	\$54,934	\$54,934	\$54,934	\$54,934	\$54,934	\$113,679
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.06	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.11
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.06	\$3.06	\$3.06	\$3.06	\$3.06	\$3.06	\$3.08

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	17,977	0	0	0	0	0	18,878
YTD Use	0	0	0	0	0	17,977	17,977	17,977	17,977	17,977	17,977	36,855
Applicable Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
Month \$	\$0	\$0	\$0	\$0	\$0	\$78,560	\$0	\$0	\$0	\$0	\$0	\$82,497
YTD \$	\$0	\$0	\$0	\$0	\$0	\$78,560	\$78,560	\$78,560	\$78,560	\$78,560	\$78,560	\$161,057

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	25,589	0	0	0	0	0	27,153
YTD Use	0	0	0	0	0	25,589	25,589	25,589	25,589	25,589	25,589	52,742
Month \$	\$0	\$0	\$0	\$0	\$0	\$111,824	\$0	\$0	\$0	\$0	\$0	\$118,659
YTD \$	\$0	\$0	\$0	\$0	\$0	\$111,824	\$111,824	\$111,824	\$111,824	\$111,824	\$111,824	\$230,483
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37

### Use Avoidance

Month Use	0	0	0	0	0	(7,612)	0	0	0	0	0	(8,275)
YTD Use	0	0	0	0	0	(7,612)	(7,612)	(7,612)	(7,612)	(7,612)	(7,612)	(15,887)

### Cost Avoidance

Month \$	\$0	\$0	\$0	\$0	\$0	(\$33,264)	\$0	\$0	\$0	\$0	\$0	(\$36,162)
YTD \$	\$0	\$0	\$0	\$0	\$0	(\$33,264)	(\$33,264)	(\$33,264)	(\$33,264)	(\$33,264)	(\$33,264)	(\$69,426)



# Meter Detail Report

## Meter: Ruth L. Bennett Water

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	3,079	3,362	2,825	2,742	3,153	2,723	3,101	2,947	3,223	3,281	2,817	3,152
YTD Use	3,079	6,441	9,266	12,008	15,161	17,884	20,985	23,932	27,155	30,436	33,253	36,405
Month \$	\$5,514	\$5,820	\$4,958	\$4,817	\$5,500	\$4,765	\$5,334	\$5,272	\$5,864	\$5,822	\$5,100	\$4,877
YTD \$	\$5,514	\$11,334	\$16,292	\$21,109	\$26,609	\$31,374	\$36,708	\$41,980	\$47,844	\$53,666	\$58,766	\$63,643
Month Rate	\$1.79	\$1.73	\$1.76	\$1.76	\$1.74	\$1.75	\$1.72	\$1.79	\$1.82	\$1.77	\$1.81	\$1.55
YTD Rate	\$1.79	\$1.76	\$1.76	\$1.76	\$1.76	\$1.75	\$1.75	\$1.75	\$1.76	\$1.76	\$1.77	\$1.75

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	3,079	3,362	2,825	2,742	3,153	2,723	3,101	2,947	3,223	3,281	2,817	3,152
YTD Use	3,079	6,441	9,266	12,008	15,161	17,884	20,985	23,932	27,155	30,436	33,253	36,405
Applicable Rate	\$2.51	\$2.51	\$2.49	\$2.50	\$2.50	\$2.49	\$2.53	\$2.75	\$2.43	\$2.52	\$2.45	\$2.54
Month \$	\$7,713	\$8,445	\$7,045	\$6,855	\$7,888	\$6,790	\$7,852	\$8,096	\$7,843	\$8,254	\$6,899	\$8,019
YTD \$	\$7,713	\$16,158	\$23,203	\$30,057	\$37,945	\$44,735	\$52,587	\$60,683	\$68,526	\$76,780	\$83,679	\$91,698

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	4,445	4,297	4,712	4,565	4,521	4,723	3,903	1,982	7,025	4,216	6,236	3,699
YTD Use	4,445	8,742	13,454	18,019	22,540	27,263	31,166	33,148	40,173	44,389	50,625	54,324
Month \$	\$11,135	\$10,793	\$11,751	\$11,412	\$11,310	\$11,777	\$9,883	\$5,445	\$17,095	\$10,606	\$15,272	\$9,411
YTD \$	\$11,135	\$21,928	\$33,679	\$45,091	\$56,401	\$68,178	\$78,061	\$83,506	\$100,601	\$111,207	\$126,479	\$135,890
Month Rate	\$2.51	\$2.51	\$2.49	\$2.50	\$2.50	\$2.49	\$2.53	\$2.75	\$2.43	\$2.52	\$2.45	\$2.54
YTD Rate	\$2.51	\$2.51	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.52	\$2.50	\$2.51	\$2.50	\$2.50

### Use Avoidance

Month Use	(1,366)	(935)	(1,887)	(1,823)	(1,368)	(2,000)	(802)	965	(3,802)	(935)	(3,419)	(547)
YTD Use	(1,366)	(2,301)	(4,188)	(6,011)	(7,379)	(9,379)	(10,181)	(9,216)	(13,018)	(13,953)	(17,372)	(17,919)

### Cost Avoidance

Month \$	(\$3,422)	(\$2,348)	(\$4,706)	(\$4,557)	(\$3,422)	(\$4,987)	(\$2,031)	\$2,651	(\$9,252)	(\$2,352)	(\$8,373)	(\$1,392)
YTD \$	(\$3,422)	(\$5,770)	(\$10,476)	(\$15,034)	(\$18,456)	(\$23,443)	(\$25,474)	(\$22,823)	(\$32,075)	(\$34,427)	(\$42,800)	(\$44,192)

# Meter Detail Report

## Meter: WM Penn Sewer

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	0	0	0	0	0	14,557	0	0	0	0	0	14,318
YTD Use	0	0	0	0	0	14,557	14,557	14,557	14,557	14,557	14,557	28,875
Month \$	\$0	\$0	\$0	\$0	\$0	\$44,532	\$0	\$0	\$0	\$0	\$0	\$43,848
YTD \$	\$0	\$0	\$0	\$0	\$0	\$44,532	\$44,532	\$44,532	\$44,532	\$44,532	\$44,532	\$88,380
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.06	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.06
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$3.06	\$3.06	\$3.06	\$3.06	\$3.06	\$3.06	\$3.06

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	14,557	0	0	0	0	0	14,318
YTD Use	0	0	0	0	0	14,557	14,557	14,557	14,557	14,557	14,557	28,875
Applicable Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
Month \$	\$0	\$0	\$0	\$0	\$0	\$63,614	\$0	\$0	\$0	\$0	\$0	\$62,570
YTD \$	\$0	\$0	\$0	\$0	\$0	\$63,614	\$63,614	\$63,614	\$63,614	\$63,614	\$63,614	\$126,184

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	0	0	0	0	0	8,511	0	0	0	0	0	11,893
YTD Use	0	0	0	0	0	8,511	8,511	8,511	8,511	8,511	8,511	20,404
Month \$	\$0	\$0	\$0	\$0	\$0	\$37,193	\$0	\$0	\$0	\$0	\$0	\$51,972
YTD \$	\$0	\$0	\$0	\$0	\$0	\$37,193	\$37,193	\$37,193	\$37,193	\$37,193	\$37,193	\$89,165
Month Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37
YTD Rate	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37	\$4.37

### Use Avoidance

Month Use	0	0	0	0	0	6,046	0	0	0	0	0	2,425
YTD Use	0	0	0	0	0	6,046	6,046	6,046	6,046	6,046	6,046	8,471

### Cost Avoidance

Month \$	\$0	\$0	\$0	\$0	\$0	\$26,421	\$0	\$0	\$0	\$0	\$0	\$10,597
YTD \$	\$0	\$0	\$0	\$0	\$0	\$26,421	\$26,421	\$26,421	\$26,421	\$26,421	\$26,421	\$37,018

# Meter Detail Report

## Meter: WM Penn Water

### Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	2,418	2,690	2,397	2,435	2,241	2,415	2,648	2,315	2,646	2,130	2,284	2,233
YTD Use	2,418	5,108	7,505	9,940	12,181	14,596	17,244	19,559	22,205	24,335	26,619	28,852
Month \$	\$4,294	\$4,739	\$4,278	\$4,323	\$4,019	\$4,287	\$4,481	\$4,123	\$4,679	\$3,807	\$4,057	\$3,665
YTD \$	\$4,294	\$9,033	\$13,311	\$17,634	\$21,653	\$25,940	\$30,421	\$34,544	\$39,223	\$43,030	\$47,087	\$50,752
Month Rate	\$1.78	\$1.76	\$1.78	\$1.78	\$1.79	\$1.78	\$1.69	\$1.78	\$1.77	\$1.79	\$1.78	\$1.64
YTD Rate	\$1.78	\$1.77	\$1.77	\$1.77	\$1.78	\$1.78	\$1.76	\$1.77	\$1.77	\$1.77	\$1.77	\$1.76

### Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	2,418	2,690	2,397	2,435	2,241	2,415	2,648	2,315	2,646	2,130	2,284	2,233
YTD Use	2,418	5,108	7,505	9,940	12,181	14,596	17,244	19,559	22,205	24,335	26,619	28,852
Applicable Rate	\$2.49	\$2.68	\$2.68	\$2.70	\$2.72	\$2.21	\$2.79	\$2.70	\$2.76	\$2.65	\$2.69	\$2.55
Month \$	\$6,016	\$7,197	\$6,435	\$6,568	\$6,102	\$5,330	\$7,399	\$6,258	\$7,315	\$5,649	\$6,152	\$5,693
YTD \$	\$6,016	\$13,214	\$19,648	\$26,216	\$32,318	\$37,648	\$45,047	\$51,305	\$58,620	\$64,269	\$70,421	\$76,115

### Actual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	4,460	2,167	2,117	2,052	1,919	(3,760)	1,641	2,013	1,749	2,323	2,085	2,085
YTD Use	3,297	5,464	7,581	9,633	11,552	7,792	9,433	11,446	13,195	15,518	17,603	19,688
Month \$	\$11,097	\$5,798	\$5,683	\$5,535	\$5,225	(\$8,299)	\$4,585	\$5,442	\$4,835	\$6,161	\$5,616	\$5,316
YTD \$	\$11,097	\$16,895	\$22,578	\$28,113	\$33,338	\$25,039	\$29,624	\$35,066	\$39,901	\$46,062	\$51,678	\$56,994
Month Rate	\$2.49	\$2.68	\$2.68	\$2.70	\$2.72	\$2.21	\$2.79	\$2.70	\$2.76	\$2.65	\$2.69	\$2.55
YTD Rate	\$3.37	\$3.09	\$2.98	\$2.92	\$2.89	\$3.21	\$3.14	\$3.06	\$3.02	\$2.97	\$2.94	\$2.89

### Use Avoidance

Month Use	(2,042)	523	280	383	322	6,175	1,007	302	897	(193)	199	148
YTD Use	(2,042)	(1,519)	(1,239)	(856)	(534)	5,641	6,648	6,950	7,847	7,654	7,853	8,001

### Cost Avoidance

Month \$	(\$5,081)	\$1,399	\$752	\$1,033	\$877	\$13,629	\$2,814	\$816	\$2,480	(\$512)	\$536	\$377
YTD \$	(\$5,081)	(\$3,681)	(\$2,930)	(\$1,897)	(\$1,020)	\$12,609	\$15,423	\$16,239	\$18,719	\$18,207	\$18,743	\$19,121

# Meter Detail Report

Meter: Ruth L. Bennett Gas

## Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	4,159	3,879	4,000	1,519	263	428	767	-	204	534	2,051	4,349
YTD Use	4,159	8,038	12,038	13,557	13,820	14,248	15,015	15,015	15,219	15,753	17,804	22,153
Month \$	\$ 48,538	\$ 45,264	\$ 46,682	\$ 17,722	\$ 3,064	\$ 4,989	\$ 8,951	\$ -	\$ 2,381	\$ 6,232	\$ 23,936	\$ 50,755
YTD \$	\$ 48,538	\$ 93,802	\$ 140,484	\$ 158,206	\$ 161,270	\$ 166,259	\$ 175,210	\$ 175,210	\$ 177,591	\$ 183,823	\$ 207,759	\$ 258,514
BP Length	35	29	29	29	32	29	31	31	30	29	29	33
HDD	866	752	668	228	92	-	-	-	-	64	327	767
CDD	-	-	-	6	-	212	355	390	275	41	-	-
Month Rate	\$ 11.671	\$ 11.669	\$ 11.671	\$ 11.667	\$ 11.650	\$ 11.657	\$ 11.670	\$ -	\$ 11.672	\$ 11.670	\$ 11.670	\$ 11.670
YTD Rate	\$ 11.671	\$ 11.670	\$ 11.670	\$ 11.670	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.669

## Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	4,092	4,383	2,315	1,597	950	316	260	252	278	433	1,514	3,741
YTD Use	4,092	8,475	10,790	12,387	13,337	13,653	13,913	14,165	14,443	14,876	16,390	20,131
Month \$	\$ 57,008	\$ 61,051	\$ 32,246	\$ 22,246	\$ 13,228	\$ 4,397	\$ 3,629	\$ 3,508	\$ 3,871	\$ 6,034	\$ 21,088	\$ 52,115
YTD \$	\$ 57,008	\$ 118,059	\$ 150,305	\$ 172,551	\$ 185,779	\$ 190,176	\$ 193,805	\$ 197,313	\$ 201,184	\$ 207,218	\$ 228,306	\$ 280,421
BP Length	35	31	29	29	29	32	30	29	32	29	29	34
HDD	752	817	410	267	139	8	-	-	-	36	251	684
CDD	2	-	5	9	9	244	418	506	413	66	23	-
Month Rate	\$ 13.932	\$ 13.929	\$ 13.929	\$ 13.930	\$ 13.924	\$ 13.915	\$ 13.958	\$ 13.921	\$ 13.924	\$ 13.935	\$ 13.929	\$ 13.931
YTD Rate	\$ 13.932	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.929	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930

## SimActual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	2,914	3,106	2,317	1,999	688	526	425	371	419	492	1,787	2,101
YTD Use	2,914	6,020	8,337	10,336	11,024	11,550	11,975	12,346	12,765	13,257	15,044	17,145
Month \$	\$ 40,592	\$ 43,267	\$ 32,276	\$ 27,846	\$ 9,584	\$ 7,327	\$ 5,920	\$ 5,168	\$ 5,837	\$ 6,854	\$ 24,893	\$ 29,267
YTD \$	\$ 40,592	\$ 83,859	\$ 116,135	\$ 143,981	\$ 153,565	\$ 160,892	\$ 166,812	\$ 171,980	\$ 177,817	\$ 184,671	\$ 209,564	\$ 238,831
BP Length	35	31	29	29	29	32	30	29	32	29	29	34
HDD	752	817	410	267	139	8	-	-	-	36	251	684
CDD	2	-	5	9	9	244	418	506	413	66	23	-
Month Rate	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.929	\$ 13.930	\$ 13.931	\$ 13.931	\$ 13.930	\$ 13.930
YTD Rate	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930

## Use Avoidance

Month Use	1,178	1,277	(2)	(402)	262	(210)	(165)	(119)	(141)	(59)	(273)	1,640
YTD Use	1,178	2,455	2,453	2,051	2,313	2,103	1,938	1,819	1,678	1,619	1,346	2,986

## Cost Avoidance

Month Use \$	\$ 16,416	\$ 17,784	\$ (30)	\$ (5,600)	\$ 3,644	\$ (2,930)	\$ (2,291)	\$ (1,660)	\$ (1,966)	\$ (820)	\$ (3,805)	\$ 22,848
YTD \$	\$ 16,416	\$ 34,200	\$ 34,170	\$ 28,570	\$ 32,214	\$ 29,284	\$ 26,993	\$ 25,333	\$ 23,367	\$ 22,547	\$ 18,742	\$ 41,590

# Meter Detail Report

Meter: WM Penn Gas

## Reference

	Jan 2005	Feb 2005	Mar 2005	Apr 2005	May 2005	Jun 2005	Jul 2004	Aug 2004	Sep 2004	Oct 2004	Nov 2004	Dec 2004
Month Use	1,670	1,331	1,316	734	442	278	226	209	223	405	740	1,275
YTD Use	1,670	3,001	4,317	5,051	5,493	5,771	5,997	6,206	6,429	6,834	7,574	8,849
Month \$	\$ 19,490	\$ 15,533	\$ 15,358	\$ 8,560	\$ 5,158	\$ 3,244	\$ 2,632	\$ 2,439	\$ 2,597	\$ 4,721	\$ 8,630	\$ 14,874
YTD \$	\$ 19,490	\$ 35,023	\$ 50,381	\$ 58,941	\$ 64,099	\$ 67,343	\$ 69,975	\$ 72,414	\$ 75,011	\$ 79,732	\$ 88,362	\$ 103,236
BP Length	30	28	32	30	31	31	33	31	30	30	32	29
HDD	795	747	568	169	36	-	-	-	1	197	514	738
CDD	-	-	-	6	46	307	434	345	173	4	-	-
Month Rate	\$ 11.671	\$ 11.670	\$ 11.670	\$ 11.662	\$ 11.670	\$ 11.669	\$ 11.646	\$ 11.670	\$ 11.646	\$ 11.657	\$ 11.662	\$ 11.666
YTD Rate	\$ 11.671	\$ 11.670	\$ 11.670	\$ 11.669	\$ 11.669	\$ 11.669	\$ 11.668	\$ 11.668	\$ 11.668	\$ 11.667	\$ 11.666	\$ 11.666

## Baseline

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	1,445	1,510	871	653	456	281	253	244	270	299	628	1,271
YTD Use	1,445	2,955	3,826	4,479	4,935	5,216	5,469	5,713	5,983	6,282	6,910	8,181
Month \$	\$ 20,135	\$ 21,040	\$ 12,131	\$ 9,094	\$ 6,355	\$ 3,915	\$ 3,521	\$ 3,404	\$ 3,756	\$ 4,171	\$ 8,742	\$ 17,705
YTD \$	\$ 20,135	\$ 41,175	\$ 53,306	\$ 62,400	\$ 68,755	\$ 72,670	\$ 76,191	\$ 79,595	\$ 83,351	\$ 87,522	\$ 96,264	\$ 113,969
BP Length	35	31	29	29	29	32	30	29	32	29	29	33
HDD	752	817	410	267	139	8	-	-	-	36	251	649
CDD	2	-	5	9	9	244	418	506	413	66	23	-
Month Rate	\$ 13.934	\$ 13.934	\$ 13.928	\$ 13.926	\$ 13.936	\$ 13.932	\$ 13.917	\$ 13.951	\$ 13.911	\$ 13.950	\$ 13.920	\$ 13.930
YTD Rate	\$ 13.934	\$ 13.934	\$ 13.933	\$ 13.932	\$ 13.932	\$ 13.932	\$ 13.931	\$ 13.932	\$ 13.931	\$ 13.932	\$ 13.931	\$ 13.931

## SimActual

	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
Month Use	1,507	1,648	1,057	849	570	370	267	206	200	252	549	1,210
YTD Use	1,507	3,155	4,212	5,061	5,631	6,001	6,268	6,474	6,674	6,926	7,475	8,685
Month \$	\$ 20,993	\$ 22,957	\$ 14,724	\$ 11,827	\$ 7,940	\$ 5,154	\$ 3,719	\$ 2,870	\$ 2,786	\$ 3,510	\$ 7,648	\$ 16,855
YTD \$	\$ 20,993	\$ 43,950	\$ 58,674	\$ 70,501	\$ 78,441	\$ 83,595	\$ 87,314	\$ 90,184	\$ 92,970	\$ 96,480	\$ 104,128	\$ 120,983
BP Length	35	31	29	29	29	32	30	29	32	29	29	33
HDD	752	817	410	267	139	8	-	-	-	36	251	649
CDD	2	-	5	9	9	244	418	506	413	66	23	-
Month Rate	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.931	\$ 13.930	\$ 13.930	\$ 13.929	\$ 13.932	\$ 13.930	\$ 13.929	\$ 13.931	\$ 13.930
YTD Rate	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930	\$ 13.930

## Use Avoidance

Month Use	(62)	(138)	(186)	(196)	(114)	(89)	(14)	38	70	47	79	61
YTD Use	(62)	(200)	(386)	(582)	(696)	(785)	(799)	(761)	(691)	(644)	(565)	(504)

## Cost Avoidance

Month Use \$	\$ (858)	\$ (1,917)	\$ (2,593)	\$ (2,733)	\$ (1,585)	\$ (1,239)	\$ (198)	\$ 534	\$ 970	\$ 661	\$ 1,094	\$ 850
YTD \$	\$ (858)	\$ (2,775)	\$ (5,368)	\$ (8,101)	\$ (9,686)	\$ (10,925)	\$ (11,123)	\$ (10,589)	\$ (9,619)	\$ (8,958)	\$ (7,864)	\$ (7,014)

## Report Delivery Receipt

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Honeywell has presented the Cost Avoidance Review for Chester Housing Authority, Contract No. 40105934. This report details energy savings results for Calendar Year 2016 and indicates a total cost avoidance of \$285,691 for the calendar year compared to the annual guarantee/rolling base year savings of \$283,948. The net savings for January 2016 – December 2016 is \$1,743.

**Please sign below to acknowledge receipt of this report. Your signature does not indicate acceptance of the results.** If the results are not agreed upon, Chester Housing Authority has forty-five (45) days from the delivery date of this report to provide a detailed explanation and request for action, in writing, to Honeywell International, Inc., Energy Analyst, 5006 103<sup>rd</sup> Street, Lubbock, TX 79424. Otherwise, the cost avoidance results will be deemed accepted.

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