



Operations Monitoring Report

Second Quarter FY24

Prepared by:

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January 31, 2024

I. Executive Summary

A review of the fiscal year 2024 (FY24) 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.

During the Second Quarter FY24, CES has continued to improve the performance of the EGF resulting in consistently meeting the chilled water-electric, the steam-electric, and chilled water-water guarantees for the quarter. However, CES did not meet the steam-fuel and steam-water guarantees each month. CES is required to meet this performance criteria each month in accordance with Paragraph 8.d of Amendment 2 of the Amended and Restated DES Management Agreement (ARMA) between Metro and CES and Section 18 of the ARMA. CES has made operational changes and other improvements to the DES over the past few years which have resulted in approvals to the facility and increased efficiencies. These changes have resulted in CES consistently meeting the chilled water-water guarantee each month of the quarter, which was met only once in the previous quarter, and has met the steam-water guarantee for two months this quarter which has not been met in over two years. CES and TEG continue to monitor the efficiency and performance of the DES looking for means of improving the system.

For the Second Quarter FY24, the chilled water sales increased 2.1% over the previous Second Quarter (FY23). The chilled water sendout also increased 4.2% over the previous Second Quarter. However, the system losses increased significantly. The number of cooling degree days increased 143%. The peak chilled water demand for the current quarter was 13,732 tons, which is 18.1% higher than the previous Second Quarter. The increase in sales and number of cooling degree days are indicative of a warmer than usual quarter.

Steam sendout for the current quarter decreased 12.6% over the previous Second Quarter with steam sales also decreasing 12.6%. This decrease came with a 13.6% decrease in heating degree days reflective of a warmer than usual quarter. Total steam system losses decreased 12.5% from the previous Second Quarter. The peak steam demand for the current quarter is 103,025 pounds per hour, which represents a decrease in the previous Second Quarter demand of approximately 24.4%.

Work continued with the DES Capital and Repair & Improvement Projects during the Second Quarter. Repair and Improvements to the EDS continued as scheduled. Of the eighteen open projects, CES currently is only involved in ten. Of these ten projects, five are either in close-out or have minimal CES involvement. As noted in prior quarterly monitoring reports, the postponement or deferral of some of these items will result in an increase in maintenance costs to the DES and could impact the delivery of steam and chilled water. Projects DES214, DES215 and DES216 have been added. Projects DES191, DES194, and DES198 were closed during the quarter.

The current fiscal year system operating costs to date are \$10,347,682. This value represents approximately 46.6% of the total budgeted operating cost for FY24 and includes the First Quarter

Self-Funded Debt Service Payments. The customer revenues from the sales of steam and chilled water for FY24 are \$10,229,809 (46.9% of budgeted amount) which includes the annual true-up amount for FY23 and other miscellaneous revenue sources. Although not confirmed at the time of this report, the First Quarter Metro Funding Amount (\$96,100; 25% of budget) has been transferred. The actual MFA can only be estimated due to outstanding invoices as of the date of this report.

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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 2.1% increase in sales for the current quarter over the same quarter of the previous fiscal year.

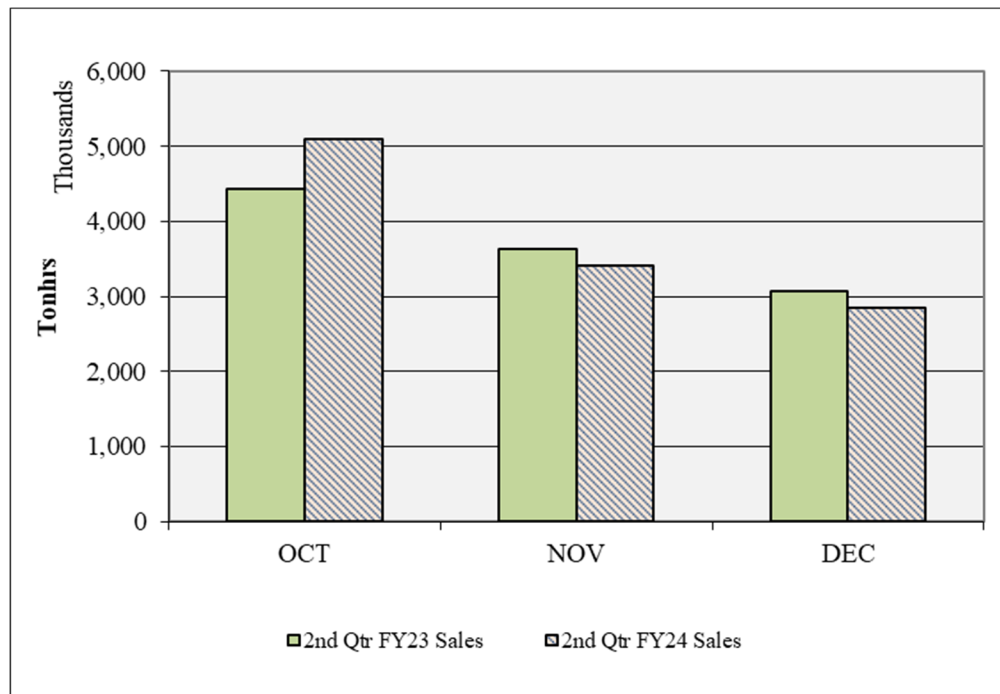


Figure 1. Chilled Water Sales Comparison

The peak chilled water demand for the current quarter was 13,732 tons, which represents an 18.1% increase over the previous Second Quarter.

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 were 143% higher in FY24 than in FY23 and are tracked for comparison.

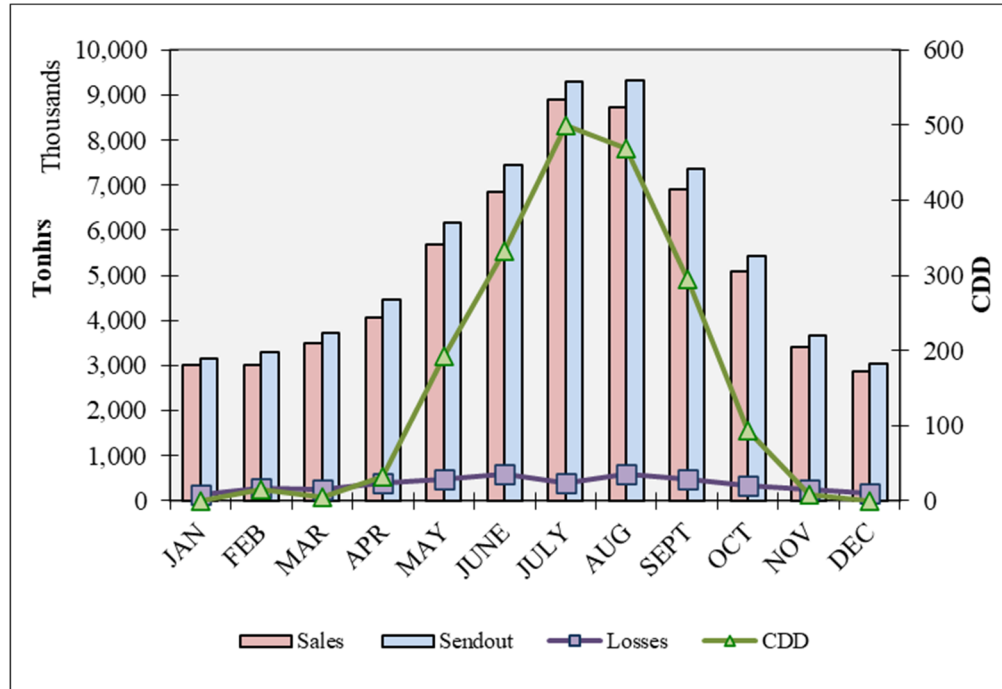


Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months

2. Losses

A significant increase in the chilled water energy losses previously noted for the Fourth Quarter FY23 was determined to be related to an issue with the chilled water meter at the Bridgestone Arena. This issue was resolved prior to the First Quarter FY24. However, the losses for the Second Quarter have significantly increased (47.2%). TEG and CES will investigate the cause of these 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 and may reflect differences in the meter accuracy between the EGF sendout meter and the customer meters.

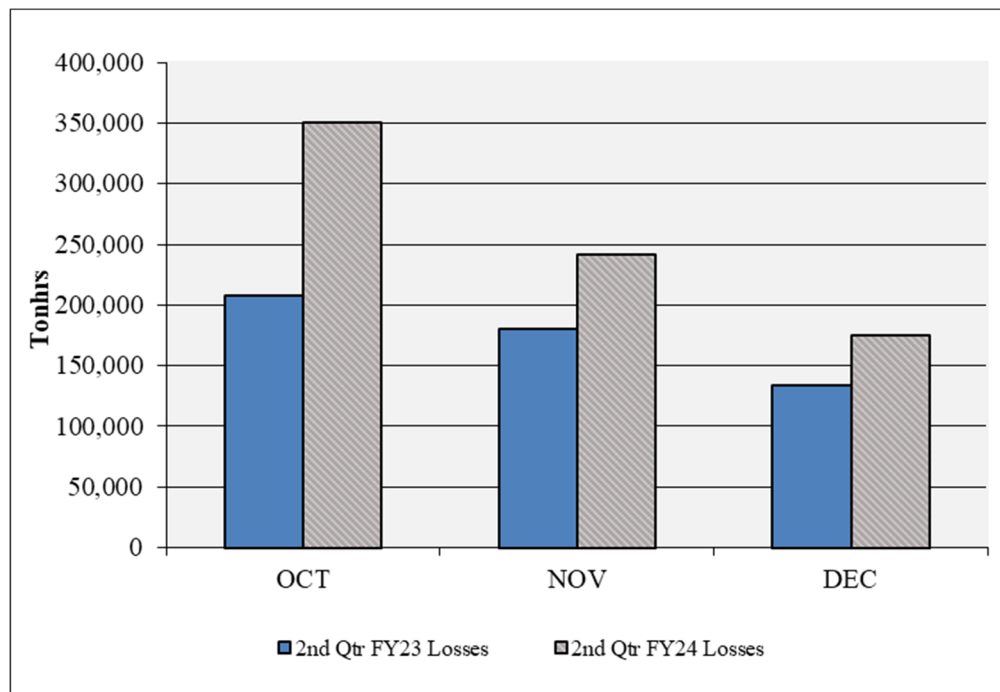


Figure 3. Chilled Water System Loss Comparison

The EDS make-up decreased marginally over the previous Second Quarter as the average daily make-up amounts have dropped to less than 13,000 gallons per day (on average for the quarter). TEG and CES suspect another leak in 5th Ave N, but previous efforts to locate the actual source of the leak have been unsuccessful. TEG and CES 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 increased 4.1% over the previous Second Quarter. The water usage in the cooling towers is typically proportional to the production of chilled water and should vary with chilled water sales, thus the increase in cooling tower make-up would be expected with an increase in sales. The

total chiller plant water use increased 3.8% over the Second Quarter FY23. The overall city water make-up comparison for the chilled water system Second Quarter is shown in Figure 4.

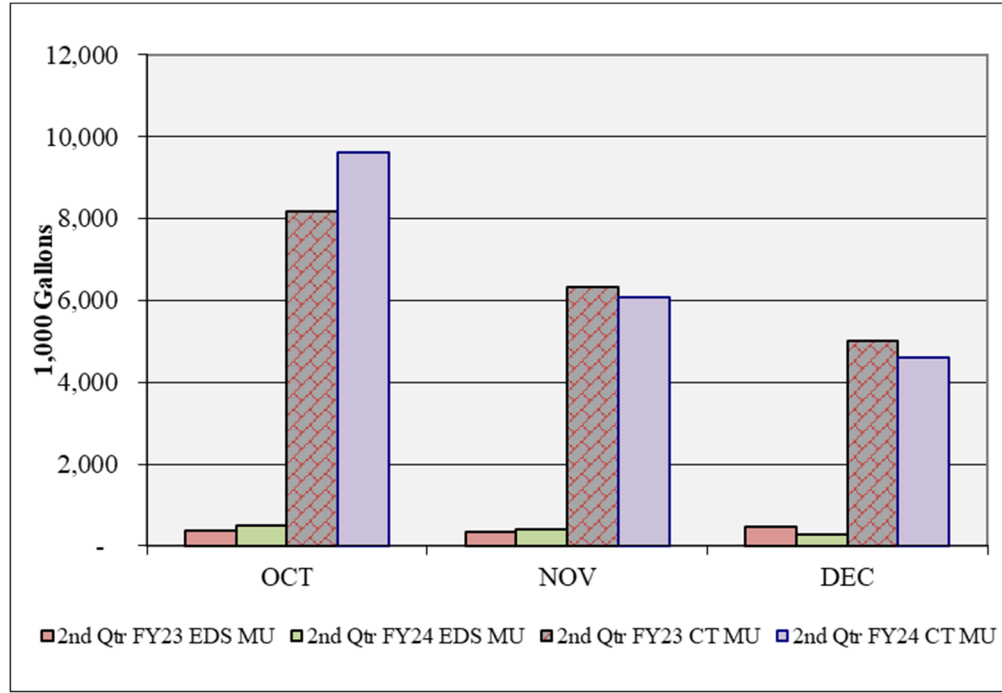


Figure 4. Chilled Water System City Water Usage Comparison

Beginning in March 2023, CES and TEG began monitoring the cooling tower blowdown ratio in earnest. The relationship between the cooling tower blowdown and the chilled water production should be consistent and tracking this relationship may prove helpful in reducing the chiller plant water usage. CES has made operational changes with respect to this metric with the expectation of reducing the water usage and improving their performance relative to the chilled water-water guarantee. When a comparison is made between the Second Quarter FY24 and FY23, the ratio decreased 26.7%. This metric will continue to be tracked and monitored to verify operational changes made by CES at the EGF have resulted in a decrease in chiller plant water usage. Figure 5 shows the comparison of this metric for the Second Quarter.

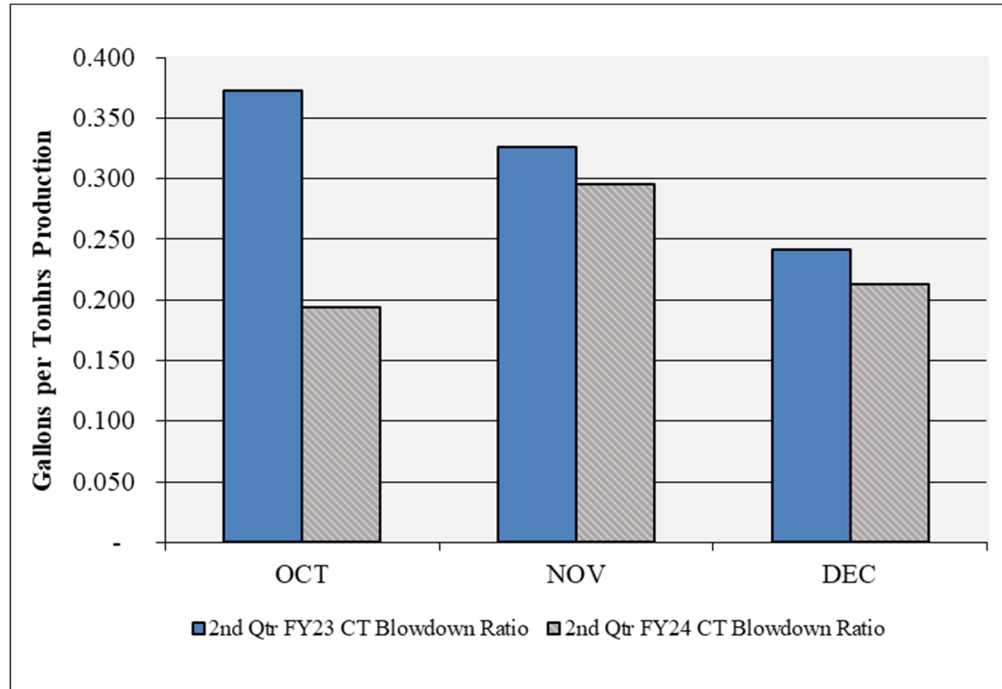


Figure 5. Cooling Tower Blowdown Ratio Comparison

3. Performance

The performance of the chilled water portion of the EGF is presented in the following two charts, Figures 6 and 7, 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-electric for each month of the Second Quarter. The chilled water-electric guarantee has also been met for the previous twelve months. The chilled water-water guarantee was met each month during the quarter.

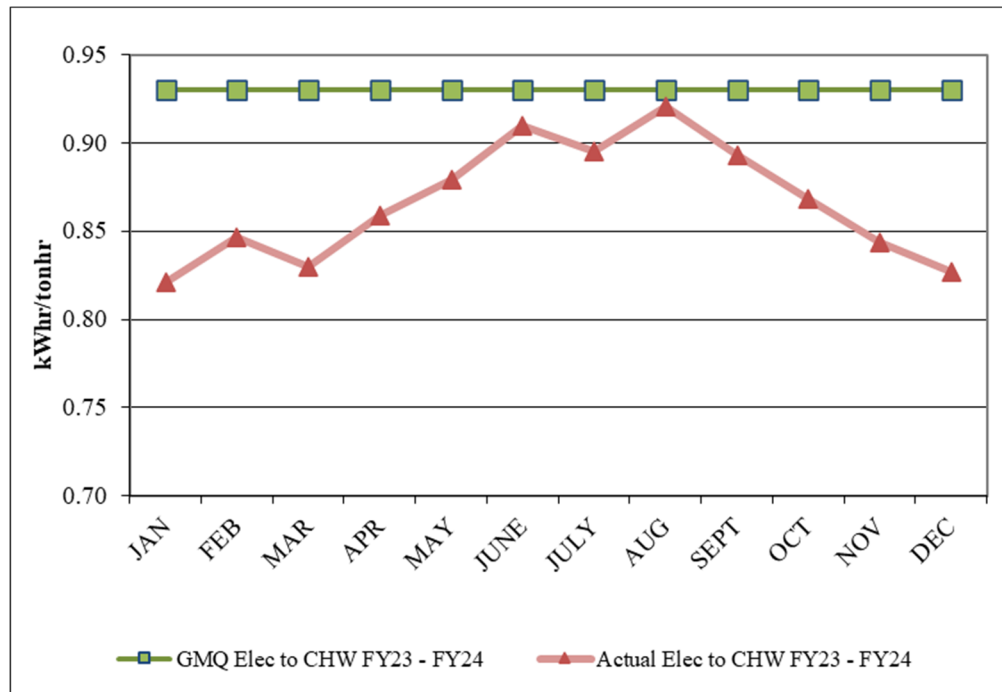


Figure 6. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months

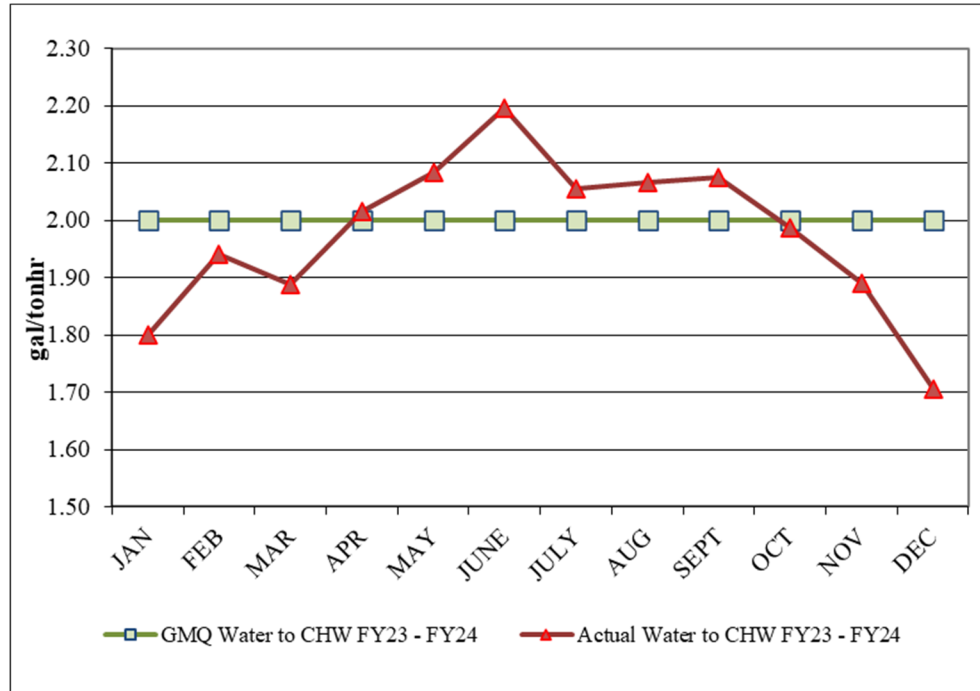


Figure 7. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months

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 increased 2.4% over the previous Second Quarter. The increase in the average value of the metric for this quarter may be attributable to the performance of the cooling towers and the warmer-than-usual quarter. CES and TEG continue to monitor the improvements created by CES’s operational changes.

The total consumption of city water for the chiller plant for the current quarter has increased over the previous Second Quarter due largely to an increase in chilled water sales. The water conversion factor for the chiller plant increased by only 0.6% (on average) over the Second Quarter FY23. The guaranteed value was met in each month of the quarter.

B. Steam

1. Sales and Sendout

The steam sendout decreased by approximately 12.6% over the previous Second Quarter (FY23), and the sales also decreased 12.6%. Similarly, the heating degree days during the quarter decreased 13.6% due largely to a warmer-than-normal quarter. The steam system losses decreased 12.5%, and the relative amount of condensate return decreased 19.6% during the quarter due to dumping condensate at several customer buildings for DES196 and in MH-18 for the work associated with DES198. DES198 was completed during the quarter, and condensate was being returned by mid-November. DES196 is expected to not be completed until mid-January. The peak steam demand for the current quarter was 103,025 pph, which reflects a 24.4% decrease in the peak steam production over the previous Second Quarter. A comparison for the Second Quarter steam sales is shown in Figure 8.

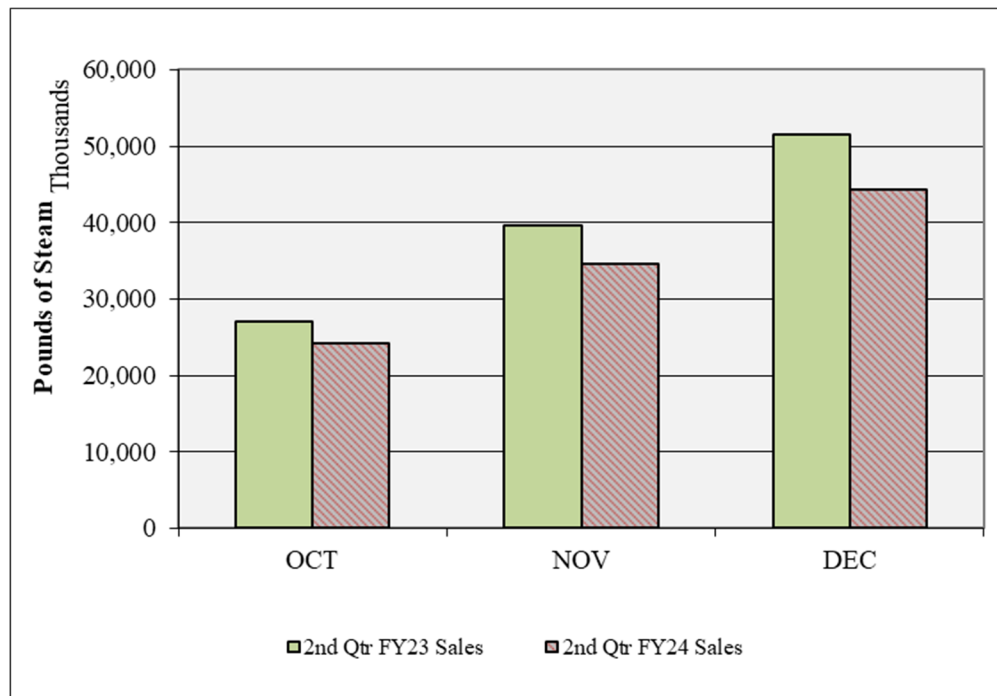


Figure 8. Steam Sales Comparison

Figure 9 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.

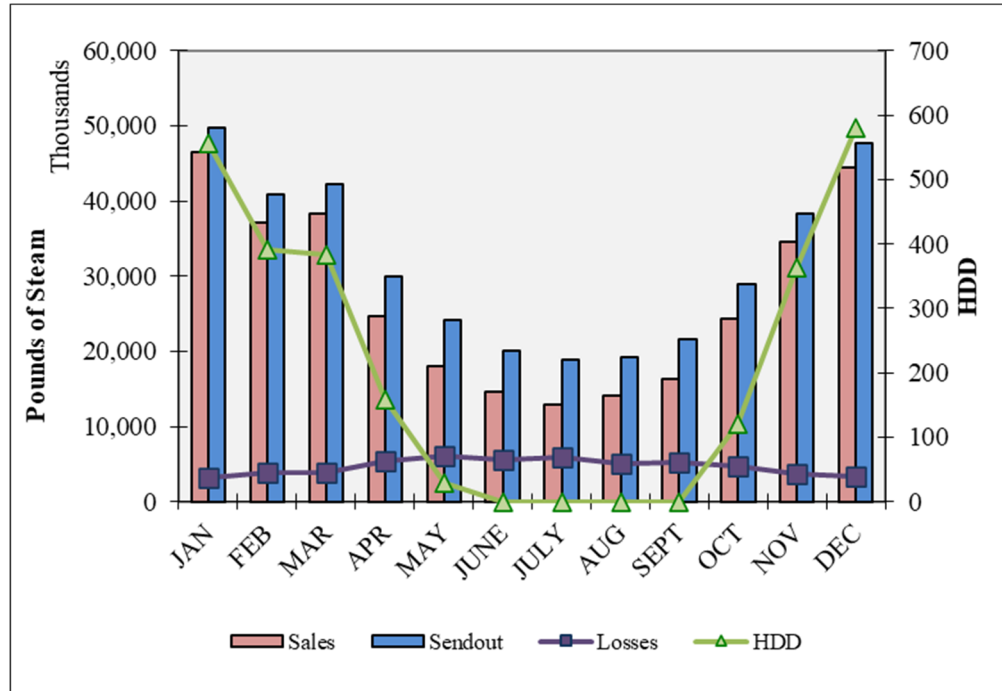


Figure 9. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months

2. Losses

A comparison of the total steam mass losses in the EDS for the Second Quarter is shown in Figure 10. 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.

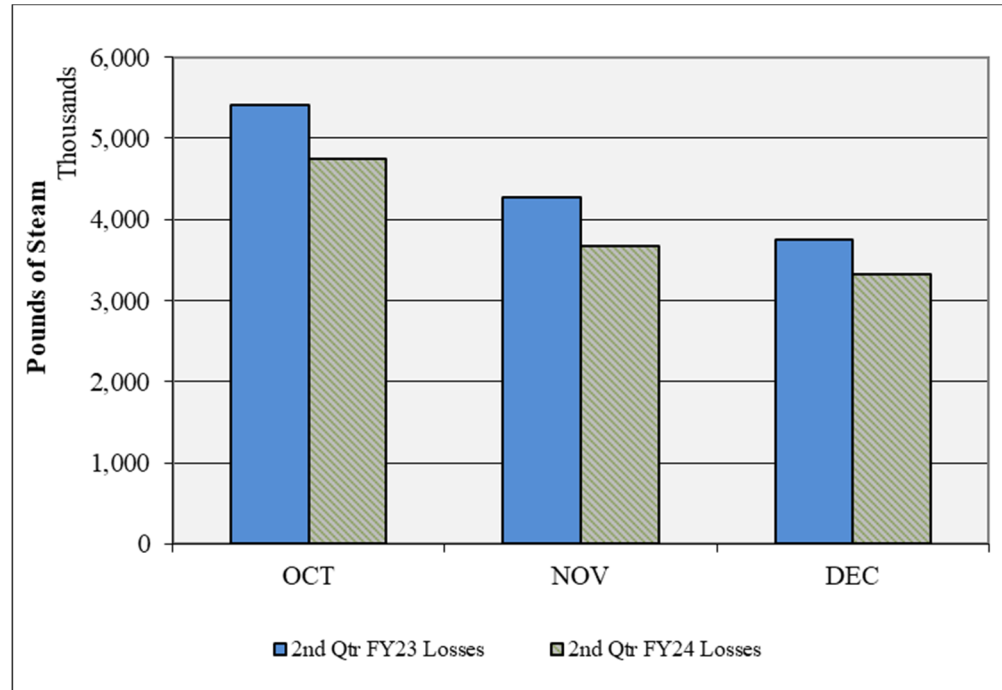


Figure 10. Steam System Losses

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 amount of make-up to the steam system increased 19.2% over the Second Quarter FY23. As discussed previously, condensate is being dumped for project DES196 and was dumped for part of the quarter for project DES198. The corresponding data for steam system make-up is shown in the comparison of Second Quarter data in Figure 11.

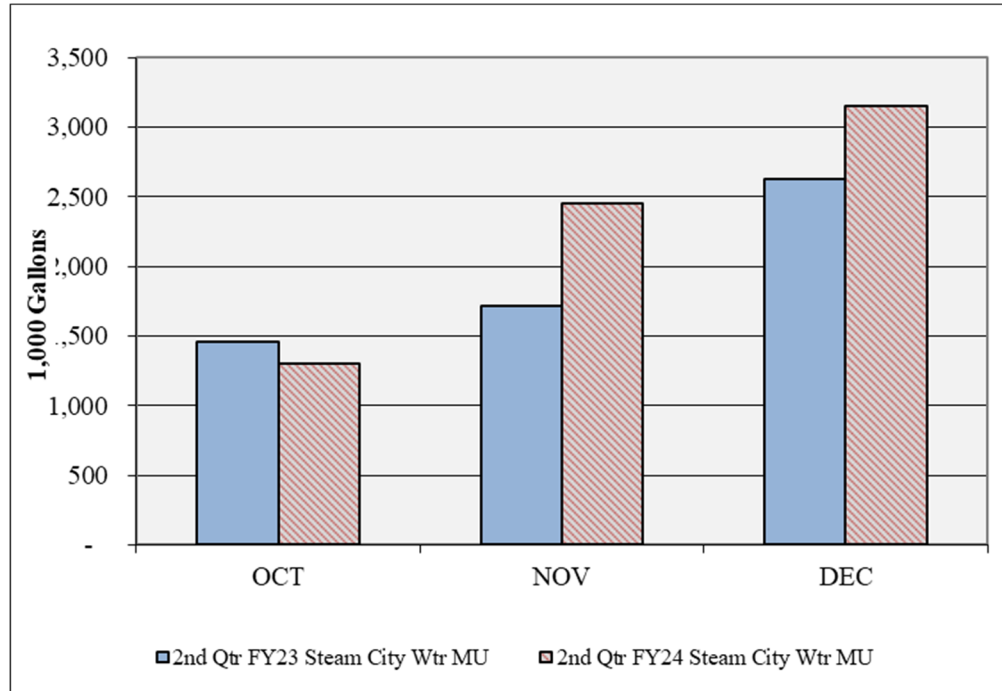


Figure 11. Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system of the EGF is presented in the following three charts, Figures 12, 13 and 14. The steam electric conversion factor was met each month of the quarter. The steam plant electric consumption for the current quarter was 9.0% lower in FY24 than in FY23. The steam-electric metric increased 3.4% over the previous Second Quarter. The monthly steam-to-electric conversion factors, along with the guaranteed values, are shown in Figure 12.

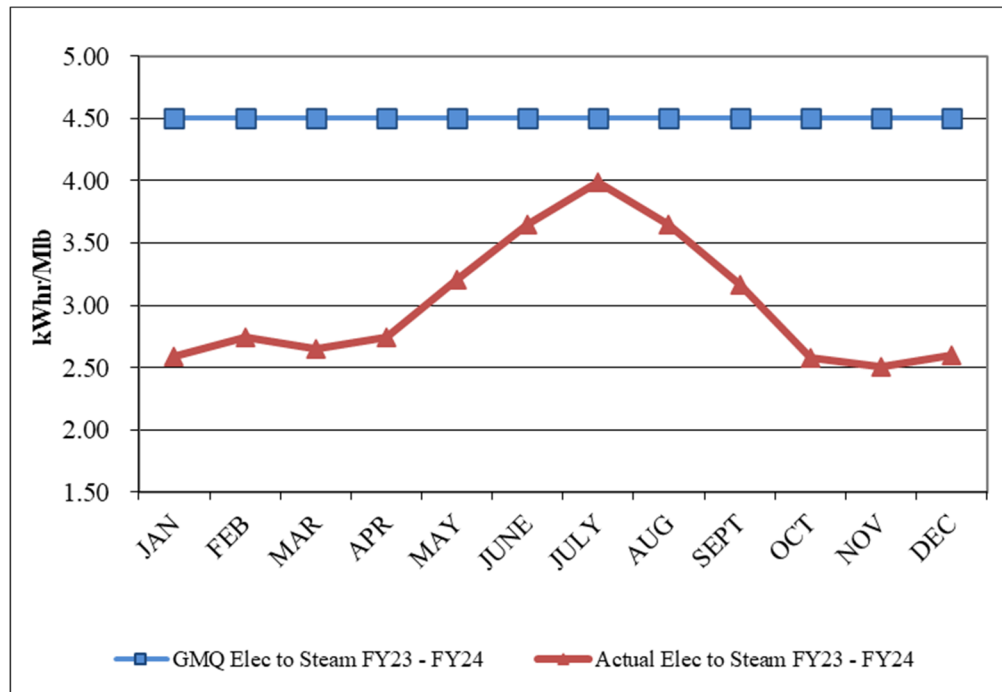


Figure 12. Steam Plant Electric Performance Guarantee for the Previous Twelve Months

The steam water conversion factor exceeded the guaranteed values for only one month during the quarter. CES and TEG continue to monitor the performance of the EGF as CES makes efforts to improve the DES performance. The guaranteed steam-water performance value is based on an equation which incorporates the amount of steam sendout and condensate return and did not change with the adoption of the new performance values in Amendment 2. CES has verified the accuracy of the meter readings and continues to review the operation. The steam water conversion factors are shown in Figure 13.

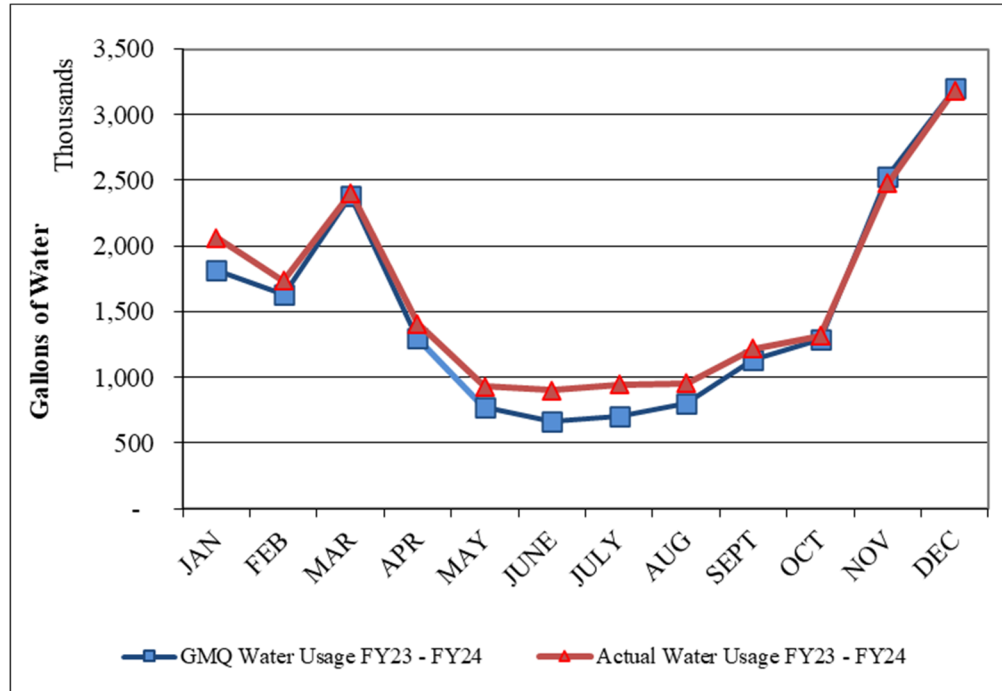


Figure 13. Steam Plant Water Performance Guarantee for the Previous Twelve Months

The steam fuel conversion factor met the guaranteed values for each month in the quarter. The fuel consumption per unit of steam sendout increased 0.2% over the previous Second Quarter. 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. Figure 14 shows the performance of the conversion factors for the previous twelve months.

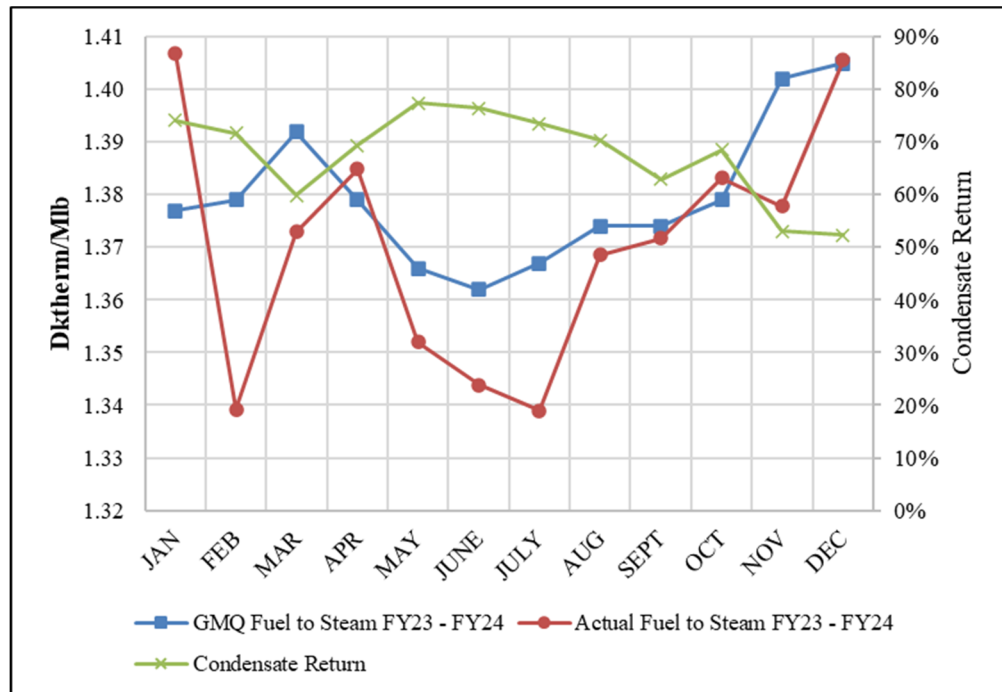


Figure 14. Steam Plant Fuel Performance Guarantee for the Previous Twelve Months

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).

Table 1. Second Quarter FY24 Production, Sales, and Consumption Summary

Item	Unit	Second Quarter FY24	Second Quarter FY23	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kWhrs	9,926,599	9,483,811	4.67%
Chilled Water	kWhrs	9,661,738	9,192,691	5.10%
Steam	kWhrs	264,861	291,120	-9.02%
Total Water Use	kgal	28,369	26,462	7.21%
Total Chilled Water	kgal	21,459	20,665	3.84%
EDS Make-up	kgal	1,176	1,179	-0.25%
Cooling Towers	kgal	20,283	19,486	4.09%
Calc CT Evaporation	kgal	17,500	15,978	9.52%
CT Blowdown	kgal	2,784	3,508	-20.65%
Calc # Cycles		6.29	4.55	38.03%
Steam	kgal	6,910	5,797	19.20%
Total Fuel Use	mmBTU	159,895	182,241	-12.26%
Natural Gas	mmBTU	159,813	182,233	-12.30%
Propane	mmBTU	82	8	925.00%
Condensate Return	kgal	7,988	11,363	-29.71%
	lbs	65,146,597	92,677,476	-29.71%
Avg Temp	°F	176.7	173.0	2.12%
Sendout				
Chilled Water	tonhrs	12,130,300	11,645,900	4.16%
Steam	lbs	114,973,000	131,526,000	-12.59%
Peak CHW Demand	tons	13,732	11,632	18.05%
Peak Steam Demand	lb/hr	103,025	136,325	-24.43%
CHW LF		40.01%	45.34%	-11.77%
Steam LF		50.54%	43.70%	15.67%
Sales				
Chilled Water	tonhrs	11,362,474	11,124,414	2.14%
Steam	lbs	103,233,640	118,106,964	-12.59%
Losses				
Chilled Water	tonhrs	767,826	521,486	47.24%
Steam	lbs	11,739,360	13,419,036	-12.52%
		10.21%	10.20%	0.08%
Degree Days				
CDD		102	42	142.86%
HDD		1,064	1,231	-13.57%
Cooling Tower Blowdown Ratio				
Cooling Tower Blowdown	gal	2,783,500	3,508,000	-20.65%
Chilled Water Production	tonhrs	12,130,300	11,205,000	8.26%
Ratio	gal/tonhrs	0.229	0.313	-26.71%

*positive percent difference values imply an increase from FY23 to FY24

Table 2. Second Quarter FY24 Performance Guarantee Comparison for Steam and Chilled Water

GMQ Calculations	Unit	Second Quarter FY24	Second Quarter FY23	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	4.50	4.50	
Electric Conversion	kWhr/Mlb	2.56	2.48	3.44%
GMQ Plant Efficiency	Dth/Mlb	1.395	1.380	
Plant Efficiency	Dth/Mlb	1.389	1.386	0.24%
Actual %CR		56.66%	70.46%	-19.59%
Avg CR Temp	°F	177	173	2.12%
GMQ Water Conversion	gal	7,025,676	5,477,762	
Water Conversion	gal	6,979,100	5,854,970	19.20%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	0.930	0.930	
Electric Conversion	kWhr/tonhr	0.846	0.826	2.39%
GMQ Water Conversion	gal/tonhr	2.00	2.00	
Water Conversion	gal/tonhr	1.86	1.85	0.64%

*positive percent difference values imply an increase from FY23 to FY24

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 is 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 \$10,347,682. This value represents approximately 46.6% of the total budgeted operating cost for FY24 and includes the First Quarter Self-Funded Debt Service Payments. The customer revenues from the sales of steam and chilled water for FY24 are \$10,229,809 (46.9% of budgeted amount) which includes the annual true-up amount for FY23 and other miscellaneous revenue sources. Although not confirmed at the time of this report, the First Quarter Metro Funding Amount (\$96,100; 25% of budget) has been transferred. The actual MFA can only be estimated due to outstanding invoices as of the date of this report.

Table 3. DES Expenses and Revenues to Date

Item	FY24 Budget	First Quarter Expenses	Second Quarter Expenses	Third Quarter Expenses	Fourth Quarter Expenses	Total Spending to Date	% of Budget
Operating Management Fee							
FOC: Basic	\$ 4,127,000	\$ 1,031,756	\$ 1,031,756	\$ -	\$ -	\$ 2,063,512	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	\$ 331,200	\$ 82,934	\$ 67,911	\$ -	\$ -	\$ 150,845	45.55%
Insurance	\$ 30,400	\$ 33,584	\$ -	\$ -	\$ -	\$ 33,584	110.47%
Marketing: CNE Sales Activity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Incentive Payments	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
FEA: Steam	\$ 91,400	\$ 10,642	\$ 5,136	\$ -	\$ -	\$ 15,778	17.26%
Chilled Water	\$ 125,800	\$ (8,868)	\$ 22,361	\$ -	\$ -	\$ 13,493	10.73%
Misc: Metro Credit	\$ -	\$ (504,153)	\$ (236,242)	\$ -	\$ -	\$ (740,395)	n.a.
ARFA	\$ 64,900	\$ 16,227	\$ 16,227	\$ -	\$ -	\$ 32,454	50.01%
Deferral	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Subtotal - Man Fee =	\$ 4,770,700	\$ 1,166,275	\$ 1,143,391	\$ -	\$ -	\$ 2,309,666	48.41%
Reimbursed Management Fee + Chem Treatment		\$ 1,150,801	\$ 755,260	\$ -	\$ -	\$ 1,906,061	0.00%
Metro Costs							
Pass-thru Charges: Engineering	\$ 53,900	\$ 18,808	\$ 28,703	\$ -	\$ -	\$ 47,511	88.15%
EDS R&I Transfers	\$ 312,900	\$ 78,225	\$ 78,225	\$ 26,075	\$ -	\$ 182,525	58.33%
Metro Marketing	\$ 62,700	\$ -	\$ -	\$ -	\$ -	\$ -	0.00%
Project Administration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Metro Incremental Cost	\$ 491,300	\$ 141,840	\$ 126,589	\$ 4,706	\$ -	\$ 273,134	55.59%
Utility Costs: Water/Sewer	\$ 1,132,000	\$ 489,250	\$ 216,973	\$ -	\$ -	\$ 706,223	62.39%
EDS Water/Sewer	\$ -	\$ 48	\$ 184	\$ -	\$ -	\$ 232	n.a.
EDS Electricity	\$ 75,300	\$ 14,939	\$ 19,405	\$ -	\$ -	\$ 34,345	45.61%
Electricity	\$ 6,269,000	\$ 1,991,229	\$ 950,244	\$ -	\$ -	\$ 2,941,473	46.92%
Natural Gas Consultant	\$ 12,400	\$ 3,330	\$ 4,500	\$ -	\$ -	\$ 7,830	63.15%
Natural Gas Transport	\$ -	\$ 55,762	\$ 110,894	\$ -	\$ -	\$ 166,656	n.a.
Natural Gas Fuel	\$ 3,904,400	\$ 329,756	\$ 682,031	\$ -	\$ -	\$ 1,011,788	25.91%
Propane	\$ 140,400	\$ 82,366	\$ -	\$ -	\$ -	\$ 82,366	58.67%
Subtotal - Metro Costs =	\$ 12,454,300	\$ 3,205,553	\$ 2,217,748	\$ 30,781	\$ -	\$ 5,454,082	43.79%
Subtotal - Operations =	\$ 17,225,000	\$ 4,371,828	\$ 3,361,140	\$ 30,781	\$ -	\$ 7,763,749	45.07%
Debt Service							
2012A Bonds	\$ 3,035,500	\$ 769,787	\$ 769,787	\$ -	\$ -	\$ 1,539,575	50.72%
2005B Bonds	\$ 599,700	\$ 588,376	\$ -	\$ -	\$ -	\$ 588,376	98.11%
Series 2018	\$ 117,200	\$ 88,300	\$ -	\$ -	\$ -	\$ 88,300	75.34%
Series 2015C	\$ 68,500	\$ 57,807	\$ -	\$ -	\$ -	\$ 57,807	84.39%
Series 2017	\$ 41,800	\$ 33,006	\$ -	\$ -	\$ -	\$ 33,006	78.96%
Series 2013A	\$ 613,500	\$ 106,562	\$ -	\$ -	\$ -	\$ 106,562	17.37%
Series 2021C	\$ 122,000	\$ 28,264	\$ -	\$ -	\$ -	\$ 28,264	23.17%
Series 2022A	\$ 149,500	\$ 40,913	\$ -	\$ -	\$ -	\$ 40,913	27.37%
Series 2022B	\$ 26,300	\$ 7,031	\$ -	\$ -	\$ -	\$ 7,031	26.73%
MIP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Oper. Reserve Fund	\$ 188,200	\$ 47,050	\$ 47,050	\$ -	\$ -	\$ 94,100	50.00%
Subtotal - Capital =	\$ 4,962,200	\$ 1,767,096	\$ 816,837	\$ -	\$ -	\$ 2,583,934	52.07%
Total =	\$ 22,187,200	\$ 6,138,924	\$ 4,177,977	\$ 30,781	\$ -	\$ 10,347,682	46.64%
Customer Revenues							
Taxes Collected		\$ 125,583	\$ 100,032	\$ -	\$ -	\$ 225,616	n.a.
Taxes Paid		\$ 123,002	\$ 68,356	\$ -	\$ -	\$ 191,358	n.a.
Interest & Misc Revenue	\$ 333,300	\$ 181,927	\$ 169,516	\$ -	\$ -	\$ 351,443	105.44%
Penalty Revenues/Credits		\$ 31,029	\$ 2,212	\$ -	\$ -	\$ 33,240	n.a.
Energy Revenues Collected	\$ 21,469,500	\$ 5,344,278	\$ 4,466,591	\$ -	\$ -	\$ 9,810,869	45.70%
Revenues =	\$ 21,802,800	\$ 5,559,815	\$ 4,669,994	\$ -	\$ -	\$ 10,229,809	46.92%
Metro Funding Amount =	\$ 384,400	\$ 579,109	\$ (492,017)	\$ 30,781	\$ -	\$ 117,873	30.66%

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, the charges for the FY23 True-up, 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	\$ 2,438,393	12,733,355	\$ 0.1915	\$ 785,626	41,383	\$ 18.9845
State Government	\$ 1,878,305	7,564,228	\$ 0.2483	\$ 985,780	46,453	\$ 21.2212
Metro Government	\$ 2,763,876	15,607,872	\$ 0.1771	\$ 959,093	58,891	\$ 16.2860
New Customers	\$ 1,737,118	8,905,200	\$ 0.1951	\$ 671,089	43,888	\$ 15.2911
Total	\$ 7,080,574	35,905,455	\$ 0.1972	\$ 2,730,500	146,726	\$ 18.6095

Total Revenue \$ 9,811,075
 True-up and Adjustments (Net) \$ 418,735
 Net Revenue \$ 10,229,809

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CES for FY24. 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 relate 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.

- NES performed required maintenance on the electrical feed to the EGF on November 6, which required a plant outage beginning at 11 p.m.. The chilled water sendout temperature was above 43.3°F for four hours and twenty-four minutes. The steam sendout pressure was below 150 psig for three hours and forty-five minutes.
- A bad solenoid valve on the control air compressor caused the steam sendout pressure to drop below 150 psig on two occasions on November 7. The pressure reached a low of 116 psig for forty-five minutes each occurrence. The solenoid valve was replaced.
- Boiler 3 tripped on November 18 while performing a mud drum blowdown. The boiler was immediately restarted by the steam sendout pressure fell below 150 psig for forty-five minutes reaching a low pressure of 112 psig.
- Chiller 6 tripped on November 24 and would not re-start causing the chilled water sendout temperature to rise above 43.3°F for ninety minutes. The chilled water temperature reached 45°F during this period.
- There were no other reported issues during the quarter.

B. Efficiency

The operation of the EGF did not satisfy the steam-water guaranteed levels for each month during the quarter. The steam-water and chilled water-water guarantees were not met during the quarter. All other performance guarantees were met. 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 requires regular attendance of online safety courses for their employees.

D. Personnel

As of the end of the quarter, CES has reported they are 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 and DEI 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 buildings also occurs regularly to monitor the concentration and distribution of the steam system chemicals.

- Steam System
 - The condensate return averaged approximately 56.7% of the steam sendout during the quarter, which represents a 19.6% decrease over the previous Second Quarter. A portion of the condensate continued to be dumped due to project DES196, which is anticipated to be completed in January 2024, and DES198 which was completed in mid-November.
 - The Legislative Plaza and War Memorial buildings are dumping their condensate due to iron levels and do not plan on making repairs until after building renovations have been completed.
 - 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 20.1% over the previous Second Quarter. This decrease resulted in an average increase in the cycles of concentration in the cooling towers of 38.0%.
 - CES began monitoring and tracking the ratio of the cooling tower blowdown to the chilled water production. The average value for the quarter decreased 26.7% over the previous Second Quarter. TEG and CES continue to monitor various performance metrics within the EGF and EDS to look for ways to improve system efficiency.

- 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.
 - The side stream filter was installed in FY23 and became operational on May 9, 2023. The filter has significantly reduced the amount of suspended solids in the chilled water and improved the turbidity of the system. Figure 15 shows the results of several measured metrics within the chilled water system.

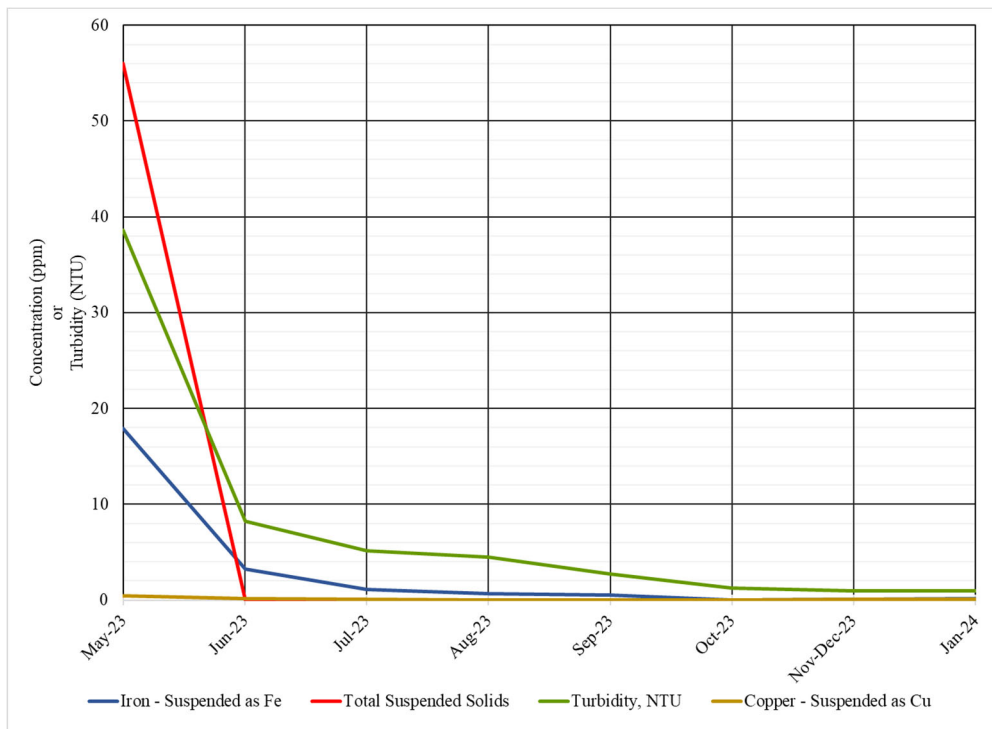


Figure 15. Chilled Water Composition Downstream of Side Stream Filter

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 and are not the responsibility of Metro or the DES customers.

Repairs and As Needed Maintenance

- Office Janitorial Services, equipment room cleanup and pest control;
- Checked, updated, and backed up plant computers and servers;

- Checked and adjusted packing on all pumps;
- Assisted with data acquisition for Plant Efficiency (Skyspark);
- The EGF was thoroughly cleaned, and several items were repainted in anticipation of the Twentieth Anniversary Event which occurred on December 21;

Repairs or Replacement

- A leak on BFWP 2 oiler was repaired;
- Refrigerant from chiller 4A was removed and the oil pump relays were repaired;
- The oil regulator on chiller 3B was replaced;
- The outboard bearing on BFWP 3 was replaced;
- The 40215 chemical line leak was repaired;
- The water columns on boilers 2 and 4 were repaired;
- The front door latch was repaired;
- The cooling tower 7 vibration switch was repaired;
- Chiller 8 evaporator valve was repaired;
- The solenoid on the control air compressor was replaced;
- The steam blanket for boiler 2 was replaced;
- The high-pressure condensate line at the deaerators was repaired;
- A new cooling tower blowdown meter was installed;
- Due to issues with chiller 2 (see DES214), its refrigerant was removed;
- Boiler 2 feedwater valve positioner was replaced;
- Trane repaired the oil pump on chiller 8 and replaced the oil transducer on chiller 1;
- Air curtain 5 was repaired;
- 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 3, 2024, 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) has made a significant effort to improve the cleanliness and appearance of the EGF. Several areas have been painted and additional lighting has been installed. However, the following items were observed during this Walkthrough which require attention.

- TEG previously reported the louvers and portions of the fill at cooling towers 1, 6 and 15 appeared to have been damaged. Cooling tower 5 was repaired prior to the Fourth Quarter FY23 Walkthrough and cooling tower 15 was repaired prior to the First Quarter FY24 Walkthrough. **CES stated the remaining repairs for cooling towers 1 and 6 will be made after the cooling season but had not been made prior to the Second Quarter Walkthrough. Tower 6 was observed leaking water on the cooling tower deck.**

- The pressure gauge at the expansion tank indicated a pressure of approximately 100 psig. However, the chilled water return pressure was reported to be approximately 130 psig, as indicated on the control room screen. The difference between these two instruments should be approximately equal to their elevation difference. TEG discovered discrepancies with other pressure instrumentation on the city water make-up line during the Walkthrough and found that the valves for the compressed air service to the expansion tanks had been closed. TEG discussed the issues with CES during the Fourth Quarter FY23 Walkthrough. **CES replaced several of the pressure gauges and checked the calibration of a few of the pressure transmitters. After reviewing the piping arrangement during this Walkthrough, the reported pressures appear consistent. This item will be removed from future reports.**
- Chemical leaks and build-up were noted between chemical tanks 12900 and 10600 and between tanks 12001 and 34170. **CES has cleaned the affected areas and repaired the leaks between tanks 12900 and 10600. A leak remains between tanks 12001 and 34170. CES has repaired this leak and cleaned the areas around the tanks and piping. Unless another leak appears, this item will be removed from future reports.**
- The vacuum breaker check valve on DA 2 was venting steam. **CES has purchased a replacement valve, bolts, nuts, and gasket and intends to replace the existing valve once DA 2 can be shut down.**
- Since the new illuminated sign has been installed on the north side of the EGF, the old signs need to be removed. **CES needs to remove these signs.**
- Cooling Towers 14 and 15 have algae present on the louvers, fill, and/or basins. **CES should clean the towers of the algae.**
- The thermometers on the suction and discharge headers at the condensing water pumps need to be cleaned and are unreadable. **CES has cleaned the thermometer glass or replaced the thermometers. This item will be removed from future reports.**
- The insulation on the 42” chilled water piping at the north end of the plant is damaged. **CES needs to repair this insulation.**
- Water appears to be leaking from or around a roof drain or sanitary vent onto the main operating floor near boiler 3. Water was found pooling on the floor next to the switchgear panel. **CES needs to address this issue and make repairs.**
- Other action items previously noted to be addressed by CES have been completed. (See also the “Quarterly EGF Walkthrough Report,” dated January 3, 2024, 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 FY24 Open Projects

The following projects remained open at the end of the Second Quarter FY24.

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

The Peabody Union development includes the construction of Guthrie St that will require 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. This project number is used to track costs and activities associated with the new road, the on-site construction activities, and their impact on DES. Demolition of the wall and fence along the east side of the EGF property is anticipated to begin in January 2024.

DES remains in contact with the contractor and the developer regarding construction at this site. CES presented TEG and Metro with a proposal to upgrade the security system which included an additional keycard reader and latch for the existing north pedestrian gate. This latter proposal was provided to Peabody Union personnel since the addition of the new wall and fencing and the new parking garage will restrict visitor access to the plant site. Peabody Union agreed to pay DES for one-half the price of the latch and card reader on the north pedestrian gate.

TEG and CES remain in contact with the Peabody Union personnel and their contractor regarding the scheduling of activities affecting DES and its operation.

2. DES191 – MH-20 Repairs

This project is in close-out.

3. DES192 – Peabody Street Development

This project number is used to track expenses with the proposed expansion of the EDS along Peabody Street and into the Rolling Mill Hill area. This project is on hold pending confirmation of additional customers along the proposed route.

4. DES194 – MH B4 Repairs

This project is in close-out.

5. DES195 – DES Parking Area

This project is on hold pending the completion of the Guthrie Street construction.

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

CES has identified condensate entering the condensate pipe wall penetration in MH-9. This section of condensate piping between Manholes 9 and 10 has been repaired at least twice in recent years and therefore TEG recommended replacing the entire piping run between the two manholes. The design was completed, and the scope was bid, however only one bidder responded, and the price was significantly higher than expected. TEG and CES met with a separate contractor who then provided pricing for the replacement of the entire line between manholes and was substantially less than the bid price. Metro approved proceeding with this contractor and price.

During the Second Quarter FY24, construction began, and the replacement pre-insulated piping was installed. In addition, work began on the replacement of a short section of condensate return piping immediately west of Manhole 10. During construction, the casing of the adjacent steam piping was found to be in very poor condition immediately west of Manhole 9 and immediately west of Manhole 10. TEG developed a design to repair these areas and the installing contractor began its implementation during the quarter.

The construction is anticipated to be completed during the Third Quarter FY24 with the repaving occurring later due to the shutdown of asphalt plants during the winter months. The street will be temporarily paved until the asphalt plants open and NDOT identifies the final paving requirements.

7. DES198 – MH-18 Condensate Pump Replacement

The onsite construction for this project began on September 25. The work was scheduled to be completed by September 29, but the work carried forward into October. However, the pumps were installed in September and became operational on October 2. The remaining punch list items were completed in December. This project is now closed.

8. 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 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. The

options for district energy on the East Bank include the development of one or more new sustainable plants serving multiple customers.

Conversations with MDHA continued during the quarter with the expectation of providing service to their proposed development at Shelby Street and 5th St.

9. DES202 – 7th and Commerce Hotel

The preliminary survey work was completed during the First Quarter. The work on the project site has been reported by the developer to be on hold.

10. DES203 – Printers and Bankers Alley Building

The engineers for the developer reported the project is on hold.

11. DES206 - 7th Ave Fan Replacement

The 7th Ave ventilation fan broke apart during operation and needs to be replaced. A new fan was ordered and was received by CES. TEG completed the design documents for the fan's installation and because of the immediate need to have the fan in operation, the project was awarded to a contractor on a T&M basis with cost substantiation. The mechanical work was completed during September but the installation of the variable frequency drive (VFD) for the fan motor was delayed because of water damage to electrical components. Because of this delay, the installing contractor was instructed to wire the fan without the VFD and put it into operation. A mechanical punch list review was conducted on September 22, 2023.

The VFD was installed during the Second Quarter FY24. The electrical and mechanical were reviewed during the quarter and punch lists were issued. At the time of this report, a few minor punch list items remain to be completed. In addition, cost substantiation documentation needs to be presented for TEG's review and approval. The project is anticipated to be completed in the Third Quarter FY24.

12. DES207 – MH N1 Insulation

This project was moved from DES143 since CES initially intended to address the insulation of this manhole under its Amendment 2 obligations; DES143 was then closed. Under Amendment 2, the scope of the insulation in this manhole would extend beyond CES's contract expiration. Therefore, TEG and CES agreed to share the payment of this work. With this agreement, CES's Amendment 2 obligations for manhole insulation is met through the end of their contract.

CES bid the work and an award was made. However, due to field conditions, some changes needed to be made to the specifications. CES and TEG met with the insulation contractor and reviewed changes to the specifications, and a revised, and

lower priced proposal was presented. This work began during the Second Quarter FY24 with work taking place during lower humidity levels to reduce the amount of surface condensation. It is expected that this project will be completed during the Third Quarter FY24.

13. DES208 – 2023 Steam Outage

There were some maintenance/repair items at the EGF and in the EDS that could not be completed without the steam system being off-line. Therefore, CES assembled a list of items to be completed and scheduled a steam system shutdown for September 24-25, 2023. This shutdown took place as scheduled with all work being completed except the re-insulation of piping. The insulation portion of the work was completed during the Second Quarter FY24, and cost substantiation documentation is expected to be presented early in the Third Quarter FY24. It is expected that this project will be closed during the Third Quarter FY24.

14. DES209 – MH B2 Sump Pump Discharge Repair

The sump pump discharge piping from Manhole B2 is either obstructed or possibly damaged which is preventing the evacuation of the accumulated groundwater in this manhole. TEG researched and found a company that could trace buried piping and located the obstructed/damaged portion of the discharge piping. This company (GPRS) was retained by CES to determine the location of the blockage and GPRS was also able to locate the buried piping beyond the blockage.

This project involves the excavation of the discharge piping to repair/replace the obstructed/damaged portion of the piping and to also determine if the remaining piping still discharges to a nearby catch basin. If not, then the project also involves the re-introduction of this discharge piping to the catch basin.

This work was executed during the Second Quarter FY24. The piping was found to be damaged in one location and it was also discovered that it was not re-connected to the new catch basin that was installed during the construction of the new building at 222 2nd Ave S. The piping was repaired and connected to the catch basin.

This was a T& M project, therefore cost substantiation needs to be submitted for TEG's review/approval. It is expected that these items will be completed during the Third Quarter FY24, and this project will then be closed.

15. DES210 – MH C Electric Sump Pump Installation

MH C is in the street adjacent to the MTA bus station. CES reviews this manhole monthly, however its access is complicated due to its proximity to the bus station. Portions of the DES piping in this manhole has been replaced due to corrosion from

groundwater accumulation. And CES has had to visit this manhole more than once per month to pump out the groundwater. To reduce the number of visits and lessen the likelihood of corrosion, TEG contacted MTA and asked if DES could obtain electric power from the bus station for a small sump pump. MTA has agreed to this and has signed an agreement.

This project involves the evaluation of the cost to install this sump pump, and if acceptable, the installation of the power and pump will take place. TEG investigated the costs associated with this project and found it to be cost prohibitive. Therefore, this project was canceled.

16. DES211 – AA Birch Tunnel and MH D Repairs

The AA Birch Tunnel and MH D include several metal piping and platform supports that are experiencing corrosion. This project addresses the cleaning, coating, and potential replacement of some of these components.

TEG has developed a scope of work, drawings, and specifications for this project and is awaiting a coordinated site visit with CES to conduct a final review of the scope requirements. It is expected that this site visit will take place during the Third Quarter FY24 with pricing to soon follow. It is anticipated that this work will take place during the Third and Fourth Quarters of FY24.

17. DES212 – MH 2 End Can Replacement

The existing western end can at the steam piping wall penetration is badly corroded and requires replacement. TEG provided scope documents to CES and the installing contractor, and TEG met with the installing contractor on-site to review the work scope. Most of this work took place during the Second Quarter FY 24. TEG performed a review of the work and noted some punch list items. Additionally, concrete damage to the interior wall of this manhole was discovered during this work. TEG and CES have contacted a concrete repair contractor which is scheduled to make this repair in January.

The end can work is T&M, therefore cost substantiation documentation will have to be submitted for TEG's review/approval. This project is anticipated to be completed during the Third Quarter FY24.

18. DES213 – 4th Ave, 7th Ave and Broadway Tunnel Piping Support Slide Repairs

The piping supports in the three main tunnels (4th Ave, 7th Ave, and Broadway) include slides and guides to allow the piping to move freely due to thermal expansion/contraction in a linear direction with little resistance. The slides include Teflon coatings which have been damaged or have become unattached over the

years of service. These slides/guides need to be replaced to maintain a low resistance to expansion/contraction. This project addresses the replacement/repair of these supports.

TEG is in the process of preparing a scope, design drawings, and specifications for this work, and is coordinating a site review of the tunnels to confirm the extent of the work needed. It is anticipated that the design documents will be completed during the Third Quarter FY24, with bidding of the work occurred during the Third Quarter FY24.

19. DES214 – Trane “R’newal” of Chiller 2

During the quarter, CES observed anomalous operation with chiller 2. The chiller was shut down and Trane investigated the apparent issues. As a result, significant repairs to the unit became necessary. Trane and CES reported a plan to DES which would result in replacing the motors, compressors, most of the rotating parts, and several other components of the chiller while offering DES a seven-year warranty on the twenty-year-old chiller. Metro accepted this offer and agreed to pay approximately two-thirds of the “R’newal” program cost while CES pays for the remaining portion. The work on the chiller is anticipated to begin in January 2024.

20. DES215 – State Utility Survey

The State of Tennessee is having a survey done of all the underground utilities on the State Capitol property which includes the State Tunnel System. TEG has been asked to attend a few meetings regarding the State Tunnel System and CES has been asked to provide One-Call markings of the piping/tunnel. Not knowing the extent of TEG’s participation, this project number was established to track TEG’s time and expenses related to this project.

It is not anticipated that TEG or CES will have much involvement in this project.

21. DES216 – Manholes 6, 12 and 13 Repairs

The structural steel in Manholes 6, 12 and 13 has some active corrosion that needs to be addressed before metal replacement is required. TEG directed CES to obtain pricing from Enecon to address these issues. Pricing was received and reviewed by TEG. TEG recommended that CES execute contracts with Enecon to have this work done.

The work began during the Second Quarter FY24 and is expected to be completed during the Third Quarter FY24.

22. DES217 – Auto Nashville Hotel, LLC DES Service Connection

A new customer, Auto Nashville Hotel, LLC, will be constructing a new hotel at the intersection of 8th Avenue South and Demonbreun St within the next few years. TEG has been in contact with the development team for many months evaluating options for DES service and are anticipating connecting the hotel to the DES. An executed Customer Service Agreement for chilled water service to this customer is anticipated in January 2024. This project will track costs associated with the post-marketing efforts, engineering, surveying, and construction of the new service.

B. Second Quarter FY24 Closed Projects

DES191, 194 and 198 are in close-out. DES210 was canceled.

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. All the projects closed during FY24 may not be noted due to outstanding invoices from the contractors.

Table 5. Capital Projects Expense Summary

DES Project #	Description	Total Budget	FY24 Spending to Date	Total Spent to Date	Remaining Balance
Fund-49116					
DES163	Parcel K Service	\$ 1,018,802	\$ 4,195	\$ 88,414	\$ 930,388
DES178	MH-5 Repairs	\$ 97,500	\$ 21,385	\$ 53,182	\$ 44,318
DES191	MH 20 Repairs	\$ 94,875	\$ 47,453	\$ 116,508	\$ (21,633)
DES192	Peabody Developments	\$ 40,000	\$ 114	\$ 28,803	\$ 11,197
DES194	MH-B4 Repairs	\$ 80,000	\$ 888	\$ 31,129	\$ 48,872
DES195	DES Parking Lot	\$ 275,000	\$ -	\$ 12,688	\$ 262,312
DES196	Condensate Line Leak Repair at MH9	\$ 715,000	\$ 539,349	\$ 555,647	\$ 159,353
DES198	MH18 Condensate Return Pump Replacement	\$ 175,000	\$ 180,822	\$ 228,042	\$ (53,042)
DES200	Sidestream Filter	\$ 330,000	\$ 396	\$ 5,597	\$ 324,403
DES201	East Bank and Oracle Development	\$ 110,000	\$ 8,314	\$ 41,447	\$ 68,553
DES202	Service to 7th and Commerce	\$ 1,630,000	\$ 13,821	\$ 27,864	\$ 1,602,136
DES203	Service to Printer's Alley Residential	\$ 850,000	\$ 57	\$ 1,564	\$ 848,436
DES206	7th Avenue Fan	\$ 110,000	\$ 9,511	\$ 33,914	\$ 76,086
DES207	MH N1 Insulation	\$ 25,300	\$ 1,344	\$ 4,319	\$ 20,981
DES208	2023 Stm Outage	\$ 33,000	\$ 2,306	\$ 4,557	\$ 28,443
DES209	MH B2 Pump Line Repair	\$ 44,000	\$ 2,822	\$ 2,936	\$ 41,064
DES210	MH C Sump Pump	\$ 125,000	\$ 13,321	\$ 13,321	\$ 111,679
DES211	MHD and AA Birch Tunnel	\$ 141,500	\$ 7,228	\$ 7,228	\$ 134,272
DES212	MH2 Repair	\$ 46,500	\$ 4,864	\$ 4,864	\$ 41,636
DES213	Tunnel Support Repair	\$ 321,500	\$ 15,872	\$ 15,872	\$ 305,628
DES214	Chiller 2 R'newel	\$ 330,000	\$ 2,525	\$ 2,525	\$ 327,475
DES215	State Utility Mapping	\$ 4,000	\$ 725	\$ 725	\$ 3,275
DES216	MH6, 11 and 12 Coating	\$ 37,400	\$ 2,153	\$ 2,153	\$ 35,247
DES217	DES Service to AutoNashville Hotel, LLC	\$ 3,079,000	\$ 4,703	\$ 4,703	\$ 3,074,297
DES218	MH B2,B6,B7,B8,B9 and 23B Cleanout/Coatings/Repairs	\$ 60,500	\$ 2,626	\$ 2,626	\$ 57,874
Total Closed Projects		\$ 4,607,490	\$ -	\$ 4,607,490	\$ -
Metro Project Admin		\$ -	\$ -	\$ -	\$ -
Project Man, Development, etc		\$ 11,618,633	\$ -	\$ -	\$ 11,618,633
Fund Total		\$ 26,000,000	\$ 886,793	\$ 5,898,117	\$ 20,101,883

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 \$280,034. Table 6 provides a summary of the FY24 expenditures and revenues to date associated with the R&I budget.

Table 6. FY24 Repair and Improvement Expenditure and Revenue Summary

Description	Date	Tracking #	Vendor	Expenditure	Transfers	Balance
Value at end of FY23				\$ 285,919.91		\$ 278,274.07
Interest	7/3/2023	-	-	\$ 1,960.82		
Interest	7/3/2023	-	-	\$ (1,960.82)		
CES July 2023 R&I	8/24/2023	-	CES	\$ 1,793.89		
Interest	8/1/2023	-	-	\$ 2,182.76		
Interest	8/1/2023	-	-	\$ (2,182.76)		
CES Aug 2023 R&I	9/20/2023	-	CES	\$ 20,361.63		
DES206 7th Ave Fan	9/20/2023	-	CES	\$ 23,182.35		
Interest	9/1/2023	-	-	\$ 2,360.98		
Interest	9/1/2023	-	-	\$ (2,360.98)		
DES206 7th Ave Fan	10/18/2023	-	CES	\$ 34,376.27		
DES208 Steam Outage	10/18/2023	-	CES	\$ 27,529.33		
CES Sept 2023 R&I	10/18/2023	-	CES	\$ 5,403.74		
			Sub-Total First Quarter	\$ 112,647.21	\$ 78,225.00	\$ 243,851.86
Interest	10/02/23	-	-	\$ 2,405.30		
Interest	10/02/23	-	-	\$ (2,405.30)		
CES Oct 2023 R&I	11/15/23	-	CES	\$ 1,703.69		
Interest	11/01/23	-	-	\$ 2,607.47		
Interest	11/01/23	-	-	\$ (2,607.47)		
CES Nov 2023 R&I	12/21/23	-	CES	\$ 7,113.55		
DES-194 MHB4 Steel	12/22/23	-	CES	\$ 46,170.00		
DES-216 MH6,12,13	12/22/23	-	CES	\$ 10,284.00		
DES-198 MH18 Cond Pumps	12/22/23	-	CES	\$ 1,400.26		
Interest	12/01/23	-	-	\$ 1,707.22		
Interest	12/01/23	-	-	\$ (1,707.22)		
CES Dec 2023 R&I	01/18/24	-	CES	\$ 1,446.77		
			Sub-Total Second Quarter	\$ 68,118.27	\$ 78,225.00	\$ 253,958.59
			Sub-Total Third Quarter	\$ -	\$ 26,075.00	\$ 280,033.59
			Sub-Total Fourth Quarter	\$ -	\$ -	\$ 280,033.59
			FY24 Year to Date	\$ 180,765.48	\$ 182,525.00	\$ 280,033.59

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. Insulation repairs are needed in some vaults; some of these needs will be addressed through capital projects.
 - e. Additional action items and maintenance issues are discussed in the EDS Walkthrough section of this report.
2. Water chemistry samples at customer buildings were taken as scheduled.
3. Other EDS items are included in the CES monthly reports.

C. Emergencies

There were no emergencies reported during the quarter.

D. EDS Walkthrough

This quarter's walkthrough was conducted on December 7, 2023. The manholes that were visited include Manholes B1, B2, B3, B4, B6, B7, B8, B9, B10, 14A, 16A, 22B, Viridian, S4A, and U.

In summary, fifteen separate manholes were reviewed.

- Manhole B1 is a sump pump manhole (there is no DES piping) and always contains water.
 - Because of the dry conditions, only 5 manholes contained too much water to enter (typically most do) and were pumped prior to entry (B2, B3, B4, 14A, and Viridian; Manhole B2 has a sump pump but due to the shallow depth of the sump, is not able to remove all the water from the manhole floor.
 - Manhole B4 just had a project completed that involved the cleaning and coating of all the piping support steel and re-insulation of all the piping.
 - Manhole 14A is an abandoned manhole that is checked annually for structural distress.
 - Several of the manholes have deteriorated grout behind anchor wall plates and therefore are a high priority that needs to be replaced within the next 3 months.
 - The driplegs in two of the manholes should be shortened ("raised") during the next shutdown to reduce corrosion and then the possible failure of the dripleg drain lines.
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- Three of the manholes had maintenance work performed which disturbed the piping insulation and the insulation has not been repaired. The repairs in two of these manholes should wait until the driplegs are shortened.
 - One trap needs to be reviewed for proper operation and possibly replaced as a high priority.
 - There is some moderate corrosion in some of the manholes that CES has been cleaning and painting with cold galvanizing paint. Pricing needs to be obtained from Enecon to clean and coat these supports.
 - There are several items which have appeared in the prior year's (in some cases the prior two years' reports) that need to be increase3d to a high priority and addressed as soon as possible.

The following comments and observations are a result of these visits.

1. Manhole B1
 - a. This is a sump pump manhole located in 1st Avenue South to the west of Manhole B. It was constructed to reduce/control the amount of groundwater infiltration in Manhole B.
 - b. DES recently installed a new aluminum ladder in this manhole as part of their obligation under Amendment 2 of their contract with Metro.
 - c. No deficiencies noted.
2. Manhole B2
 - a. Water was present in the manhole, and it required pumping via the manhole's electric sum pump prior to entry. [see items b) and c) below].
 - b. This manhole has an electric sump pump. However, the sump is not deep enough to enable the removal of all water before the level control/float stops the pump. As a result, there is always a small amount of water in the floor of this manhole. TEG investigated deepening the sump to eliminate this problem, but a well point needs to be installed to prevent the groundwater from flooding the manhole while the work takes place. The addition of a well point would add substantially to the construction cost, so this option was not pursued.
 - c. The sump pump was out of service for a time because the discharge piping was damaged and disconnected during the construction of the building at 222 2nd Ave. N. The discharge piping was recently repaired, and the pump was put back into service. However, the water level in the manhole was high. CES personnel adjusted the level control/float during this review. CES should monitor the water level and, if needed, continue to adjust the level control/float to minimize the amount of standing water.
 - d. CES recently replaced the ladder with a new aluminum ladder under their Amendment 2 obligations.
 - e. The piping support steel in this manhole was cleaned and coated by Enecon to help prevent corrosion. There was some flaking on the ends of some bolts on the overhead support steel and a coating failure on one of the

- overhead steel supports. TEG notified Enecon of these areas and Enecon recently made repairs to these areas. CES should monitor these steel supports and report any degradation to TEG.
- f. The sparge tube stanchion support is corroded. In the prior report, TEG had requested that this be cleaned and coated by Enecon as an R&I project when Enecon made the repairs to the coating failures; this did not occur. CES should coordinate with Enecon to clean and coat the sparge tube stanchion in the next quarter. **This item appeared in the last quarterly review.**
 - g. The southern condensate wall penetration end can is corroded. CES should have Enecon clean and coat this end can when the other items are addressed by Enecon.
 - h. The western steam penetration pre-insulated piping end can was badly corroded and allowing groundwater to enter the manhole. This penetration was repaired using Enecon products to rebuild the end can and then form a “donut” around the penetration with an Enecon hydraulic cement material. There is some distress to this cement material. TEG had requested that this be reviewed by Enecon when Enecon made the repairs to the coating failures; this did not occur during Enecon’s recent repairs. CES should coordinate with Enecon to review this penetration and address any needed repairs within the next quarter. **This item appeared in the last quarterly review.**
 - i. The insulation jacketing was removed from the steam isolation valve next to the western steam wall penetration when the penetration repairs [see item h) above] were completed. The re-installation of this jacketing was postponed ensuring that the wall penetration repair was effective. This jacketing needs to be re-installed, and the insulation possibly needs repairs. However, due to the proximity of this valve to the dripleg, these insulation repairs should wait until the dripleg is raised [see item j below]. **This item appeared in the last quarterly review.**
 - j. The steam dripleg is low to the floor. Because of this, the drain piping/valve at the bottom of the dripleg is low to the floor and is prone to corrosion. To alleviate a potential problem with degradation of this drain piping due to corrosion, this dripleg should be “raised” during the next steam shutdown/isolation. CES should add this item to their list of projects to be completed during the next steam shutdown/isolation.
 - k. The insulation jacketing on the northern lower CHW 90° ell needs to be repaired and the two drain valves on the CHW piping should be insulated. CES should have this insulation jacketing repaired when the other insulation/jacketing repairs are addressed. **This item appeared in the last quarterly review.**
 - l. The trap piping was re-routed to avoid being in the path of maintenance personnel. The new and disturbed piping has not yet been insulated which includes portions of the dripleg and sparge tube. These insulation repairs should wait until the dripleg is raised [see item j) above]. **This item appeared in the last two quarterly reviews.**
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- m. The sump pump discharge piping was blocked due to a damaged section of piping which apparently occurred during the construction of the 222 2nd Avenue North building. This blockage was recently repaired and during this repair it was also discovered that the discharge piping was not re-connected to the new catch basin. The discharge piping was also re-connected to the new catch basin during these repairs. The sump pump in this manhole is now able to discharge the accumulated water. CES should make sure that the street pavement is repaired as soon as possible.
 - n. There are three electrical enclosures in the manhole for the sump pump; one of these enclosures is stainless steel and in good condition. The other two enclosures are steel and are corroded, one of them badly. In the quarterly report two years ago, I estimated that these enclosures needed to be replaced within the next 2 years. Based upon the condition of one of these enclosures, they need replacement soon. CES needs to replace these two enclosures as soon as possible with stainless steel, non-corrosive, code compliant enclosures. **This item appeared in the last two quarterly reviews.**
 - o. Unistrut supports are used for the electrical conduit and sump pump discharge piping supports; these supports are corroded and need to be replaced. CES should plan on replacing these supports with stainless steel as soon as possible. **This item appeared in the last two quarterly reviews.**
 - p. CES should continue to monitor the structural steel coatings and report any degradation to TEG.
 - q. CES should continue to monitor the concrete surfaces and the concrete patching and report any degradation to TEG.
 - r. CES installed a new aluminum ladder in this manhole to meet its Amendment 2 obligation.
3. Manhole B3
- a. There was some water present in the manhole, and it required pumping prior to entry.
 - b. The steam dripleg is low to the floor. Because of this, the drain piping/valve at the bottom of the dripleg is low to the floor and is prone to corrosion. To alleviate a potential problem with degradation of this drain piping due to corrosion, this dripleg should be “raised” during the next steam shutdown/isolation. CES should add this item to their list of projects to be completed during the next steam shutdown/isolation.
 - c. CES should monitor the structural steel coatings and report any degradation to TEG.
 - d. CES should monitor the concrete surfaces and the concrete patching and report any degradation to TEG.
 - e. The trap piping was re-routed to avoid being in the path of maintenance personnel. The new and disturbed piping has not yet been insulated which includes portions of the dripleg and sparge tube. These insulation repairs
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- should wait until the dripleg is raised [see item b above]. **This item appeared in the last two quarterly reviews.**
- f. The CHW piping drain valves need to be insulated and the insulation/jacketing around the CHW valves is damaged. Additionally, there is water seeping from the western CHW wall penetrations. This could be groundwater seepage at the wall penetration, or it could be condensation resulting from inadequate or unsealed insulation at the wall penetration. The source of this water needs to be investigated. If the source is the wall penetration, the link seals need to be tightened or Enecon’s hydraulic cement needs to be installed. This work should be done during the winter months to reduce the amount of condensation. **Some of these items appeared in the last two quarterly reviews.**
 - g. The condensate piping has some missing and damaged insulation – this work should wait until the dripleg is raised.
 - h. The steam trap was chattering constantly during the review. This chattering may be caused by an insufficient amount of condensate in the trap. CES should close the downstream valve and wait several minutes to allow condensate to “build up” within the trap. (An indication that condensate has “built up” in the trap is that the temperature of the trap has decreased.) CES should then reopen the downstream valve and monitor the trap’s operation to determine if it is functioning properly. If the “chatter” continues, CES should then replace the trap as soon as possible with an Armstrong Model 811.
4. Manhole B4
- a. There was water present in this manhole, and it required pumping prior to entry.
 - b. CES should monitor the structural steel coatings and report any degradation to TEG.
 - c. CES should monitor the concrete patching/repairs and report any degradation to TEG.
5. Manhole B6
- a. There was not any appreciable water present in this manhole, so it did not require pumping prior to entry.
 - b. CES had installed a new ladder in this manhole to meet its Amendment 2 obligations, however the ladder did not extend close enough to grade to meet OSHA requirements. CES recently added an extension to the ladder to conform with OSHA requirements.
 - c. There are some insulation repairs/replacements needed in this manhole. This includes:
 - i. Some of the trap piping insulation is absent due to piping repairs. The trap piping should be insulated up to the trap (excluding the trap). This should be insulated within the next quarter. **This item appeared in the last two quarterly reviews.**
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- ii. Due to piping repairs, the main steam valve insulation was removed but was never re-installed. The insulation has been temporarily re-installed with Gorilla Tape. This valve needs to be re-insulated within the next quarter. **This item appeared in the last two quarterly reviews.**
 - d. The grout behind the anchor beam wall plates has cracked and needs to be repaired. When making this repair, if the system is active, only half of the grout behind each end plate should be removed/replaced at a time. Then, the new grout should be allowed to cure before the remaining half of the grout is removed/replaced. CES should have these repairs completed within the next 3 months to prevent further degradation and possible failure of the wall attachments. **This item appeared in the last two quarterly reviews.**
 - e. There is some corrosion on the wall penetration end can retainer plates and the anchor beam. CES has been cleaning and painting these areas with cold galvanizing paint and should continue to do so. Within the next quarter, CES should have Enecon provide a quote to clean and coat these plates. This quote should also include an additional item to clean/coat the anchor beam.
 - f. There is some hairline cracking of the concrete. CES should monitor this cracking and notify TEG of any significant changes.
 - g. CES replaced both the condensate return slip-type expansion joint and the steam slip-type expansion joint insulation blankets.
- 6. Manhole B7
 - a. There was not any appreciable water present in this manhole, so it did not require pumping prior to entry.
 - b. Portions of the grout behind the anchor beam wall plates has cracked and fallen out; this grout needs to be replaced. When making this repair, if the system is active, only half of the grout behind each end plate should be removed/replaced at a time. The new grout should be allowed to cure before the remaining half of the grout is removed/replaced. CES should have this grout replaced within the next 3 months to prevent further degradation and possible failure of the wall attachments. **This item appeared in the last 2 quarterly reviews.**
 - c. During the last quarterly review, the steam piping from the southern steam piping wall penetration to the vertical 90° ell showed evidence of movement. The evidence of this movement included debris in the floor of the manhole that appears to have been some type of sealant at the wall penetration; the link seal at the wall penetration is dislodged; and creases exist in the insulation jacketing on the steam piping. The anchor welds were reviewed and there is no evidence of any cracking or splitting. CES should continue to monitor the piping and the pipe anchor in this manhole and immediately report any changes to TEG.
 - d. Some of the nuts on the anchor beam anchor bolts are loose. These nuts should be tightened to be snug with the wall plate and then an additional

- quarter turn. **This item appeared in the last quarterly review.** CES should monitor the structural integrity of this attachment and report any changes to TEG.
- e. The western wall penetration end cans are beginning to corrode. CES has been cleaning and painting areas of corrosion on the anchor beam with cold galvanizing paint and should continue to do so. Within the next quarter, CES should obtain a quotation from Enecon to clean and paint 1) the anchor beam, 2) the western end cans, and 3) the kicker from the steam piping to the northern wall.
 - f. The trap piping stanchion support is corroded very badly at its base. This support is not needed. Once the metal degradation from the corrosion allows the removal of this support, CES should remove it.
7. Manhole B8
- a. There was no water in this manhole.
 - b. There are some hairline cracks in the ceiling; these should be monitored by CES, and any significant changes reported to TEG.
 - c. Some deterioration of the grout behind the anchor beam wall plates has occurred and some portions of the grout is missing. All the grout behind the wall plates needs to be replaced. When making this replacement, if the system is active, only half of the grout behind each end plate should be removed and replaced at a time. The new grout should be installed and allowed to cure before the remaining half of the grout is removed/replaced. CES should have these repairs done within the next 3 months to prevent further degradation and possible failure of the wall attachments. **This item appeared in the last two quarterly reviews.**
 - d. There is some corrosion on the steel components within this manhole; CES has been cleaning and painting these areas with cold galvanizing paint and should continue to do so. Within the next quarter, CES should obtain a quote from Enecon to clean and coat 1) the anchor beam, 2) the end can retainer plates, and 3) the end cans.
 - e. CES replaced one of the broken retaining all-thread pieces on the eastern condensate piping end can retainer plate.
 - f. The eastern condensate end can vent valve has corroded and the vent piping has failed. This vent piping and valve needs to be replaced. This will require the removal of the remaining piece of vent piping attached to the end can and the subsequent installation of a new vent pipe and valve. This should be replaced as soon as possible to prevent the possible infiltration of water into the pre-insulated piping casing due to accumulation of surface and groundwater within the manhole. **This item appeared in the last two quarterly reviews.**
 - g. CES replaced both the condensate return slip-type expansion joint and the steam slip-type expansion joint insulation blankets.
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8. Manhole B9
 - a. There was no water in this manhole.
 - b. There are some hairline cracks in the ceiling of this vault. CES should monitor these cracks and report any significant changes to TEG.
 - c. There is some corrosion on portions of the anchor beam support in this manhole. CES has been cleaning and painting these areas with cold galvanizing paint and should continue to do so. Within the next quarter, CES should obtain a quote from Enecon to clean and coat 1) the anchor beam, 2) the end can retainer plates, and 3) the end cans.
 - d. The handwheel on the blowdown valve on the trap strainer downstream of the trap is missing. It is my understanding that CES has been unsuccessful in locating a replacement handwheel. Because this strainer is located downstream of the trap, it can be eliminated. CES should plan on removing this strainer and valve at the earliest opportunity.

 9. Manhole B10
 - a. There was no water in this manhole.
 - b. CES should continue to monitor the corrosion on the steel and clean/paint it as needed.
 - c. There are some hairline cracks in the ceiling of this vault. CNE should monitor these cracks and report any significant changes to TEG.
 - d. The handwheel on the blowdown valve on the trap strainer downstream of the trap is missing. It is my understanding that CES has been unsuccessful in locating a replacement handwheel. Because this strainer is located downstream of the trap, it can be eliminated. CES should plan on removing this strainer and valve at the earliest opportunity.

 10. Viridian Manhole
 - a. There was water present in the manhole, and it required pumping prior to entry.
 - b. There is some mud in this manhole. CES should clean this manhole within the next quarter. **This item appeared in the last quarterly review.**
 - c. The northern blind flange needs to be re-insulated along with the two vent valves. CES should have this done within the next 6 months. **This item appeared in the last two quarterly reviews.**

 11. Manhole 14A
 - a. There was water present in this manhole, and it required pumping before entry.
 - b. This manhole is no longer in service. It is in Dr MLK Jr. Blvd (formerly Charlotte Ave) between 3rd and 4th Avenue. It is reviewed annually to make sure that the structure is sound. The main manhole houses abandoned steam and condensate return piping. There are two smaller manholes west of the main manhole which house abandoned chilled water supply and return piping isolation valves.
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- c. There is a large amount of mud in the floor of the main manhole. The next time CES schedules a vac truck to clean other manholes, this manhole should be cleaned also.
 - d. The ceiling is beginning to flake where rebar chair feet are close to the surface. CES should monitor these areas and report any significant changes to TEG.
12. Manhole 16A
- a. This manhole is at the top of a vertical shaft which connects to the 4th Ave Tunnel.
 - b. There was no water in this manhole.
 - c. No deficiencies to report.
13. Manhole 22B
- a. This manhole is at the top of a vertical shaft which connects to the 7th Ave Tunnel.
 - b. This manhole is in 7th Ave N. This street was recently re-paved by Metro. When re-paving occurs, the manway frames and lids are removed and then re-installed after paving is complete. The re-installation of the manways in new pavement sometimes requires the position of the frames to be higher than they were formally and then requires the installation of bricks and/or mortar to get the frames repositioned. Apparently, this was done on this manhole with the result being that there is a lot of concrete debris in the riser and floor of the manhole. CES needs to clean the manhole as soon as possible.
 - c. The thermal movement of the steam and condensate piping has created indentions in the insulation jacketing at the penetration of the piping through the floor grating. Most likely this is the result of the vertical shaft piping being in a slightly different position than what it was originally when the new piping was installed. CES should monitor the piping/insulation at the grate penetration and report any significant changes to TEG.
 - d. Portions of the grating covering the vertical shaft opening is corroded. CES should obtain quotes from contractors to replace this grating as an R&I project. TEG will provide specifications for the new grating along with estimated opening sizes for the piping due to thermal movement.
 - e. CES should continue to monitor/clean/paint the CHW piping support steel as needed.
 - f. Water is seeping through the CHW east wall penetrations. CES should tighten the link seals to see if this stops the seepage. If not, CES should direct Enecon to install hydraulic grout around the wall openings. This will require the removal of a portion of the insulation jacketing, and possibly a portion of the insulation from the pipe. Therefore, this work should be done during the winter months to reduce the amount of surface condensation.
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14. Manhole S4A
 - a. There was a no water present in this manhole.
 - b. There are hairline cracks in the walls of this manhole. CES should continue to monitor these cracks and report any significant changes to TEG.
 - c. There is some minor spalling of the concrete walls in this manhole. CES should continue to monitor this spalling and notify TEG of any significant changes.

15. Manhole U
 - a. There was a small amount of water present in this manhole, but it did not require pumping prior to entry.
 - b. Because of groundwater infiltration into this manhole, secondary steam results and the roadway area above this manhole remains warm. In the past, this heat has caused settlement and some depression of the asphalt above the manways and could result in damage to one, or both, of the manway lids/frames. CES should continue to monitor this condition and report any significant changes to TEG.
 - c. The condensate return piping that passes through this manhole began leaking several years ago and a repair clamp was installed. This repair clamp was not leaking during this review. CES should continue to monitor this and report any leaks/changes to TEG.
 - d. A steel plate was installed against the exterior lower southern wall of this manhole several years ago to prevent dirt/fill from flowing into the manhole. This plate has begun to delaminate. CES should clean this plate and paint it with cold galvanizing paint to mitigate the progression of this corrosion. **This item appeared in the last quarterly review.**

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 developer for the site at 8th and Demonbreun is expected to execute a Customer Service Agreement in January 2024. Auto Nashville Hotel, LLC intends to construct a new hotel on the site. Work for this project is tracked under DES217.

TEG continues to have discussions with potential developments along the Peabody St corridor and the Rolling Mill Hill area. These potential sites include 1st Ave S and KVB, 4th and Lea, Peabody and Rutledge, and 2nd Ave S and Peabody. In addition to the Peabody St corridor, TEG continues to reach out to other developments within the service area for DES. TEG also met with representatives from the United States General Services Administration regarding potential service to the Estes Kefauver Courthouse on Broadway.

Metro Water Services (MWS) participates on the East Bank planning team, which consists of representatives from Metro departments associated with development and infrastructure in the city. The Metro Liaison represents DES 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.

Oracle's development plan for the East Bank has been placed on hold until 2024. DES is also pursuing opportunities to serve other developments and MWS infrastructure in the River North area. DES continues to explore options for serving other potential developments on the East Bank, including proposed developments with MDHA.

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.

- Bridgestone Arena reported higher than normal chilled water supply temperatures in October. CES investigated the issue and determined the building had a faulty temperature sensory.
- Steam service to the State Tunnel system, and the State customer buildings, was interrupted three times during the month of October and twice in November. CES investigated the issue and determined repairs were needed to the control air compressor in the Andrew Jackson Building. TEG and CES began evaluating the cost and feasibility of installing a new electrically-actuated steam control valve and abandoning the pneumatic controls due to the cost and frequency of the interruptions in the steam supply.
- CES and TEG investigated steam flow issues at the Wildhorse Saloon in November. The building personnel determined the issues were related to their pressure reducing valve and made the necessary repairs.
- Steam service to the State Tunnel was interrupted again in December due to a faulty UPS (uninterruptible power supply). The UPS (uninterruptible power supply) was replaced, and service was restored two days after CES became aware of the issue.
- TEG and CES investigated a low steam supply pressure at the Cordell Hull building. An instrumentation issue was determined to be cause of the low-pressure indication. CES recalibrated the DES instrumentation and the correct pressure was being reported. Building personnel also reviewed their in-building steam traps to ensure their proper operation.
- 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. CES continues to improve its operation and has succeeded in meeting several of the guaranteed metrics. In TEG's opinion, CES needs to continue their efforts to improve the operations of the EGF to meet the remaining metrics more consistently. In addition, CES has improved its maintenance over the last several quarters reducing the number of previously unaddressed items included in TEG's quarterly walkthrough reports regarding manholes and the EGF. However, there are several outstanding manhole items in this report which have appeared in previous reports. CES needs to expeditiously address the long-outstanding items.

Based on the review of the Second Quarter FY24 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 continue to address the cooling tower repairs and other maintenance items noted in the EGF Walkthrough Reports.
- 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.
- 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 or replaced.
- 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.