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| **Prepared by:**  **HDR Engineering, Inc.**  **5426 Bay Center Drive, Suite 400**  **Tampa, Florida 33609-3444** | C:\Users\kperrin\Desktop\November 2016\P1030005.JPG | |
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**Definition of Abbreviations & Acronyms**

|  |  |
| --- | --- |
| Abbreviation/Acronym | Definition |
| APC | Air Pollution Control |
| Apr | April |
| Aug | August |
| Avg | Average |
| Btu | British thermal unit |
| CAAI | Covanta Alexandria Arlington, Inc. |
| CEMS | Continuous Emissions Monitoring System |
| CO | Carbon Monoxide |
| Dec | December |
| ECOM | Emergency Communications |
| Feb | February |
| FMG | Facility Monitoring Group |
| FY | Fiscal Year |
| gal | Gallon |
| GAT | Guaranteed Annual Tonnage |
| HCl | Hydrochloric (Hydrogen Chlorides) |
| HDR | HDR Engineering Inc |
| HHV | Estimated Waste Heating Value (Btu/lb) |
| ID | Induced Draft |
| Jan | January |
| Jul | July |
| Jun | June |
| klbs | Kilo-pounds (1,000 lbs) |
| kWhr | Kilowatt hours (1,000 watt-hours) |
| lbs | Pounds |
| LOA | Letter of Agreement |
| Mar | March |
| Max | Maximum |
| May | May |
| Min | Minimum |
| MSW | Municipal Solid Waste |
| MWhr | Megawatt hours |
| No | Number |
| NOV | Notice of Violation |
| Nov | November |
| NOx | Nitrogen Oxide |
| Oct | October |
| OSHA | Occupational Safety and Health Administration |
| PDS | Potomac Disposal Services |
| ppm | Parts per million |
| ppmdv | Parts per million dry volume |
| PSD | Prevention of Significant Deterioration |
| Q1 | First Quarter |
| Q2 | Second Quarter |
| Q3 | Third Quarter |
| Q4 | Fourth Quarter |
| RE | Reportable Exempt |
| RNE | Reportable Non-Exempt |
| SDA | Spray Dryer Absorber |
| Sep | September |
| SO2 | Sulfur Dioxide |
| TCLP | Toxicity Characteristic Leaching Procedure |
| VADEQ | Virginia Department of Environmental Quality |
| WL | Warning Letter |
| yr | Year |
| YTD | Year to date |

Alexandria/Arlington Waste-to-Energy Facility

Second Quarter Operations Report – Fiscal Year 2017

# Purpose of Report

HDR Engineering, Inc. (HDR) was authorized by the Facility Monitoring Group (FMG) to conduct quarterly inspections and provide quarterly reports regarding the operation and maintenance of the Covanta Alexandria/Arlington Waste-to-Energy Facility (Facility) for the 2016 calendar year. This report is prepared for the second quarter of the 2017 fiscal year and summarizes Facility operations between October 1, 2016 and December 31, 2016. This report identifies the fiscal year beginning on July 1, 2016 as FY17 and the quarter beginning on October 1, 2016 as Q2FY17.

This report is based upon HDR’s experience in the waste-to-energy industry, upon site observation visits and previous reports provided by HDR, and upon data provided by Covanta Alexandria / Arlington, Inc. (CAAI), the Facility owner and operator.

# Executive Summary

CAAI operated the Facility in an acceptable manner and in accordance with established waste-to-energy industry practices during Q2FY17. The operation of the Facility, maintenance, safety, and overall cleanliness continue to be above average. Environmental performance was excellent with no reportable environmental excursions throughout the quarter.

During Q2FY17, the Facility experienced one (1) instance of unscheduled downtime for the boilers totaling 9.0 hours, and no unscheduled downtime for turbine generators. There were two (2) scheduled boiler outages during Q2FY17 totaling 252.5 hours. During the quarter, the boilers experienced two (2) instances of standby time totaling 84.0 hours, and the turbine generators experienced one (1) instance of standby time totaling 103.7 hours. Note that standby time isn’t factored into overall availability. A detailed listing of downtime is provided in Section 5.2 of this report.

Average waste processed during the quarter was 930.5 tons per day, or 95.4% of nominal facility capacity. Waste deliveries averaged 920.1 tons per day, which is 1.1% lower than the burn rate. The capacity utilization of 95.4% compares favorably to industry averages, which are generally in the 88% to 92% range.

Performance trends for various measurements are presented in Section 4. In general, the Facility continues to demonstrate reasonable consistency in month to month performance throughout the most recent three-year period tracked for detailed comparisons.

During the quarter, MSW processed slightly increased (less than 0.1%) from the corresponding quarter in FY16; steam production increased (1.8%), and electricity generated (gross) increased (4.9%) from the corresponding quarter in FY16. The increase in steam generation is attributable to the increase (4.5%) in calculated waste heating value offset by more downtime (20.1 additional hours) and CAAI throttling the boilers back to stay below the steam production limit. The increase in electricity generated (gross) in Q2FY17, is attributed to higher steam production, and less downtime (69.4 fewer hours) experienced by the turbine generators.

# Facility Inspection and Records Review

In November 2016, HDR met with the Facility management and other plant personnel to discuss Facility operations, and maintenance, acquire data and reports, perform an independent visual inspection of the operating Facility, photograph areas of interest, and perform a review of recent Facility activity. This visit was coordinated with the scheduled FMG meeting. At the time of the inspection, HDR reviewed CAAI records, discussed performance issues with CAAI staff, and provided a verbal report and performance statistics at the November 2016 FMG meeting. HDR maintains a running tabulation of the status of corrective actions and plant performance trends. CAAI provides the following documents for each month:

* Facility Monthly Operating Reports
* Monthly Continuous Emissions Monitoring System (CEMS) Reports

Table 1 summarizes maintenance, repair, and plant condition issues reported during this and prior reporting periods. An “A” indicates an issue of the highest priority and worthy of immediate attention. Such items are usually safety or operability issues. A “B” indicates that the issue needs to be dealt with as quickly as possible, but is not urgent. These items will usually result in a process improvement or will help avoid future “urgent” issues. A “C” indicates that the issue should be dealt with at the earliest convenience, but is not a priority issue. This category might include issues related to aesthetics, non-urgent maintenance, or housekeeping improvements which are not safety related.

Note that HDR inspections are generally performed while equipment is operating, and are not intended to address the internal condition, performance or life expectancy of mechanical, electrical and electronic equipment and structures. HDR inspections are only performed quarterly, generally representing findings on the day of the inspection. CAAI is responsible, without limitation, for operations, maintenance, environmental performance and safety and should not rely on HDR observations or inspection reports which are overviews of Facility external conditions only.

Table 1: Summary of Inspection Report Deficiencies

\*A is highest priority & demands immediate attention: B needs attention, but is not urgent; C can be addressed at earliest opportunity & is not urgent.

| Item No. | Inspection Report Deficiencies | Issue Reported | Priority\* | HDR Recommendation | Status | Open / Closed |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | Corrosion on ceiling panels in Turbine Generator Enclosure | August 2014 | C | Sand, Prime, Paint and Preserve, and replace deteriorated panels as necessary | **HDR observed the corroded/deteriorated sections had been primed, but no panels were replaced. CAAI reports that it plans to replace panels in 1 to 2 years.** | Open |
| 2 | Corrosion on ceiling panels in Turbine Generator Enclosure (Alternate Location) | August 2014 | C | Sand, Prime, Paint and Preserve, and replace deteriorated panels as necessary | **HDR observed the corroded/deteriorated sections had been primed, but no panels were replaced. CAAI reports that it plans to replace panels in 1 to 2 years.** | Open |
| 3 | Deteriorated purlin east wall in Tipping Floor Enclosure | November 2014 | C | Replace deteriorated purlin | **CAAI reports that it will replace sections of the east wall of the Tipping Floor Enclosure as a 2016 Budget Item.** | Open |
| 4 | Panels on east wall in Charging Floor damaged | February 2015 | C | Replace damaged wall panels | **Complete** | Closed |
| 5 | Induced Draft Fan No. 1 Lagging deteriorated, west side of CEMS Enclosure | May 2015 | C | Replace deteriorated Induced Draft Fan Lagging | **Status Unchanged** | Open |
| 6 | Pot hole, southeast corner of Ash Trailer Canopy | August 2015 | C | Repair road surface | **Status Unchanged** | Open |
| 7 | Holes in Ash Trailer (License Plate: 18 5294C) near ladder | February 2016 | C | Report to ash hauling company and assure proper repairs are made | **CAAI reports that a new ash hauling company has been contracted and the existing ash trailers will no longer be used at the Facility. This item will be removed from the next Quarterly Report.** | Closed |
| 8 | Chemical storage container deteriorated, north of Main Vibrating Pan, at ground elevation | February 2016 | A | Replace storage container | **During the August 2016 FMG Meeting, CAAI indicated it planned to purchase a new storage container and dispose of the deteriorated container.** | Open |
| 9 | Safety Cage on Rotary Sootblower No. 27 detached and gears exposed | August 2016 | A | Adjust rotary sootblower cage to shield exposed gears | **Status Unchanged** | Open |
| 10 | Underside of grating deteriorated, upper elevations of all three economizers | August 2016 | C | Replace economizer grating in upper elevations | **Status Unchanged** | Open |
| 11 | Hole in wall where forklift is typically parked, northwest corner of Main Vibrating Conveyor | August 2016 | C | Patch hole in wall | **Complete** | Closed |
| 12 | Emergency eye wash station is leaking, just off CEMS Enclosure | August 2016 | C | Repair leaking emergency eye wash station | **Complete** | Closed |
| 13 | Pavement spider-cracking at Tipping Floor Entrance – See Figure 1 (Appendix B) | November 2016 | C | Resurface section of pavement at Tipping Floor Entrance | **Status Unchanged** | Open |
| 14 | Concrete slab damaged that Citizen’s Drop-off Roll-off is on – See Figure 2 (Appendix B) | November 2016 | C | Repair concrete slab | **Status Unchanged** | Open |
| 15 | Pothole where Tipping Floor Exit Road enters Eisenhower Avenue – See Figure 3 (Appendix B) | November 2016 | C | Repair pothole | **Status Unchanged** | Open |
| 16 | Multiple Cooling Tower Access Stairs Split – See Figure 4 (Appendix B) | November 2016 | A | Replace damaged stairs | **Status Unchanged** | Open |
| 17 | Corrosion on Scale House – See Figure 5 (Appendix B) | November 2016 | C | Conduct proper painting preservation measures on corroded spots of Scale House | **Status Unchanged** | Open |

# Facility Performance

Monthly operating data provided by CAAI indicates that 85,603 tons of MSW were processed during Q2FY17, and a total of 84,648 tons of MSW including 2,902 tons of Special Handling Waste were received. Total ash production during the quarter was 17,953 tons, which represents 21.0% of the waste processed by weight. The average uncorrected steam production rate for Q2FY17 was 3.12 tonssteam/tonwaste, which is higher (1.7%) than the corresponding quarter in FY16. The increase in this metric does not correlate with the 4.5% increase in the average waste heating value (HHV) calculated by CAAI, and is indicative of poorer boiler performance or some other currently unidentified cause. This trend continues to be unexplained.

Chart 1: Tons of Waste Processed

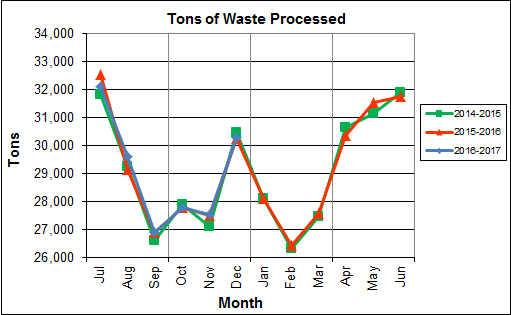


Chart 1 illustrates that Q2FY17 waste processed was ever so slightly higher (less than 0.1%) than the corresponding quarter, Q2FY16.

CAAI reported that 471 tipping floor/MSW internal inspections were conducted during the quarter and three (3) notices of violation (NOVs) were issued to haulers for the following issues:

* October 2016 – One (1) NOV was issued for unloading refuse without getting a ticket
* November 2016 – Two (2) NOVs were issued for:
  + One (1) NOV for driving on the scale in the wrong direction and damaging the radiation detector
  + One (1) NOV for not following safety procedures and being too close to the pit.

Chart 2: Tons of Ash Produced per Ton of Waste Processed

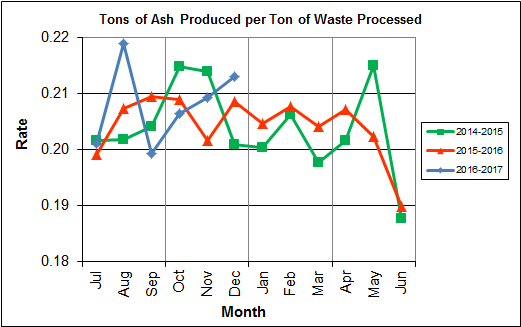


Chart 2 illustrates that the average ash production rate in Q2FY17 was higher (0.4%) at 21.0% of processed waste, compared to the corresponding quarter in FY16 when the rate was 20.6%. Ash production remains in the 20.0% to 21.0% range, as a result of the installation of the “semi-dry” ash discharger spray system in May 2012, and represents less moisture in the ash residue shipped to disposal.

Chart 3: Ferrous Recovery Rate

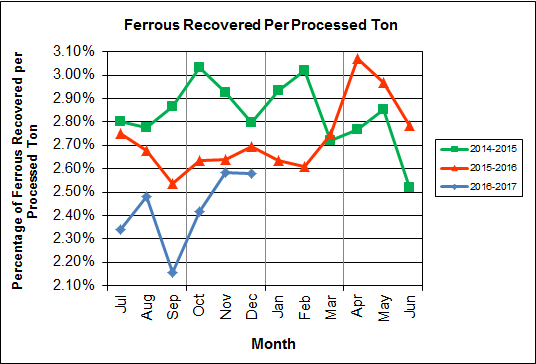
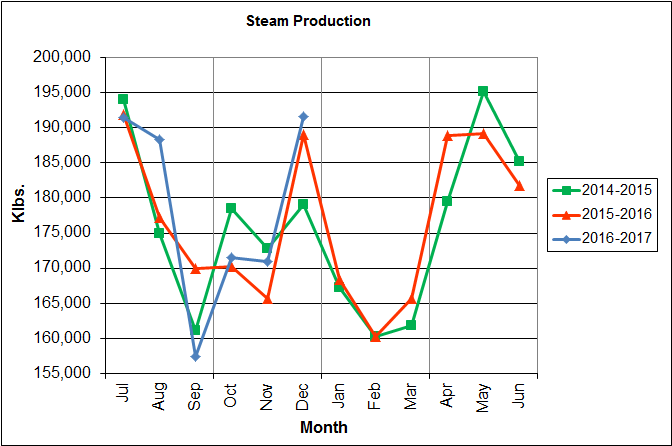


Chart 3 depicts the monthly ferrous metal recovery rate as a percentage of processed MSW tonnage. In Q2FY17, 2,163 tons of ferrous metals were recovered, which is 4.9% lower than the corresponding quarter in FY16 and equivalent to 2.5% of processed waste. CAAI indicated that it replaced an end section of the vibrating pan during Q1FY16 which was worn due to wear from material getting caught between the pan and magnet. However, ferrous metal recovery remains significantly below prior results. CAAI attributes the significant decline to an increase in recycling rates resulting in less metal in the MSW.

Chart 4: Steam Production



In Chart 4, the total steam production for Q2FY17 was 534,113 klbs., and higher (1.8%) than the corresponding quarter in FY16. The increase in steam generation is attributable to the increase (4.5%) in calculated waste heating value offset by more downtime (20.1 additional hours) and CAAI throttling the boilers back to stay below the steam production limit.

Chart 5: 12-Month Rolling Steam Production

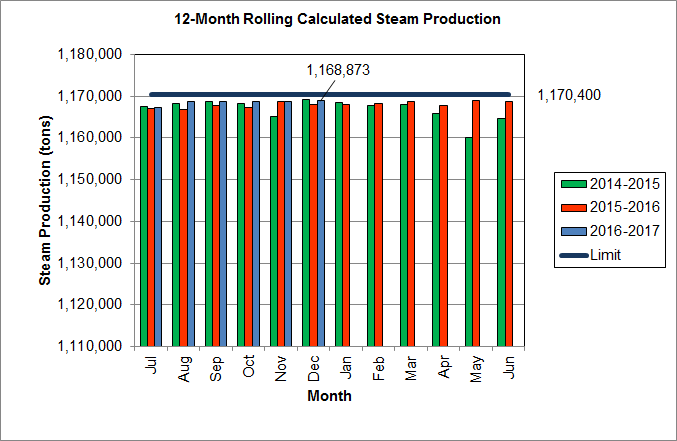


Chart 5 depicts the 12-month rolling steam production total for the period ending in December 2016. According to the Title V permit, the annual steam production for the Facility shall not exceed 1,170,400 tons on the basis of an average value of 3.34 lbs of steam per lb of MSW processed, calculated monthly as the sum of each consecutive 12 month period. The Facility was in compliance with the 12-month rolling steam production total every month in Q2FY17. The 12-month rolling total for steam production ending in December 2016 was 1,168,873 tons which is 99.9% of the limit. Chart 5 clearly shows that Facility throughput, and in turn, steam and electricity production are being throttled to stay ever so slightly below the steam production limit nearly every month.

Chart 6: Steam Production Rate

\

In Chart 6, the conversion of raw waste tonnages into “reference tons” is another way of analyzing steam production, and helps to determine whether changes are related to boiler performance or to fuel issues. “Reference tons” are adjusted to account for the calculated average fuel heating value, so that lower Btu fuel raw tonnages are adjusted upwards and vice versa. In Q2FY17, this metric tracked lower (2.6%) at 2.7 tonssteam/tonref, compared to the corresponding quarter in FY16. This trend should continue to be monitored to determine if it is indicative of poorer boiler performance, an aberration during scheduled outage periods, or some other currently unexplained cause.

Chart 7: Calculated Waste Heating Value

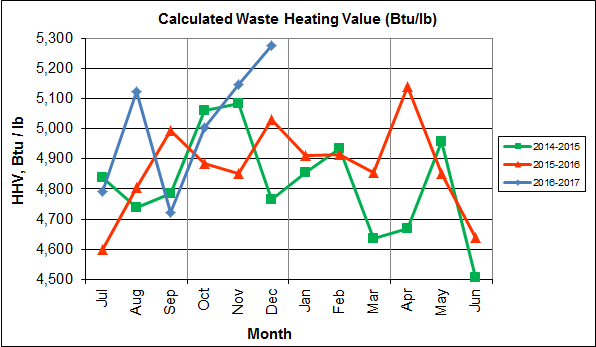


Chart 7 illustrates that Q2FY17 calculated average waste heating value was higher (4.5%) at 5,142 Btu/lb than the corresponding quarter Q2FY16, which averaged 4,922 Btu/lb.

Table 2: Quarterly Performance Summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Month | | Waste Processed (tons) | Waste Diverted  (tons) | Ash Shipped  (tons) | Special Handling (Supplemental)  (tons) | Ferrous Recovered  (tons) | Steam Produced (klbs) | Net Electrical Generation  (MWhr) |
| **Q2FY15** | **Quarterly Totals** | **85,456** | **0** | **17,912** | **1,814** | **2,492** | **530,413** | **37,911** |
| October -14 | 27,883 | 0 | 5,990 | 521 | 846 | 178,450 | 12,745 |
| November -14 | 27,099 | 0 | 5,799 | 764 | 793 | 172,875 | 12,276 |
| December -14 | 30,474 | 0 | 6,123 | 529 | 853 | 179,088 | 12,890 |
| **Q2FY16** | **Quarterly Totals** | **85,572** | **0** | **17,669** | **2,147** | **2,274** | **524,844** | **36,665** |
| October -15 | 27,796 | 0 | 5,807 | 684 | 732 | 170,190 | 11,899 |
| November -15 | 27,510 | 0 | 5,549 | 676 | 726 | 165,681 | 11,626 |
| December -15 | 30,266 | 0 | 6,313 | 787 | 816 | 188,973 | 13,140 |
| **Q2FY17** | **Quarterly Totals** | **85,603** | **0** | **17,953** | **2,902** | 2,163 | **534,113** | **38,588** |
| October -16 | 27,778 | 0 | 5,734 | 926 | 671 | 171,525 | 12,140 |
| November -16 | 27,525 | 0 | 5,762 | 941 | 711 | 170,976 | 12,229 |
| December -16 | 30,300 | 0 | 6,457 | 1,035 | 781 | 191,612 | 14,219 |
| **FY17 YTD Totals** | | **174,225** | **0** | **36,260** | **4,782** | **4,229** | **1,071,236** | **75,955** |
| **FY16 Totals** | | **349,881** | **0** | **71,401** | **8,567** | **9,571** | **2,118,125** | **148,529** |
| **FY15 Totals** | | **348,686** | **0** | **71,019** | **5,413** | **9,864** | **2,109,442** | **145,085** |

Table 2 presents the production data provided to HDR by CAAI for Q2FY17 on both a monthly and quarterly basis. For purposes of comparison, data for Q2FY15 and Q2FY16 are also shown, as well as FY15, FY16 and FY17 YTD totals.

In comparing quarterly totals, the data shows:

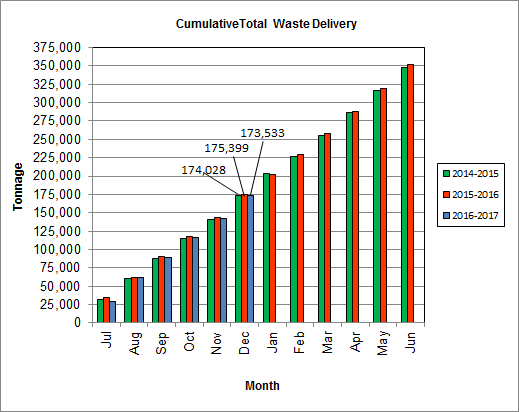
* Slightly more waste was processed in Q2FY17 than Q2FY16 and Q2FY15
* More steam was generated in Q2FY17 than Q2FY16 and Q2FY15
* More electricity was generated in Q2FY17 than Q2FY16 and Q2FY15
* More supplemental waste was received in Q2FY17 than Q2FY16 and significantly more than in Q2FY15.

Please note that the total steam generation figures presented in Table 2 do not correlate with the annual steam production limit from the Facility Permit; such limits apply on a 12-month rolling average monthly basis, and not a fiscal year basis. It is also worth noting that the quantity of waste processed during Q2FY17 continues to be limited by the steam production permit restrictions (refer to Chart 5).

Table 3: Waste Delivery Classification

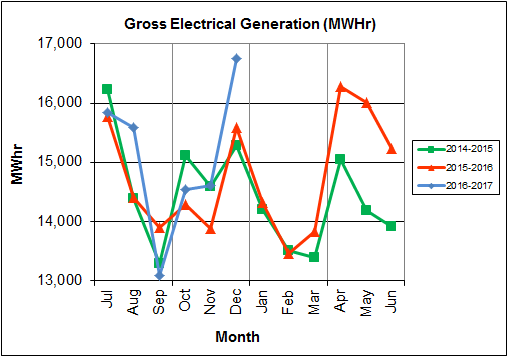
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Totals** | **% of Total** |
| **FY13** | **Jurisdiction Waste** | 19,413 | 18,357 | 16,632 | 17,625 | 18,838 | 16,195 | **-** | **-** | **-** | **-** | **-** | **-** | 107,058 | 30.76% |
| **Spot Waste tons** | 10,516 | 11,326 | 10,610 | 10,317 | 9,330 | 9,558 | **-** | **-** | **-** | **-** | **-** | **-** | 61,656 | 17.72% |
| **City Waste** | **-** | **-** | **-** | **-** | **-** | **-** | 1,683(1) | 1,287 | 1,444 | 2,382 | 2,286 | 1,919 | 11,000 | 3.16% |
| **County Waste** | **-** | **-** | **-** | **-** | **-** | **-** | 2,442(1) | 2,100 | 2,372 | 3,381 | 3,932 | 3,309 | 17,536 | 5.04% |
| **Municipal Solid Waste** | **-** | **-** | **-** | **-** | **-** | **-** | 25,019(1) | 23,637 | 21,661 | 27,066 | 25,794 | 24,930 | 148,107 | 42.56% |
| **Supplemental Waste** | 151 | 11 | 80 | 25 | 234 | 405 | 363 | 365 | 76 | 403 | 281 | 271 | 2,665 | 0.77% |
| **MSW Totals** | **29,928** | **29,683** | **27,241** | **27,942** | **28,167** | **25,753** | **29,507** | **27,388** | **25,552** | **33,231** | **32,293** | **30,429** | **348,022** | **100.00%** |
|  |  | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Totals** | **% of Total** |
| **FY14** | **City Waste** | 2,065 | 1,693 | 1,702 | 1,924 | 1,566 | 1,780 | 1,529 | 1,231 | 1,556 | 2,256 | 2,203 | 1,883 | 21,389 | 6.11% |
| **County Waste** | 3,459 | 3,079 | 2,784 | 3,091 | 2,707 | 2,802 | 2,568 | 1,957 | 2,272 | 3,326 | 3,987 | 3,387 | 35,419 | 10.12% |
| **Municipal Solid Waste** | 26,167 | 23,604 | 22,034 | 23,354 | 21,879 | 25,531 | 23,869 | 22,523 | 23,198 | 25,414 | 27,206 | 24,812 | 289,590 | 82.75% |
| **Supplemental Waste** | 546 | 676 | 248 | 410 | 188 | 268 | 275 | 192 | 231 | 253 | 151 | 110 | 3,548 | 1.01% |
| **MSW Totals** | **32,237** | **29,053** | **26,768** | **28,779** | **26,340** | **30,380** | **28,241** | **25,903** | **27,256** | **31,249** | **33,546** | **30,193** | **349,946** | **100.00%** |
|  |  | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Totals** | **% of Total** |
| **FY15** | **City Waste** | 1,814 | 1,497 | 1,699 | 1,737 | 1,518 | 1,770 | 1,411 | 1,209 | 1,648 | 2,155 | 2,059 | 2,045 | 20,562 | 5.91% |
| **County Waste** | 3,297 | 2,868 | 2,973 | 3,095 | 2,508 | 2,852 | 2,358 | 1,833 | 2,411 | 3,269 | 3,652 | 3,572 | 34,687 | 9.96% |
| **Municipal Solid Waste** | 26,661 | 24,466 | 21,887 | 21,241 | 21,678 | 27,906 | 24,611 | 20,915 | 24,094 | 25,189 | 23,126 | 25,667 | 287,442 | 82.57% |
| **Supplemental Waste** | 141 | 275 | 329 | 521 | 764 | 529 | 389 | 351 | 272 | 613 | 531 | 698 | 5,413 | 1.55% |
| **MSW Totals** | **31,913** | **29,106** | **26,888** | **26,595** | **26,468** | **33,057** | **28,769** | **24,308** | **28,424** | **31,225** | **29,369** | **31,982** | **348,105** | **100.00%** |
|  |  | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Totals** | **% of Total** |
| **FY16** | **City Waste** | 1,960 | 1,563 | 1,723 | 1,645 | 1,685 | 1,872 | 1,147 | 1,619 | 1,811 | 2,024 | 1,950 | 2,220 | 21,219 | 6.03% |
| **County Waste** | 3,627 | 2,880 | 2,832 | 2,869 | 2,682 | 2,891 | 2,025 | 2,389 | 2,694 | 2,406 | 2,508 | 2,661 | 32,465 | 9.22% |
| **Municipal Solid Waste** | 27,933 | 22,999 | 22,552 | 22,850 | 20,679 | 26,138 | 22,632 | 22,781 | 22,935 | 24,388 | 26,561 | 27,355 | 289,801 | 82.32% |
| **Supplemental Waste** | 676 | 427 | 771 | 684 | 676 | 787 | 642 | 850 | 792 | 996 | 605 | 661 | 8,565 | 2.43% |
| **MSW Totals** | **34,196** | **27,869** | **27,878** | **28,047** | **25,722** | **31,687** | **26,446** | **27,639** | **28,232** | **29,814** | **31,623** | **32,896** | **352,049** | **100.00%** |
|  |  | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **YTD Totals** | **YTD**  **% of Total** |
| **FY17** | **City Waste** | 1,678 | 1,836 | 1,668 | 1,722 | 1,817 | 1,708 |  |  |  |  |  |  | 10,428 | 6.01% |
| **County Waste** | 2,386 | 2,469 | 2,370 | 2,184 | 2,321 | 2,289 |  |  |  |  |  |  | 14,019 | 8.08% |
| **Municipal Solid Waste** | 24,862 | 26,976 | 22,760 | 22,110 | 21,598 | 25,996 |  |  |  |  |  |  | 144,301 | 83.16% |
| **Supplemental Waste** | 504 | 642 | 734 | 926 | 941 | 1,036 |  |  |  |  |  |  | 4,783 | 2.76% |
| **MSW Totals** | **29,430** | **31,922** | **27,532** | **26,941** | **26,677** | **31,030** |  |  |  |  |  |  | **173,533** | **100.00%** |
| **Note (1): Beginning January 2013, the method in which waste was classified was modified as compared to prior periods due to change in contractual obligations and plant ownership** | | | | | | | | | | | | | | | |

Chart 8: Cumulative Total Waste Delivery



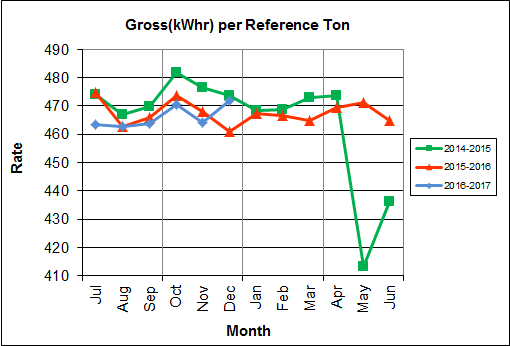
As depicted in Table 3 and Chart 8, for the quarter ending in December 2016; cumulative total waste delivery was 1.1% less compared to the same period in FY16.

Chart 9: Gross Electrical Generation



During Q2FY17, the Facility generated 45,907 MWhrs (gross) of electricity compared to Q2FY16 generation of 43,757 MWhrs (gross), a 4.9% increase. The increase in electricity generated (gross) in Q2FY17, is attributed to higher steam production, and less downtime (69.4 fewer hours) experienced by the turbine generators. Note that the sharp spikes depicted in Chart Nos. 10 through 14 for the months of May and June 2015 are a result of significant downtime (424.7 hours) experienced by Turbine Generator No. 1 to repair an exciter failure.

Chart 10: Gross Conversion Rate



As shown in Chart 10, the average gross electrical generation per reference ton of refuse processed during Q2FY17 was 469 kWhr, which is 0.3% higher than the corresponding quarter in FY16, and is attributable to less downtime experienced by the turbine generators during the quarter when compared to the corresponding quarter in FY16. Since this calculated value uses reference or normalized tonnages of waste, it should cancel the effect of MSW heating value (Btu content) variability.

Chart 11: Net Conversion Rate

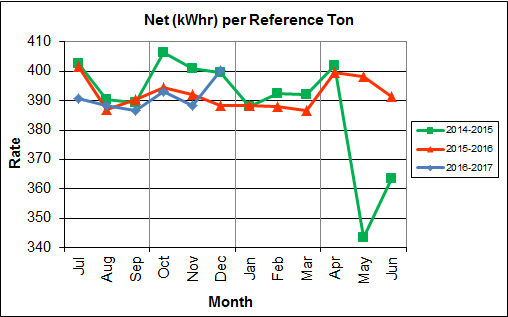


Chart 11 depicts the normalized net power (gross minus in-house usage) generation history. In Q2FY17, the average net electrical generation per reference ton was 394 kWhr, which is 0.6% higher than the corresponding quarter in FY16.

Chart 12: Net Conversion Rate

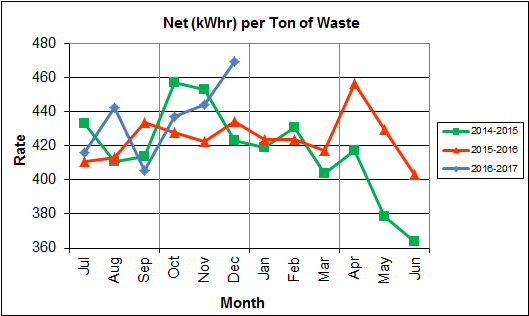
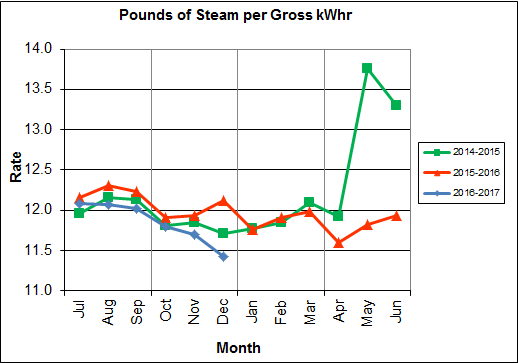


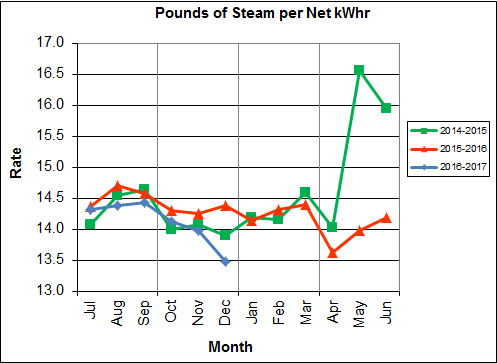
Chart 12 depicts the net power generation per processed ton. The net electrical generation per processed ton in Q2FY17 was 450 kWhr, which is 5.1% higher than the corresponding quarter in FY16, and attributable to higher (4.5%) calculated waste heating value, and less downtime experienced by the turbine generators when compared to the corresponding quarter last fiscal year.

Chart 13: Gross Turbine Generator Conversion Rate



Charts 13 and 14 illustrate the quantities of steam required to generate one (1) kWhr of electricity, gross and net respectively. This measure is a turbine generator performance indicator, where lower steam rates indicate superior performance. For simplification, this calculated rate is based on the average for the two turbine generators. In Q2FY17 the average lbs of steam consumed per gross kWhr generated was 11.6, which is 3.0% lower (improved) than the corresponding quarter Q2FY16. A factor that negatively impacts this metric is Turbine Generator No. 2 continues to operate with its Stage 9 blades removed from the rotor. CAAI reported that during the Turbine Generator No. 2 overhaul in November 2013, some cracking was observed on the Stage 9 blades of the rotor, and the blading in that row was removed as a precautionary measure. CAAI originally indicated that a new set of blades would be manufactured and installed during a Turbine Generator No. 2 Outage in 2016, but advised in May 2015, that the implementation of the replacement blades installation would be delayed, and did not provide a date for repair. The average lbs of steam consumed per net kWhr was 13.8, which is 3.3% lower (improved) than the corresponding quarter in FY16. The average steam temperature during the quarter was 688.3° F, which is 1.5% higher than the average steam temperature of the corresponding quarter last fiscal year and 11.7° F lower than design temperature of 700o F.

Chart 14: Net Turbine Generator Conversion Rate



## Utility and Reagent Consumptions

Table 4: Facility Utility and Reagent Consumptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Utility** | **Units** | **Q2FY17 Total** | **Q2FY16**  **Total** | **Q2FY17”Per Processed Ton” Consumption** | **Q2FY16”Per Processed Ton” Consumption** | **FY17 YTD**  **Total** |
| **Purchased Power** | MWhr | 5,712 | 5,560 | 0.07 | 0.06 | 11,310 |
| **Fuel Oil** | Gal. | 10,630 | 9,050 | 0.12 | 0.11 | 32,060 |
| **Boiler Make-up** | Gal. | 1,740,000 | 1,748,000 | 20.33 | 20.43 | 3,381,000 |
| **Cooling Tower Make-up** | Gal. | 36,611,403 | 35,132,772 | 427.69 | 410.56 | 81,630,429 |
| **Pebble Lime** | Lbs. | 1,290,000 | 1,396,000 | 15.07 | 16.31 | 2,544,000 |
| **Ammonia** | Lbs. | 180,000 | 167,000 | 2.10 | 1.95 | 350,000 |
| **Carbon** | Lbs. | 94,000 | 102,000 | 1.10 | 1.19 | 186,000 |
| **Dolomitic Lime** | Lbs. | 170,000 | 215,200 | 1.99 | 2.51 | 340,000 |

Fuel oil usage during the quarter represents approximately 0.19% of the total heat input to the boilers, which compares favorably with industry averages, and slightly higher than the percentage of heat input in Q2FY16 which was 0.16%. Fuel oil is used to stabilize combustion of wet fuel, as well as during start-up and shut-down of the boilers for maintenance. Boiler makeup water usage during the quarter represents 2.7% of steam flow, which is slightly lower than the boiler makeup in Q2FY16 which was 2.8%, and is acceptable. Pebble lime usage, at 1,290,000 lbs. is lower (7.6%) than the corresponding quarter last year, and the quarterly consumption rate of 15.1 lbs/ton is below historical levels (16-18 lbs/ton).

In comparing Q2FY17 to Q2FY16 on a per processed ton consumption basis:

* the purchased power consumption rate was 2.7% higher
* the total fuel oil consumption rate was 17.4% higher
* the boiler make-up water consumption rate was 0.5% lower
* the cooling tower make-up water consumption rate was 4.2% higher
* the total pebble lime consumption rate was 7.6% lower
* the ammonia consumption rate was 7.8% higher
* the carbon consumption rate was 7.9% lower
* the total dolomitic lime consumption rate was 21.0% lower

CAAI reported that the significant decrease in dolomitic lime usage is a result of lowering feed rate in recent months based on pH levels (average in-house pH of 9.8 during Q2FY17).

## Safety & Environmental Training

The Facility experienced no OSHA recordable accidents during the quarter and has operated 103 days without an OSHA recordable accident. During the quarter, Safety and Environmental training was conducted with themes as follows:

**October 2016**

* Safety:
  + Guarding
  + Tipping Floor Safety
  + Mobile Equipment
  + Hand and Power Tools
* Environmental:
  + Electronics Processing
  + Vector Control
  + Universal Waste

**November 2016**

* Safety:
  + Reviewing the OSHA Globally Harmonized System (GHS) Label Training Video
  + Electrical Safety
  + GHS Shipping Labels
  + GHS Pictograms
  + Workplace Hazardous Materials Information System (WHMIS) 2015 Pictograms
  + WHMIS 2015 Shipping Labels
* Environmental:
  + Hazardous Materials and Storage
  + Receiving Waste
  + Screening Loads
  + Handling Prohibited Waste

**December 2016**

* Safety:
  + Ergonomics and Stretch and Flex
  + Heat Stress and JOB Observations
* Environmental:
  + Root Cause Analysis
  + Excess NO­x and SO2

# Facility Maintenance

Throughout the quarter, significant routine and preventative maintenance was performed. HDR considers that the Facility is implementing an effective maintenance regimen, and is performing routine and preventative maintenance, along with selected equipment replacements in a timely manner. CAAI monthly maintenance reports provide a detailed account of maintenance performed.

Beginning October 8, 2016 Boiler No. 1 experienced 129.8 hours of downtime for a scheduled maintenance. Some significant maintenance items completed during the outage are as follows:

* Change-out of nine (9) grate bars total on both runs
* Change-out of angular brake plates on the feed rams
* Repacking of the attemperator valve
* Replacement of four (4) sets of drain valves on the back of the boiler at various levels
* Installation of seven (7) new wear plates in the ash discharger
* Repair of multiple holes in the ash discharger and transition chute
* Replacement of the north side lower ash discharger door
* Change-out of the entire baghouse screw conveyor troughs on both sides for G123 and G124 Conveyors
* Change-out of all three (3) screws on the north side of the baghouse G124 conveyor and all three (3) bearings and coupling shafts and bolts
* Change-out of the tail end bearing on the south side baghouse screw conveyor and replacement of one of the covers
* Replacement of elements on G9B Sootblower Nos. 6, 7, and 8
* Removal and replacement of 43 superheater tube shields

Beginning November 5, 2016 Boiler No. 3 experienced 122.7 hours of downtime for a scheduled maintenance outage. Some significant maintenance items completed during the outage are as follows:

* Change-out of one (1) grate bar on run 2 side
* Change-out of the angular brake plates on the feed rams
* Replacement of the Sootblower upper root valve with a 900 lb. class valve
* Replacement of the Sootblower steam trap drain valves
* Re-plating of both sides of the ash discharger transition chute where the doors are
* Re-plating of the feed chute hopper door and installation of a 3-foot piece of steel on the top of the feed chute that was missing.
* Replacement of elements on G9B Sootblower No. 12
* Change-out of three (3) zone damper hydraulic cylinders
* Removal and replacement of 14 superheater tube shields
* RE-plating of the bottom of the superheater hopper where it ties into the double dump valve
* Repair of multiple holes in the baghouse hoppers
* Repair of several holes in the ID Fan outlet fan box
* Repair of several holes in the inlet duct to the baghouse

In addition to the scheduled maintenance, CAAI reports that 1,050 preventative maintenance actions were completed during the quarter.

## Availability

Facility availabilities for Q2FY17 are shown in Table 5. According to CAAI reports, the average unit availabilities for Boiler Nos. 1, 2, and 3 for Q2FY17 were 97.9%, 99.6%, and 94.3%, respectively. The three-boiler average availability during the quarter was 97.3%, which is excellent.

During Q2FY17, the average availability for Turbine Generator Nos. 1 and 2 was 100.0%. The two-turbine generator average availability during the quarter was 100.0%, which is excellent.

Table 5: Quarterly Facility Unit Availabilities

|  |  |  |  |
| --- | --- | --- | --- |
| **Availability** | **Q1FY17 Average** | **Q2FY17 Average** | **FY17 YTD**  **Average** |
| Boiler No. 1 | 97.7% | 97.9% | 97.8% |
| Boiler No. 2 | 94.6% | 99.6% | 97.1% |
| Boiler No. 3 | 98.7% | 94.3% | 96.5% |
| ***Avg.*** | ***97.0%*** | ***97.3%*** | ***97.1%*** |
| Turbine No. 1 | 100.0% | 100.0% | 100.0% |
| Turbine No. 2 | 100.0% | 100.0% | 100.0% |
| ***Avg.*** | ***100.0%*** | ***100.0%*** | ***100.0%*** |

## Downtime Summary

Table 6: Boiler Downtime – Q2FY17

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Boiler Number** | **Outage Begin Date** | **Outage End Date** | **Hours Unavailable** | | **Downtime**  **Classification** | **Reason Unavailable** |
| 1 | 10/8/16 | 10/14/16 | 129.8 | | Scheduled | Scheduled Fall Major Outage |
| 3 | 10/19/16 | 10/20/16 | 48.0 | | Standby | Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit |
| 2 | 10/30/16 | 10/31/16 | 9.0 | | Unscheduled | Induced Draft (ID) Fan Coupling Failure |
| 3 | 11/5/16 | 11/10/16 | 122.7 | | Scheduled | Scheduled Fall Major Outage |
| 2 | 11/9/16 | 11/10/16 | 36.0 | | Standby | Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit and Dominion work at sub-station |
| **Total Unscheduled Downtime** | | | | **9.0 Hours** | | |
| **Total Scheduled Downtime** | | | | **252.5 Hours** | | |
| **Total Standby Downtime** | | | | **84.0 Hours** | | |
| **Total Downtime** | | | | **345.5 Hours** | | |

Table 7: Turbine Generator Downtime – Q2FY17

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Turbine Generator Number** | **Outage Begin Date** | **Outage End Date** | **Hours Unavailable** | | **Downtime**  **Classification** | **Reason Unavailable** |
| 2 | 11/6/16 | 11/10/16 | 103.7 | | Standby | Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit and Dominion work at sub-station |
| **Total Unscheduled Downtime** | | | | **0.0 Hours** | | |
| **Total Scheduled Downtime** | | | | **0.0 Hours** | | |
| **Total Standby Downtime** | | | | **103.7 Hours** | | |
| **Total Downtime** | | | | **103.7 Hours** | | |

## Facility Housekeeping

CAAI is performing Facility housekeeping and maintaining plant cleanliness in accordance with acceptable industry practices. A site inspection was conducted in November 2016. At the time of the inspection, new deficiencies were recorded and prior deficiencies were given a status update. Photos of interest from the inspection are depicted in Appendix B. The Facility housekeeping ratings from the November 2016 inspection are presented in Table 8.

Table 8: Facility Housekeeping Ratings – November 2016

| **Facility Area** | **Acceptable** | **Needs Improvement** | **Unacceptable** |
| --- | --- | --- | --- |
| **Tipping Floor** | √ |  |  |
| **Citizen’s Drop-off Area** | √ |  |  |
| **Tipping Floor Truck Exit** | √ |  |  |
| **Front Parking Lot** | √ |  |  |
| **Rear Parking Lot** | √ |  |  |
| **Boiler House Pump Room** | √ |  |  |
| **Lime Slurry Pump Room** | √ |  |  |
| **Switchgear Area** | √ |  |  |
| **Ash Load-out Area** | √ |  |  |
| **Vibrating Conveyor Area** | √ |  |  |
| **Ash Discharger Area** | √ |  |  |
| **Cooling Tower Area** | √ |  |  |
| **Truck Scale Area** | √ |  |  |
| **SDA/FF Conveyor Area** | √ |  |  |
| **SDA Penthouses** | √ |  |  |
| **Lime Preparation Area** | √ |  |  |
| **Boiler Drum Levels** | √ |  |  |
| **Turbine Room** | √ |  |  |
| **Electrical Room** | √ |  |  |

# Environmental

The air pollution control equipment maintained emission concentrations well within the established regulations. Average Continuous Emission Monitoring System (CEMS) data collected for each monthly period during Q2FY17 are summarized in Appendix A. No permit deviations were reported by the Facility during Q2FY17.

On August 8, 2014, CAAI sent a letter to the Virginia Department of Environmental Quality (VADEQ) requesting relief from the steam permit limit requirements in the Facility’s Title V and PSD permits. These requested changes relate to the permit values established for the calculated steam-to-waste ratio, which has resulted in a reduction of MSW throughput. In recent discussions, CAAI indicated that it is re-evaluating options to the proposed permit changes, and will provide further updates on this issue.

## Nitrogen Oxide Emissions

During Q2FY17, the monthly emission concentrations of nitrogen oxides (NOx) averaged 166.0 ppmdv, 160.0 ppmdv and 163.3 ppmdv for Boiler Nos. 1, 2, and 3, respectively. CAAI continues to operate the units at the lower (160 ppmdv) set-points, except immediately following a scheduled outage and associated boiler cleaning.

## Sulfur Dioxide Emissions

During Q2FY17 the monthly emission concentration of stack sulfur dioxide (SO2) averaged 2.0 ppmdv, 1.3 ppmdv, and 1.0 ppmdv for Boiler Nos. 1, 2, and 3, respectively. All of these stack SO2 concentrations are significantly below the 40 CFR Subpart Cb requirement of 29 ppmdv @ 7% O2.

## Carbon Monoxide Emissions

During Q2FY17, the average CO emission concentrations on Boiler Nos. 1, 2, and 3 were 36.7 ppmdv, 38.0 ppmdv, and 35.3 ppmdv, respectively, and all are well within permit limits (100 ppmdv, hourly average). However, as reported by HDR during the May 2016 FMG Meeting, and continuing through Q2FY17, CO averages have been trending higher over the past year of operations on all three boilers, and CAAI has been requested to investigate and mitigate this uptrend. While not a permit issue, it is indicative of poorer boiler performance and combustion efficiency.

## Opacity

During Q2FY17, the average opacity for Boiler Nos. 1, 2, and 3 was 0.9%, 0.4%, and 0.0% respectively. All of these averages are significantly below the 10% (6-minute) average permit limit.

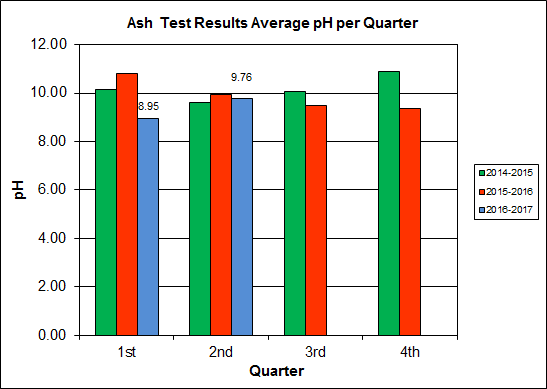
## Daily Emissions Data

Appendix A, Tables 9, 10, and 11 tabulate the monthly average, maximum, and minimum emissions data for each unit during Q2FY17. Excursions, if any, would appear in bold print. It should be noted that these tabulations of monthly averages, reported here for informational purposes, are based on tabulations of daily averages. These averages do not correlate with official reports to the regulatory agencies because of differences in averaging times and other technical differences required by agency report formats.

## Ash System Compliance

The dolomitic lime feed rate is adjusted periodically in order to maintain a desired ash pH level in the range of 8.0 to 11.0. Since initial startup, the feed rate has varied from between 1 to 9 lbs per ton each month. Ash Toxicity (TCLP) tests were not performed during Q1FY16. CAAI samples ash monthly in-house and documents pH reading to adjust dolomitic lime feed rate. The results for the ash pH tests are found below in Chart 15 where each quarter is represented by the average of the respective monthly readings. During Q2FY17, the average ash pH for in-house tests was 9.8.

Chart 15: Quarterly Ash Test Results



APPENDIX A  
FACILITY CEMS DATA

Table 9: Unit #1 Monthly Summary for Reportable Emissions Data

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group#-Channel#** | | **G8-C35** | **G8-C28** | **G8-C8** | **G8-C4** | **G8-C12** | **G8-C34** | **G8-C37** | **G8-C40** | **G8-C39** |
| **Long Descrip.** | | **U-1 Steam** | **U-1 Econ** | **U-1 Stack** | **U-1 Stack** | **U-1 Stack** | **U-1 Opaci** | **U-1 FF In** | **U-1 Carbo** | **U-1 Lime** |
| **Short Descrip.** | | **SteamFl** | **SO2ec** | **SO2sc** | **COsc** | **NOxsc** | **Opacity** | **FF InTemp** | **CarbInj** | **LimeFlow** |
| **Units** | | **K#/Hr** | **ppmc** | **ppm** | **ppmc** | **ppmc** | **%** | **deg F** | **#/hr** | **gpm** |
| **Range** | | **0-100** | **0-2000** | **0-500** | **0-4000** | **0-1000** | **0-100** | **100-500** | **0-50** | **0-20** |
| Oct-16 | AVG | 83.1 | 44.0 | 2.0 | 31.0 | 175.0 | 0.0 | 300.0 | 15.4 | 3.2 |
| Max | 89.6 | 66.0 | 6.0 | 44.0 | 185.0 | 0.7 | 305.0 | 15.8 | 3.8 |
| Min | 74.6 | 26.0 | 0.0 | 19.0 | 164.0 | 0.0 | 295.0 | 15.3 | 2.9 |
| Nov-16 | AVG | 82.7 | 38.0 | 2.0 | 35.0 | 161.0 | 1.4 | 300.0 | 15.8 | 3.0 |
| Max | 85.5 | 55.0 | 4.0 | 46.0 | 171.0 | 1.6 | 302.0 | 16.2 | 3.2 |
| Min | 79.2 | 24.0 | 0.0 | 25.0 | 159.0 | 0.9 | 298.0 | 15.6 | 2.9 |
| Dec-16 | AVG | 83.2 | 23.0 | 2.0 | 44.0 | 162.0 | 1.4 | 297.0 | 16.1 | 3.1 |
| Max | 85.8 | 101.0 | 20.0 | 55.0 | 191.0 | 2.0 | 300.0 | 16.2 | 4.1 |
| Min | 80.2 | 6.0 | 0.0 | 34.0 | 158.0 | 1.0 | 285.0 | 15.8 | 3.0 |
| **Quarter Average** | | 83.0 | 0.0 | 2.0 | 36.7 | 166.0 | 0.9 | 299.0 | 15.8 | 3.1 |
| **Quarter Max Value** | | 89.6 | 101.0 | 20.0 | 55.0 | 191.0 | 2.0 | 305.0 | 16.2 | 4.1 |
| **Quarter Min Value** | | 74.6 | 6.0 | 0.0 | 19.0 | 158.0 | 0.0 | 285.0 | 15.3 | 2.9 |
| **Limits:** | | 98 | NA | 29 | 100 | 205 | 10 | 333 | 16(a) |  |

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

Table 10: Unit #2 Monthly Summary for Reportable Emissions Data

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group#-Channel#** | | **G8-C35** | **G8-C28** | **G8-C8** | **G8-C4** | **G8-C12** | **G8-C34** | **G8-C37** | **G8-C40** | **G8-C39** |
| **Long Descrip.** | | **U-2 Steam** | **U-2 Econ** | **U-2 Stack** | **U-2 Stack** | **U-2 Stack** | **U-2 Opaci** | **U-2 FF In** | **U-2 Carbo** | **U-2 Lime** |
| **Short Descrip.** | | **SteamFl** | **SO2ec** | **SO2sc** | **COsc** | **NOxsc** | **Opacity** | **FF InTemp** | **CarbInj** | **LimeFlow** |
| **Units** | | **K#/Hr** | **ppmc** | **ppm** | **ppmc** | **ppmc** | **%** | **deg F** | **#/hr** | **gpm** |
| **Range** | | **0-100** | **0-2000** | **0-500** | **0-4000** | **0-1000** | **0-100** | **100-500** | **0-50** | **0-20** |
| Oct-16 | AVG | 83.2 | 44.0 | 1.0 | 33.0 | 161.0 | 0.0 | 300.0 | 15.3 | 3.1 |
| Max | 88.6 | 95.0 | 5.0 | 47.0 | 178.0 | 0.0 | 302.0 | 15.5 | 3.7 |
| Min | 73.4 | 17.0 | 0.0 | 20.0 | 156.0 | 0.0 | 296.0 | 15.2 | 2.7 |
| Nov-16 | AVG | 85.1 | 36.0 | 1.0 | 38.0 | 158.0 | 1.9 | 300.0 | 15.8 | 3.2 |
| Max | 88.4 | 48.0 | 5.0 | 54.0 | 161.0 | 2.4 | 301.0 | 17.0 | 3.5 |
| Min | 81.2 | 22.0 | 0.0 | 29.0 | 156.0 | 0.6 | 298.0 | 15.4 | 2.7 |
| Dec-16 | AVG | 85.6 | 29.0 | 2.0 | 43.0 | 161.0 | 0.8 | 299.0 | 16.0 | 3.2 |
| Max | 88.7 | 106.0 | 17.0 | 57.0 | 191.0 | 1.5 | 300.0 | 17.5 | 4.3 |
| Min | 82.2 | 16.0 | 0.0 | 31.0 | 157.0 | 0.4 | 299.0 | 15.2 | 2.8 |
| **Quarter Average** | | 84.6 | 36.3 | 1.3 | 38.0 | 160.0 | 0.9 | 299.7 | 15.7 | 3.2 |
| **Quarter Max Value** | | 88.7 | 106.0 | 17.0 | 57.0 | 191.0 | 2.4 | 302.0 | 17.5 | 4.3 |
| **Quarter Min Value** | | 73.4 | 16.0 | 0.0 | 20.0 | 156.0 | 0.0 | 296.0 | 15.2 | 2.7 |
| **Limits:** | | 96 | NA | 29 | 100 | 205 | 10 | 330 | 16(a) |  |

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

Table 11: Unit #3 Monthly Summary for Reportable Emissions Data

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group#-Channel#** | | **G8-C35** | **G8-C28** | **G8-C8** | **G8-C4** | **G8-C12** | **G8-C34** | **G8-C37** | **G8-C40** | **G8-C39** |
| **Long Descrip.** | | **U-3 Steam** | **U-3 Econ** | **U-3 Stack** | **U-3 Stack** | **U-3 Stack** | **U-3 Opaci** | **U-3 FF In** | **U-3 Carbo** | **U-3 Lime** |
| **Short Descrip.** | | **SteamFl** | **SO2ec** | **SO2sc** | **COsc** | **NOxsc** | **Opacity** | **FF InTemp** | **CarbInj** | **LimeFlow** |
| **Units** | | **K#/Hr** | **ppmc** | **ppm** | **ppmc** | **ppmc** | **%** | **deg F** | **#/hr** | **gpm** |
| **Range** | | **0-100** | **0-2000** | **0-500** | **0-4000** | **0-1000** | **0-100** | **100-500** | **0-50** | **0-20** |
| Oct-16 | AVG | 85.0 | 34.0 | 1.0 | 33.0 | 162.0 | 0.0 | 295.0 | 15.4 | 2.9 |
| Max | 90.6 | 68.0 | 4.0 | 47.0 | 169.0 | 0.0 | 301.0 | 15.9 | 3.5 |
| Min | 75.0 | 17.0 | 0.0 | 23.0 | 160.0 | 0.0 | 266.0 | 15.1 | 2.3 |
| Nov-16 | AVG | 88.7 | 44.0 | 1.0 | 35.0 | 167.0 | 0.0 | 298.0 | 15.7 | 3.4 |
| Max | 91.7 | 86.0 | 3.0 | 48.0 | 176.0 | 0.0 | 301.0 | 15.8 | 3.9 |
| Min | 84.7 | 24.0 | 0.0 | 27.0 | 154.0 | 0.0 | 296.0 | 15.7 | 3.0 |
| Dec-16 | AVG | 88.6 | 34.0 | 1.0 | 38.0 | 161.0 | 0.0 | 298.0 | 16.1 | 3.4 |
| Max | 91.4 | 92.0 | 10.0 | 47.0 | 185.0 | 0.0 | 299.0 | 17.5 | 4.0 |
| Min | 85.4 | 11.0 | 0.0 | 25.0 | 157.0 | 0.0 | 297.0 | 15.7 | 3.1 |
| **Quarter Average** | | 87.4 | 37.3 | 1.0 | 35.3 | 163.3 | 0.0 | 297.0 | 15.7 | 3.2 |
| **Quarter Max Value** | | 91.7 | 92.0 | 10.0 | 48.0 | 185.0 | 0.0 | 301.0 | 17.5 | 4.0 |
| **Quarter Min Value** | | 75.0 | 11.0 | 0.0 | 23.0 | 154.0 | 0.0 | 266.0 | 15.1 | 2.3 |
| **Limits:** | | 98 | NA | 29 | 100 | 205 | 10 | 327 | 16(a) |  |

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

APPENDIX B  
SITE PHOTOS – NOVEMBER 2016

|  |  |
| --- | --- |
| C:\Users\kperrin\Desktop\November 2016\P1020984.JPG  Figure 1: Pavement spider-cracking at Tipping Floor Entrance – New Deficiency | C:\Users\kperrin\Desktop\November 2016\P1020991.JPG  Figure 2: Concrete slab damaged that Citizen’s Drop-off Roll-off is on – New Deficiency |
| C:\Users\kperrin\Desktop\November 2016\P1030031.JPG  Figure 3: Pothole where Tipping Floor Exit Road enters Eisenhower Avenue – New Deficiency | C:\Users\kperrin\Desktop\November 2016\P1030057.JPG  Figure 4: Multiple Cooling Tower Access Stairs Split – New Deficiency |
| C:\Users\kperrin\Desktop\November 2016\P1020988.JPG  Figure 5: Corrosion on Scale House – New Deficiency | C:\Users\kperrin\Desktop\November 2016\P1030038.JPG  Figure 6: Boiler No. 3 Outage in Progress – Scaffolding Inside Boiler |
| C:\Users\kperrin\Desktop\November 2016\P1030018.JPG  Figure 7: Boiler No. 3 Outage in Progress – Ash Discharger cleaned out for maintenance | C:\Users\kperrin\Desktop\November 2016\P1030032.JPG  Figure 8: Boiler No. 3 Outage in Progress – Maintenance on Superheater Hopper |
| C:\Users\kperrin\Desktop\November 2016\P1020980.JPG  Figure 9: Boiler No. 3 Outage in Progress – Boiler grates and scaffolding | C:\Users\kperrin\Desktop\November 2016\P1030052.JPG  Figure 10: Boiler No. 3 Outage in Progress – Superheater tubes and tube shields |
| C:\Users\kperrin\Desktop\November 2016\P1020977.JPG  Figure 11: Firing Aisle | **C:\Users\kperrin\Desktop\November 2016\P1020985.JPG**  Figure 12: External view of repairs to East Tipping Floor Wall – Completion of Deficiency Item No. 4 |
| C:\Users\kperrin\Desktop\November 2016\P1020986.JPG  Figure 13: White Goods Roll-Off | C:\Users\kperrin\Desktop\November 2016\P1020990.JPG  Figure 14: Citizen’s Drop Roll-off |
| C:\Users\kperrin\Desktop\November 2016\P1020978.JPG  Figure 15: Overhead view Ferrous Magnet – Note extension of vibrating pan | C:\Users\kperrin\Desktop\November 2016\P1020994.JPG  Figure 16: General Facility View – Photo from east on Eisenhower Avenue |
| C:\Users\kperrin\Desktop\November 2016\P1020998.JPG  Figure 17: General Facility View – Front of Facility | C:\Users\kperrin\Desktop\November 2016\P1030005.JPG  Figure 18: General Facility View – Photo from west on Eisenhower Avenue |
| C:\Users\kperrin\Desktop\November 2016\P1030022.JPG  Figure 19: APC Area and Cooling Towers | C:\Users\kperrin\Desktop\November 2016\P1030024.JPG  Figure 20: General View of Tipping floor from Entrance |
| C:\Users\kperrin\Desktop\November 2016\P1030028.JPG  Figure 21: New column and louvers on east wall of Tipping Floor | C:\Users\kperrin\Desktop\November 2016\P1030040.JPG  Figure 22: Refuse pit – Photo from north end of Charging Floor |
| C:\Users\kperrin\Desktop\November 2016\P1030042.JPG  Figure 23: Ash Trailer Canopy | C:\Users\kperrin\Desktop\November 2016\P1030049.JPG  Figure 24: Crane Pulpit |