

# Medina City Schools



## Energy Savings Program

PERFORMANCE YEAR 11  
October 2019 – September 2020  
YEAR END SAVINGS REPORT  
January 21<sup>st</sup>, 2021

Prepared by:  
The Brewer-Garrett Company  
6800 Eastland Road  
Middleburg Heights, OH 44130



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**Section 1: Overview**

The Brewer-Garrett Company ("Brewer-Garrett") is pleased to present results of this year's energy savings benefits of the Energy Savings Program at Medina City Schools ("Medina"). Construction was completed in the fall of 2009, so we are currently tracking savings for Performance Year 11 (October 2019 through September 2020). The unique challenges presented by COVID-19 impacted everyday lifestyle and energy usage alike during Performance Year 11. Section 9 explains how the baseline trend was reduced, based on data analysis, weather patterns, and previous trends. All savings and information in the body of this report take those adjustments into account.

Year 11 (PY11), ending in September 2020, was another successful year for energy savings. Medina saved \$506,639, this past year for a total cumulative savings of \$5,549,983. See Section 3 for an updated summary of savings over the entire history of the project.

Brewer-Garrett has conducted surveys of your interior and exterior lighting systems throughout the Medina City School District. Interior fluorescent and HID lighting were replaced with new LED lamps and fixtures as a part of this project. The exterior parking lots, walkways, and building lighting systems have been updated and transformed with these new lighting systems. This retrofit project has resulted in lighting which now enhances the appearance of the District, improves overall lighting quality, reduces environmental impact, improves District safety, and reduces energy and operational costs. Brewer-Garrett installed more than 31,000 LED lamps, 4,300 ballasts, 520 interior LED fixtures, and 500 exterior LED fixtures resulting in an annual utility savings of \$200,991 and utility rebates of \$90,994 paid directly to the District. More information on this District Wide LED Retrofit Project can be accessed in the Lighting Measurement & Verification Project Report presented on November 22<sup>nd</sup>, 2019 or can be found in this report in Appendix B.

**Section 2: Savings Guarantee Summary**

The Performance Guarantee is governed by the Energy Performance Agreements executed by Medina City Schools and The Brewer-Garrett Company on August 31, 2007 and September 30, 2013 (collectively as the "Contract"). The Performance Guarantee, summarized in Table 2a, is based on the Contract dated 8/31/2007 Schedule C "Energy and Operational Savings Guarantee." The Total Guaranteed Savings over the term of this agreement (15 years) is \$4,736,535.

**Table 2a: Performance Guarantee Summary**

Total Guaranteed Savings (\$) per Contract 8/31/2007	\$4,736,535
Total Guaranteed Savings (\$) per Contract 9/30/2013	\$419,467

See Table 3a.

Guaranteed Savings (\$)				
Performance Year	Water/Sewer/ Energy Savings (\$)	Stipulated Operational Savings (\$)	Total Guaranteed Savings (\$)	Cumulative Guaranteed Savings (\$)
1 2010	\$315,769	\$0	\$315,769	\$315,769
2 2011	\$315,769	\$0	\$315,769	\$631,538
3 2012	\$315,769	\$0	\$315,769	\$947,307
4 2013	\$315,769	\$0	\$315,769	\$1,263,076
5 2014	\$315,769	\$0	\$315,769	\$1,578,845
6 2015	\$315,769	\$0	\$315,769	\$1,894,614
7 2016	\$315,769	\$0	\$315,769	\$2,210,383
8 2017	\$315,769	\$0	\$315,769	\$2,526,152
9 2018	\$315,769	\$0	\$315,769	\$2,841,921
10 2019	\$315,769	\$0	\$315,769	\$3,157,690
11 2020	\$315,769	\$0	\$315,769	\$3,473,459
12 2021	\$315,769	\$0	\$315,769	\$3,789,228
13 2022	\$315,769	\$0	\$315,769	\$4,104,997
14 2023	\$315,769	\$0	\$315,769	\$4,420,766
15 2024	\$315,769	\$0	\$315,769	\$4,736,535
Total	\$4,736,535	\$0	\$4,736,535	

Note: The Combined Heat and Power (CHP) project (contract executed 9/30/2013) guaranteed \$537,112 to cover the cost of the project (adjusted to \$419,467 since the project was not financed.) This guarantee amount is not included in the table above, since the CHP project was funded via excess savings from years 1 through 3 of the program. See Table 3a.

A second Energy Performance and Service Agreement dated 9/30/2013 provided for the installation of a Combined Heat and Power ("CHP") Project that was estimated to generate \$62,833 in additional energy savings and increase operational costs by \$17,760 annually for a net savings of \$45,073. This second agreement guaranteed that Medina would recover the cost of the CHP project including construction and financing costs estimated at \$537,122. Since Medina was able to fund the project without financing, thereby eliminating interest costs, the guaranteed amount was adjusted to \$419,467, equivalent to the installed cost for the CHP system.

For auditing and verification purposes the parties agreed that the original Total Guaranteed Savings amount of \$4,736,535 for the original contract should not be increased to reflect the additional CHP project guarantees; instead the Cumulative Actual Savings achieved during Performance Years 1 through 3 was reduced by \$419,467 as shown in Table 3a.

**Section 3: Performance History**

At the end of Performance Year 11, Medina City Schools had accumulated more than \$5.5 million in savings since the beginning of the energy savings program, more than \$2 million above the cumulative guaranteed savings.

**Table 3a: Performance History for the Medina City Schools Energy Savings Program**

Performance Year	Guaranteed Savings (\$)	Actual Savings (\$)	Cumulative Guaranteed Savings (\$)	Cumulative Actual Savings (\$)
--- Interim Period	-----	\$470,472	-----	\$470,472
1 10/09 - 9/10	\$315,769	\$438,675	\$315,769	\$909,147
2 10/10 - 9/11	\$315,769	\$478,648	\$631,538	\$1,387,795
3 10/11 - 9/12	\$315,769	\$444,287	\$947,307	\$1,832,082
Note: CHP Project contract was signed 9/30/2013 and guaranteed total savings of \$419,467; this Project was funded via the excess savings from years 1 through 3 of the guarantee. The annual Guaranteed Savings amount has not been increased to reflect the additional CHP Project guarantee; instead the Cumulative Actual Savings for Performance Year 3 has been reduced by \$419,467.				
3 rev 10/11 - 9/12	\$315,769	\$444,287	\$947,307	\$1,412,615
4 10/12 - 9/13	\$315,769	\$501,965	\$1,263,076	\$1,914,580
5 10/13 - 9/14	\$315,769	\$566,866	\$1,578,845	\$2,481,447
6 10/14 - 9/15	\$315,769	\$501,972	\$1,894,614	\$2,983,419
7 10/15 - 9/16	\$315,769	\$440,660	\$2,210,383	\$3,424,079
8 10/16 - 9/17	\$315,769	\$460,049	\$2,526,152	\$3,884,128
9 10/17 - 9/18	\$315,769	\$583,582	\$2,841,921	\$4,467,710
10 10/18 - 9/19	\$315,769	\$575,634	\$3,157,690	\$5,043,344
11 10/19 - 9/20	\$315,769	\$506,639	\$3,473,459	\$5,549,983
12 10/20 - 9/21	\$315,769			
13 10/21 - 9/22	\$315,769			
14 10/22 - 9/23	\$315,769			
15 10/23 - 9/24	\$315,769			
Total	\$4,736,535			

**Energy Audit for Medina City Schools, Year 11**

The undersigned agrees that The Brewer-Garrett Company delivered this audit report to Medina City Schools. If no written reply is made to The Brewer-Garrett Company concerning the validity of this audit in 30 days, it will be considered received by Medina City Schools.

Received by:

Date:

Medina City Schools

Delivered by:

Date:

The Brewer-Garrett Company

## YEAR END SAVINGS REPORT

### Section 4: Summary of Savings

#### Medina City Schools ~ Performance Year 11

#### Summary of Savings

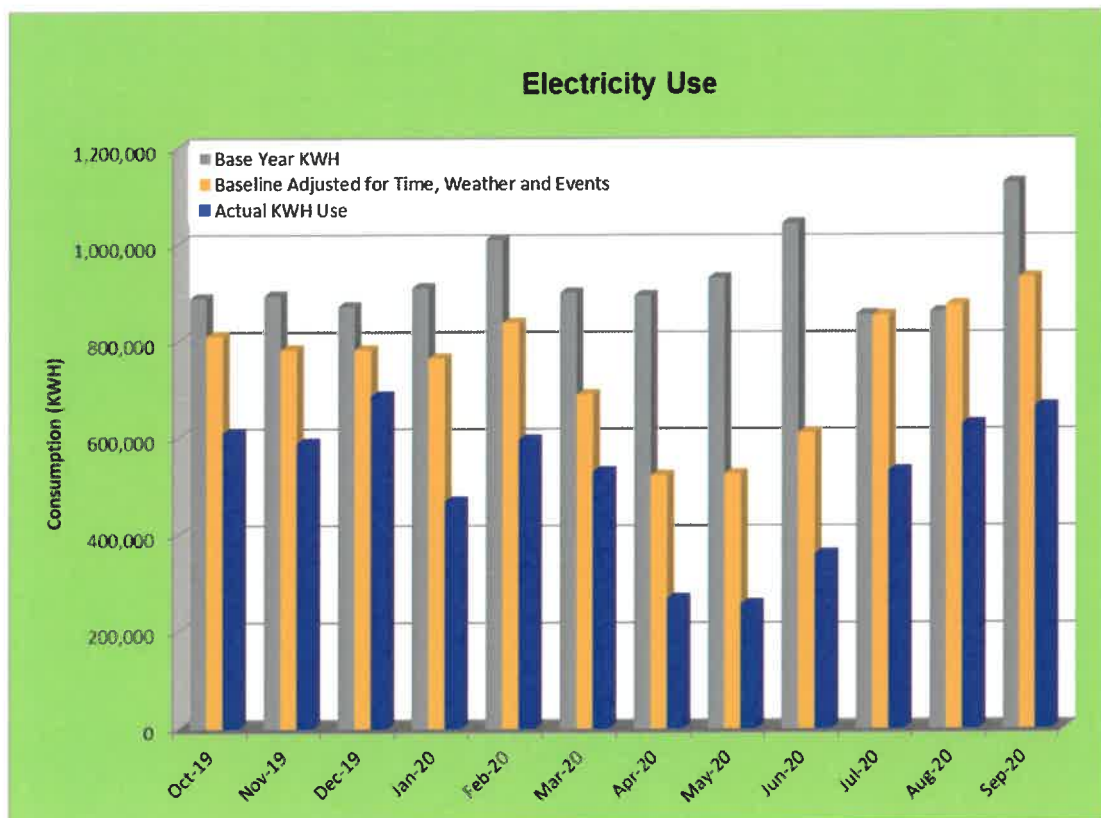
<b>Electric</b>			
KWH Used In Base Year		11,180,440	KWH
Baseline for	Performance Year 11	8,978,906	KWH
Actual Usage for	Performance Year 11	6,185,380	KWH
Total KWH Saved		2,793,526	KWH
Total Dollars Saved		\$329,629	
<b>Natural Gas</b>			
MCF Used In Base Year		42,373	MCF
Baseline for	Performance Year 11	39,135	MCF
Actual Usage for	Performance Year 11	25,714	MCF
Total MCF Saved		13,421	MCF
Total Dollars Saved		\$155,678	
<b>Water and Sewer</b>			
Water Used In Base Year		3,676	CCF
Water Baseline for	Performance Year 11	2,803	CCF
Water Actual Usage for	Performance Year 11	1,735	CCF
Total Water CCF Saved		1,068	CCF
Total Water Dollars Saved		\$1,869	
Total Sewer Dollars Saved		\$18,093	
Lighting M&V Savings at Bus Garage	Performance Year 11	\$1,370	
<b>Stipulated Operational Savings (Costs)</b>			
CHP Maintenance Costs	Performance Year 11	\$0	
<b>Total Actual Savings</b>			
	Performance Year 11	\$506,639	
<b>Total Guaranteed Savings</b>			
	Performance Year 11	\$315,789	

**Table 4a**

## Section 5: Electric Savings

Several projects implemented as part of the Medina City Schools Energy Savings Program were projected to achieve electric savings. These projects include a) district wide lighting retrofits and occupancy sensor installations, b) lighting controls at the High School, c) district wide vending machine control, d) variable frequency drives at Ella Canavan, Root and the High School, e) demand ventilation at Blake, Heritage, High School and Root, f) building automation system upgrades at the High School, and g) electric fan coil unit replacement with a natural gas unit at Heritage. The savings at Blake, as a result of our rate investigation with First Energy/Ohio Edison have continued.

The adjusted electric baseline usage, actual electric usage, and base year electric usage are plotted side by side by side for each month in Figure 5a below.

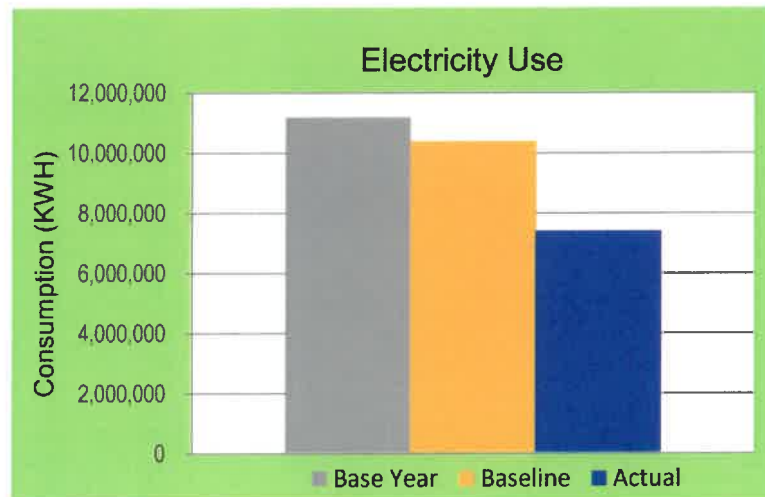


**Figure 5a**

Electric savings are determined by multiplying the energy and demand saving units by the applicable utility rate to convert units saved to dollars saved. Units of electricity saved are equal to the Baseline kWh minus Actual kWh, where the Baseline is the Base Year adjusted for time, weather and events. The electric savings are calculated monthly and then summed to yield an annual amount. The applicable utility rate is based on the larger of the electric rate paid during the Performance Year or the Base Year as specified in Section 8.1 of the Contract.

The electricity savings at the Bus Garage as a result of the lighting retrofit are calculated based on the Measurement and Verification (M&V) methodology explained in Schedule F of the Contract. This methodology is used because the lighting retrofit is the only Energy Conservation Measure implemented at the Bus Garage; therefore, electric savings due to lighting can be isolated. An analysis of the utility bill is unnecessary. Voltage and amperage readings were taken in several locations throughout the Bus Garage and the other Medina schools, before and after the lighting retrofits took place. The before and after readings were taken with the same meters, in the same locations, and were used to calculate an average of watts of energy used by each lamp technology. The average readings for both the before and after measurements were inserted into a standard lighting spreadsheet to generate units saved. These units saved were multiplied by the utility rate to convert units saved to dollars saved. The electric savings at the Bus Garage resulting from the lighting retrofit are \$1,370 for each year including this Performance Year.

Electric use in all of the Medina City Schools that were affected by Brewer-Garrett is summarized in Figure 5b. During Performance Year 11, the annual electric usage in the schools affected by the Energy Savings Program decreased by nearly 3 million kWh (31%) from the Baseline. This is a savings of \$329,629 to Medina, and a reduction of 5,388 metric tons of CO<sub>2</sub> emissions.



**Figure 5b**

## Section 6: Natural Gas Savings

Several projects implemented as part of the Medina City Schools Energy Savings Program were projected to result in natural gas savings. These projects include a) demand ventilation at Blake, Heritage, High School and Root, b) building automation system upgrades at the High School, c) heat recovery and pool system modifications at the High School, and d) replacement of heating/ventilating units at Fenn and Garfield. The replacement of an electric fan coil unit with a gas-fired unit at Heritage was expected to save electricity but use more natural gas.

The adjusted natural gas baseline usage, actual natural gas usage, and base year natural gas usage are plotted side by side for each month in Figure 6a below.

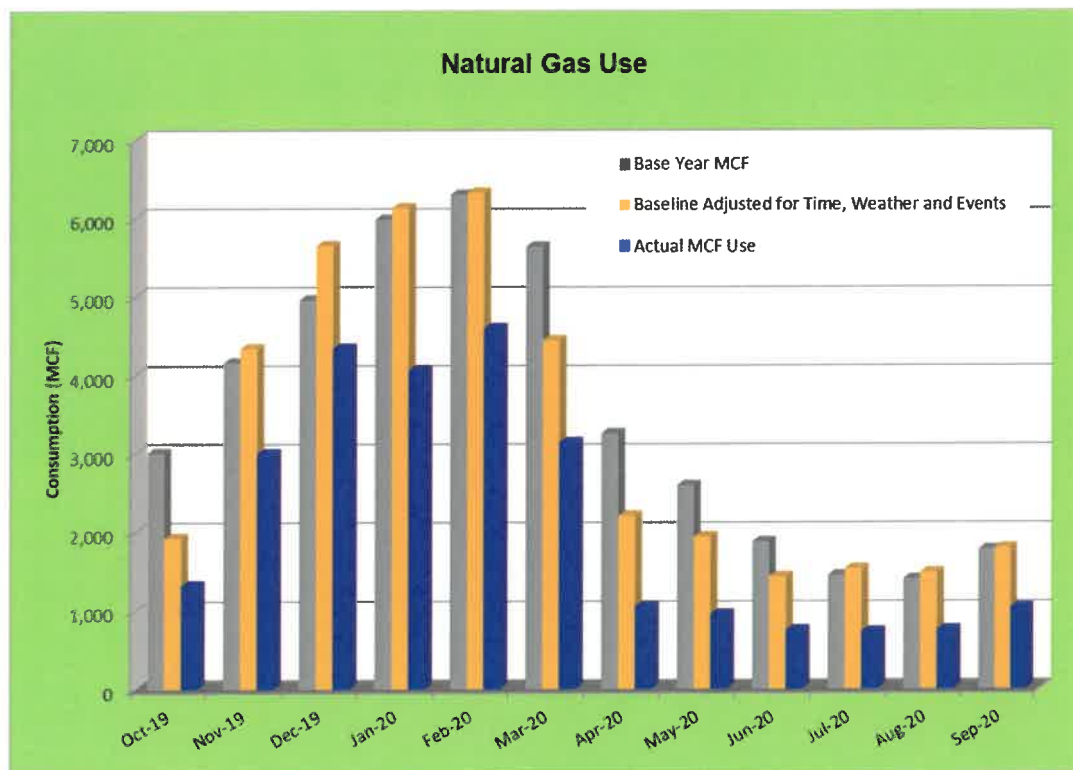
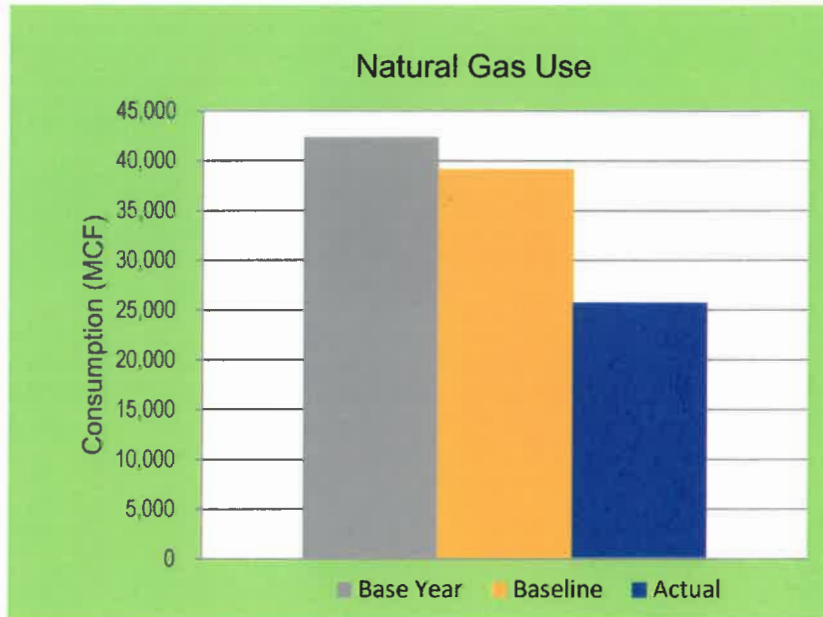


Figure 6a

Natural gas dollar savings are calculated each month by multiplying the monthly natural gas rate in \$/MCF by the units of natural gas saved. The monthly natural gas rate in \$/MCF is calculated based on  $\text{Total Natural Gas \$} / \text{Total Natural Gas MCF}$  and is calculated separately for each building. The units of natural gas saved are equal to the Baseline MCF minus Actual MCF, where Baseline is the Base Year adjusted for time, weather and events. The natural gas savings are calculated each month, and then summed to yield an annual savings.

The energy savings are calculated based on the larger of the natural gas rate paid during the Performance Year or the Base Year as specified in Section 8.1 of the Contract.

Natural gas use in all the Medina City Schools that were affected by Brewer-Garrett is summarized in Figure 6b. During Performance Year 11, the natural gas usage in the schools affected by the Energy Savings Program has been reduced by 13,421 MCF, or 34% from the Baseline. This is a savings of \$155,678 to Medina, and a reduction of 1,385 metric tons of CO<sub>2</sub> emissions.



**Figure 6b**

**Section 7: Water and Sewer Savings**

Water conservation projects were implemented at Claggett and Garfield as part of the Medina City Schools Energy Savings Program and included the replacement of water cooled condensers with air cooled units, and the automation of flush systems for urinals in the boys' bathrooms. In addition, Brewer-Garrett was instrumental in effecting a sewer rate change for Claggett. As a result, water and sewer savings were expected at both Claggett and Garfield.

Sewer savings were expected at the High School, where a sub-meter was installed for the cooling tower. This sub-meter enables the measurement of water evaporation to the atmosphere during the cooling process.

During a review of sewer billing data, it was determined that the Medina County Sanitary Engineering Department has reduced the quantity of sewer UNITS that each school is billed, no doubt in response to a reduction in water use. An analysis was performed to validate the sewer billing practices; this summary is shown in Table 7a. It appears that the High School, Claggett, and Garfield were all over-billed for this Performance Year. As a result of these findings, Medina City Schools is working to with the Sanitary Engineering Department to address the overbillings of this Performance Year. A district wide analysis will be done by the Sanitary Engineering Department to develop a more accurate billing method moving forward.

<b>Sewer UNITS Billing Analysis</b>		<b>Claggett</b>	<b>Garfield</b>	<b>High School</b>
Annual Actual Water Use	CCF	642	1,093	8,104
Annual Actual Water Use	Gallons	480,216	817,564	6,061,792
Annual Actual UNITS Used	UNITS	69	117	866
Annual UNITS Billed	UNITS	180	224	1,187
Monthly Actual UNITS Used	UNITS	5.7	9.7	72.2
Monthly UNITS Billed	UNITS	14.99	18.64	98.94
Overbilled or (Underbilled)	UNITS	111	107	321
Overbilled or (Underbilled)	\$	\$3,256	\$3,128	\$9,398
Total Overbilled (Underbilled)	UNITS		540	
Total Overbilled (Underbilled)	\$		\$15,782	

Note:

1 "Unit" = 230 gallons/day

1 "Unit" = 7,000 gallons/month

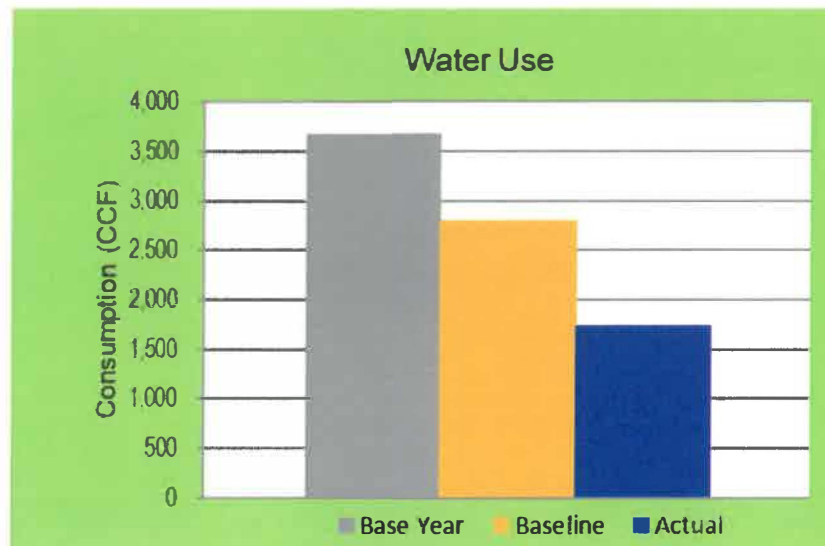
**Table 7a**

Water dollar savings are calculated each month by multiplying the monthly water rate in \$/CCF by the units of water saved. The monthly water rate in \$/CCF is calculated based on: Total Water \$ / Total Water CCF and is calculated separately for each building. The units of water saved are equal to the Baseline CCF minus Actual CCF, where Baseline is the Base Year use with no adjustments. The water savings are calculated each month, and then summed to yield an annual savings.

Sewer dollar savings are calculated bi-monthly, to correspond with actual sewer bills. Sewer savings in this performance report are from: a) Claggett, as the result of the reduction in sewer “units” that Brewer-Garrett was instrumental in securing, and b) Garfield, as the result of the reduction in water use, and the corresponding reduction in sewer “units” that the Medina County Sanitary Engineering Department implemented. No sewer savings for the High School were included in this report. The sewer savings in terms of “units” are multiplied by the sewer rate in \$/“unit” on a bi-monthly basis, and then summed to yield an annual savings.

The water and sewer savings are calculated based on the larger of the water and sewer rates paid during the Performance Year or the Base Year as specified in Section 8.1 of the Contract.

The combined water use for Claggett and Garfield is summarized in Figure 7b. The Base Year, Baseline and Actual total usage during Performance Year 11 are shown side-by-side for comparison. The overall water usage in these schools has been reduced by approximately 38% from the Baseline; this is a savings to Medina of over \$19,962 in water and sewer charges.



**Figure 7b**

**Section 8: Operational Savings**

No operational savings were claimed on this project.

## **Section 9: Adjustments**

Adjustments are incorporated in the baseline projection for energy use to include changes in the number of days in a billing period as well as weather fluctuations, and events.

### **COVID19**

The impact of COVID19 on electricity, natural gas, and water and sewer consumption was investigated for each month of the pandemic, starting in March, and continuing through the end of the performance year in September. Adjustments were then made monthly based on the observed data during those individual months.

### **Electric**

Electric usage data was first analyzed for all buildings except the Medina High School, due to its relatively large usage. The actual performance year data was compared to the previous performance year data to develop a percent reduction for each month. This reduction was then adjusted for the weather differences between the two years. The baseline usage was then reduced by 10% in March, 30% in April, 30% in May, and 10% in June. Adjustments after June were not needed in any buildings besides the High School. The percent reduction was removed from the baseline year to calculate a new adjusted baseline year. After adjusted savings were calculated based on the actual usage and adjusted baseline year the savings were compared to the previous year. Data for all buildings besides the High School is shown in Appendix A as Figure A.1.

The trends developed for the other buildings were then applied to the High School/ Recreation Center. The combined building was treated as both a Recreation Center which saw a much larger baseline drop and High School which showed a baseline year drop that was consistent with the other school buildings. As a result, the adjusted baseline for the High School and Rec Center was computed as a weighted average of the two buildings based on usage pattern. The combined building showed a reduction of 19% in March, 42% in April, 42% in May, 34% in June, and 6% in July through September. The full data for the High School can be seen in Appendix A as Figure A.2.

### **Natural Gas**

The Natural Gas usage baseline was also adjusted for less use due to the pandemic. Reductions were based on changes in usage from the previous project year, previous baseline year, and changes in weather from the previous year. These adjustments begin in March 2020 due to area school closures and continue through June 2020. The adjustments do not continue from July to September because there was no significant change from the previous project year. This is due to a decreased heating load in summer months.

The natural gas baseline year consumption was reduced by 25% in March, 60% in April, 50% in May and 30% in June. These percentages were used to adjust the baseline year units consumed in each month. An adjusted savings was calculated from the adjusted baseline year and compared to the previous performance year savings. Figure A.3 in Appendix A contains a full tabulation of natural gas adjustment data.

#### Water

Water actual usage decreased significantly because of COVID19. To adjust the water, baseline the lowest previous base year usage at either school was used. This data was populated for March, April, May, and June to adjust the baseline usage. The adjusted baseline can be seen in Figure A.4 in Appendix A.

#### Additional Equipment

The heating/ventilating units at Fenn and Garfield were replaced and air conditioning was added as part of the Energy Savings Program. The energy use associated with the air conditioning equipment is an adjustment to the baseline as addressed in Schedule F of the Contract: Savings Calculation Formulae: Methodology to Adjust Baseline.

The additional demand and energy use for these units is calculated based on the information in Table 9a and is included in the Electric Baseline.

School Name	Quantity	Unit Description
Fenn Elementary	1	Library/Computer Lab Unit 10 ton, EER=11, 2300 hrs
	1	Gym Unit 10 ton, EER=11, 2700 hrs
Garfield Elementary	1	Gym Unit 12 ton, EER=9.7, 2925 hrs

**Table 9a**

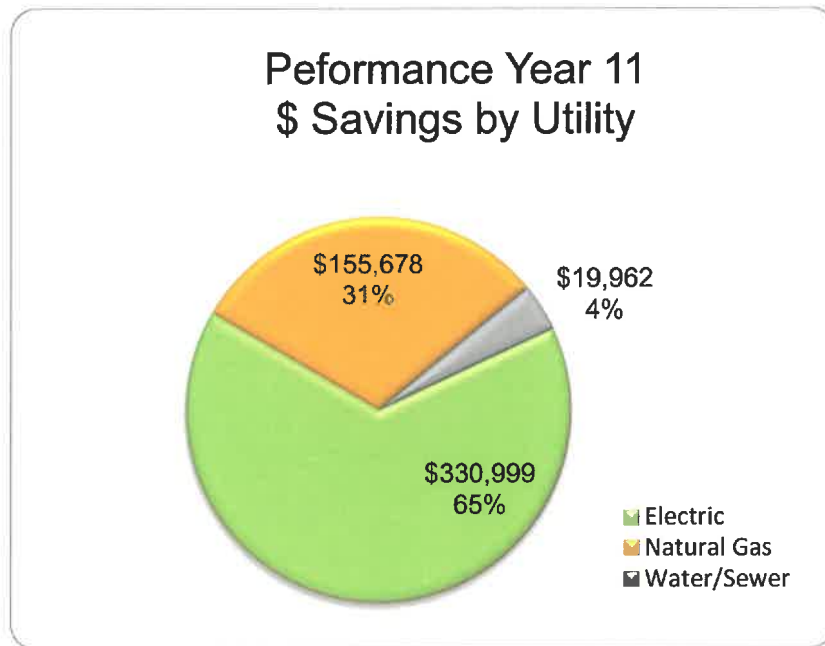
#### Lighting Retrofit

The District Wide Lighting Retrofit Project realized its first full year of savings during Performance Year 11. The lighting project is separate from the original energy savings program. To ensure the savings from the lighting retrofit were not accounted for twice, the energy savings associated with lighting project is an adjustment to the baseline of the energy savings program. The lighting retrofit adjustment were calculated from measurement and verification savings. The Lighting M&V Savings Summary is provided in Appendix B.

**Section 10: Energy Savings – Performance Year 11**

For Performance Year 11 (October 2019 through September 2020), Brewer-Garrett guarantees \$315,769 in annual savings as shown in Table 2a.

Based on utility bills for electric, natural gas, water and sewer, Medina saved \$506,639.



**Figure 10a**

**Section 11: Conclusion**

Brewer-Garrett is pleased to be Medina's energy partner. We believe in bringing value to the partnership in areas outside of merely reporting energy savings. Brewer-Garrett is committed to finding a long-term solution for the cogeneration unit in the high school. Several options are being thoroughly explored and Medina City Schools will regularly be updated on the progress being made on this investigation.

## **Appendix A – Baseline Adjustments**

Figure A.1

COVID Electricity Adjustments (All Buildings Except HS)												
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Actual PY10 (KWH) 10/18-9/19	223514	231033	213048	246504	230983	196694	196162	195150	139121	134870	270982	230891
Actual PY11 (KWH) 10/19-9/20	190189	199976	192978	217422	188981	147871	115514	90828	93674	135295	248710	216742
Acutal Reduction (KWH)	33325	31057	20070	29082	42002	48823	80648	104322	45447	-425	22272	14149
Percent Reduction in Usage PY10-PY11	15%	13%	9%	12%	18%	25%	41%	53%	33%	0%	8%	6%
Reduction in HDD PY10-PY11	19	212	-5	187	203	8	-239	-76	71	-9	-3	-223
Percent Reduction Adjustment	0%	0%	0%	0%	0%	10%	30%	30%	10%	0%	0%	0%
Unit Reduction Adjustment (KWH)	0	0	0	0	0	14787	34654	27248	9367	0	0	0
Adjusted Base Line Year (KWH)	246177	277374	280334	261776	295655	246284	221335	200567	165766	168414	202917	229322
Savings PY11- After Adjustment (KWH)	55988	77398	87356	44354	106674	98413	105821	109739	72092	472122	831044	1521613
Savings PY10 (KWH)	52775	92200	98604	75493	99369	94429	65862	39369	69896	25484	-63922	-20579
Savings PY11- Before Adjustment (KWH)	55988	77398	87356	44354	106674	113200	140475	136987	81460	472122	831044	1521613

Figure A.2

COVID Electricity High School and Rec Center Adjustments												
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Actual PY10 (KWH) 10/18-9/19	421200	332400	524400	159600	452400	270000	367200	470400	436800	444000	490800	517200
Actual PY11 (KWH) 10/19-9/20	418800	388800	493200	250800	406800	381600	152400	165600	266400	396000	379200	447600
Actual Reduction (KWH)	2400	-56400	31200	-91200	45600	-111600	214800	304800	170400	48000	111600	69600
Percent Reduction in Usage PY10- PY11	1%	-17%	6%	-57%	10%	-41%	58%	65%	39%	11%	23%	13%
Reduction in HDD PY10- PY11	73	23	23	142	81	244	-126	-124	-14	65	0	-53
Percent Reduction Adjustment School (40%)	0	0	0	0	0	10	30	30	10	0	0	0
Percent Reduction Adjustment Recreation (60%)	0	0	0	0	0	25	50	50	50	10	10	10
Percent Reduction Adjustment	0%	0%	0%	0%	0%	19%	42%	42%	34%	6%	6%	6%
Unit Reduction Adjustment (KWH)	0	0	0	0	0	103968	217789	234850	228944	43681	42841	44745
Adjusted Base Line Year (KWH)	563828	504361	501100	502873	541594	443231	300756	324317	444420	684337	671168	701003
Savings PY11- After Adjustment (KWH)	145028	115561	7900	252073	134794	61631	148356	158717	178020	288337	291968	253403
Savings PY10 (KWH)	166675	183628	34	331606	124196	255515	174017	163604	159083	256174	307677	223480
Savings PY11- Before Adjustment (KWH)	145028	115561	7900	252073	134794	165598	366145	393567	406964	332018	334808	298148

Figure A.3

COVID Natural Gas Adjustments												
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Actual PY10 (MCF)	1969	3573	4693	5172	5384	4804	2373	1605	1093	719	794	1076
Actual PY11 (MCF)	1316	2996	4336	4058	4592	3140	1053	955	750	728	754	1036
Acutal Reduction (MCF)	653	577	357	1114	792	1664	1320	650	343	-9	40	40
Percent Reduction in Usage PY10-PY11	33%	16%	8%	22%	15%	35%	56%	40%	31%	-1%	5%	4%
Reduction in HDD PY10-PY11	73	23	23	142	81	244	-126	-124	-14	65	0	-53
Percent Reduction Adjustment	0%	0%	0%	0%	0%	25%	60%	50%	30%	0%	0%	0%
Unit Reduction Adjustment (MCF)	0	0	0	0	0	433	1721	980	289	0	0	0
Adjusted Base Line Year (MCF)	1919	4334	5642	6123	6324	4384	1961	1749	1714	1527	1477	1790
Savings PY11- After Adjustment (MCF)	603	1338	1306	2065	1732	1244	908	794	675	799	723	754
Savings PY10 (MCF)	431	867	1012	1854	1367	1538	910	691	587	1131	683	592
Savings PY11- Before Adjustment (MCF)	603	1338	1306	2065	1732	1732	2869	1960	964	799	723	754

Figure A.4

Water Baseline Units CCF

CCF		Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Total
	Claggett Middle	187	146	140	120	154	58	58	58	58	58	69	102	1,208
	Garfield Elementary	250	175	175	156	203	58	58	58	58	112	128	164	1,595
Total CCF		437	321	315	276	357	116	116	116	116	170	197	266	2,803

## **Appendix B – Lighting M&V Data**

## Lighting M & V Savings Summary

Building	Area	Projected Savings <sup>1</sup>				Actual Savings <sup>2</sup>				Excess or (Shortfall)			
		Electricity		Natural Gas		Electricity		Natural Gas		Electricity		Natural Gas	
		KWH	\$	MCF	\$	KWH	\$	MCF	\$	KWH	\$	MCF	\$
Blake Elementary	Interior	77,496	9,697	(44)	(232)	95,539	11,942	(51)	(264)	18,043	\$2,255	(6)	(332)
	Exterior	15,200	1,900			14,976	1,872			(221)	0	0	\$0
	Total	92,696	\$11,597	(44)	(\$232)	110,518	\$13,815	(51)	(\$264)	17,822	\$2,228	(6)	(\$32)
Board Office	Interior	18,525	2,186	(6)	(53)	21,481	2,535	(11)	(74)	2,955	\$349	(3)	(521)
	Exterior	11,771	1,359			10,177	1,201			(1,594)	(\$186)	0	\$0
	Total	30,297	\$3,575	(8)	(\$53)	31,658	\$3,736	(11)	(\$74)	1,362	\$161	(3)	(\$21)
Bus Garage	Interior	16,305	2,136	(13)	(91)	25,503	3,341	(14)	(101)	9,197	\$1,205	(1)	(\$10)
	Exterior	45,642	5,906			32,630	4,275			(12,912)	(\$1,661)	0	\$0
	Total	61,947	\$8,102	(13)	(\$91)	58,133	\$7,615	(14)	(\$101)	3,714	(\$487)	(1)	(\$10)
Claggett Middle School	Interior	108,348	12,460	(61)	(430)	98,533	11,331	(52)	(367)	8,815	(\$1,128)	9	\$63
	Exterior	6,357	731			7,884	907			1,527	\$178	0	\$0
	Total	114,704	\$13,191	(61)	(\$430)	106,417	\$12,238	(52)	(\$367)	8,288	(\$953)	9	\$63
Ella Canavan Elementary	Interior	54,744	7,666	(29)	(204)	53,998	7,526	(26)	(200)	1,146	(\$161)	1	\$4
	Exterior	12,893	1,806			12,893	2,780			6,940	\$874	0	\$0
	Total	67,637	\$9,472	(29)	(\$204)	73,400	\$10,305	(26)	(\$200)	5,794	\$883	1	\$4
Fenn Elementary	Interior	30,377	3,463	(16)	(80)	36,177	3,440	(16)	(78)	(200)	(\$23)	1	\$2
	Exterior	5,462	625			5,891	672			488	\$47	0	\$0
	Total	35,860	\$4,088	(16)	(\$80)	36,067	\$4,112	(16)	(\$78)	208	\$74	1	\$2
Garfield Elementary	Interior	52,443	6,031	(26)	(139)	55,741	6,410	(26)	(144)	3,297	\$379	(1)	(\$6)
	Exterior	2,478	285			2,436	280			(43)	(\$5)	0	\$0
	Total	54,922	\$6,316	(26)	(\$139)	58,176	\$6,690	(26)	(\$144)	3,254	\$374	(1)	(\$6)
Heritage Elementary	Interior	59,316	6,940	(32)	(225)	61,894	7,231	(33)	(230)	2,488	\$291	(1)	(\$35)
	Exterior	4,342	508			4,076	477			(265)	(\$31)	0	\$0
	Total	63,658	\$7,448	(32)	(\$225)	65,971	\$7,708	(33)	(\$230)	2,222	\$260	(1)	(\$35)
Medina High School	Interior	341,596	32,110	(182)	(762)	277,417	26,077	(142)	(616)	64,179	(\$8,033)	35	\$146
	Exterior	283,889	24,815			305,558	28,722			41,589	\$3,907	0	\$0
	Total	605,585	\$56,925	(182)	(\$762)	582,575	\$54,800	(147)	(\$616)	22,610	(\$2,125)	35	\$146
Recreation Center Pools and Fieldhouse	Interior	93,085	8,750	(50)	(206)	163,635	15,382	(87)	(363)	70,550	\$8,632	(37)	(\$155)
	Exterior												
	Total	93,085	\$8,750	(50)	(\$206)	163,635	\$15,382	(87)	(\$363)	70,550	\$8,632	(37)	(\$155)
H.S. Hallway Downlights	Interior	83,851	7,862	(45)	(187)	69,738	6,555	(37)	(155)	(14,113)	(\$1,327)	8	\$32
	Exterior												
	Total	83,851	\$7,862	(45)	(\$187)	69,738	\$6,555	(37)	(\$155)	(14,113)	(\$1,327)	8	\$32
Maintenance Shop	Interior	18,110	1,756	(10)	(71)	14,958	1,630	(6)	(46)	(1,152)	(\$126)	2	\$15
	Exterior	2,220	242			1,499	163			(721)	(\$79)	0	\$0
	Total	18,330	\$1,998	(10)	(\$71)	16,458	\$1,794	(8)	(\$56)	(1,873)	(\$204)	2	\$15
Northrop Elementary	Interior	69,411	10,134	(36)	(244)	80,294	11,723	(43)	(276)	10,883	\$1,559	(5)	(\$32)
	Exterior	31,806	4,670			35,350	5,161			3,543	\$491	0	\$0
	Total	101,217	\$14,804	(36)	(\$244)	115,643	\$16,884	(43)	(\$276)	14,426	\$2,050	(5)	(\$32)
Root Middle School	Interior	148,977	19,814	(82)	(398)	147,811	19,659	(78)	(381)	1,155	(\$155)	3	\$17
	Exterior	36,677	4,878			35,626	4,871			(1,051)	(\$131)	0	\$0
	Total	185,654	\$24,692	(82)	(\$398)	183,437	\$24,530	(78)	(\$381)	(1,217)	(\$162)	3	\$17
Waite Elementary	Interior	68,939	10,134	(36)	(244)	69,040	10,149	(37)	(246)	101	\$15	1	\$6
	Exterior	32,027	4,708			36,138	5,312			4,110	\$604	0	\$0
	Total	100,966	\$14,842	(36)	(\$244)	105,178	\$15,461	(37)	(\$238)	5619	\$619	1	\$6
	Interior												
Added Exterior Lighting Scope	Exterior												
	Total	0	\$0	0	\$0	31,114	\$2,909	0	\$0	31,114	\$2,909		
All Buildings													
TOTAL													