



Operations Monitoring Report

First Quarter FY13

Prepared by:

**Thermal Engineering Group, Inc.
105 Hazel Path Court, Ste 2
Hendersonville, TN 37075**

November 1, 2012

I. Executive Summary

A review of the fiscal year 2013 (FY13) First Quarter performance and contract obligations between Constellation New Energy (CNE) 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 are also presented. For the fiscal year 2013, CNE has satisfactorily met all of the contract obligations to Metro and has had no contract violations.

For the First Quarter FY13, the chilled water sales increased 11% over the previous First Quarter (FY12). However, the First Quarter FY13 saw a 1.9% decrease in cooling degree days from the previous First Quarter. The peak chilled water demand for the current quarter was 16,484 tons, which is marginally higher than the previous First Quarter despite setting a new record demand for the DES.

Steam sendout for the current quarter increased by approximately 21.5% over the previous First Quarter, but a 31.3% decrease in heating degree days is noted. Likewise, steam sales also increased by approximately 26.9% over the previous First Quarter. Steam system losses, as a percentage of sendout, decreased but an overall increase in losses of approximately 13% over the previous First Quarter are noted. The peak steam demand for the current quarter was 59,844 pounds per hour, which represents an approximate 37.2% increase from the previous First Quarter.

The Energy Generating Facility (EGF) performance continues to surpass the System Performance Guarantee (Guaranteed Maximum Quantity or GMQ) levels. The chilled water plant electric consumption continues to perform considerably lower than the guaranteed levels but was slightly higher than the value from the previous First Quarter. The steam plant electric consumption increased approximately 4.5% over the previous First Quarter. The steam plant fuel efficiency has increased approximately 1.8% from the previous First Quarter due in part to a significant increase in the amount of condensate return. The total water consumption for the steam and chilled water plants increased approximately 15% from the previous First Quarter marked by a 31.5% increase in the EDS make-up for the chilled water system and a 19.3% increase in the steam plant usage.

Work continued on DES Capital and Repair & Improvement Projects during the First Quarter of FY13. DES 048, 076, 087, 090, 091, 093 and 097 were closed during the First Quarter FY13. Steam service to the new Music City Convention Center began in July 2012 as scheduled (DES-077). Design was completed on the new service connection to the Nashville Hyatt (DES-098) during the quarter and the contractor has been selected. Repair and Improvements to the EDS continue as scheduled.

The current fiscal year system operating costs to date are \$5,080,511. This value represents approximately 27% of the total budgeted operating cost for FY13. The customer revenues from the sales of steam and chilled water for FY13 (to date) are \$4,781,761 which is approximately

28% of the budgeted amount. The difference between the operating costs and customer revenue is the Metro funding amount (MFA), which represents the shortfall in cash flow for the system. The MFA transferred to date for FY13 is \$578,925 (25% of budget). However, the actual MFA required cannot be accurately calculated due to the outstanding invoices.

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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 First Quarter chilled water sales is shown in Figure 1. This data reflects an 11% increase in sales for the current quarter over the same quarter of the previous fiscal year. The quarter also experienced a 1.9% decrease in the number of cooling degree days. The majority of the increase in sales is a result of the MCCC beginning to take service.

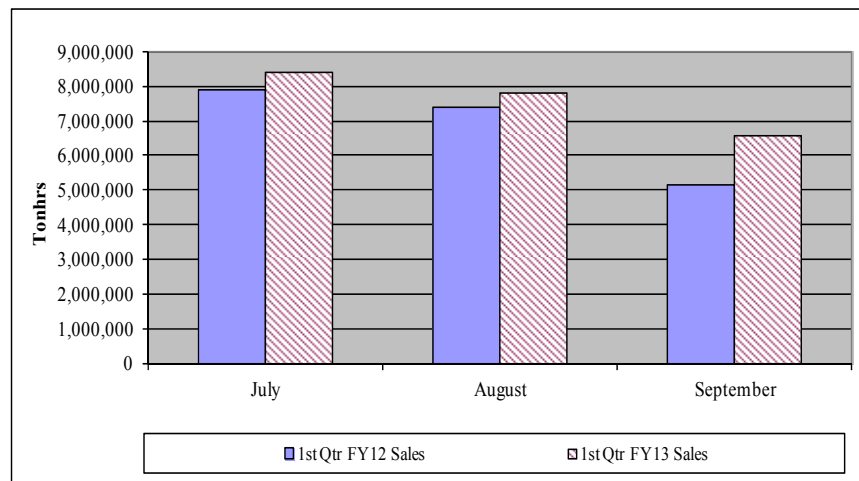


Figure 1. First Quarter FY13 Sales Comparison

The peak chilled water demand for the current quarter was 16,484 tons. This peak demand is marginally higher than in the previous First Quarter. This high peak demand can be attributed, in part, to the MCCC taking service this fiscal year.

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.

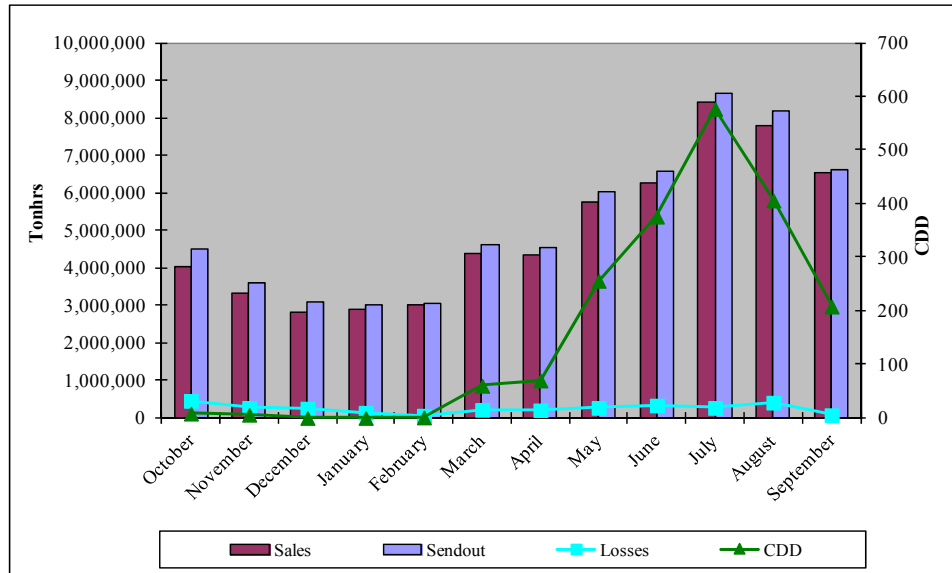


Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months

2. Losses

A comparison of the total, chilled water energy losses in the EDS for the First Quarter is shown in Figure 3. These losses are the difference in chilled water sendout and sales. During the quarter, the new flow meter in the EGF chilled water line began being used to measure the total chilled water sendout. The use of this more accurate meter contributes to the significant decrease in recorded losses for the quarter.

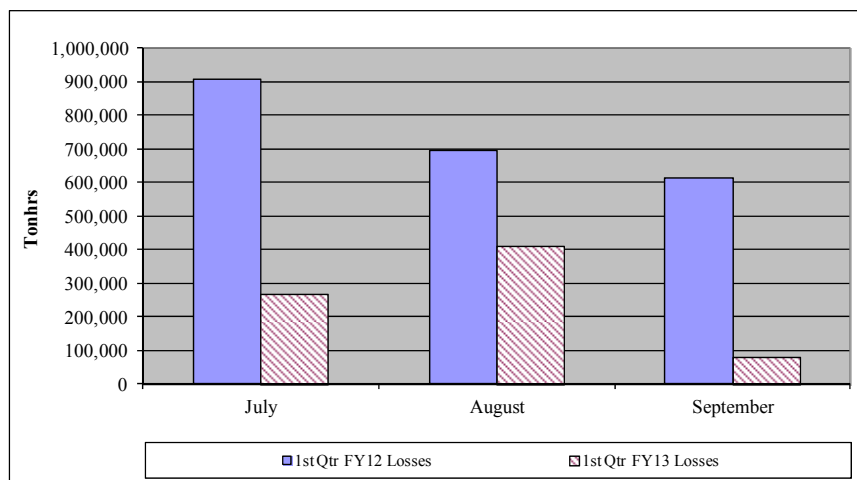


Figure 3. Chilled Water System Loss Comparison for the First Quarter FY13

The EDS make-up increased by approximately 31.5% over the previous First Quarter even though recent months have experienced a decline in water usage. However, the total EDS water usage represents only 0.6% of the total EGF water usage for the quarter. The total energy losses have decreased by approximately 66% over the previous First Quarter due to improvements in the EGF sendout metering equipment. The make-up to the cooling towers increased by approximately 14% (due to an increase in chilled water sales and ambient relative humidity). The number of cycles of concentration in the condensing water circuit experienced a 12% decrease during the current First Quarter. The overall city water make-up comparison for the chilled water system is shown in Figure 4.

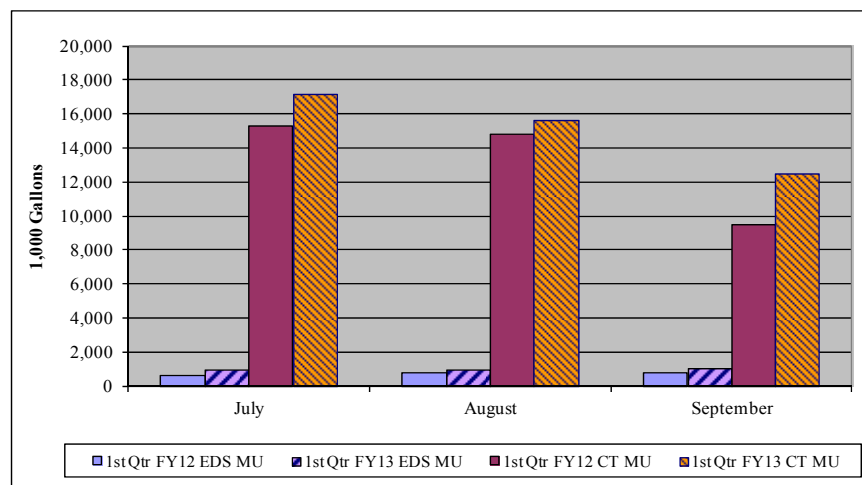


Figure 4. Chilled Water System City Water Usage Comparison

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. Under the management of CNE, the System Performance Guarantee levels as described in the ARMA are being achieved quite satisfactorily.

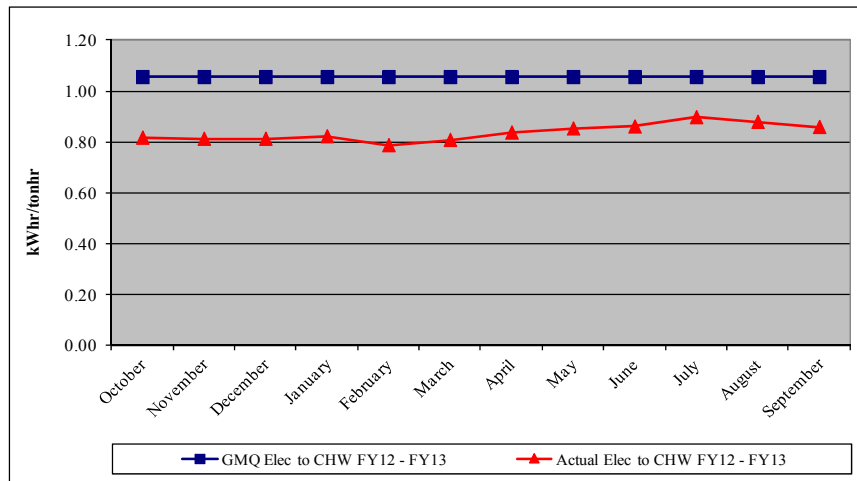


Figure 5. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months

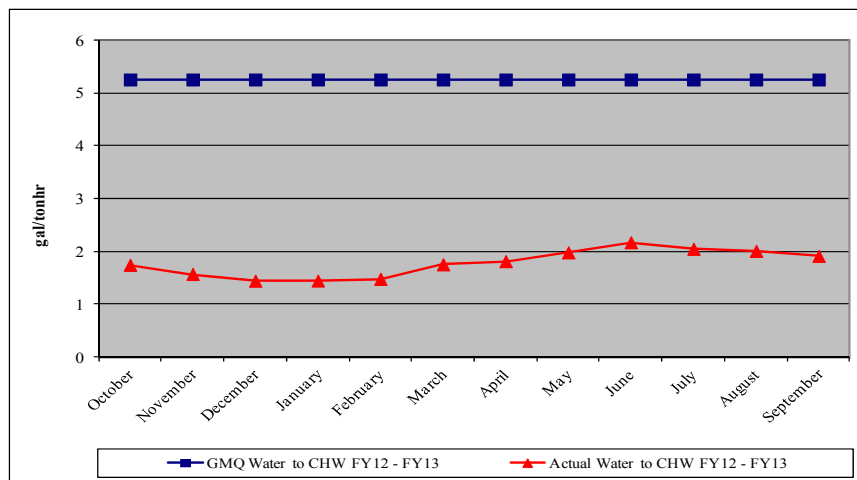


Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months

The chilled water allocation of the electric consumption falls under the GMQ limit of 1.055 kWhr per tonhr for the current quarter, and no excursion is reported for the current fiscal year. The chiller plant electric usage for the current quarter increased approximately 13.5% over the First Quarter for FY12. The actual electric conversion factor increased 2.3% in the quarter.

The actual chilled water plant water conversion factor increased approximately 3.6% over the previous First Quarter. The total consumption of city water for the chiller plant for the current quarter is approximately 15% higher than that for the previous First Quarter.

B. Steam

1. Sales and Sendout

The steam sendout increased by approximately 21.5% over the previous First Quarter (FY12), and the sales increased by approximately 26.9%. The steam system losses increased approximately 13% relative to sendout, due in part to a natural decrease in meter accuracy at relatively load steam demands at the customer buildings. The number of heating degree days have decreased by 31% over the previous First Quarter. A comparison for the First Quarter steam sales is shown in Figure 7.

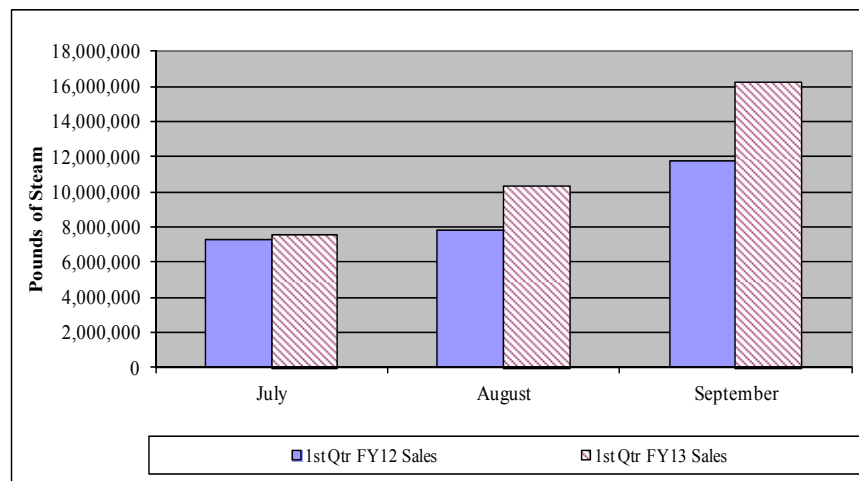


Figure 7. Steam Sales Comparison for the First Quarter FY13

The peak steam demand for the current quarter is 59,844 pph, which reflects an approximate 37.2% increase in the peak steam production over the previous First Quarter. This high peak demand is due, in part, as a result in the MCCC beginning to take service near the end of July.

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.

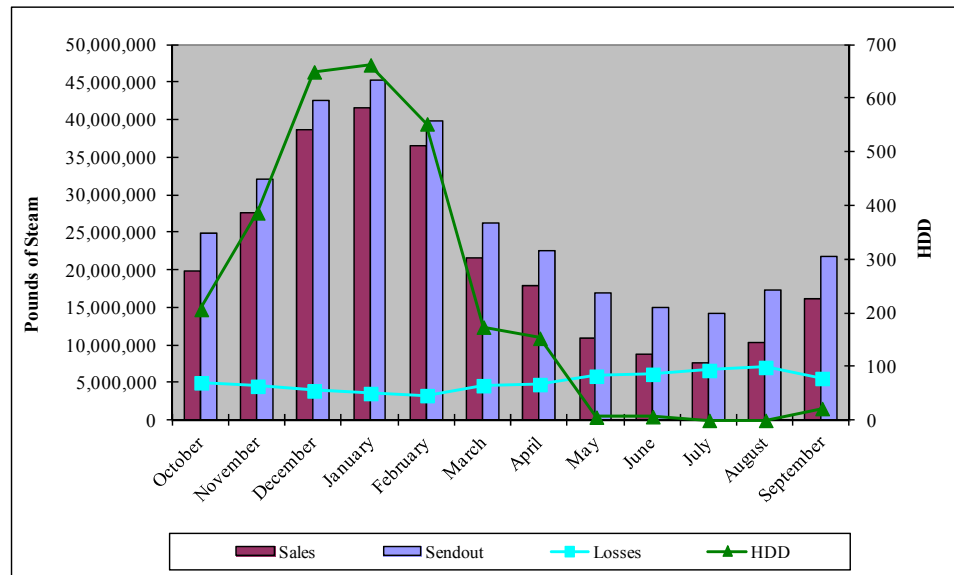


Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months

2. Losses

A comparison of the total steam mass losses in the EDS for the First 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.

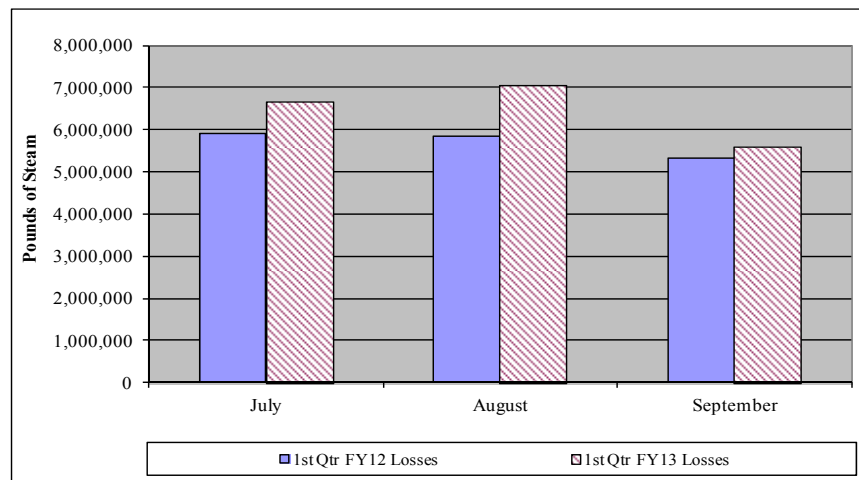


Figure 9. First Quarter FY13 Steam System Losses

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. This data is shown in the comparison of First Quarter data in Figure 10. Figure 10 depicts a significant

increase in city water make-up to the steam system of approximately 19% for the current quarter due to the dumping of condensate in the early part of the quarter for high iron content and hardness. CNE investigated the source of the iron and hardness and have since determined the source and isolated it from the rest of the EDS.

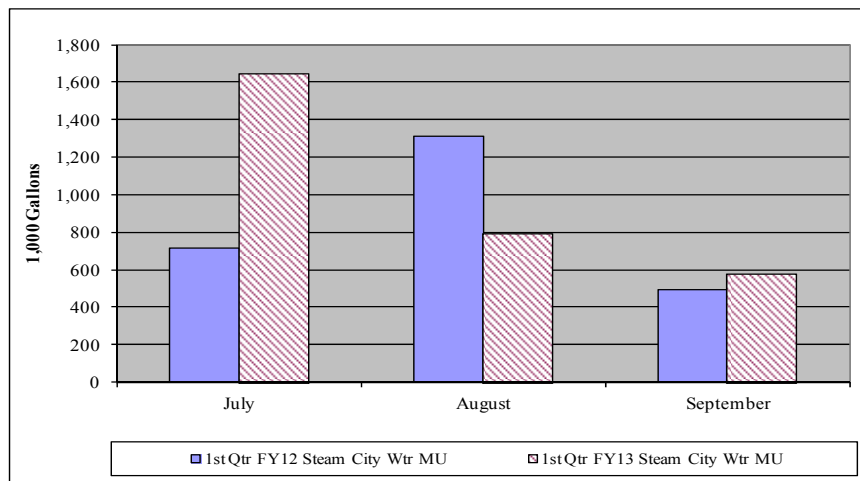


Figure 10. First Quarter FY13 Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system aspect of the EGF is presented by the following three charts, Figures 11, 12 and 13. Under the management of CNE, the System Performance Guarantee levels as described in the ARMA are being achieved satisfactorily.

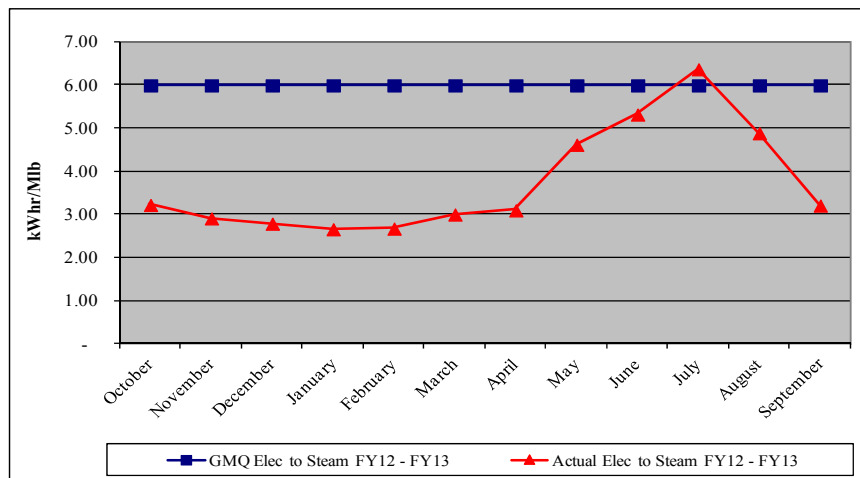


Figure 11. Steam Plant Electric Performance Guarantee for the Previous Twelve Months

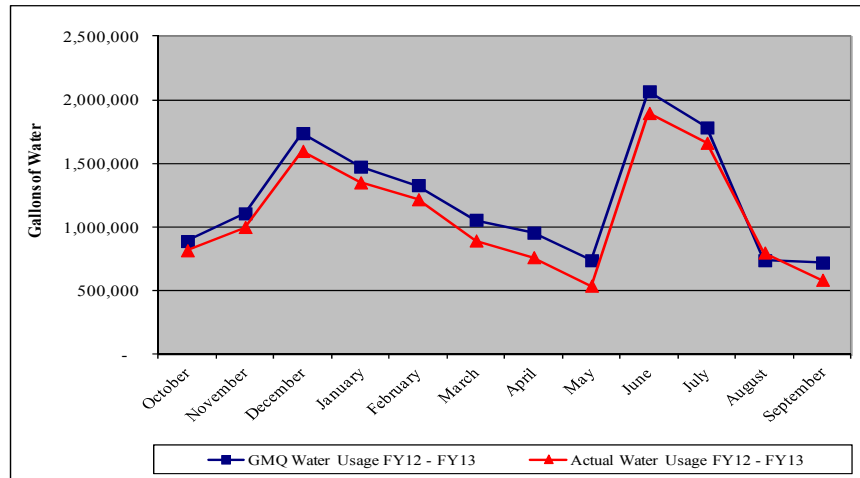


Figure 12. Steam Plant Water Performance Guarantee for the Previous Twelve Months

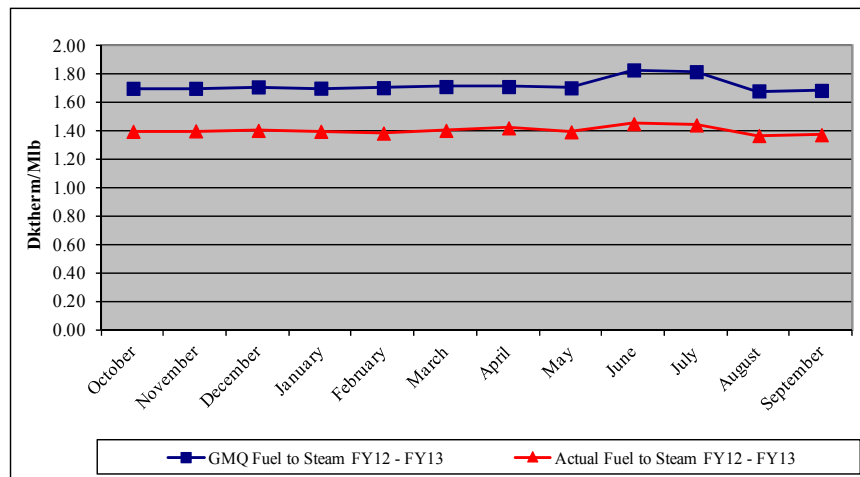


Figure 13. Steam Plant Fuel Performance Guarantee for the Previous Twelve Months

The current quarter experienced a 4.5% increase in the steam plant electric consumption while experiencing a 17.6% increase in the electric conversion factor. The water consumption for the steam plant increased 19% this quarter as compared to the previous First Quarter. The fuel consumption per unit of steam sales is relatively constant throughout the year and when compared to the historic data. The boiler plant fuel efficiency increased slightly for the current quarter.

C. Contract Guarantee Performance

The production and sales performance for the EGF and EDS are summarized in Table 1 for the current quarter and the complete fiscal year. Additional parameters, such as

cooling tower blow-down and peak demands are listed in this table, as well. Table 2 presents the Fourth Quarter and fiscal year comparisons of the Guaranteed Maximum Quantities (GMQ) of the criteria commodities (fuel, water and electricity).

Table 1. First Quarter FY13 Production, Sales and Consumption Summary

Item	Unit	First Quarter FY13	First Quarter FY12	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kWhrs	20,132,909	17,747,178	13.44%
Chilled Water	kWhrs	19,982,256	17,603,053	13.52%
Steam	kWhrs	150,653	144,125	4.53%
Total Water Use	kgal	51,100	44,352	15.21%
Total Chilled Water	kgal	48,088	41,828	14.97%
EDS Make-up	kgal	2,882	2,192	31.48%
Cooling Towers	kgal	45,206	39,636	14.05%
Calc CT Evaporation	kgal	38,194	34,138	11.88%
CT Blowdown	kgal	7,012	5,498	27.54%
Calc # Cycles		5.45	6.21	-12.28%
Steam	kgal	3,012	2,524	19.33%
Total Fuel Use	mmBTU	74,016	62,017	19.35%
Natural Gas	mmBTU	74,016	62,017	19.35%
Propane	mmBTU	0	0	n.a.
Condensate Return	kgal	3,729	3,071	21.42%
lbs		30,415,185	25,049,878	21.42%
Avg Temp	°F	169.0	173.0	-2.31%
Sendout				
Chilled Water	tonhrs	23,472,000	22,673,200	3.52%
Steam	lbs	53,379,000	43,937,000	21.49%
Peak CHW Demand	tons	16,484	16,411	0.44%
Peak Steam Demand	lb/hr	59,844	43,625	37.18%
CHW LF		64.49%	62.57%	3.06%
Steam LF		40.40%	45.61%	-11.44%
Sales				
Chilled Water	tonhrs	22,711,341	20,459,896	11.00%
Steam	lbs	34,083,021	26,855,788	26.91%
Losses				
Chilled Water	tonhrs	760,659	2,213,304	-65.63%
Steam	lbs	19,295,979	17,081,212	12.97%
		36.15%	38.88%	-7.02%
Degree Days				
CDD		1,191	1,214	-1.89%
HDD		22	32	-31.25%

*positive percent difference values imply an increase from FY12 to FY13

Table 2. First Quarter FY13 Performance Guarantee Comparison for Steam and Chilled Water

GMQ Calculations	Unit	First Quarter FY13	First Quarter FY12	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00	
Electric Conversion	kWhr/Mlb	4.42	5.37	-17.64%
GMQ Plant Efficiency	Dth/Mlb	1.725	1.724	
Plant Efficiency	Dth/Mlb	1.387	1.411	-1.76%
Actual %CR		56.98%	57.01%	-0.06%
Avg CR Temp	°F	169	173	-2.31%
GMQ Water Conversion	gal	3,237,969	2,663,142	
Water Conversion	gal	3,042,120	2,549,240	19.33%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055	
Electric Conversion	kWhr/tonhr	0.880	0.860	2.26%
GMQ Water Conversion	gal/tonhr	5.25	5.25	
Water Conversion	gal/tonhr	2.12	2.04	3.57%

*positive percent difference values imply an increase from FY12 to FY13

D. Operating Costs

The operating costs for the DES include the management fee to CNE, debt service payments on the bonds and engineering and administration costs. 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. The vast majority of the costs incurred for the operation of the DES are passed onto the customers in the form of the demand charges (fixed costs) and energy charges (variable costs). A summary of the total operating costs for the fiscal year to date are shown in Table 3.

The revenues shown 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 paid by Metro. The shortfall exists, in part, due to the remaining capacity at the EGF that was included in the original construction and remains unsold. This capacity is available for potential future customers.

The system operating costs for FY13 to date are \$5,080,511. This value represents approximately 27% of the total budgeted operating cost for FY13 and includes expenses to date that have been invoiced but were not paid at the time of this report. Additional invoices that would be charged to the First Quarter have not been issued or paid at the time of this report. The customer revenues from the sales of steam and chilled water for FY13 are \$4,781,761 which is approximately 28% of the budgeted amount. The MFA

transferred to date is \$578,925 (25% of budget). However, the actual MFA required cannot be accurately calculated due to the outstanding invoices.

Table 3. DES Expenses and Revenues to Date

Item	FY13 Budget	First Quarter Expenses	Second Quarter Expenses	Third Quarter Expenses	Fourth Quarter Expenses	Total Spending to Date	% of Budget
Operating Management Fee							
FOC: Basic	\$ 4,190,190	\$ 1,045,307.76	\$ -	\$ -	\$ -	\$ 1,045,307.76	24.95%
9th Chiller	\$ 39,300	\$ 9,794.76	\$ -	\$ -	\$ -	\$ 9,794.76	24.92%
C/O 6A	\$ 77,900	\$ 19,337.76	\$ -	\$ -	\$ -	\$ 19,337.76	24.82%
C/O 6B	\$ 68,200	\$ 16,929.33	\$ -	\$ -	\$ -	\$ 16,929.33	24.82%
C/O 7	\$ 25,510	\$ 6,377.73	\$ -	\$ -	\$ -	\$ 6,377.73	25.00%
Pass-thru Charges: Chemical Treatment	\$ 217,600	\$ 25,210.68	\$ -	\$ -	\$ -	\$ 25,210.68	11.59%
Insurance	\$ 29,400	\$ -	\$ -	\$ -	\$ -	\$ -	0.00%
Marketing: CES Sales Activity	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Incentive Payments	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
FEA: Steam	\$ -	\$ 13,874.40	\$ -	\$ -	\$ -	\$ 13,874.40	n.a.
Chilled Water	\$ -	\$ 153,376.00	\$ -	\$ -	\$ -	\$ 153,376.00	n.a.
Misc: Metro Credit	\$ -	\$ (217,556.62)	\$ -	\$ -	\$ -	\$ (217,556.62)	n.a.
ARFA	\$ -	\$ 15,181.47	\$ -	\$ -	\$ -	\$ 15,181.47	n.a.
Deferral	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Subtotal - Man Fee =	\$ 4,648,100	\$ 1,087,833	\$ -	\$ -	\$ -	\$ 1,087,833	23.40%
Reimbursed Management Fee + Chem Treatment							
		\$ 367,806.62	\$ -	\$ -	\$ -	\$ 367,806.62	0.00%
Metro Costs							
Pass-thru Charges: Engineering	\$ 27,800	\$ 2,039.36	\$ -	\$ -	\$ -	\$ 2,039.36	7.34%
EDS R&I Transfers	\$ 262,200	\$ 65,550.00	\$ 21,850.00	\$ -	\$ -	\$ 87,400.00	33.33%
Metro Marketing	\$ 16,000	\$ 292.50	\$ -	\$ -	\$ -	\$ 292.50	1.83%
Project Administration	\$ 32,400	\$ -	\$ -	\$ -	\$ -	\$ -	0.00%
Metro Incremental Cost	\$ 513,000	\$ 98,894.24	\$ -	\$ -	\$ -	\$ 98,894.24	19.28%
Utility Costs: Water/Sewer	\$ 616,500	\$ 200,346.34	\$ -	\$ -	\$ -	\$ 200,346.34	32.50%
EDS Water/Sewer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
EDS Electricity	\$ -	\$ 17,210.28	\$ -	\$ -	\$ -	\$ 17,210.28	n.a.
Electricity	\$ 5,673,500	\$ 2,176,472.60	\$ -	\$ -	\$ -	\$ 2,176,472.60	38.36%
Natural Gas Consultant	\$ 95,500	\$ 2,100.00	\$ -	\$ -	\$ -	\$ 2,100.00	2.20%
Natural Gas Transport	\$ -	\$ 38,620.31	\$ -	\$ -	\$ -	\$ 38,620.31	n.a.
Natural Gas Fuel	\$ 3,089,600	\$ 242,838.82	\$ -	\$ -	\$ -	\$ 242,838.82	7.86%
Propane	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Subtotal - Metro Costs =	\$ 10,326,500	\$ 2,844,364	\$ 21,850	\$ -	\$ -	\$ 2,866,214	27.76%
Subtotal - Operations =	\$ 14,974,600	\$ 3,932,198	\$ 21,850	\$ -	\$ -	\$ 3,954,048	26.41%
Debt Service							
2002 Bonds	\$ 3,719,778	\$ 917,091.80	\$ -	\$ -	\$ -	\$ 917,091.80	24.65%
2005 Bonds	\$ 515,477	\$ 220,116.37	\$ -	\$ -	\$ -	\$ 220,116.37	42.70%
2007 Bonds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
2008 Bonds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
2010 Bonds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Interest Revenue	\$ (71,700)	\$ (10,745.32)	\$ -	\$ -	\$ -	\$ (10,745.32)	14.99%
MIP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Oper. Reserve Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	n.a.
Subtotal - Capital =	\$ 4,163,555	\$ 1,126,463	\$ -	\$ -	\$ -	\$ 1,126,463	27.06%
Total =	\$ 19,138,155	\$ 5,058,661	\$ 21,850	\$ -	\$ -	\$ 5,080,511	26.55%
Customer Revenues							
Taxes Collected		\$ 89,714.59	\$ -	\$ -	\$ -	\$ 89,714.59	n.a.
Taxes Paid		\$ 91,566.00	\$ -	\$ -	\$ -	\$ 91,566.00	n.a.
Penalty Revenues/Credits		\$ (81,229.72)	\$ -	\$ -	\$ -	\$ (81,229.72)	n.a.
Energy Revenues Collected		\$ 4,864,842.59	\$ -	\$ -	\$ -	\$ 4,864,842.59	n.a.
Revenues =	\$ 16,822,500	\$ 4,781,761.46	\$ -	\$ -	\$ -	\$ 4,781,761.46	28.42%
Metro Funding Amount =	\$ 2,315,655	\$ 276,899	\$ 21,850	\$ -	\$ -	\$ 298,749	12.90%

The DES serves 26 customers and 41 buildings in downtown Nashville, including the new Music City Convention Center (MCCC). These customers are divided into three categories: 1) Private customers who privately own their buildings, 2) State of TN owned buildings and 3) Metro owned buildings. For FY13, the MCCC is considered a Metro owned building even though the general contractor is paying for temporary services. 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	\$ 1,371,494	7,895,792	\$ 0.1737	\$ 248,334	6,552	\$ 37.9007
State Government	\$ 1,104,899	5,833,112	\$ 0.1894	\$ 360,141	8,416	\$ 42.7917
Metro Government	\$ 1,350,195	8,982,437	\$ 0.1503	\$ 429,780	19,115	\$ 22.4843
New Customers	\$ 491,836	2,953,010	\$ 0.1666	\$ 47,972	1,810	\$ 26.5043
Total	\$ 3,826,588	22,711,341	\$ 0.1685	\$ 1,038,254	34,083	\$ 30.4625

Total Revenue	\$	4,864,843
True-up and Adjustments (Net)	\$	(83,081)
Net Revenue	\$	4,781,761

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CNE for FY13. Communication between TEG and CNE continues to be excellent, and CNE has reported and managed all EGF operations satisfactorily and according to the ARMA with no contract violations.

A. Reliability

The principle 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.

- A scheduled steam outage occurred on July 8th and 9th to make repairs on the steam piping on First Ave and Malloy.
- A chilled water excursion occurred in September due to a failed controls circuit which caused the chillers to trip. The chillers were restarted manually, but the sendout temperature was above 43.3°F for approximately 65 minutes.
- Excursions and disruptions in operations that have occurred throughout the year are included in the individual Monthly Operational Reports from CNE.

B. Efficiency

The operation of the EGF satisfied the guaranteed levels for all commodity usage during the quarter. There were no significant 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.

Monthly safety meetings were held on Hazardous Communications, Blood Borne Pathogens, Fire Safety and Confined Space Training.

D. Personnel

The EGF currently has twenty-five full time employees. Of the current number of employees, seventeen 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. 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 source of the iron and hardness reported in the previous quarter's report was discovered and isolated in July.
 - The condensate return averaged 66% of the steam sendout during August and 77% in September.
- Condensing Water System
 - The conductivity of the condensing water continues to be normal with only a few excursions resulting in high cycles of concentration and low blowdown rates.
- Chilled Water System
 - The control of the system chemistry continues to be excellent.

G. Maintenance and EGF Repairs

CNE continues to report on the numerous routine maintenance and preventive maintenance activities performed on the EGF primary and ancillary equipment. The principle 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.

- The O2 analyzers on boilers 1, 2 and 4 were calibrated.
- The main operating floor was repainted.
- The fan belt was replaced on cooling tower #9.
- Minor repairs were made to the chemical feed system.
- Other minor repairs and maintenance were made during the quarter and are listed in the monthly reports issued by CNE.

H. EGF Walk-through

A quarterly Walk-through of the EGF was performed on September 25, 2012, by Kevin Jacobs, P.E. with TEG. This review involved a tour of the facility with the primary points of interest and concern noted herein.

- Many of the housekeeping items noted in the previous walk-through have been repaired or resolved. Some empty boxes and other items are still being stored in the electric room. These items need to be removed.
- The riser pipes in several of the cooling towers remain in need of repair.
- The insulation on chiller #1 evaporator, previously reported as being damaged, has been repaired. However, the insulation on the water boxes for chillers #3, #4 and #6 remain in need of repair.
- A water leak was observed in the previous quarter walkthrough on the city water lines in front of Boiler #4 has been repaired.
- A portion of the wooden platform at the expansion tank #2 remains and should be removed as soon as possible.
- Other minor items remaining include:
 - Cobwebs have reformed in various places throughout the plant and on MCCC 4 located near the boilers; these should be removed.

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 statuses of the projects are discussed, and the project cost-to-date and bond balances are also presented.

A. First Quarter FY13 Open Projects

The following projects remained open at the end of the First Quarter FY13.

1. DES033 – Manhole Lid and Ring Replacement/Restoration

This project relates to the repair and replacement of manhole lids and rings whenever Metro Public Works performs Street re-paving. This project will remain open.

2. DES048 – Tunnel Lighting & Electrical Upgrades Phase III

Work was completed on this project during the Fourth Quarter FY12. This project was closed during the First Quarter FY13.

3. DES076 – Manhole S4A Rehabilitation

This project was closed during the First Quarter FY13.

4. DES077 – Music City Center Service Connection

The repairs to the new steam and condensate lines were completed during the quarter and steam service to the new MCCC began in July. The chilled water service began in April of this year. Temporary services are being charged to the general contractor, Bell/Clark, until construction is complete or nearing completion and the contract for services between DES and the MCCC has been finalized. Contract negotiations between the DES and the MCCC personnel continued through the First Quarter.

Additional aspects of this project include the MCCC metering station, the cooling tower testing and the modification of the EGF chilled water pumps. The chilled water side of the MCCC metering station was completed and started in April. The check-out and start-up of the steam metering station was completed prior to the start-up of steam service.

The new chilled water pumps are complete and operational.

A second cooling tower test occurred in late July in order to verify the performance and capacity of the existing cooling towers after CNE had performed some repairs and improvements that were recommended by the cooling tower testing company (McHale) from last summer. This second cooling tower test is listed as a separate project number, DES-097.

5. DES080 – Misc. Manhole & Tunnel Safety Repairs

As a result of the ongoing review of the manholes and tunnels, some safety items have been noted that require attention. This project was established to address these items.

The remaining additional items are being completed and it is anticipated that this project will be closed during the Second Quarter FY13.

6. DES087 – Exploratory Excavation & Repairs at Manhole D (CJC)

This project was closed during the First Quarter FY13.

7. DES090 – Manhole & Tunnel Insulation Repair (Revised from DES060)

Work related to re-insulation of portions of the Tunnel piping was closed out during the First Quarter of FY13. Work associated with this project will be ongoing as required.

8. DES091 – Thermal Storage and NES Time of Use Rates

The initial location considered for the thermal storage tank (between Woodland St and James Robertson Ave bridges at the NES substation) is most likely not available as a result of the Nashville Electric Service's unwillingness to provide a portion of their property for the construction of the storage tank and pump house. This project is economically feasible, depending on the location of the storage tank, but a new location will have to be investigated. Work on this project is complete at this time.

9. DES093 – Manhole 6 Repair and Structural Rehabilitation

This project was closed during the First Quarter FY13.

10. DES 094 – Molloy Street Exploratory Dig

1st Avenue South was closed for a week late in the Fourth Quarter FY12 in order to excavate the full width of the street and make expeditious repairs. Modifications were made to the steam conduit to alleviate the infiltration of groundwater. In addition, due to the amount of groundwater entering the excavation and its impact to the steam system and manhole structures, it was decided to construct a permanent sump pit at this location. All of this work has been completed. Cost substantiation documentation was received and reviewed during the First Quarter FY13. It is anticipated that this project will be closed during the Second Quarter FY13.

11. DES 095 – Manhole B2 Water Infiltration Remediation

Groundwater infiltration into Manhole B2 has increased over the last year. Metro Water & Sewer has been contacted and they have discovered some small water leaks in the area and recently repaired a rather large leak a few blocks south of this manhole. This repair resulted in a decline in the water infiltration into Manhole B2. A contractor with expertise in water infiltration into underground structures was retained to seal this manhole. This work has included sealing the

wall penetrations and the contractor has re-visited this manhole several times to do additional sealing. A second step would be to coat/seal the interior walls of the manhole, however it has been decided to wait and make sure that the penetration repairs are successful prior to doing this. It is expected that this project will be in close-out during the Second Quarter FY13.

12. DES 097 – EGF Cooling Tower Test

A cooling tower test was performed by McHale and Associates, Inc. in July 2012. A final report was issued during the First Quarter. The results indicate that the existing cooling towers may be capable of rejecting the chiller plant heat load on a design day, but some improvements could be made to the operation of the towers during peak cooling loads to further ensure the available capacity. CNE was provided with an operating procedure by TEG which explained methods to further maximize the system's performance.

This project was closed during the quarter.

13. DES 098 – Nashville Hyatt Place Customer Connection

The Nashville Hyatt Place is a new hotel currently under construction at the intersection of Third Ave South and Molloy Street. The service connection design was completed during the quarter and a contractor has been selected to perform the work. The actual construction is anticipated in the Second Quarter and is being coordinated with hotel construction personnel. This new hotel will contract for 250 tons and 6,300 pph of steam.

B. First Quarter FY13 Closed Projects

DES 048, 076, 087, 090, 091, 093 and 097 were closed during the First Quarter FY13.

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 are shown. 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	FY12 Spending to Date	Total Spent to Date	Remaining Balance
2005B Bond Projects					
	Total Closed Projects	\$ 7,320,301	\$ -	\$ 7,840,616	\$ (520,315)
	Project Development	\$ 866,199	\$ -	\$ 293,328	\$ 520,315
	Total 2005B Bond	\$ 8,186,500	\$ -	\$ 8,186,500	\$ (0)
2010 Bond Projects					
DES070	MH 6 to 23 Cond Line	\$ 20,000	\$ -	\$ 527	\$ 19,473
DES071	Hermitage Hotel Ser Modifications	\$ 20,000	\$ -	\$ 1,119	\$ 18,881
DES072	Sheraton Stm & Cond Line	\$ 11,000	\$ -	\$ 10,462	\$ 538
DES076	MH S4A Rehabilitation	\$ 233,000	\$ 131	\$ 209,248	\$ 23,752
DES091	NES Time of Use Electric Rate	\$ 50,000	\$ 1,111	\$ 50,575	\$ (575)
	Total Closed Projects	\$ 1,763,304	\$ -	\$ 1,605,534	\$ 157,770
	Metro Project Admin	\$ -	\$ -	\$ -	\$ -
	Project Man, Development, etc	\$ 312,696	\$ -	\$ -	\$ 312,696
	Total 2010 Bond	\$ 2,410,000	\$ 1,243	\$ 1,877,465	\$ 532,535
MCCC Construction Fund					
DES077	Music City Convention Center Design/Const	\$ 545,900	\$ 31,340	\$ 442,122	\$ 103,778
DES077	MCCC Metering	\$ 121,870	\$ -	\$ 120,670	\$ 1,200
DES077	Bell/Clark Construction Fund	\$ 4,697,860	\$ -	\$ 4,063,339	\$ 634,521
DES097	EGF Cooling Tower Test #2	\$ 30,000	\$ 3,560	\$ 4,982	\$ 25,018
DES098	Nashville Hyatt Service Connection	\$ 300,000	\$ 28,741	\$ 41,353	\$ 258,647
	Sub-Total Closed Projects	\$ 656,156	\$ -	\$ 655,197	\$ 959
	Metro Project Admin	\$ -	\$ -	\$ -	\$ -
	Project Man, Development, etc	\$ 2,148,214	\$ -	\$ -	\$ 2,148,214
	Total MCCC Construction Fund	\$ 8,500,000	\$ 63,641	\$ 5,327,662	\$ 3,172,338

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

Several EDS repairs and improvements were made during the First Quarter. The principle 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 budget at the end of the current quarter is \$242,656. Table 6 provides a summary of the FY13 expenditures and revenues to date associated with the R&I budget.

C. Emergencies

No emergencies were reported during the quarter.

D. EDS Walk-through

Due to schedule conflicts, the Fourth Quarter 2012 EDS walkthrough was postponed. Therefore, this report includes both the Fourth Quarter 2012 and the First Quarter 2013 EDS review. This walkthrough was conducted by Jon B. Belcher, PE on September 18, 19 and 20, 2012. The manholes that were visited included Manholes A, B, B5, K, L, M, N1, N2, S5, S6, 15, 1, 2, 3, 4, 5, 6, 9, 10, 11, 13, 18A and D. The following comments and observations are a result of these visits.

1. Manhole A

- a. There was a small amount of water in this vault.
- b. There is some corrosion on the piping supports. These supports should be cleaned and painted to prevent additional corrosion. This vault should be included in the capital project to repair and prevent structural corrosion with a “moderate” rating.
- c. The isolation valve upstream of the trap was closed; CNE personnel opened it during this review.
- d. There is not a strainer ahead of the trap; the next time the trap needs to be replaced, a strainer should be added upstream of the trap.

2. Manhole B

- a. Recently the City has added additional fill around the manway lid and frames. Because of this, three of the manways are now a low point. CNE should engage C-K Masonry to raise these lids to help alleviate surface water flowing into the manhole through the manways.
- b. There was a lot of water in the manhole requiring about an hour to pump using two pumps.
- c. Insulation is absent from a portion of the steam line where a valve was removed from this line. This section of piping needs to be insulated. TEG will coordinate this with CNE.
- d. There is minor damage to the insulation jacketing on the chilled water side of Manhole B. This can be repaired when the steam line is insulated.
- e. The northern steam slip joint is un-insulated. A new insulation blanket should be ordered and installed. The existing blanket was damaged in the May 2010 flood and was removed. TEG will coordinate this with CNE.
- f. Most of the insulation on the steam piping on the steam side of Manhole B is absent; it has come off the pipe and is in the floor of the manhole. This piping needs to be re-insulated. TEG will coordinate this with CNE.
- g. There is some corrosion on the piping supports. These supports should be cleaned and painted to prevent additional corrosion. This vault should be

included in the capital project to repair and prevent structural corrosion with a “moderate” to “high” rating.

- h. There is a fair amount of mud in the floor of the manhole that should be removed. TEG will coordinate this with CNE.

3. Manhole M

- a. There was a small amount of water in this vault
- b. The link seal on the steam line penetration at the northern wall has been dislodged from the top portion of the pipe. CNE personnel have tried to re-position this linkseal without success. CNE should continue to monitor the linkseal and report if water infiltration or other complications arise.
- c. There is some corrosion of the structural components in this manhole. This vault should be included in the capital project to repair and prevent structural corrosion with a “moderate” rating.
- d. Recently the surface area above this manhole was paved with asphalt. As a result, there is a pile of asphalt in the floor of the manhole beneath the manway. This asphalt should be removed.

4. Manhole L

- a. There was not any appreciable water in this manhole.
- b. John E Green Company (JEG) recently replaced several trap line globe valves with gate valves. The insulation that needed to be removed was left on the floor of the manhole and the piping remains un-insulated. CNE should contact JEG and have them remove the debris and re-insulate the piping.
- c. There is some corrosion of the structural components in this manhole. This vault should be included in the capital project to repair and prevent structural corrosion with a “moderate” rating.

5. Manhole K

- a. There was a minor amount of water in the floor of the manhole.
- b. There is some mud in the floor of the manhole which was probably left from the May 2010 flood. This mud should be cleaned from the manhole. TEG will coordinate this with CNE.
- c. There is some corrosion of the structural components in this manhole. This vault should be included in the capital project to repair and prevent structural corrosion with a “moderate” rating.

6. Manhole N1

- a. There was no water present in this manhole.
- b. A portion of the mortar around the base of the manhole lid frame has broken loose and there is now an opening into the manhole. As a result there is a large amount of trash inside the manhole. This mortar needs to be repaired and the trash removed from the manhole.

7. Manhole N2
 - a. There was water present in this manhole and it required pumping.
 - b. There is quite a bit of mud in the floor of this manhole. TEG will coordinate with CNE about getting a vacuum truck to remove the water and mud from the manhole.

8. Manhole S5
 - a. There was water present in this manhole and it required pumping.
 - b. There is some degradation to the insulation in this manhole. This manhole should be listed as a “Moderate” priority on the Manhole Insulation priority list developed by CNE.
 - c. There is some structural distress of the concrete walls of this manhole. As the maintenance of the structure is the responsibility of the State, the structural integrity of the manhole should be monitored so the State can be informed if repairs become necessary. CNE’s CSR should notify the State of this pending problem.

9. Manhole S6
 - a. There was no water in the manhole.
 - b. Insulation is non-existent. Because of the small amount of piping that could be insulated in this manhole, the small size of the manhole and the absence of any valves or equipment that would require maintenance, there is no need to insulate this piping.
 - c. Because of the lack of serviceable equipment in this manhole, it is not necessary to inspect this manhole on a monthly basis; a yearly inspection would be adequate.

10. Manhole 1
 - a. There was a small amount of water in this manhole.
 - b. A section of the concrete roof at the manway entrance and a section of the wall beside the entry ladder spalled and there were concrete pieces on the manhole piping and floor. TEG has been investigating potential repair methodologies for this and other manholes with similar concrete problems. TEG will discuss these methodologies with a structural engineer and proceed with the needed repairs. The spalled concrete needs to be removed from the manhole.
 - c. The bottom portion of the entry ladder legs failed upon entry into the manhole and the ladder anchor bolts have become dislodged. This ladder needs to be replaced. TEG will coordinate this with CNE.
 - d. Portions of the existing structural steel need to be cleaned and re-painted.
 - e. The branch steam piping which once served Washington Square includes a flanged gate valve. This valve’s flange has numerous injection points indicating that the flange has leaked in the past. During the next system shut-down, since no future line extensions are expected from this section

of piping this valve should be replaced with a welded cap to avoid a potential emergency shutdown in the future.

11. Manhole 2

- a. There was water present in this manhole and it required pumping before entry.
- b. The structural steel in this manhole was replaced and then cleaned and painted approximately 2 years ago. Because of the heat and groundwater coming in contact with the steam piping and boiling, much of this paint is now damaged and needs to be cleaned and re-painted. TEG will coordinate this with CNE.
- c. There are areas of the walls and roof where concrete has fallen off due to spalling. As discussed for Manhole 1, TEG is working on a methodology to make repairs to this concrete.
- d. There is an appreciable amount of mud in the manhole floor which should be removed. The presence of this mud prevents the thorough review of the manhole structure and increases the potential for corrosion of metal structural components. TEG will coordinate this with CNE.
- e. There is a valve on the condensate service piping leaving this manhole with a broken yoke. Since the service piping from this manhole does not supply steam/condensate return any longer, these lines should be cut & capped during the next shut down of the system.
- f. New slip joint insulation blankets have been ordered; these should be installed as soon as possible.

12. Manhole 3

- a. There was water present in this manhole and it required pumping before entry.
- b. Upon entry into the manhole, the steam trap was not functioning; after working on it, CNE personnel were successful in getting the trap to work. This trap should be monitored to ensure its proper operation.
- c. The drain valve on the condensate piping is plugged and not allowing condensate to be drained. This valve should be repaired or replaced at the earliest opportunity.
- d. There are some hairline cracks in the concrete walls that should be monitored.

13. Manhole 4

- a. There was water present in this manhole and it required pumping before entry.
- b. The paint on the entry ladder is starting to peel off. These areas should be cleaned and re-painted.

14. Manhole 5
 - a. There was water present in this manhole and it required pumping before entry.
 - b. No deficiencies were noted.

15. Manhole 6
 - a. There was water present in this manhole and it required pumping before entry.
 - b. The steel structural components in the manhole were recently cleaned and repainted. It appears that there are some small areas where rust might be developing. CNE should contact the contractor that did this work and let them know that the manhole might need to be re-visited.
 - c. There is some spalling of the manhole's concrete wall. As stated, TEG is developing a methodology for this to be repaired and will follow up with CNE.

16. Manhole 9
 - a. There was water in the manhole and it required pumping prior to entry. The permanent sump pump was not functioning. CNE personnel were able to get the pump operational. The operation of this pump should be monitored.
 - b. There is some corrosion on some of the piping supports and some of the paint is starting to flake off. These places should be cleaned, prepped and re-painted. TEG will coordinate this with CNE.
 - c. There has been some water seepage around the linkseals for the water line which passes through this manhole. The linkseals should be adjusted or tightened to eliminate this seepage.

17. Manhole 10
 - a. There was water present in this manhole and it required pumping before entry. TEG is working with St. Mary's Church to get permission to installed electricity to this manhole and install a sump pump.
 - b. There is some cracking of the newly installed concrete pad at street level at this manhole projecting from the manway lids/frames. This cracking should be monitored.
 - c. The steel structural components in the manhole need to be cleaned of all rust and painted to prevent further corrosion. This manhole should be a "High" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
 - d. The concrete in the manhole is in very poor condition; there is cracking and spalling of the existing concrete which requires immediate attention. TEG is developing a methodology for this to be repaired.
 - e. There is some debris in the manhole which should be removed.
 - f. Several sections of the piping insulation need to be repaired. TEG will

coordinate this with CNE.

- g. The entry ladders have developed some corrosion and should be replaced. TEG will coordinate this with CNE.

18. Manhole 11

- a. There was water in this manhole which required pumping before entry.
- b. The trap in this manhole was not working. This trap should be repaired or replaced as soon as possible.
- c. The entry ladder consists of individual ladder rungs embedded into the concrete walls. This type of ladder rung can fail without warning and could result in personal injury. These rungs should be removed from the walls and a new ladder installed. TEG will coordinate this with CNE.

19. Manhole 13

- a. There was a small amount of water present in this manhole and it required pumping before entry.
- b. The insulation jacketing at the very bottom of the dripleg is coming off. This should be repaired.
- c. The Teflon pads on the kicker slide plates have fallen out of place. During the next shut-down of this section of piping, these pads should be re-positioned and a method devised to keep them in their proper position.
- d. The bottom of the entry ladder has begun to corrode; this should be monitored and repaired/replaced when necessary.
- e. There are several locations where concrete has spalled from the ceiling and concrete beams in the manhole and should be repaired. TEG is developing a methodology for this to be repaired.

20. Manhole 15

- a. No deficiencies to report.

21. Manhole 18A

- a. There was water present in the manhole and was pumped prior to entry.
- b. There is some very minor corrosion on the structural metal components in this manhole. This corrosion should be cleaned and painted to prevent its propagation.

22. Manhole D

- a. There was a minor amount of water present in the manhole but did not need pumping.
- b. All of the steel structural components in the manhole need to be cleaned of all rust and painted to prevent further corrosion. Some corrosion is severe. This manhole is a “High” priority on the “MH & Tunnel Structural Corrosion Prevention/Repair”.
- c. There is some minor concrete spalling within this manhole. These areas

should be repaired to prevent any further deterioration. TEG is developing a methodology for this to be repaired.

- d. There is some minor piping insulation damage in this manhole. There is no immediate need to make repairs at this time.
- e. There is some debris in the manhole from prior construction work. The manhole should be cleaned.
- f. Water hammer has been reported in prior manhole review reports for this manhole. Water hammer is still present in the manhole and appears to coincide with the discharge of the trap station in the manhole. The trap should be checked to make sure it is functioning properly. If it is functioning properly, a sparge station may need to be added to this manhole in order to reduce/eliminate this hammering.
- g. There is a minor amount of mud in the manhole which should be removed.

23. Manhole D Sump

- a. No deficiencies to report.

VI. Customer Relations

This section contains descriptions of the marketing efforts made by the DES Team during the quarter. The topics of interactions, meetings and training seminars with the customers are also discussed. There are currently 26 customers, comprised of 41 different buildings, connected to the EDS, including the Music City Convention Center. Service to each of these buildings continues to prove satisfactory, and the responsiveness to customer issues is handled by CNE in an excellent and professional manner.

A. Marketing

TEG and Metro DES continue to monitor and remain involved with the progress associated with the development of the new Music City Convention Center (MCCC). TEG is actively working on the permanent service contract with the MCCC. The contract for temporary service with Bell Clark was executed during the Third Quarter FY12.

TEG is finalizing the contract with the Nashville Hyatt Place. Construction to the service connection is anticipated to begin in the Second Quarter.

B. Customer Interaction

The CNE 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.

- The CSR coordinated several meetings between the customers, CNE, TEG and the contractors for particular projects that affected the steam, condensate and/or chilled water service to the customer.
- Several customers requested steam and condensate service isolation at their buildings during the quarter so that the customers could make internal repairs on their systems.
- The State Capitol building is currently under renovation, and this building has been isolated from all DES services. The steam and chilled water services are anticipated to be re-energized in the Second Quarter.
- CNE provided several customers assistance during the quarter regarding steam and chilled water leaks within buildings. Most of the time when such assistance is provided, it is determined that the leaks are the customers responsibility and are unrelated to the services provided by DES.
- Other minor issues and customer interactions are noted in the monthly CNE reports.

VII. Recommendations

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

- Steam traps noted as not functioning should be repaired or replaced as soon as possible.
- Spalled concrete in the vaults should be repaired.
- Structural steel that is corroded should be cleaned and painted or replaced.
- Insulation which is absent, or in disrepair, in the manholes should be addressed through either additional capital projects, which include work within these manholes, or through DES090.