Metro Nashville
DISTRICT ENERGY SYSTEM

Operations Monitoring Report

Second Quarter FY23

Prepared by:

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I. Executive Summary

A review of the fiscal year 2023 (FY23) Second Quarter performance and contract obligations between Constellation Energy Solutions, LLC. (CES) and the Metropolitan Government of Nashville and Davidson County (Metro) is presented in this report by Thermal Engineering Group, Inc. (TEG). The status of the available funds for all active capital construction and repair and improvement projects is also presented.

For the Second Quarter FY23, CES has improved the performance of the EGF resulting in consistently meeting three of the five performance guarantees each month. The steam-fuel and the steam-water metrics were not consistently met. CES is required to meet these guarantees each month in accordance with Paragraph 8.d of the Amendment 2 of the Amended and Restated DES Management Agreement (ARMA) between Metro and CES and Section 18 of the ARMA. TEG continues to monitor CES's operations.

Metro asked CES during the First Quarter FY22 for a plan to bring the operation of the EGF (Energy Generating Facility) into compliance with the new performance guarantees. CES provided a draft report from their engineer during the Second Quarter FY22. A virtual meeting was held between Metro, CES, and their engineer during that quarter to discuss the report. A final report from CES's engineer was presented to Metro in December 2022 and is under review by Metro and TEG at the time of this report.

For the Second Quarter FY23, the chilled water sales decreased 3.8% over the previous Second Quarter (FY22). The chilled water sendout also decreased 8.7% over the previous Second Quarter. However, the system losses decreased approximately 56.0%. The number of cooling degree days decreased 36.4%. The peak chilled water demand for the current quarter was 11,632 tons, which is 19.1% lower than the previous Second Quarter. The decrease in chilled water sales and the other metrics follow notably cooler October and December than in the previous Second Quarter.

Steam sendout for the current quarter increased by 18.6% over the previous Second Quarter with steam sales increasing 22.8%. This increase came with a 20.3% increase in heating degree days. Total steam system losses decreased 9.1% from the previous Second Quarter. The peak steam demand for the current quarter was 136,325 pounds per hour, which represents an increase in the Second Quarter demand by approximately 30.7%. Nashville experienced exceptionally cold temperatures and snowfall from December 23 through 26 causing the DES steam demand to be greater than normal for a December.

With the implementation of the new System Performance Guarantee (Guaranteed Maximum Quantity or GMQ) levels beginning in July 2020, CES met the performance guarantees for the chilled water-electric, chilled water-water, and the steam-electric for each month during the quarter. They met the steam-fuel performance guarantee only in October and failed to meet the steam-water metric each month of the quarter.

Work continued with the DES Capital and Repair & Improvement Projects during the First Quarter. Repair and Improvements to the EDS continue as scheduled. DES139, DES163,

DES177, DES178, DES180, DES191, DES192, DES194, DES195, DES 196, DES198, DES199, DES200, DES201, DES202, DES203, DES204 and DES205 are ongoing. As noted in prior quarterly monitoring reports, the postponement or deferral of these items will result in an increase in maintenance costs to the DES and could impact the delivery of steam and chilled water. Project DES205 has been added. Projects DES143, DES154 and DES197 are closed.

The current fiscal year system operating costs to date are $10,741,970. This value represents approximately 52.3% of the total budgeted operating cost for FY23. The customer revenues from the sales of steam and chilled water for FY23 are $10,536,975 (52.3% of budgeted amount) which includes the annual true-up amount for FY22. The Metro funding amount transferred to date for FY23 is $187,150 (50% of budget). The actual MFA can only be estimated due to outstanding invoices as of the date of this report and an audit of the customer revenues has not been performed which will be included in the FY23 True-up analysis.

Metro Nashville
DISTRICT ENERGY SYSTEM

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II. Energy Distribution Sales and Performance

A. Chilled Water

This section of the report discusses and presents performance information regarding the operation of the EGF for the periods described. Charts and tabular data are also presented to provide a more detailed description of the actual EGF performance.

1. Sales and Sendout

A comparison for the Second Quarter chilled water sales is shown in Figure 1. This data reflects a 3.8% decrease in sales for the current quarter over the same quarter of the previous fiscal year.

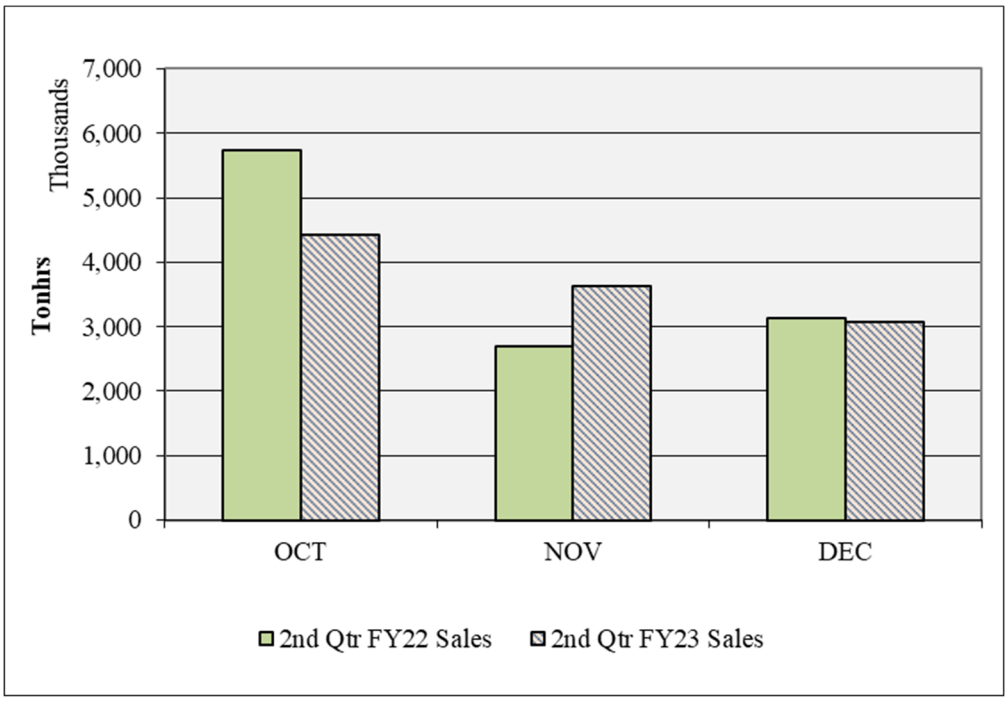

Figure 1. Chilled Water Sales Comparison

The peak chilled water demand for the current quarter was 11,632 tons, which represents a 19.1% decrease over the previous Second Quarter. The number of cooling degree days were 36.4% lower in FY23 than in FY22 due to extraordinary cooler temperatures in October and December.

Figure 2 shows the chilled water sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in tonhrs per month between the recorded sendout and sales values and represent the total energy loss for chilled water in the EDS. The number of cooling degree days per month are also tracked for comparison.

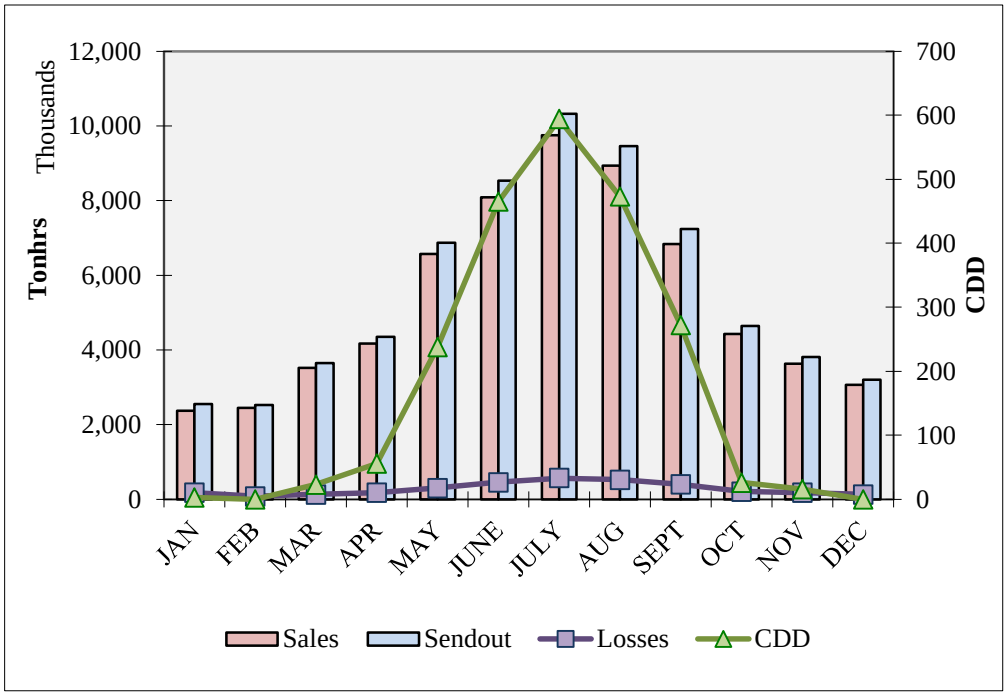

Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months

2. Losses

A comparison of the total chilled water energy losses in the EDS for the Second Quarter is shown in Figure 3. These losses are the difference in chilled water sendout and sales.

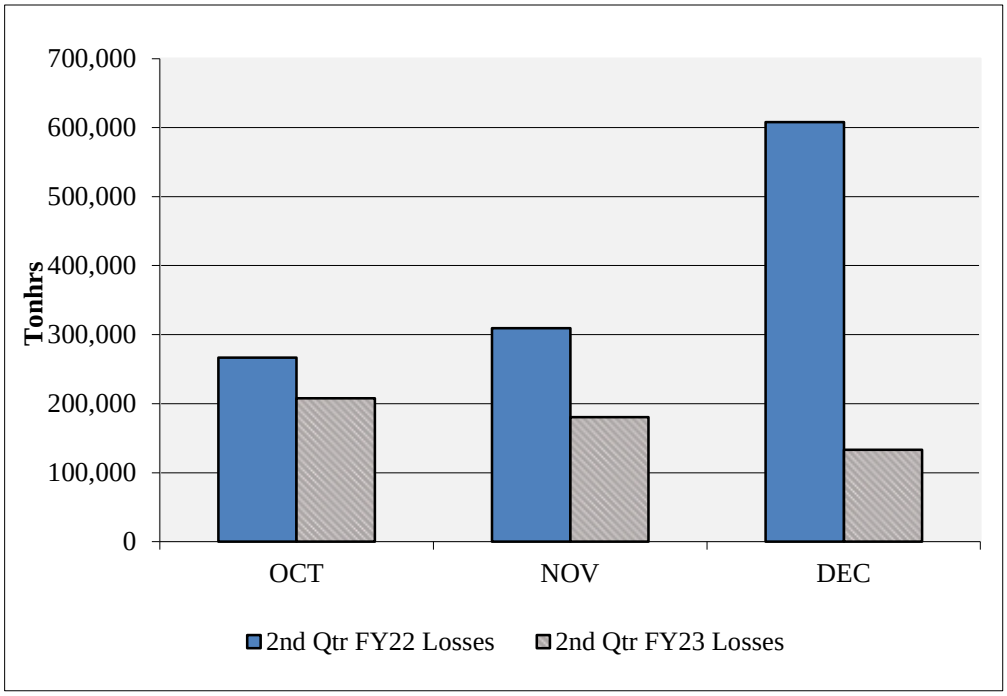

Figure 3. Chilled Water System Loss Comparison

The EDS make-up decreased by 83.1% over the previous Second Quarter due to the repair in January 2022 of the chilled water leak on 3rd Ave North near where a repair had previously been made. The make-up dropped dramatically after the repairs were made and have remained relatively low since that time, although there were occasional increases in make-up due to repairs made by customers at their buildings.

Another leak is still suspected in 5th Ave N, but previous efforts to locate the actual source of the leak have been unsuccessful. CES and TEG are continuing to monitor the EDS make-up and investigate any potential leaks. If the location of an additional leak is discovered, DES will address the issue promptly.

The make-up to the cooling towers decreased 10.7% over the previous Second Quarter. The water usage in the cooling towers is typically proportional to the consumption of chilled water and should vary with chilled water sales. The number of cycles of concentration in the condensing water circuit increased 13.1%. The total chiller plant water use decreased 28.3% over the Second Quarter FY22. The

overall city water make-up comparison for the chilled water system Second Quarter is shown in Figure 4.

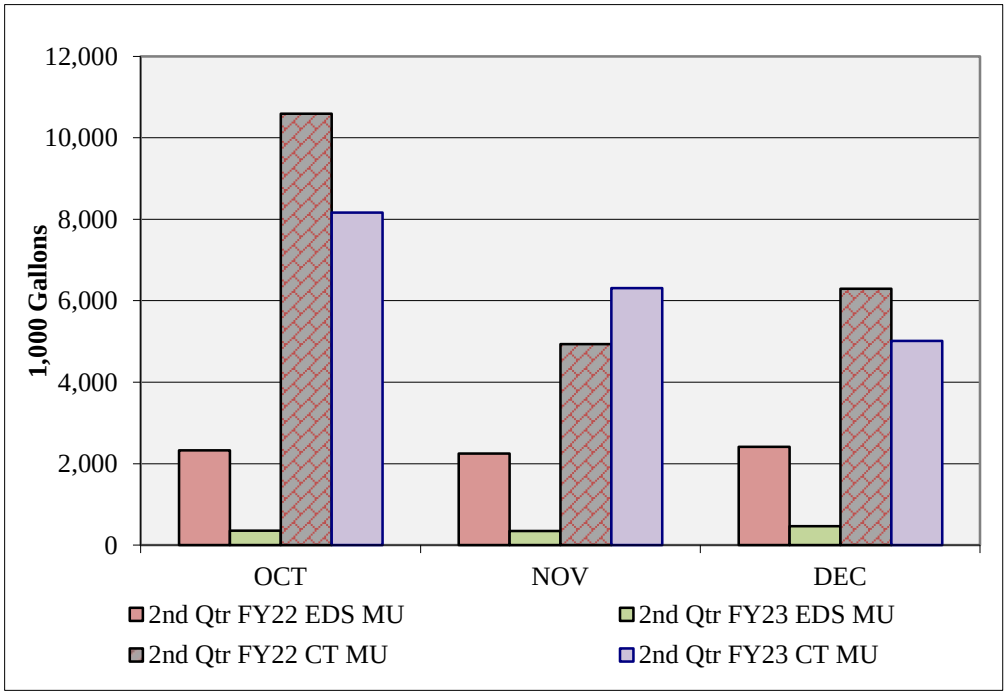

Figure 4. Chilled Water System City Water Usage Comparison

3. Performance

The performance of the chilled water aspect of the EGF is presented by the following two charts, Figures 5 and 6, for the previous twelve months. The System Performance Guarantee levels as described in Amendment 2 of the ARMA were consistently achieved for the chilled water for each month of the Second Quarter. The chilled water electric metric has also been met for the previous twelve months. The efforts made by CES and the repair on the chilled water leaks have resulted in an improvement of these metrics.

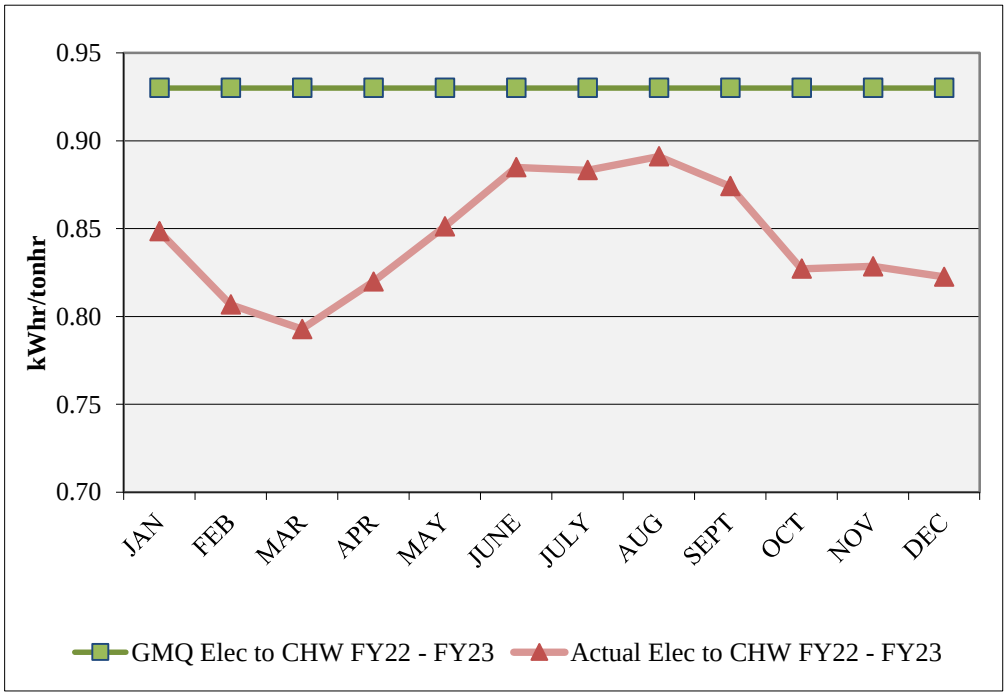

Figure 5. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months

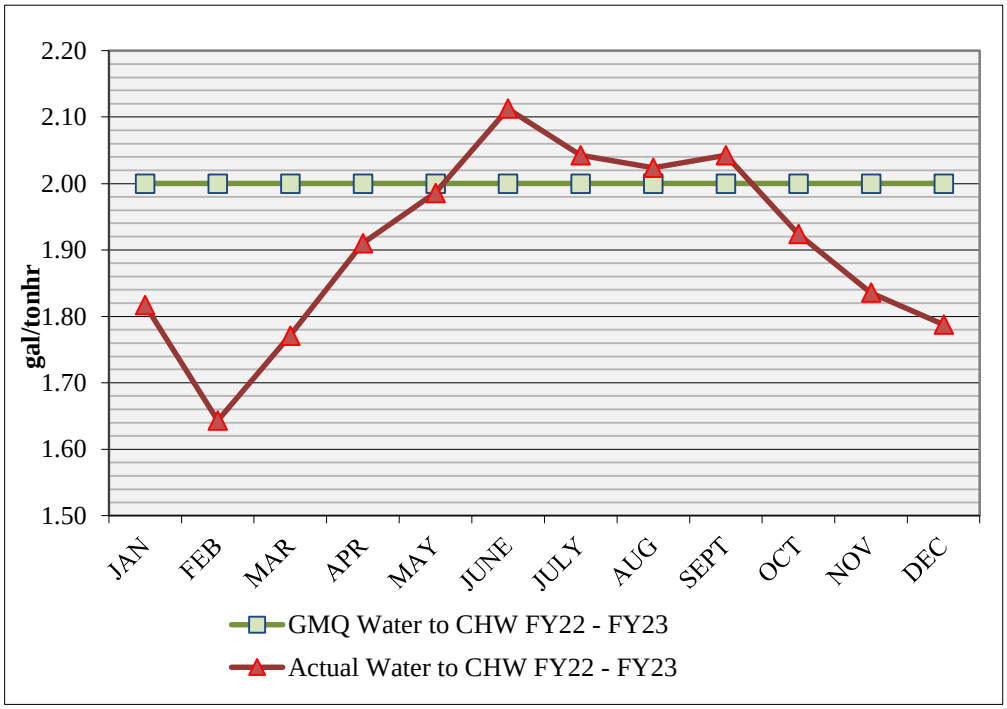

Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months

The chilled water allocation of the electric consumption falls under the GMQ limit of 0.93 kWhr per tonhr for the current quarter on average with no excursions reported for the current fiscal year. The electric usage per unit of sales decreased 7.5% over the previous Second Quarter. CES has worked to address some operational issues within the plant in an effort to improve efficiency. CES and TEG are continuing to monitor the improvements created by these changes.

The total consumption of city water for the chiller plant for the current quarter has decreased by approximately 28.3% over the previous Second Quarter due largely to the repair of the chilled water leak in the EDS and a decrease in chilled water sales. The water conversion factor for the chiller plant decreased by approximately 14.4% (on average) over the Second Quarter FY22. The cooling tower blowdown decreased 19.2% over the previous Second Quarter. CES met the chilled water-water metric each month during the quarter.

B. Steam

1. Sales and Sendout

The steam sendout increased by approximately 18.6% over the previous Second Quarter (FY22), and the sales increased by approximately 22.8%. The Quarter experienced a 20.3% increase in the number of heating degree days. The steam system losses decreased 9.1%, and the relative amount of condensate return

decreased 4.3% during the quarter due dumping part of the condensate due to hardness and iron at some of the customer buildings. A comparison for the Second Quarter steam sales is shown in Figure 7.

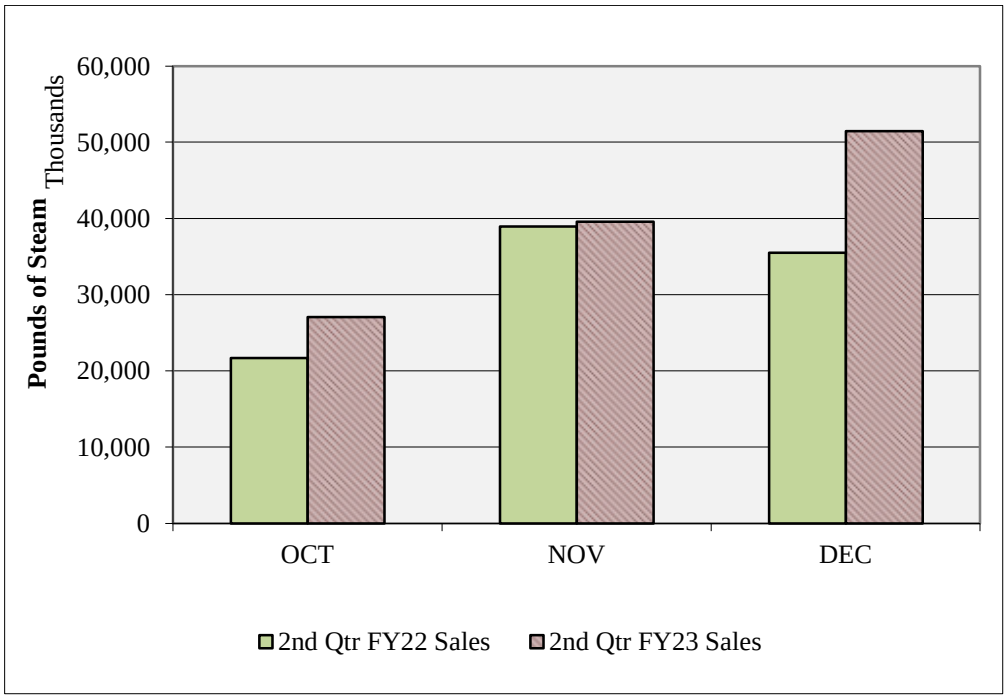

Figure 7. Steam Sales Comparison

The peak steam demand for the current quarter was 136,325 pph, which reflects a 30.7% increase in the peak steam production over the previous Second Quarter. Nashville experienced exceptionally cold temperatures and snowfall from December 23 through 26 causing the DES steam demand to be greater than normal for a December.

Figure 8 shows the steam sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in pounds per month between the recorded sendout and sales values and represent the total mass loss in the EDS between the EGF and the customer meters.

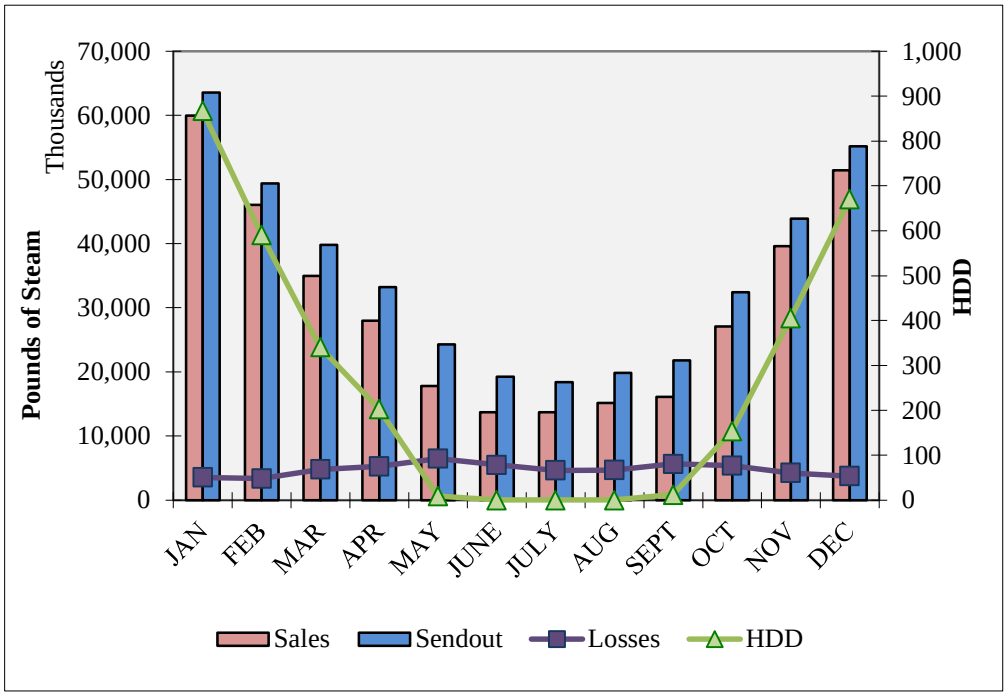

Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months

2. Losses

A comparison of the total steam mass losses in the EDS for the Second Quarter is shown in Figure 9. The mass loss is caused by the heat loss in the EDS between the EGF and the customer meters, resulting in a mass loss at steam traps. Faulty traps, steam leaks or meter error could also be a contributing cause of these losses. Whenever steam sales decrease from the previous quarter, the percent of system losses can be expected to increase since most of these losses are based on a near constant heat loss of the system.

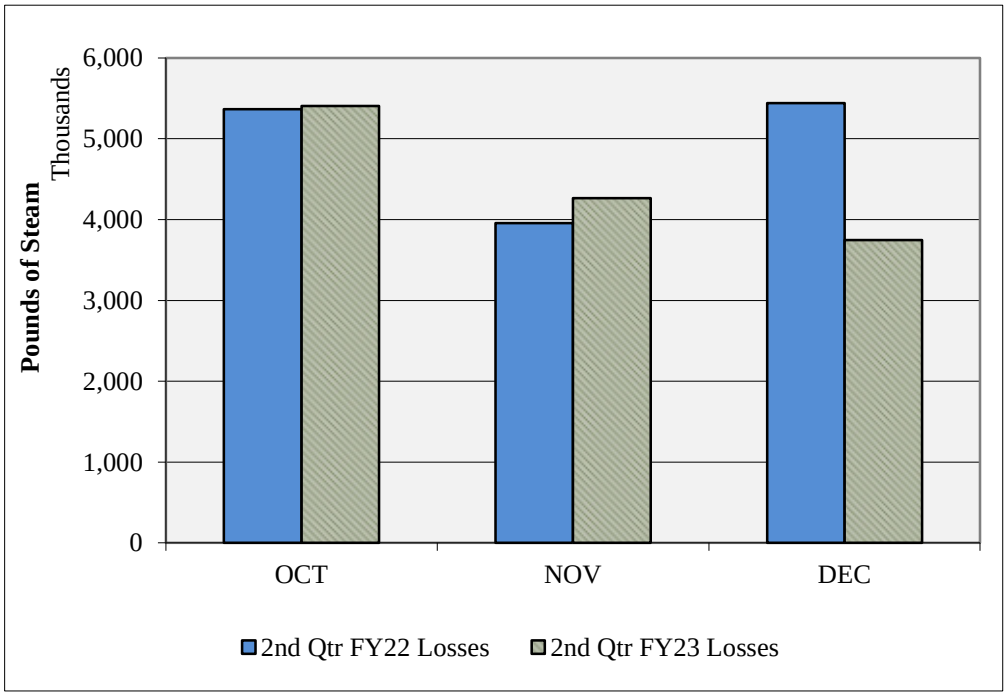

Figure 9. Steam System Losses

The amount of city water make-up (MU) to the steam system consists of the loss in mass between the EGF and the customers, in the condensate return from the customers to the EGF and losses at the EGF. The corresponding data for steam system make-up is shown in the comparison of Second Quarter data in Figure 10.

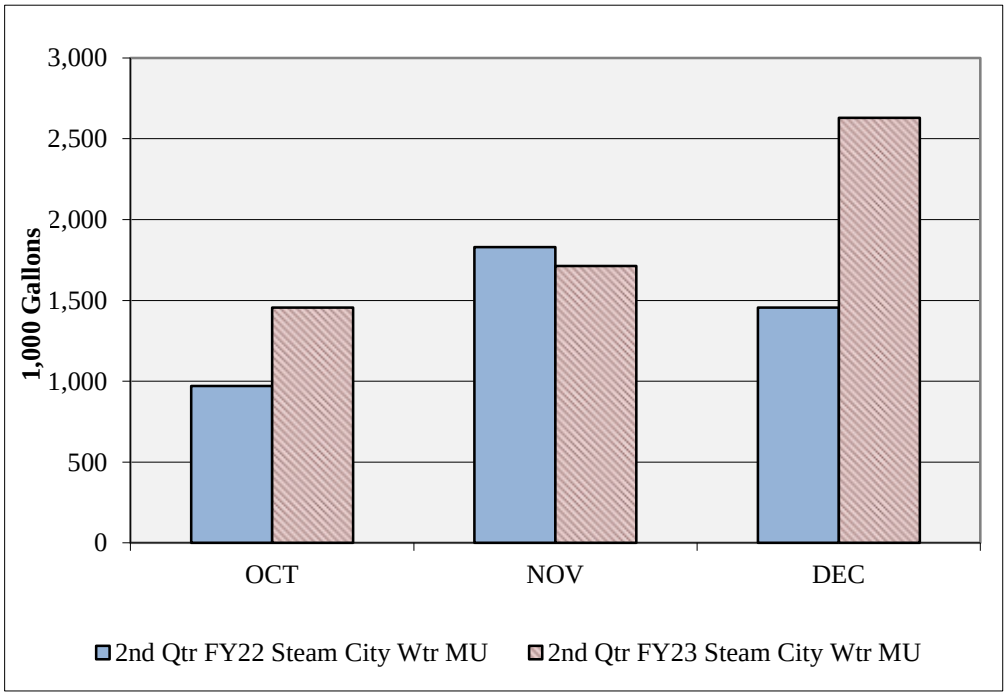

Figure 10. Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system of the EGF is presented by the following three charts, Figures 11, 12 and 13. The steam fuel conversion factor exceeded the guaranteed values for November and December 2022; however, the differences between the actual and guaranteed values were small. The steam electric conversion factor was met each month of the quarter and for the previous twelve months. The steam water conversion factor exceeded the guaranteed values for each month in the quarter. TEG monitors CES's performance regularly and will continue to report any non-compliance in the EGF's operation.

The steam plant electric consumption for the current quarter was 6.2% higher in FY23 than in FY22. The steam-electric metric decreased 13.7% over the same period due in part to the increased amount of sales and sendout. The monthly steam-to-electric conversion factors, along with the guaranteed values, are shown in Figure 11.

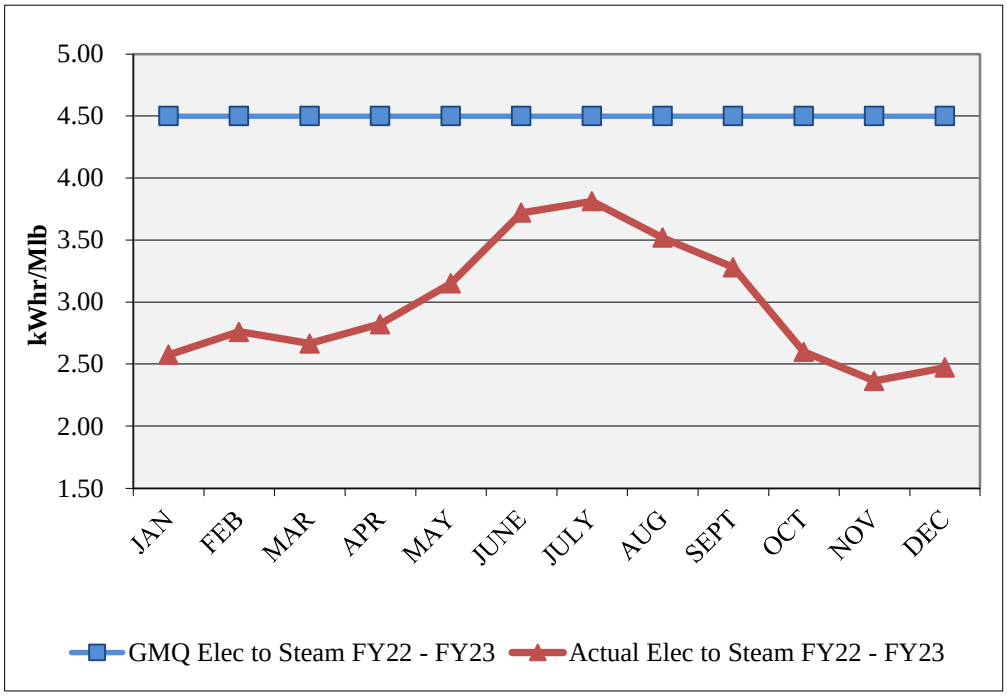

Figure 11. Steam Plant Electric Performance Guarantee for the Previous Twelve Months

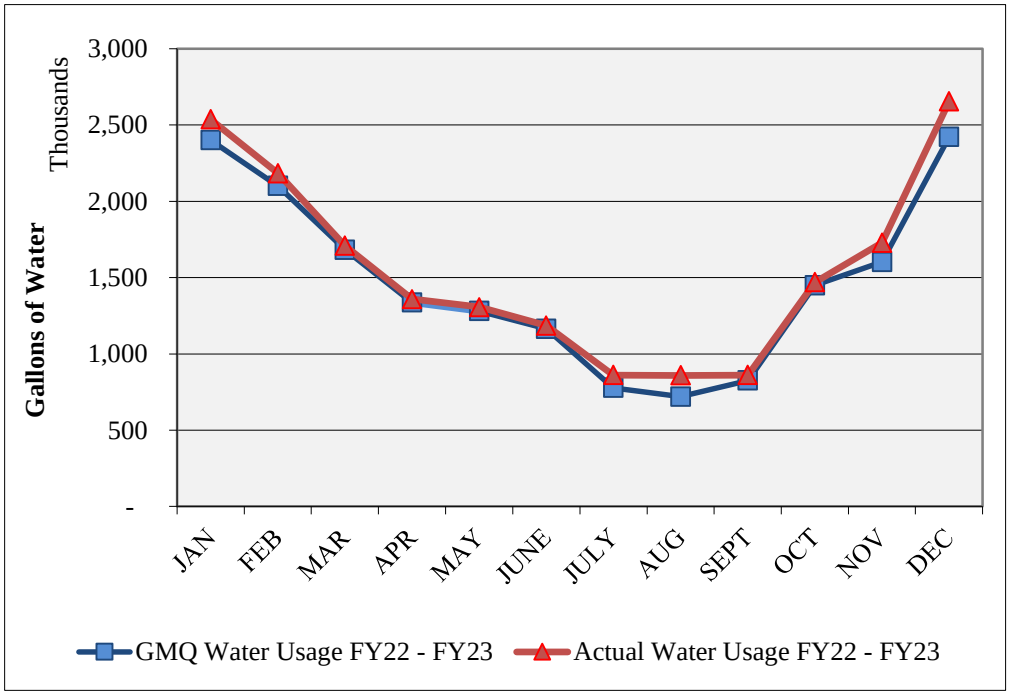

Figure 12. Steam Plant Water Performance Guarantee for the Previous Twelve Months

The water consumption for the steam plant increased 36.2% this quarter as compared to the previous Second Quarter due to a decrease in the amount of condensate returned during the quarter and the increase in sendout. Figure 12 shows the comparison between the actual and guaranteed steam-to-water usages for each month.

CES and TEG continue to monitor the performance of the EGF as CES makes efforts to improve the DES performance. However, the steam-water metric is consistently close the guaranteed value, varying less than 7% from guarantee on average for the quarter, even after the replacement of the condensate return meter in FY22. The guaranteed steam-water performance value is based on an equation which uses the amount of steam sendout and condensate return and did not change with the adoption of the new performance values in Amendment 2. CES continues to review the readings and accuracy of the meters used in this calculation.

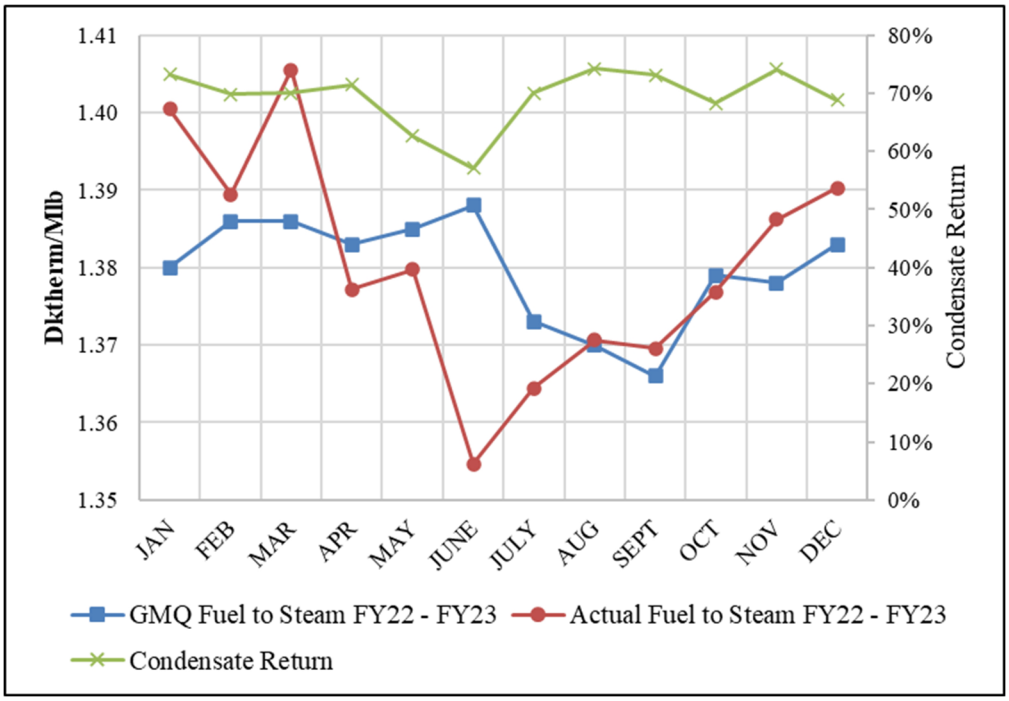

Figure 13. Steam Plant Fuel Performance Guarantee for the Previous Twelve Months

The fuel consumption per unit of steam sendout remained approximately the same as in the previous Second Quarter. As shown in Figure 13, the performance guarantee was met in October but not in November and December. The relative amount of condensate return is shown on this graph to reflect the influence that the condensate return has on the plant efficiency. Although the performance level for this metric changed with the adoption of Amendment 2, the equation used to calculate the value relies heavily on readings from the condensate return and steam sendout meters.

C. Contract Guarantee Performance

The production and sales performance for the EGF and EDS are summarized in Table 1 for the current quarter. Additional parameters, such as cooling tower blow-down and peak demands are listed in this table, as well. Table 2 presents the Second Quarter comparisons of the Guaranteed Maximum Quantities (GMQ) or System Performance Guarantees of the criteria commodities (fuel, water, and electricity).

CES failed to meet all of the performance guarantees required under Amendment 2 of the ARMA for the quarter but improvement in the operation of the EGF is noted.

Table 1. Second Quarter FY23 Production, Sales, and Consumption Summary

Item	Unit	Second Quarter FY23	Second Quarter FY22	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kWhrs	9,483,811	10,606,046	-10.58%
Chilled Water	kWhrs	9,192,691	10,332,015	-11.03%
Steam	kWhrs	291,120	274,031	6.24%
Total Water Use	kgal	26,462	33,073	-19.99%
Total Chilled Water	kgal	20,665	28,817	-28.29%
EDS Make-up	kgal	1,179	6,987	-83.13%
Cooling Towers	kgal	19,486	21,830	-10.74%
Calc CT Evaporation	kgal	15,978	17,489	-8.64%
CT Blowdown	kgal	3,508	4,341	-19.19%
Calc # Cycles		4.55	4.03	13.05%
Steam	kgal	5,797	4,256	36.21%
Total Fuel Use	mmBTU	182,241	154,323	18.09%
Natural Gas	mmBTU	182,233	154,307	18.10%
Propane	mmBTU	8	16	-50.00%
Condensate Return	kgal	11,363	10,010	13.52%
	lbs	92,677,476	81,640,255	13.52%
Avg Temp	°F	173.0	170.0	1.76%
Sendout				
Chilled Water	tonhrs	11,645,900	12,752,200	-8.68%
Steam	lbs	131,526,000	110,941,000	18.55%
Peak CHW Demand	tons	11,632	14,384	-19.13%
Peak Steam Demand	lb/hr	136,325	104,288	30.72%
CHW LF		45.34%	40.15%	12.93%
Steam LF		43.70%	48.18%	-9.31%
Sales				
Chilled Water	tonhrs	11,124,414	11,568,443	-3.84%
Steam	lbs	118,106,964	96,182,072	22.80%
Losses				
Chilled Water	tonhrs	521,486	1,183,757	-55.95%
Steam	lbs	13,419,036	14,758,928	-9.08%
		10.20%	13.30%	-23.31%
Degree Days				
CDD		42	66	-36.36%
HDD		1,231	1,023	20.33%

*positive percent difference values imply an increase from FY22 to FY23

Table 2. Second Quarter Performance Guarantee Comparison for Steam and Chilled Water

GMQ Calculations	Unit	Second Quarter FY23	Second Quarter FY22	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	4.50	4.50	
Electric Conversion	kWhr/Mlb	2.48	2.87	-13.65%
GMQ Plant Efficiency	Dth/Mlb	1.380	1.377	
Plant Efficiency	Dth/Mlb	1.384	1.391	-0.47%
Actual %CR		70.46%	73.59%	-4.25%
Avg CR Temp	°F	173	170	1.76%
GMQ Water Conversion	gal	5,477,762	4,131,495	
Water Conversion	gal	5,854,970	4,298,560	36.21%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	0.930	0.930	
Electric Conversion	kWhr/tonhr	0.826	0.893	-7.50%
GMQ Water Conversion	gal/tonhr	2.00	2.00	
Water Conversion	gal/tonhr	1.85	2.16	-14.42%

*positive percent difference values imply an increase from FY22 to FY23

D. Operating Costs

The fixed operating costs for the DES include the management fee to CES, debt service payments on the bonds and engineering and administration costs and are charged to the Initial System Customers (ISCs) relative to their contract demand. For all non-ISCs, their fixed costs are principally based on a value established by their contracts and are not tied directly to the actual costs of the debt service or CES's management fee.

The variable costs are dependent on the amounts of steam and chilled water produced and sold to the customers. These latter costs include the utility and chemical treatment costs and are passed onto the customers directly without mark-up. A summary of the total operating costs for the fiscal year-to-date are shown in Table 3.

The revenues shown in Tables 3 and 4 reflect the charges to the customers for their respective steam and chilled water service. The difference between the total costs and revenues from the customers is the shortfall that must be covered by Metro. The shortfall exists due to the remaining unsold capacity at the EGF and the debt service for bonds to which the customers do not directly contribute.

The current fiscal year system operating costs to date are $10,741,970. This value represents approximately 52.3% of the total budgeted operating cost for FY23. The customer revenues from the sales of steam and chilled water for FY23 are $10,536,975 (52.3% of budgeted amount) which includes the annual true-up amount for FY22. The Metro funding amount transferred to date for FY23 is $187,150 (50% of budget). The actual MFA can only be estimated due to outstanding invoices as of the date of this report and an audit of the customer revenues has not been performed which will be included in the FY23 True-up analysis.

Table 3. DES Expenses and Revenues to Date

Item		FY23 Budget	First Quarter Expenses	Second Quarter Expenses	Third Quarter Expenses	Fourth Quarter Expenses	Total Spending to Date	% of Budget
Operating Management Fee								
FOC:	Basic	$ 4,006,800	$ 1,001,705	$ 1,001,705	$ -	$ -	$ 2,003,409	50.00%
	9th Chiller	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	C/O 6A	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	C/O 6B	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	C/O 7	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	C/O 8	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
Pass-thru Charges:	Chemical Treatment	$ 255,700	$ 57,601	$ 51,607	$ -	$ -	$ 109,208	42.71%
	Insurance	$ 22,900	$ -	$ 29,475	$ -	$ -	$ 29,475	128.71%
Marketing:	CNE Sales Activity	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	Incentive Payments	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
FEA:	Steam	$ 84,700	$ (441)	$ 1,528	$ -	$ -	$ 1,086	1.28%
	Chilled Water	$ 126,200	$ 25,885	$ 39,621	$ -	$ -	$ 65,506	51.91%
Misc:	Metro Credit	$ -	$ (415,775)	$ (223,940)	$ -	$ -	$ (639,715)	n.a.
	ARFA	$ 63,000	$ 15,754	$ 15,754	$ -	$ -	$ 31,509	50.01%
	Deferral	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	Subtotal - Man Fee =	**$ 4,559,300**	**$ 1,100,504**	**$ 1,139,691**	**$ -**	**$ -**	**$ 2,240,194**	**49.13%**
Reimbursed Management Fee + Chem Treatment			$ 1,100,504	$ 406,963	$ -	$ -	$ 1,507,467	0.00%
Metro Costs								
Pass-thru Charges:	Engineering	$ 129,500	$ 6,332	$ 6,723	$ -	$ -	$ 13,055	10.08%
	EDS R&I Transfers	$ 303,700	$ 75,925	$ 75,925	$ -	$ -	$ 151,850	50.00%
	Metro Marketing	$ 60,900	$ -	$ -	$ -	$ -	$ -	0.00%
	Project Administration	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	Metro Incremental Cost	$ 718,800	$ 118,250	$ 133,184	$ 5,842	$ -	$ 257,276	35.79%
Utility Costs:	Water/Sewer	$ 759,700	$ 394,055	$ 207,531	$ -	$ -	$ 601,587	79.19%
	EDS Water/Sewer	$ -	$ 47	$ 214	$ -	$ -	$ 260	n.a.
	EDS Electricity	$ 71,700	$ 22,039	$ 16,416	$ -	$ -	$ 38,455	53.63%
	Electricity	$ 6,181,900	$ 2,297,773	$ 994,219	$ -	$ -	$ 3,291,992	53.25%
	Natural Gas Consultant	$ 12,400	$ -	$ 9,080	$ -	$ -	$ 9,080	73.23%
	Natural Gas Transport	$ -	$ 56,143	$ 97,308	$ -	$ -	$ 153,451	n.a.
	Natural Gas Fuel	$ 3,203,850	$ 495,442	$ 1,001,717	$ -	$ -	$ 1,497,159	46.73%
	Propane	$ 139,050	$ -	$ 119,216	$ -	$ -	$ 119,216	85.74%
	Subtotal - Metro Costs =	**$ 11,581,500**	**$ 3,466,006**	**$ 2,661,533**	**$ 5,842**	**$ -**	**$ 6,133,381**	**52.96%**
	Subtotal - Operations =	**$ 16,140,800**	**$ 4,566,510**	**$ 3,801,223**	**$ 5,842**	**$ -**	**$ 8,373,575**	**51.88%**
Debt Service	2012A Bonds	$ 3,178,500	$ 869,138	$ 769,787	$ -	$ -	$ 1,638,925	51.56%
	2005B Bonds	$ 281,100	$ 261,398	$ -	$ -	$ -	$ 261,398	92.99%
	Series 2018	$ 117,200	$ 29,300	$ 29,300	$ -	$ -	$ 58,600	50.00%
	Series 2015C	$ 64,700	$ 16,175	$ 16,175	$ -	$ -	$ 32,350	50.00%
	Series 2017	$ 41,800	$ 10,450	$ 10,450	$ -	$ -	$ 20,900	50.00%
	Series 2013A	$ 506,000	$ 126,500	$ 126,500	$ -	$ -	$ 253,000	50.00%
	Series 2021C	$ 122,000	$ 29,822	$ 30,500	$ -	$ -	$ 60,322	49.44%
	MIP	$ -	$ -	$ -	$ -	$ -	$ -	n.a.
	Oper. Reserve Fund	$ 85,800	$ 21,450	$ 21,450	$ -	$ -	$ 42,900	50.00%
	Subtotal - Capital =	**$ 4,397,100**	**$ 1,364,232**	**$ 1,004,162**	**$ -**	**$ -**	**$ 2,368,395**	**53.86%**
	Total =	**$ 20,537,900**	**$ 5,930,742**	**$ 4,805,386**	**$ 5,842**	**$ -**	**$ 10,741,970**	**52.30%**
Customer Revenues								
	Taxes Collected		$ 133,033	$ 105,053	$ -	$ -	$ 238,087	n.a.
	Taxes Paid		$ 133,033	$ 70,325	$ -	$ -	$ 203,358	n.a.
	Interest & Misc Revenue	$ 50,600	$ 35,408	$ 79,142	$ -	$ -	$ 114,550	226.38%
	Penalty Revenues/Credits		$ 21,733	$ 4,516	$ -	$ -	$ 26,249	n.a.
	Energy Revenues Collected	$ 20,113,000	$ 5,639,947	$ 4,721,500	$ -	$ -	$ 10,361,447	51.52%
	Revenues =	**$ 20,163,600**	**$ 5,697,088**	**$ 4,839,886**	**$ -**	**$ -**	**$ 10,536,975**	**52.26%**
	Metro Funding Amount =	**$ 374,300**	**$ 233,654**	**$ (34,501)**	**$ 5,842**	**$ -**	**$ 204,995**	**54.77%**

The DES serves 21 customers and 42 buildings in downtown Nashville. These customers are divided into three categories: 1) Privately-owned buildings, 2) State of TN-owned buildings and 3) Metro-owned buildings. The New Customers listed in Table 4 are non-Initial System private customers. A summary of the annual costs for each of these three categories is presented in Table 4. These values include late fees and penalties and any unpaid balances.

Table 4. Customer Revenue Summary to Date

Building	Chilled Water				Steam		
	Total Cost	Consumption (tonhrs/yr)	Unit Cost ($/tonhr)		Total Cost	Consumption (Mlb/yr)	Unit Cost ($/Mlb)
Private Customers	$ 2,526,288	13,369,470	$ 0.1890		$ 880,526	44,085	$ 19.9734
State Government	$ 1,887,982	8,078,966	$ 0.2337		$ 1,134,479	53,804	$ 21.0854
Metro Government	$ 2,794,663	15,199,200	$ 0.1839		$ 1,137,509	65,227	$ 17.4392
New Customers	$ 1,816,727	9,336,383	$ 0.1946		$ 807,104	49,631	$ 16.2622
Total	**$ 7,208,934**	**36,647,636**	**$ 0.1967**		**$ 3,152,513**	**163,116**	**$ 19.3268**

Total Revenue	**$ 10,361,447**
True-up and Adjustments (Net)	**$ 175,528**
Net Revenue	**$ 10,536,975**

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CES for FY23. TEG and CES continue to meet monthly and regularly communicate about important issues and on-going projects. CES has reported and managed EGF operations satisfactorily which is reflected in the reduction in the items noted in the EGF Walkthrough reports and in the improvement in meeting the performance guarantees in Amendment 2 of the ARMA.

A. Reliability

The principal issues surrounding the reliable operation of the EGF relates to the ability to operate without significant interruption, exclusive of planned outages, and disruption of service to the customers. The following disruptions in service occurred during the quarter.

- During the annual preventive maintenance on the electric system, the boilers were inadvertently taken offline for approximately one minute on November 7. This disruption resulted in the steam sendout pressure being less than 150 psig for approximately sixty minutes. The minimum steam pressure was noted as 109.9 psig.
- A momentary loss of electricity at the EGF on November 29 caused all of the EGF equipment to trip. The chillers were restarted and the chilled water sendout temperature did not rise above 43.3°F for more than thirty minutes (the reportable temperature limit and timeframe). The steam sendout pressure was below 150 psig for approximately 100 minutes with a minimum steam pressure of 74.9 psig. CES contacted NES (Nashville Electric Service) and were informed the loss of power was due to a fault at NES's Finn Street Substation.

- On December 1, boiler 1 tripped causing the steam sendout pressure to drop below 150 psig for approximately forty-five minutes. Boiler 4 was immediately restarted. The minimum reported pressure was 128.2 psig.
- The chilled water system lost pressure on December 15. Upon contacting DES customers and reviewing the distribution system, CES was informed by Bridgestone Arena personnel that they were testing the ice machine condenser on city water. (The ice machine makes ice for the ice rink at the arena.) The DES had not been isolated properly causing the chilled water to flow directly to the drain. The chilled water sendout temperature was above 43.3°F for approximately thirty-six minutes reaching a high temperature of 47°F.
- Nashville experienced unusually cold temperatures on December 23, 2022. In the early morning hours, boiler 3 tripped and another boiler was started. The sendout steam pressure dropped to a low of 111 psig. As the pressure was being restored, the EGF experienced an abnormal voltage imbalance from NES causing issues with the motor control centers and the plant motors leading to a trip of the boiler plant. CES was able to bring the boiler plant back to normal operation but the sendout pressure was below 150 psig with a reported low pressure of 12.6 psig. The total time the sendout pressure was below 150 psig for this day was six hours and four minutes.
- There were no other reported issues during the quarter.

B. Efficiency

The operation of the EGF did not satisfy all of the guaranteed levels for all commodity usage during the quarter. There were excursions above the guaranteed levels for the current quarter. A more detailed discussion of the contract guarantee performance was presented previously in this report.

C. Environment, Health, and Safety

No environmental violations were reported during the quarter.

CES has implemented and is requiring regular attendance for online safety courses for their employees. Masks are to be worn within the EGF and when social distancing cannot be implemented. However, in person meetings are now being held at the EGF.

D. Personnel

As of the end of the quarter, CES is currently staffed with nineteen full time employees, one remote part-time employee and two shared employees. Of the current number of employees, thirteen were previously employed by Nashville Thermal Transfer Corporation.

E. Training

Staff training for this quarter consisted of the Health and Safety training discussed previously.

F. Water Treatment

The water treatment program consists of regular testing and monitoring of the water chemistry in the steam, chilled water, and condensing water systems. Chemicals are added to control the water hardness, chlorine levels and biologicals and to aid in the prevention of corrosion. Remote testing of the condensate at the AA Birch, Tennessee Tower and the Andrew Jackson also occurs regularly to monitor the concentration and distribution of the steam system chemicals.

- Steam System
  - The condensate return averaged approximately 70.5% of the steam sendout during the quarter, which represents a 4.3% decrease over the previous Second Quarter. A portion of the condensate was dumped during the quarter due to hardness or iron from customer buildings. The Legislative Plaza and War Memorial buildings are dumping their condensate due to iron levels and do not plan on making repairs until building renovations begin.
  - Feedwater iron, pH, and hardness (for the portion of the condensate returned) remained within their acceptable ranges during the quarter.
- Condensing Water System
  - The conductivity of the condensing water continues to be normal with only a few excursions.
  - The cooling tower blowdown decreased 19.2% over the previous Second Quarter. This decrease resulted in an average increase in the cycles of concentration in the cooling towers by 13.1%.
- Chilled Water System
  - CES continues to monitor and test for the presence of bacteria in the system. The biological growth in the system, as measured at the EGF and at the customer buildings, has become essentially non-existent. Chem-Aqua's proprietary biological treatment system continues to function properly.
  - Metro approved the installation of the side stream filter at the EGF. Installation is currently scheduled for the Third Quarter FY22 due to production and shipping delays. The filter will be installed under project number DES200.

G. Maintenance and EGF Repairs

CES continues to report on the routine and preventative maintenance activities performed on the EGF primary and ancillary equipment. The principal items are discussed herein as they relate to the repair, maintenance or replacement of equipment or devices at the facility

and are not considered extraordinary. The cost for these items is included as part of the FOCs.

- Backed up plant computers and servers;
- Repaired plant lighting and electrical system;
- Checked and adjusted packing on all pumps;
- Assisted with data acquisition for Plant Efficiency (Skyspark);
- Repaired leak on 40215 chemical line;
- Replaced mini split AC unit in control room;
- Repaired refrigerant alarm;
- Repaired actuator on chiller 7;
- Wired and checked rotation for condensing water pump motor 4;
- Repaired or replaced locks, signage, and access gates;
- Winterized plant;
- Repaired cooling tower makeup valve;
- Refurbished GE 750 Multilin relay;
- Repaired differential pressure switch on BFWP 3;
- Repaired roof leak;
- Checked for tube leak on boiler 1;
- Repaired propane vaporizer;
- Re-pipes brine draw lines for water softeners;
- Repaired boiler 1 flame scanners;
- Other repairs, maintenance and preventative maintenance were made during the quarter and are listed in the monthly reports issued by CES.

H. EGF Walkthrough

The EGF Walkthrough was conducted on January 10, 2023, by Kevin L. Jacobs, P.E. Based on the review of the EGF, the following comments and observations are presented. Constellation Energy Solutions, LLC (CES) have made significant efforts within the past year to address many of the issues contained in the previous reports resulting in the elimination of many of the older items. However, some items remain which are noted herein. In addition, a chilled water outage occurred on January 4 which included work and maintenance at the EGF. Some insulation repairs and clean-up are necessary which are not noted herein since some of this work remains in progress.

- CES has reported in the previous quarters that the riser tubes in all of the cooling towers had been painted and that the cooling tower fill had all been replaced. Rust spots on the riser tubes remained present in the Fourth Quarter FY19 Walkthrough and continued to worsen. CES applied a new coating on the riser tubes to most of the cooling towers. **CES stated that only a few more of the cooling towers require the new coating and that they would be addressed after the cooling season.**
- The louvers and portions of the fill at cooling towers 1, 6 and 15 appear to have been damaged. As noted in the First Quarter FY22 Walkthrough, no additional work appears to have been completed since this item was noted in the Third Quarter FY20 Walkthrough. The damaged portions need to be repaired or replaced. In addition, the sections of the louvers on towers 5 and 6 appear to have separated in several places. **CES had previously stated they may request an updated quote from their contractor to address this issue, but no work has been performed to date.**
- Chemical feed lines were noted as leaking with visible salt build-up on some of the lines between the tanks labeled 12900 and 10600 and tanks 12001 and 34170. This item was first noted in the Second Quarter FY22 Walkthrough report. **CES has repaired these leaks and cleaned the area. This item will be removed from future reports.**
- The west side of cooling tower 18 and the east side of towers 7, 8, and 17 all had some black colored debris or mastic-type substance splattered against the exterior of the basins. **CES should clean these locations during their annual tower cleaning.**
- The air curtain heaters were venting steam and dripping condensate. Water had accumulated on the floor in the area. **CES should repair these leaks and clean the area.**
- A section of the steam insulation has been damaged or was removed on the east side of the de-aerator in the basement. **CES should repair the damaged insulation.**
- A small portion of algae has returned to the cooling tower deck on the east side of the EGF. **CES should clean this area during their annual tower cleaning.**
- One of the lamps above the catwalk near the expansion tank was flickering during the walkthrough. **CES should repair this lamp.**
- Miscellaneous trash was noted on the west side of the exterior of the EGF. **CES should remove this trash.**
- Other action items previously noted to be addressed by CES have been completed. (See also the "Quarterly EGF Walkthrough Report," dated January 11, 2023, by TEG for additional information.)

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. Costs for these projects will be paid from funds already appropriated. The status of the projects is discussed, and the project cost-to-date and bond balances are also presented.

A. Second Quarter FY23 Open Projects

The following projects remained open at the end of the First Quarter FY23.

1. DES139 – DES Options Review

TEG, the Metro Liaison, and Metro Water Services (MWS) discussed the Business and Marketing Plans proposed by TEG in FY21. The draft of these documents remain under review by MWS, but TEG is working under this project number to address the questions and comments raised by MWS during this meeting and is preparing other documentation that presents recommendations for the DES moving into the future while remaining under Metro ownership. No additional work was requested by Metro during the quarter.

2. DES154 – Manhole K Repairs

This project is in close-out.

3. DES143/161 – Manhole N1, N2 and S6 Insulation

This project addresses the installation of insulation in three (3) manholes: Manhole N1, Manhole N2 and Manhole S6. Manhole N1 and N2 house chilled water piping which is partially uninsulated. Manhole S6 is a small manhole that is a part of the State distribution system which houses steam and condensate return piping which is uninsulated. These projects address the insulation of this uninsulated piping.

Manhole S6 (DES-161) is closed.

The steel cleaning/coating in Manhole N1 was completed during the First Quarter of FY23. CES has decided to include the insulation in Manhole N1 under their Amendment 2 obligations. CES has also decided to include the insulation in Manhole N2 under their Amendment 2 obligations. Therefore, these projects will be closed.

4. DES163 – New Service to MDHA Parcel K (Peabody Union)

The Peabody Union development includes the construction of Guthrie St that will require the modification to the east retaining wall along the EGF property. The installation of this new road may affect the entrance and exit to the EGF site and

result in the loss of DES property. Unfortunately, they have elected to not be a DES customer. This project number will be used to track costs and activities associated with the new road, the on-site construction activities, and their impact to DES.

Blasting at the site continued during the quarter. CES, VibraTech, and TEG regularly monitor and review the facility and operation of the DES to ensure no damage or operational issues occur or have occurred. Should any issues arise, CES will promptly address the issues and report their findings to TEG and Metro immediately.

A meeting with the contractor and the owner's representative is scheduled for January 2023 to discuss the construction and coordination of the Guthrie St work and its impact on DES operations. The goal of this meeting will be to have an agreement in place for coordination and a mutually agreeable routing and site aesthetic.

5. DES177 – Manhole B1 Ladder and Platform

Manhole B1 is in 1st Ave South and houses a groundwater sump pump to alleviate the amount of groundwater that infiltrates into Manhole B. Manhole B1 is a 4 ft diameter, precast manhole with individual embedded rung access ladder. Currently, personnel stand on partially submerged concrete blocks when maintenance is required within this manhole. This project addresses the installation of a platform and ladder for maintenance.

This project was bid and verbally awarded during the Fourth Quarter FY21. There is a dispute between CES and DES regarding scope items that CES is requesting additional compensation to perform this work, therefore this project is on hold until the matter is resolved.

6. DES178 – Manhole 5 Repairs

Manhole 5 has several structural steel piping supports which are corroded and need to be cleaned and coated. This project addresses the cleaning and coating of these components and the replacement of damaged and missing piping insulation.

The cleaning and coating of the structural steel has been completed and reviewed by TEG. The insulation has been priced and CES has verbally awarded the work to the successful bidder and requested that the needed insulation blankets be ordered. However, CES is converting to a new financial system, therefore purchase orders could not be issued during the Second Quarter FY23. Once the new system is in place a purchase order will be issued and the work will commence.

7. DES180 – State Tunnel Pipe Support Repairs

The State Tunnel has several steel piping supports which are corroded and need to be cleaned and coated. This project addresses the cleaning and coating of these components. The primary cause of this corrosion is water infiltration into the tunnel, and it would be prudent for the State to make repairs to the tunnel structure to address the water infiltration before the steel piping supports are cleaned and coated. TEG has spoken with the State and transmitted photos outlining the existing conditions and damage. TEG and CES met with the State and their structural engineer and conducted a walk-through of the tunnel on March 3, 2022. Based on a conference call with the State, they are approaching the needed repairs in two phases: Short-Term Repairs and Long-Term Repairs. Their engineer recently revisited the tunnel system to better define the entire scope of repairs and TEG was told that a report with their recommendations and an estimated budget to the State in November 2022. The latest update from the State indicates that they have asked for construction estimates which should be received during the First Quarter FY23. The State has indicated that the interior waterproofing of the tunnel will be addressed in the short-term.

TEG has compiled a scope outline of the most severely corroded supports to be cleaned and coated and CES has obtained pricing and presented a proposal to TEG for this scope. The intent is to have these supports addressed prior to the State initiating the interior waterproofing of the tunnel. However, CES has included statements in their proposal to retain the right to ask for additional mark-up on this work. The inclusion of this proposal statement is being disputed by TEG and Metro legal is reviewing the situation. The project's initiation and completion of the most severely corroded supports will be dictated by the outcome of this dispute. The completion of the cleaning and coating of the remaining supports will be dictated by the State's schedule/repair plan.

8. DES188 - 4th and Church Access Tunnel Repairs

This project closed during the quarter.

9. DES191 – Manhole 20 Repairs

Manhole 20 houses steam, condensate return and chilled water service piping for Hume Fogg High School, and it sits on top of a vertical shaft that connects to the 7th Ave Tunnel. The pipe supports within the manhole are badly corroded, the existing entry ladder consists of individual embedded rungs which are prone to failure with little warning, a caisson that prevents groundwater from flowing down the vertical shaft is badly corroded, and the condensate return piping is leaking. This project addresses these issues.

This project was bid during the Third Quarter FY22. The project was awarded during the Fourth Quarter FY22. The excavation portion of this project was completed during the First Quarter FY23. Some of the work within the manhole was completed during the Second Quarter FY23, however due to a delivery delay for a high temperature hose, the project has been on hold. It is expected that the hose will be delivered during the Third Quarter FY23, and the work scope will be complete.

10. DES192 – Peabody Street Development

With new potential customer developments along Peabody Street, a survey of the area from the west side of the EGF and along Peabody to 4th Avenue South was commissioned and provided to DES during FY22. TEG used this information to develop a plan to cross Hermitage Ave with new DES service and to formulate a course of action for a potential new parking area (DES195). Any new customer connection south and west of the EGF would be connected from this proposed service.

In addition, this project number is used to track costs associated with connecting the proposed development at 133 KVB to the DES. TEG has remained in contact with this potential customer who has stated they are continuing to develop their plans for the site but remain interested in DES service.

11. DES194 – Manhole B4 Repairs

The structural steel pipe supports within Manhole B4 are corroded and require cleaning and coating. In addition, most of the insulation within Manhole B4 needs replacement and the entry ladder needs to be extended. This project addresses these needs.

TEG completed construction documents for this work during the Third Quarter FY22. CES is going to obtain quotations for this work during the Third Quarter FY23 with the work to follow.

12. DES195 – DES Parking Area

With the addition of Guthrie St adjacent to the east side of the DES property line (see DES163), the new road will impact the north and south ends of the DES property. This change will decrease the available parking area at the DES and also eliminate laydown areas used by CES and the DES contractors. Options for the new parking area were presented by a civil engineering firm hired by TEG. These options have been reviewed and discussed with Metro, but no decision has been made due to date.

13. DES196 – Exploratory Excavation and Condensate Leak Repair at MH 9

CES has identified condensate entering the condensate pipe wall penetration in MH-9. TEG is evaluating the scope of repairs needed and developing a scope and construction drawings.

14. DES197 – Manhole 3 Coatings and Repairs

This project is now in close-out.

15. DES198 – Manhole 18 Condensate Pump Replacement

The pumps and variable speed drives arrived during the Second Quarter. The construction must now be delayed until after the heating season to facilitate a possible shut down on the condensate system at MH-18 and to wait until the steam sales decrease.

16. DES199 – Manhole D3 Sparge Tube Addition

The bottom of an existing pipe stanchion is severely corroded rendering the support ineffective. Due to the absence of this support, when a nearby trap discharges, the condensate piping shakes due to steam hammer. This project addresses the replacement of the support and the installation of a sparge tube to address any steam hammering.

The structural work was completed and reviewed by TEG during the First Quarter FY23, however the support was not installed in the position. TEG developed a modification of the support based on its installed location. The installing contractor made these modifications during the Second Quarter FY23. Once the insulation is repaired, this project will be complete.

17. DES200 – Chilled Water Side Stream Filter

Due to additional material and delivery delays, the side stream filter is anticipated to be delivered during the Third Quarter FY23 with the construction and installation scheduled soon thereafter. The filter is expected to be operational in the Third or Fourth Quarters FY23.

Since the filter will be considered part of the chemical treatment system, the DES customers will be charged for its capital cost over the course of approximately five (5) years once the filter becomes operational.

18. DES201 – East Bank Development

TEG, the DES Metro Liaison, and Metro's other engineering consultant, FVB, have been involved during the quarter with meetings and investigations into the developments on the East Bank. These developments include the possible construction of the new stadium for the Tennessee Titans, the development of the Oracle campus on River North, and the other potential commercial and residential developments in the area which could benefit from district energy. FVB is also working on a high-level report of the potential for development in the area. The options for district energy on the East Bank include the development of one or more new sustainable plants serving multiple customers.

19. DES202 – 7th and Commerce Hotel

TEG has remained in contact with the engineers and development team for a proposed hotel, restaurant, and retail spaces at 7th Ave N and Commerce St. The design of the new site is progressing with the intention of utilizing the services from DES. The estimated loads are 700 tons of chilled water and 11,000 pph of steam. A non-binding letter of intent was provided to TEG by the developer during the quarter. Additional engineering is anticipated during the Third Quarter FY23.

20. DES203 – Printers and Bankers Alley Building

TEG has remained in contact with the engineers and development team for a new multi-story residential and retail development located on 3rd Ave N at Printer's and Banker's Alley. The design of the new site is progressing with the intention of utilizing chilled water from DES with an estimated load of 600 tons.

21. DES204 – New Signs for the EGF

The new signs were approved and are scheduled to be installed in January 2023.

22. DES205 (EMR23-001) – Chilled Water Outage

A 24-hour chilled water outage is scheduled to take place from 12:15 a.m. January 4, 2023, until 12:15 a.m. January 5, 2023. This outage is necessary to 1) replace several valves in the EGF; 2) remove the corroded chilled water vent valves in MH 15; and 3) remove buried chilled water drain valves from the distribution piping in the 5th Ave N and Union St intersection that are suspected to be leaking.

B. Second Quarter FY23 Closed Projects

DES143, DES154, and DES197 were closed during the Second Quarter FY23.

C. Capital Projects Budget

The following table summarizes the costs and remaining balance of the DES capital projects based on reported expenditures to date. Open projects or completed projects that require some additional management efforts are shown. Projects discussed in this report that are not listed did not have any expenses during the quarter. Total costs for projects that are closed are shown with a gray highlight. Only the funds currently available are shown.

Table 5. Capital Projects Expense Summary

	DES Project #	Description	Total Budget	FY22 Spending to Date	Total Spent to Date	Remaining Balance
Fund-49116						
	DES133.1	NCC Blasting Issue	$ 200,000	$ -	$ 166,017	$ 33,983
	DES139	Options Review	$ 450,000	$ 769	$ 319,209	$ 130,791
	DES143	MH N1, N2 and S6 Insulation	$ 30,000	$ 655	$ 7,204	$ 22,796
	DES154	MH K Repairs	$ 75,085	$ 45	$ 35,732	$ 39,353
	DES163	Parcel K Service	$ 1,018,802	$ 42,926	$ 68,284	$ 950,518
	DES177	MHB1 Ladder & Platform	$ 45,500	$ -	$ 6,833	$ 38,667
	DES178	MH-5 Repairs	$ 97,500	$ 144	$ 31,797	$ 65,703
	DES179	MH-11 Repairs	$ 76,500	$ 12,588	$ 75,537	$ 963
	DES180	State Tunnel Support Repairs	$ 140,000	$ 3,506	$ 6,790	$ 133,210
	DES188	4th and Church Access Tunnel Repairs	$ 180,000	$ 3	$ 177,045	$ 2,955
	DES189	MH4 Structural Steel and Insulation Repairs	$ 56,750	$ -	$ 13,960	$ 42,790
	DES191	MH 20 Repairs	$ 94,875	$ 40,229	$ 68,938	$ 25,937
	DES192	Peabody Developments	$ 40,000	$ 1	$ 28,689	$ 11,311
	DES193	MH-13 Repairs	$ 30,000	$ -	$ 6,673	$ 23,327
	DES194	MH-B4 Repairs	$ 80,000	$ 45	$ 7,470	$ 72,530
	DES195	DES Parking Lot	$ 275,000	$ 7,327	$ 12,688	$ 262,312
	DES196	Condensate Line Leak Repair at MH9	$ 130,000	$ 358	$ 411	$ 129,589
	DES197	MH3 Coatings and Repairs	$ 13,500	$ -	$ 9,888	$ 3,612
	DES198	MH18 Condensate Return Pump Replacement	$ 175,000	$ 1,060	$ 9,736	$ 165,264
	DES199	MHD3 Sparge Tube	$ 25,000	$ 2,514	$ 3,200	$ 21,800
	DES200	Sidestream Filter	$ 330,000	$ 731	$ 2,161	$ 327,839
	DES201	East Bank and Oracle Development	$ 110,000	$ 17,430	$ 22,723	$ 87,277
	DES202	Service to 7th and Commerce	$ 1,630,000	$ 1,493	$ 1,830	$ 1,628,170
	DES203	Service to Printer's Alley Residential	$ 850,000	$ 48	$ 144	$ 849,856
	DES204	DES Sign Replacement	$ 73,000	$ 27,826	$ 27,826	$ 45,174
		Total Closed Projects	$ 3,698,579	$ -	$3,698,579	$ -
		Metro Project Admin	$ -	$ -	$ -	$ -
		Project Man, Development, etc	$16,074,909	$ -	$ -	$16,074,909
		Fund Total	**$26,000,000**	**$ 159,699**	**$4,809,362**	**$21,190,638**

V. Energy Distribution System Repairs, Improvements, PM, and Emergencies

Several EDS repairs and improvements were made during the Second Quarter. The principal items for discussion are presented in the following sections.

A. Repairs and Improvements

Several repairs were made to the EDS and at customer buildings during the quarter. The remaining value of the R&I account to date is $369,225. Table 6 provides a summary of the FY23 expenditures and revenues to date associated with the R&I budget.

Table 6. FY22 Repair and Improvement Expenditure and Revenue Summary

Description	Date	Tracking #	Vendor	Expenditure	Transfers	Net Market Adjustment	Market Value	Balance
Value at end of FY22				**$ 88,215.28**		**$ -**	**$ 254,534.91**	**$ 254,534.91**
July 2022 EDS R&I	11/4/2022	DES2426	CES	$ 12,814.77				
Interest	7/1/2022	-	-	$ 115.92				
Interest	7/1/2022	-	-	$ (115.92)				
Interest	8/1/2022	-	-	$ 232.10				
Interest	8/1/2022	-	-	$ (232.10)				
Aug 2022 EDS R&I	12/22/2022	DES2430	CES	$ 8,376.70				
Interest	9/1/2022	-	-	$ 465.76				
Interest	9/1/2022	-	-	$ (465.76)				
Sept 2022 EDS R&I	12/22/22	DES2430	CES	$ 3,840.65				
	Sub-Total First Quarter			**$ 25,032.12**	**$ 75,924.99**	**$ -**	**$ 50,892.87**	**$ 305,427.78**
Interest	10/03/22	-	-	$ 589.35				
Interest	10/03/22	-	-	$ (589.35)				
Oct 2022 EDS R&I	11/16/22	-	CES	$ 4,851.51				
Interest	11/01/22	-	-	$ 796.31				
Interest	11/01/22	-	-	$ (796.31)				
Nov 2022 EDS R&I	12/21/22	-	CES	$ 15,313.24				
DES-143 Manhole N1	12/21/22	-	CES	$ 7,410.00				
DES-199 Manhole D3	12/21/22	-	CES	$ 8,750.00				
Interest	12/01/22	-	-	$ 1,014.33				
Interest	12/01/22	-	-	$ (1,014.33)				
Dec 2022 EDS R&I	01/18/23	-	CES	$ 1,111.35				
	Sub-Total Second Quarter			**$ 37,436.10**	**$ 75,924.99**	**$ -**	**$ 38,488.89**	**$ 343,916.67**
	Sub-Total Third Quarter			**$ -**	**$ 25,308.33**	**$ -**	**$ 25,308.33**	**$ 369,225.00**
	Sub-Total Fourth Quarter			**$ -**	**$ -**	**$ -**	**$ -**	**$ 369,225.00**
	FY23 Year to Date			**$ 62,468.22**	**$ 177,158.31**	**$ -**	**$ 369,225.00**	**$ 369,225.00**

B. Preventive Maintenance

Preventive maintenance, tunnel and manhole inspections and reviews of customers' mechanical rooms were performed during the quarter. The principal items for discussion are presented.

1. EDS Manhole/Tunnel Inspections
   a. The monthly vault/tunnel reviews were conducted as scheduled.
   b. CES continues to replace trap assemblies within the EDS as needed.
   c. CES should continue to clean areas of minor corrosion and then paint those areas with a cold galvanizing paint. If maintained, this should help reduce/slow down the progression of some areas of corrosion.
   d. Minor insulation repairs are needed in some vaults.
2. Customer metering station calibration checks were completed as scheduled.
3. Water chemistry samples at customer buildings were taken as scheduled.
4. Other EDS items are included in the CES monthly reports.

C. Emergencies

There were no emergencies reported during the quarter.

D. EDS Walkthrough

Due to the holidays and a death in Jon Belcher's family, the Second Quarter FY23 walkthrough was not conducted during the quarter. The Second and Third Quarter walkthroughs will be conducted during the Third Quarter FY23 and reported in the Third Quarter report.

VI. Customer Relations

This section contains descriptions of the marketing efforts made by the DES Team during the quarter and prominent existing customer interactions. The topics of interactions, meetings and training seminars with the customers are also discussed. There are currently 21 customers, comprised of 42 different buildings, connected to the EDS. Service to each of these buildings continues to prove satisfactory, and the responsiveness to customer issues is handled by CES in an expeditious and professional manner.

A. Marketing

The design and development of the proposed hotels at 1st Ave S and KVB have been delayed. However, TEG continued discussions with the development team for the site and will continue to work with them through their design options.

Metro Water Services (MWS) participates on the East Bank Technical Advisory Committee, which consists of more than two dozen representatives of interested utilities, regulatory bodies, planning agencies, property owners, and design professionals. DES is represented by the Metro Liaison who also represents the interests of MWS infrastructure. The Metro Liaison has been actively promoting the use of district energy in the East Bank planning process by identifying synergies with other utility, transportation, and public recreation agencies. Work associated with the East Bank Development is tracked under the project DES201.

MWS and DES are currently in discussions regarding the developing plans for the Oracle campus, but those plans have not been widely publicized. DES is also pursuing opportunities to serve other developments and MWS infrastructure in the River North area. DES continues to explore options for serving the Oracle campus, Nissan Stadium, and other East Bank developments in a sustainable way.

TEG has made efforts to contact the parties involved with new developments south of Peabody St in the Rolling Mill Hill area. This potential development could be served from new service lines along Peabody St (DES192). TEG contacted two of these developments during the quarter who appear interested in DES services.

TEG has remained in contact with the development team for a new hotel to be located at Demonbruen and 8th Ave S during the quarter. The design and development are in the early stages and more conversations are anticipated in the coming months.

B. Customer Interaction

The CES customer service representative (CSR) continues to respond to customer issues as they arise. Much of the communication involves minor problems with the customers' heating and cooling systems that are unrelated to DES service. Other more significant issues are summarized herein.

- Several customers made repairs within their buildings during the Quarter and requested assistance from CES, which was provided. Some of these repairs involved isolating the steam or chilled water services to the building for the customers.
- TEG was contacted by a local engineer that the Davidson County Detention Center Building had their chilled water pump fuses to blow. CES's CSR was notified and reviewed building data which showed no differential pressure issues within their building data that could cause this issue.
- The Bobby Hotel's Building Engineer requested that CES check the steam flow meter at their Building. CES I & E personnel investigated and found no problem with the meter.
- The Wildhorse Saloon's Building Engineer requested the CSR to review a steam leak inside their building to determine the responsible party for making the repair.

It was determined that the leak was the building's responsibility. The customer also reported a noise coming from near the location of the steam pipe entry into the building. CES investigated and found a faulty steam trap in Manhole K causing the noise. The steam trap was replaced on November 3.

- CES kept the customers informed of the issues at the EGF on December 23 due to the unusually low temperatures.
- CES was contacted by the Hyatt Place building engineer to report the condensate return making unusual noises in their building. CES investigated and found a steam trap blowing through in their building and isolated the issue.
- CES were checking for chilled water leaks near the lines that cross to the Titans Stadium and observed several people congregating near the secured area. The gate had a hole in it allowing access to the area beneath the chilled water lines under the Woodland St bridge. The area was full of burned debris and presented a safety issue. Repairs were made to the gated area on December 30 with the help of Nashville Public Works.
- Other minor issues and customer interactions are noted in the monthly reports from CES.

VII. Recommendations

CES is obligated to meet the standard of good utility practice and performance guarantees as outlined by the ARMA. Based upon the operating data, CES continues to fail to consistently meet the steam-fuel and steam-water performance guarantees. The plan currently being developed by CES's engineer has been delayed but should be implemented in the Third Quarter FY23. In TEG's opinion, CES needs to continue to improve the operations of the EGF to comply with the ARMA. CES has greatly improved its maintenance over the last several quarters, and there are fewer items which have been repeated in TEG's quarterly walkthrough reports. CES has addressed many of the recurring issues in these reports and improved the overall condition, appearance, and operation of the EGF. CES needs to expeditiously address any long-outstanding items.

Based on the review of the Second Quarter FY23 EGF and EDS operations, the following recommendations are made.

- CES needs to address the maintenance items included in the EGF and EDS Walkthrough sections of this report as soon as possible.
- CES needs to increase their preventative maintenance program to decrease the number of equipment malfunctions and trips within the EGF or otherwise improve the operation of the system to prevent such frequent occurrences in the future.
- CES needs to address their inability to meet the new performance guarantees for the EGF such that they are consistently met. Failure to meet the performance guarantees for twelve consecutive months may be considered an Event of Default according to Section 18.02 (B)(4) of the ARMA. CES has operated the EGF for thirty consecutive months with at least one performance guarantee excursion each month.

- The structural steel within vaults and tunnels that has been professionally cleaned and coated should be closely monitored so that if deterioration occurs, it can be addressed quickly and cost effectively.
- Structural steel within the vaults and tunnels that have not been professionally cleaned and coated which exhibit evidence of corrosion should be cleaned and coated by CES using cold galvanizing paint to mitigate the progression of corrosion.
- Insulation that is absent or in disrepair in the vaults and tunnels should be repaired/replaced through Amendment 2 of CES's contract or through capital and R&I projects.
- Steam traps which need repair or replacement should be addressed immediately.
- Expansion joint leaks should be repaired by either re-packing the joint or injection of a sealant once the leak(s) is sufficient for the repair to be effective.
- CES should continue to remove debris and mud from manholes.