



Alexandria/Arlington Resource Recovery Facility  
Fiscal Year 2015  
First Quarter Operating Report



November  
**2014**

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## Definition of Abbreviations & Acronyms

### Abbreviation/Acronym

APC  
Apr  
Aug  
Avg  
Btu  
CAAI  
CEMS  
CO  
Dec  
Feb  
FMG  
FY  
gal  
GAT  
HCl  
HDR  
ID  
Jan  
Jul  
Jun  
klbs  
kWhr  
lbs  
LOA  
Mar  
Max  
May  
Min  
MSW  
MWhr  
No  
NOV  
Nov  
NO<sub>x</sub>  
Oct  
  
OSHA  
PDS  
ppm  
ppmdv  
PSD  
Q1  
Q2  
Q3  
Q4  
RE  
RNE  
SDA  
Sep  
SO<sub>2</sub>  
TCLP  
  
VADEQ  
WL  
yr  
YTD

### Definition

Air Pollution Control  
April  
August  
Average  
British thermal unit  
Covanta Alexandria Arlington, Inc.  
Continuous Emissions Monitoring System  
Carbon Monoxide  
December  
February  
Facility Monitoring Group  
Fiscal Year  
Gallon  
Guaranteed Annual Tonnage  
Hydrochloric (Hydrogen Chlorides)  
HDR Engineering Inc  
Induced Draft  
January  
July  
June  
Kilo-pounds (1,000 lbs)  
Kilowatt hours (1,000 watt-hours)  
Pounds  
Letter of Agreement  
March  
Maximum  
May  
Minimum  
Municipal Solid Waste  
Megawatt hours  
Number  
Notice of Violation  
November  
Nitrogen Oxide  
October  
Occupational Safety and Health  
Administration  
Potomac Disposal Services  
Parts per million  
Parts per million dry volume  
Prevention of Significant Deterioration  
First Quarter  
Second Quarter  
Third Quarter  
Fourth Quarter  
Reportable Exempt  
Reportable Non-Exempt  
Spray Dryer Absorber  
September  
Sulfur Dioxide  
Toxicity Characteristic Leaching Procedure  
Virginia Department of Environmental  
Quality  
Warning Letter  
Year  
Year to date

# Alexandria/Arlington Waste-to-Energy Facility First Quarter Operating Report – Fiscal Year 2015

## 1.0 Purpose of Report

HDR Engineering, Inc. (HDR) was given authorization by the Facility Monitoring Group (FMG) to conduct quarterly inspections and provide quarterly monitoring reports regarding the operation and maintenance of the Covanta Alexandria/Arlington Waste-to-Energy Facility (Facility) for the 2014 calendar year. This report is prepared for the first quarter of the 2015 fiscal year and summarizes Facility operations between July 1, 2014 and September 30, 2014. This report identifies the fiscal year beginning on July 1, 2014 as FY15 and the quarter beginning on July 1, 2014 as Q1FY15.

This report is based upon the experience HDR has 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.

## 2.0 Executive Summary

CAAI operated the Facility in an acceptable manner and in accordance with established waste-to-energy industry practices during Q1FY15. 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 Q1FY15, the Facility experienced four (4) instances of unscheduled downtime for the boilers totaling 109.1 hours, and no unscheduled downtime for the turbine generators. Beginning September 20, 2014, Boiler No. 1 experienced 109.5 hours of downtime for scheduled maintenance. The boilers experienced six (6) instances of standby time totaling 204.1 hours, and no standby time was experienced by the turbine generators during the quarter. A detailed listing of downtime is provided in Section 5.2 of this report.

Average waste processed during the quarter was 952.8 tons per day, or 97.7% of nominal facility capacity. Waste deliveries averaged 955.5 tons per day, which is 0.3% higher than the burn rate. The capacity utilization of 97.7% 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 increased 0.9% from the corresponding quarter in FY14; steam production increased 1.9%, and electricity generated (gross) increased 2.6% from the corresponding quarter in FY14. The increase in steam generation was largely attributable to the increase (0.4%) in the calculated average waste heating value, offset by more (11.4 additional hours) scheduled, unscheduled, and standby downtime experienced by the boilers. The increase in gross electrical generation in Q1FY15 as compared to Q1FY14 is attributable to the increase in steam production, as well as less (173.8 fewer hours) of scheduled, unscheduled, and standby downtime experienced by the turbine generators.

### **3.0 Facility Inspection and Records Review**

In August 2014, HDR met with the Facility management and other plant personnel to discuss Facility operations and maintenance, acquire Facility 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 visit, HDR reviewed CAAI records, discussed performance issues with CAAI staff, and provided a verbal report and performance statistics. 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 audit 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.



**Table 1: Summary of Audit 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.	Audit Report Deficiencies	Issue Reported	Priority*	Resolution/Status	Date Resolved	Open / Closed
1	Spider cracking at scale entry area	July 2010	C	Repair		Open
2	Pothole at truck entry roadway	May 2012	C	Repair		Open
3	Fire hose not mounted properly at SDA No. 3 Penthouse Access Door	May 2014	A	Properly stow fire hose	August 2014	Closed
4	Personal Protective Equipment locker in APC MCC Electrical Room Empty	May 2014	A	Stock PPE Locker with proper equipment	August 2014	Closed
5	Unused tarp laying over cable trays at Slaker Room No. 1	May 2014	A	Remove tarp	August 2014	Closed
6	Pothole at Tipping Floor Exit Driveway	May 2014	C	Repair pothole	August 2014	Closed
7	Concrete to roadway drain at truck entrance damaged – exposing reinforcing bar	May 2014	C	Repair damaged concrete		Open
8	Turbine Generator Enclosure Roof Leaking (3 Locations Observed) - See Figure 1 (Appendix B)	August 2014	C	Repair roof		Open
9	Corrosion on ceiling panels in Turbine Generator Enclosure – See Figure 2 (Appendix B)	August 2014	C	Sand, Prime, Paint and Preserve		Open
10	Corrosion on ceiling panels in Turbine Generator Enclosure (Alternate Location) – See Figure 3 (Appendix B)	August 2014	C	Sand, Prime, Paint and Preserve		Open
11	Damaged Tipping Floor wall panels – Rainwater running from outside to inside – See Figure 4 (Appendix B)	August 2014	C	Repair damaged Tipping Floor Walls		Open
12	Tipping Floor Enclosure roof leaking at truck entrance – See Figure 5 (Appendix B)	August 2014	C	Repair roof		Open
13	Tire supporting PVC drain pipe at Tipping Floor Entrance – See Figure 6 (Appendix B)	August 2014	C	Properly support drain pipe		Open
14	Exterior siding discolored outside Charging Floor louver above Administration Entrance – See Figure 7 (Appendix B)	August 2014	C	Pressure wash siding around louver		Open



## 4.0 Facility Performance

Monthly operating data provided by CAAI indicates that 87,659 tons of MSW were processed during Q1FY15, and a total of 87,907 tons of MSW including 756 tons of Special Handling Waste were received. Total ash production during the quarter was 17,751 tons, which represents 20.3% of the waste processed. The average uncorrected steam production rate for Q1FY15 was 3.0 tons<sub>steam</sub>/ton<sub>waste</sub>, which is 1.0% more than the corresponding quarter in FY14. The increase in this metric is attributable to the increase (0.4%) in the calculated average waste heating value that was experienced during the quarter, as compared to the corresponding quarter in FY14.

Chart 1: Tons of Waste Processed

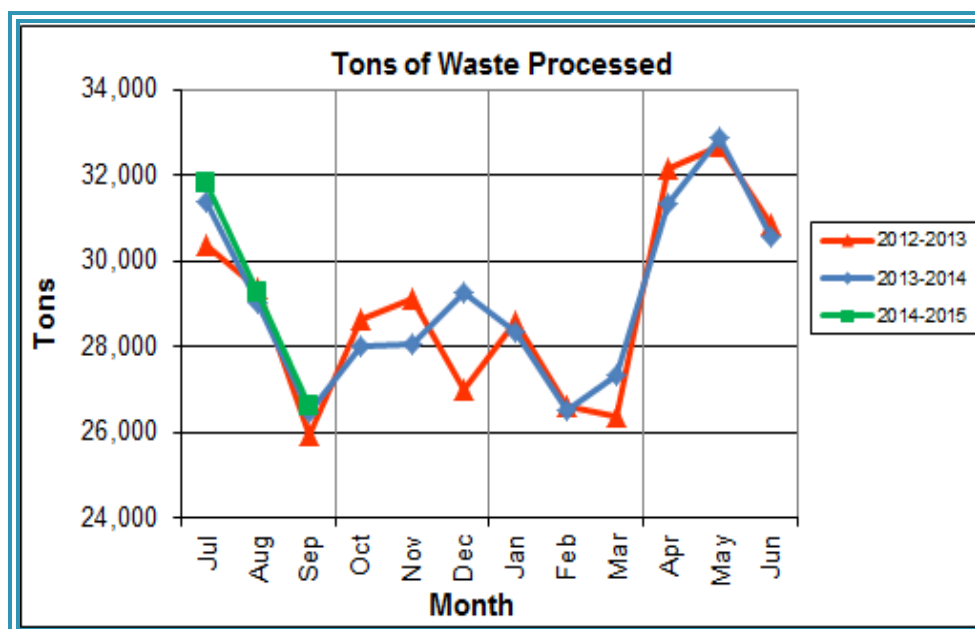


Chart 1 illustrates that Q1FY15 waste processed was slightly higher (0.9%) than the corresponding quarter, Q1FY14.

CAAI reported that 450 tipping floor/MSW internal inspections were conducted during the quarter and CAAI issued five (5) notices of violation (NOVs) for the following:

- July 2014 – Three (3) NOVs were issued for:
  - Dragging trash onto the road

- Excessive metal in the load
- Driver hitting the crash bar due to not lowering tailgate before exiting
- August 2014 – One (1) NOV was issued for:
  - Rider on the back of the truck
- September 2014 – One (1) NOV was issued for:
  - Truck leaving the tipping floor with trash on it

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

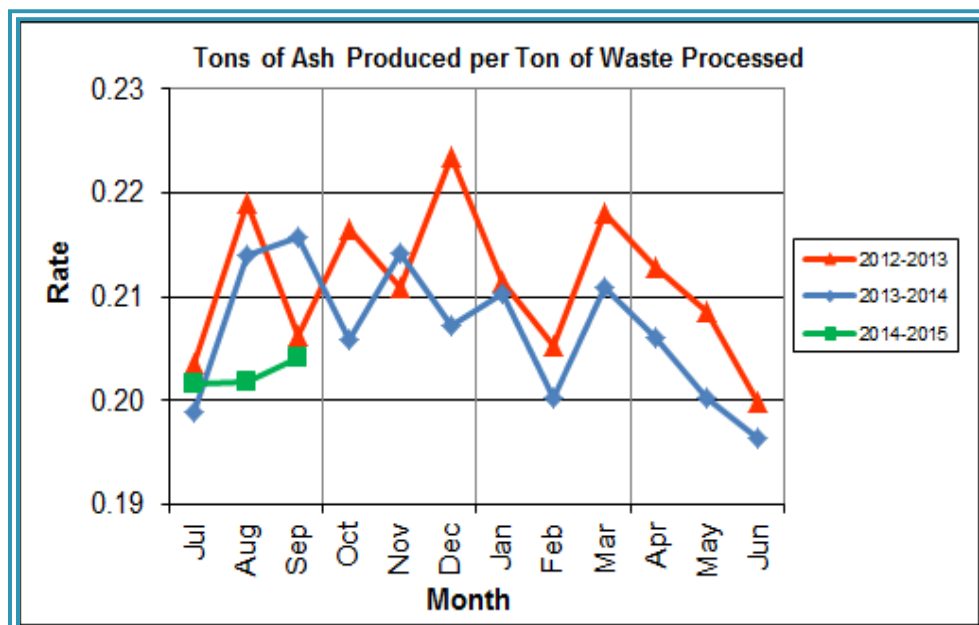


Chart 2 illustrates that ash production rates in Q1FY15 are lower (3.2%) at 20.3% of processed waste, compared to the corresponding quarter in FY14 when the ash production rate was 20.9% of processed waste. The decrease in quarterly ash is attributable to the significant increase (20.7%) in ferrous metal recovery. 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. Another contributing factor is the aforementioned increase in ferrous metal recovery. CAAI installed a new ferrous magnet shell during the latter part of the fall outage

season in December 2013 and ferrous metal recovery has been significantly higher in recent months as a result.

**Chart 3: Ferrous Recovery Rate**

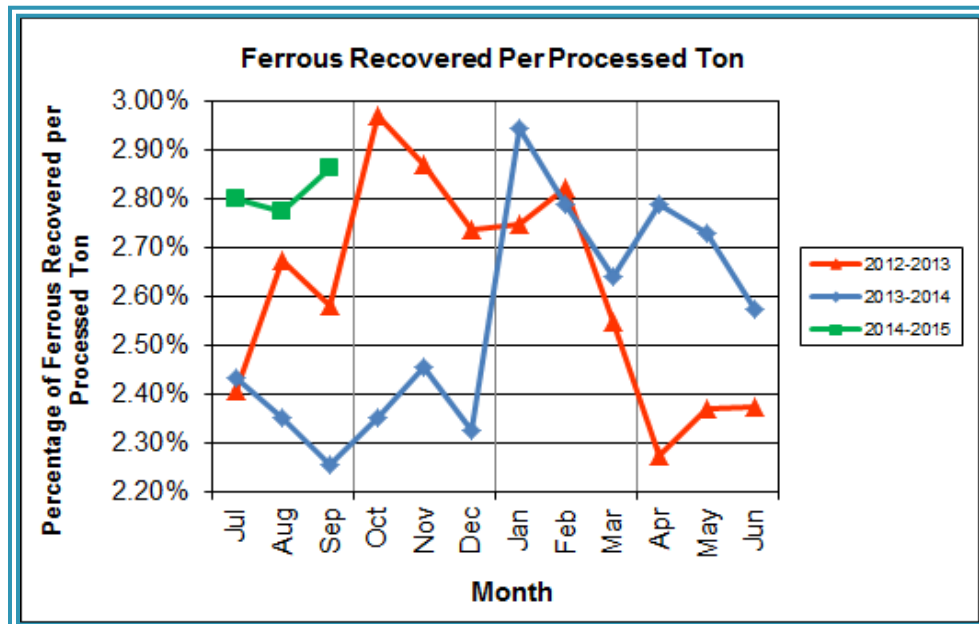
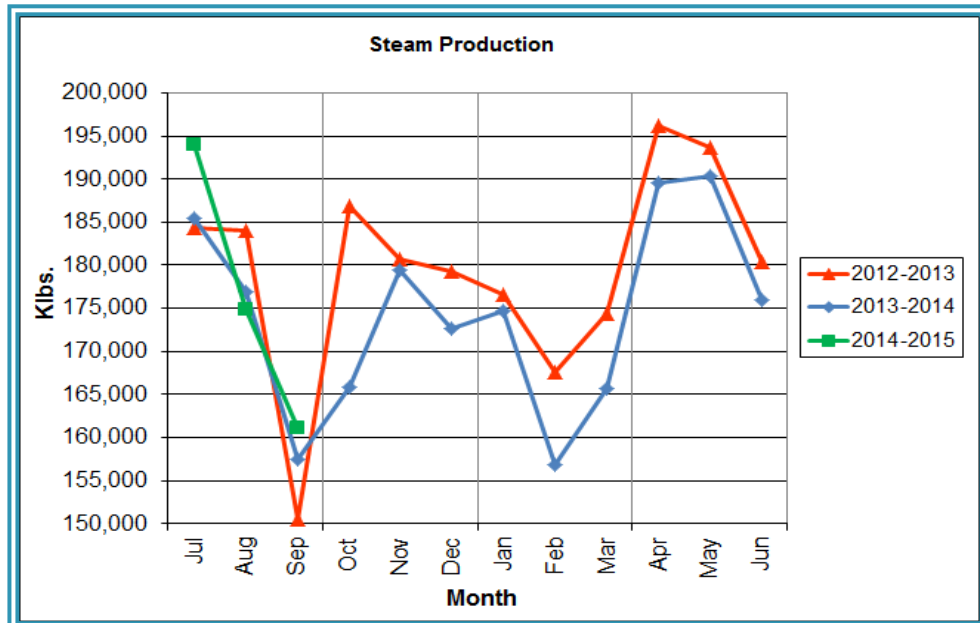


Chart 3 depicts the monthly ferrous metal recovery rate as a percentage of processed MSW tonnage. In Q1FY15, 2,465 tons of ferrous metals were recovered, which is 20.7% higher than the corresponding quarter in FY14 and equivalent to 2.8% of processed waste. The increase in ferrous metal recovery is attributable to the recently installed ferrous magnet shell, which was replaced during an outage in December 2013.

**Chart 4: Steam Production**



In Chart 4, the total steam production for Q1FY15 was 530,025 klbs., or 1.9% higher than the corresponding quarter in FY14. The increase in steam production is attributable to the higher (0.4%) calculated average waste heating value during the quarter.

**Chart 5: 12-Month Rolling Steam Production**

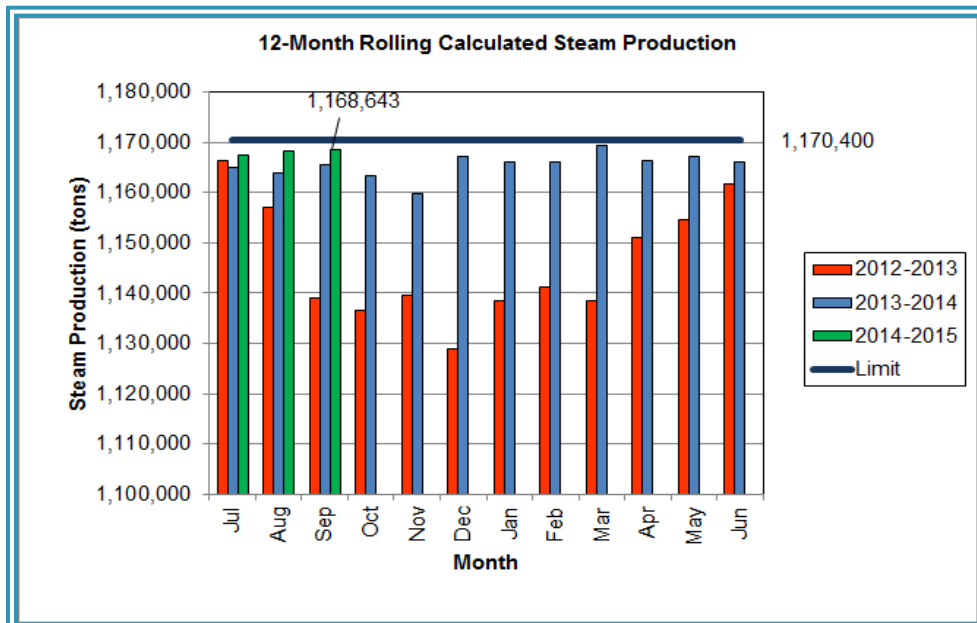
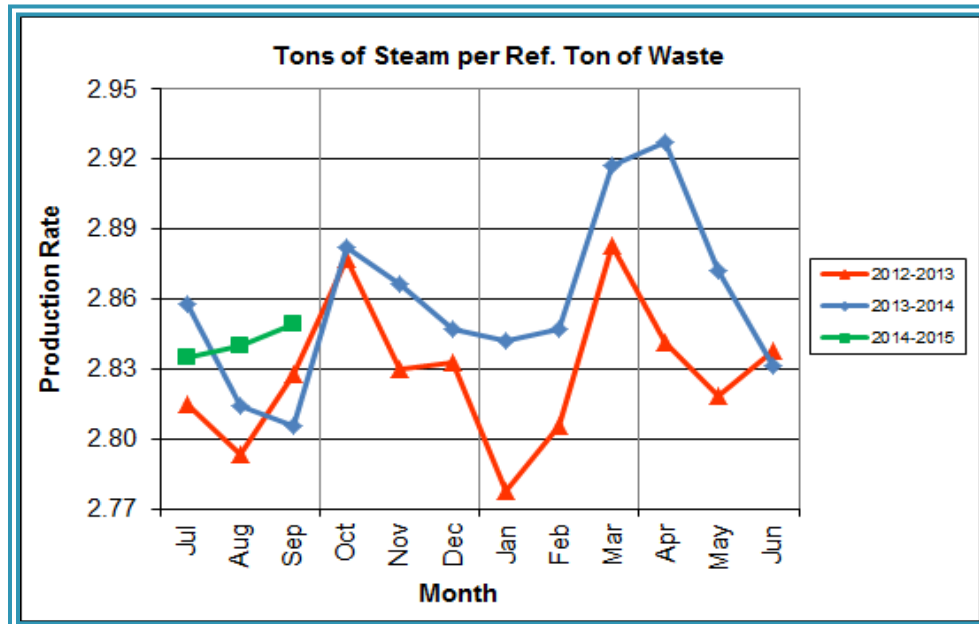


Chart 5 depicts the 12-month rolling steam production total for the period ending in September 2014. According to the Title V permit, the annual steam production

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 the quarter. The 12-month rolling total for steam production ending in September 2014 was 1,168,643 tons which is 99.8% of the limit.

**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 Q1FY15 this metric tracked higher (0.5%), at 2.8 tons<sub>steam/ton<sub>ref</sub></sub>, than the corresponding quarter in FY14.

**Chart 7: Calculated Waste Heating Value**

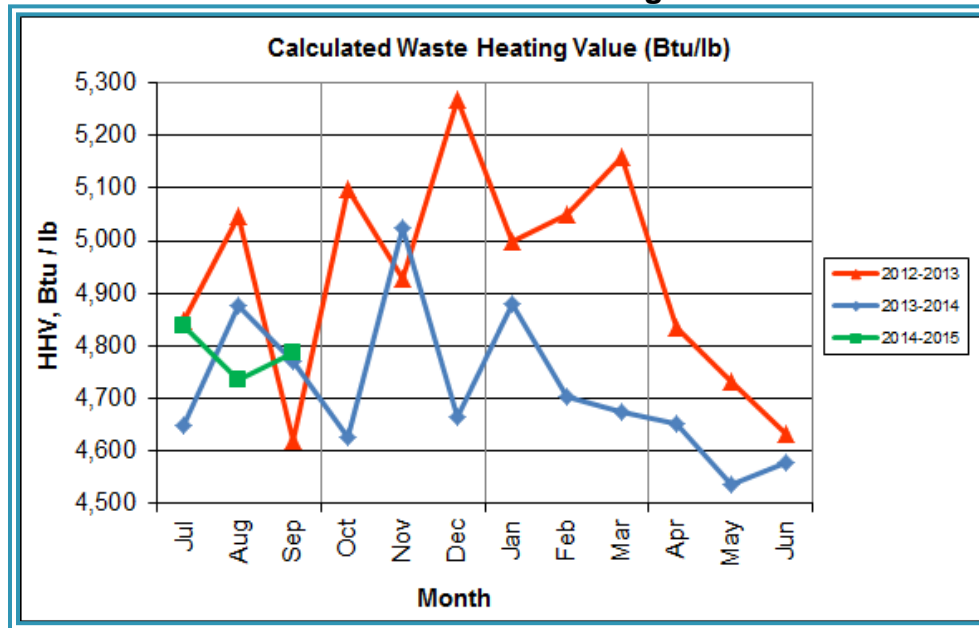


Chart 7 illustrates that Q1FY15 calculated average waste heating value was higher (0.4%) at 4,787 Btu/lb than the corresponding quarter Q1FY14, which averaged 4,766 Btu/lb.

**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)
Q1FY13	Quarterly Totals	85,696	0	17,970	242	2,187	518,902	36,007
	July-12	30,390	0	6,185	151	732	184,330	13,067
	August-12	29,376	0	6,437	11	786	184,057	12,978
	September-12	25,930	0	5,348	80	669	150,515	9,962
Q1FY14	Quarterly Totals	86,884	0	18,167	1,470	2,043	519,971	35,635
	July-13	31,409	0	6,249	546	764	185,488	12,755
	August-13	29,000	0	6,206	676	682	176,948	12,208
	September-13	26,475	0	5,712	248	597	157,535	10,672
Q1FY15	Quarterly Totals	87,659	0	17,751	756	2,465	530,025	36,806
	July-14	31,818	0	6,417	141	891	193,977	13,779
	August-14	29,247	0	5,904	266	812	174,887	12,018
	September-14	26,594	0	5,430	349	762	161,161	11,009
FY15 YTD Totals		87,659	0	17,751	756	2,465	530,025	36,806
FY14 Totals		349,118	0	72,071	3,549	8,922	2,099,974	143,064
FY13 Totals		347,790	0	73,446	2,665	9,063	2,154,201	148,366

Table 2 presents the production data provided to HDR by CAAI for Q1FY15 on both a monthly and quarterly basis. For purposes of comparison, data for Q1FY13 and Q1FY14 are also shown, as well as FY13, FY14 and FY15 year to date totals.

In comparing quarterly totals, the data shows:

- More waste was processed in Q1FY15 than Q1FY14 and Q1FY13
- More steam was generated in Q1FY15 than Q1FY14 and Q1FY13
- More electricity was generated in Q1FY15 than Q1FY14 and Q1FY13
- Less supplemental waste was received in Q1FY15 than Q1FY14 and more than Q1FY13.

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 Q1FY15 and FY15 continues to be limited by the steam production permit restrictions (refer to Chart 5).



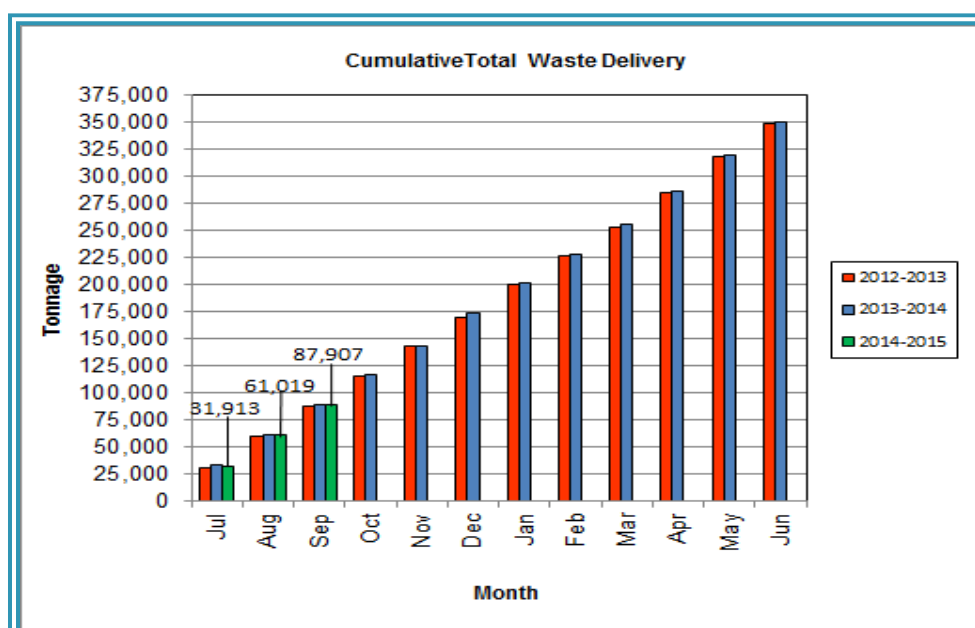
**Table 3: Waste Delivery Classification**

		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals	% of Total
FY11	Jurisdiction Waste	18,201	19,320	18,100	18,244	17,812	17,394	16,316	15,212	18,279	18,596	20,355	19,382	217,213	62.20%
	Spot Waste tons	13,996	13,917	11,696	9,336	10,177	11,441	12,968	7,016	8,459	10,177	12,947	9,657	131,786	37.74%
	Supplemental Waste	8	17	12	13	6	13	14	34	25	29	26	6	203	0.06%
	MSW Totals	32,205	33,254	29,808	27,593	27,995	28,848	29,298	22,262	26,763	28,803	33,328	29,044	349,202	100.00%
FY12	Jurisdiction Waste	18,112	20,021	19,304	17,796	17,523	17,211	16,202	14,952	17,430	18,338	20,138	18,361	215,381	61.89%
	Spot Waste tons	8,901	13,623	13,303	9,788	11,976	11,900	10,276	10,697	10,283	10,029	11,333	10,177	132,295	38.01%
	Supplemental Waste	10	10	34	15	15	21	12	22	15	23	68	91	336	0.10%
	MSW Totals	27,023	33,654	32,641	27,599	29,514	29,132	26,490	25,672	27,729	28,390	31,539	28,629	348,012	100.00%
FY13	Jurisdiction Waste	19,413	18,357	16,632	17,625 <sup>(1)</sup>	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 <sup>(1)</sup>	1,287	1,444	2,382	2,286	1,919	11,000	3.16%
	County Waste	-	-	-	-	-	-	2,442 <sup>(1)</sup>	2,100	2,372	3,381	3,932	3,309	17,536	5.04%
	Municipal Solid Waste	-	-	-	-	-	-	25,019 <sup>(1)</sup>	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%
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%
FY15	City Waste	1,814	1,497	1,699										5,009 <sup>(2)</sup>	5.70%
	County Waste	3,297	2,868	2,973										9,137 <sup>(2)</sup>	10.39%
	Municipal Solid Waste	26,661	24,466	21,887										73,014 <sup>(2)</sup>	83.06%
	Supplemental Waste	141	275	329										745 <sup>(2)</sup>	0.85%
	MSW Totals	31,913	29,106	26,888										87,907 <sup>(2)</sup>	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

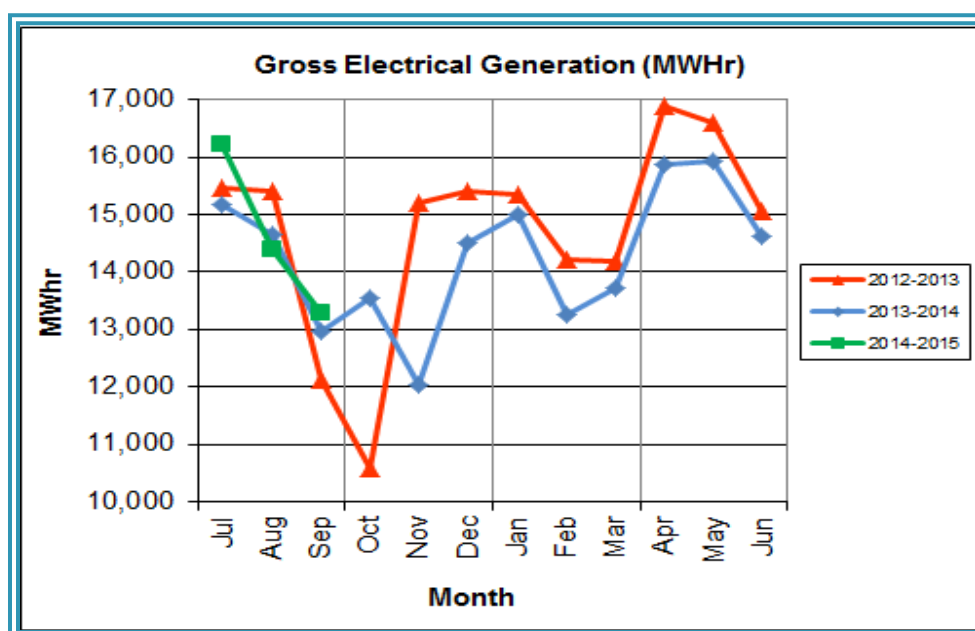
Note (2): Totals are Year to Date (YTD) Values

**Chart 8: Cumulative Total Waste Delivery**



As Depicted in Table 3 and Chart 8, for the period ending in September 2014; cumulative total waste delivery was 0.2% less compared to the same period in FY14.

**Chart 9: Gross Electrical Generation**

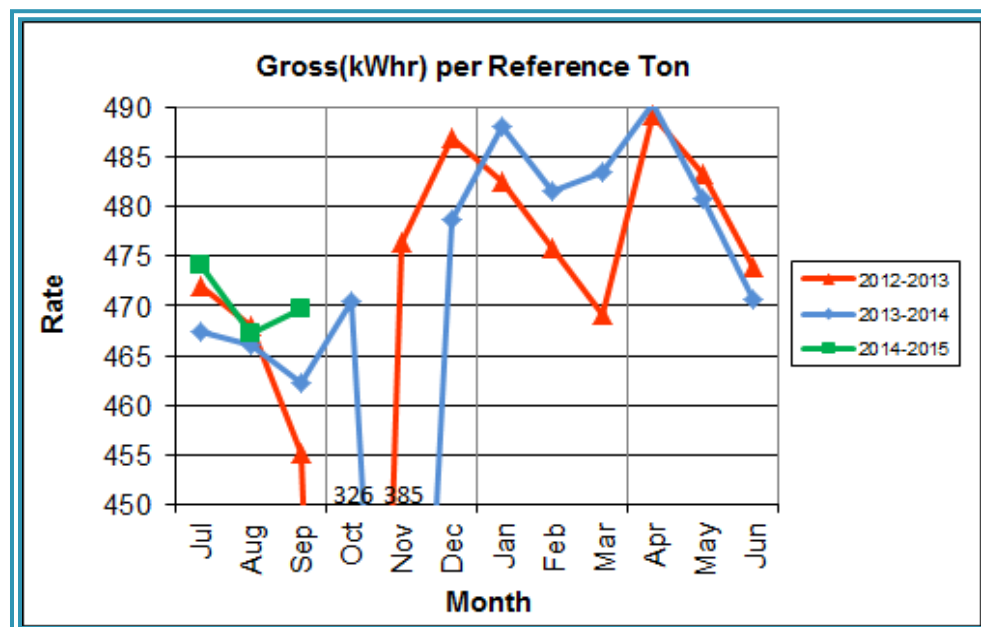


During Q1FY15, the Facility generated 43,891 MWhrs (gross) of electricity compared to Q1FY14 generation of 42,797 MWhrs (gross), a 2.6% increase. The increase in gross electrical production is attributable to the increase (1.9%)

in steam production and less (173.8 fewer hours) scheduled, unscheduled, and standby downtime.

Note that the 3-year low of gross electrical production experienced in October 2012 was due to Turbine Generator No. 1 experiencing 494.5 hours of downtime for scheduled maintenance and again in November 2013 when Turbine Generator No. 2 had a major overhaul and experienced 494.8 hours of downtime. Evidence of the downtime experienced by the Turbine Generators is also apparent in Chart Nos. 10 through 14, including sharp spikes in the trends for the months of October 2012 and November 2013 when the Overhauls were conducted on Turbine Generator Nos. 1 and 2, respectively.

**Chart 10: Gross Conversion Rate**



As shown in Chart 10, the average gross electrical generation per reference ton of refuse processed during Q1FY15 was 470 kWhr, which is 1.1% higher than the corresponding quarter in FY14. 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**

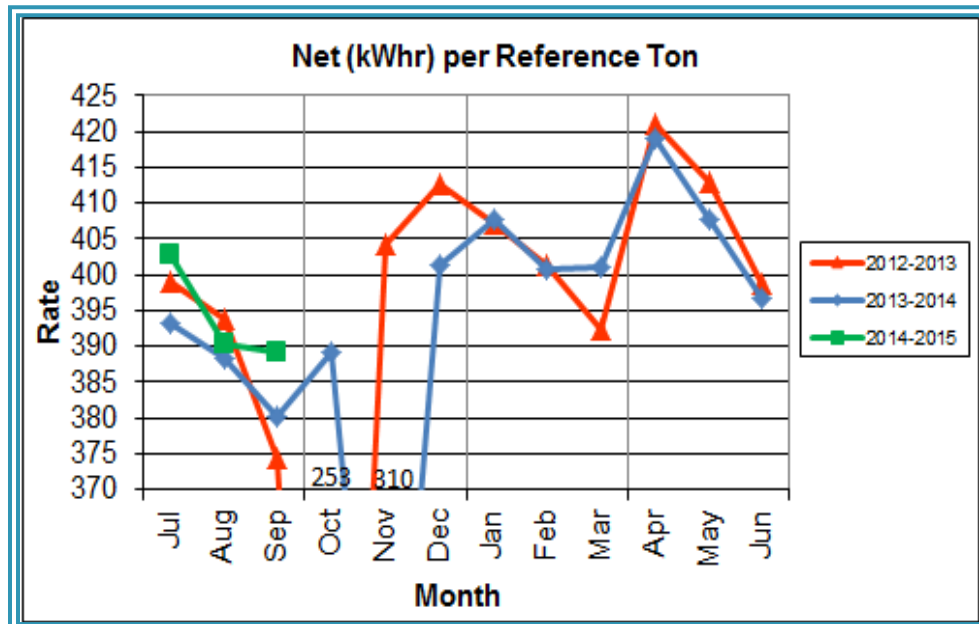


Chart 11 depicts the normalized net power (gross minus in-house usage) generation history. In Q1FY15, the average net electrical generation per reference ton was 394 kWhr, which is 1.8% higher than the corresponding quarter in FY14.

**Chart 12: Net Conversion Rate**

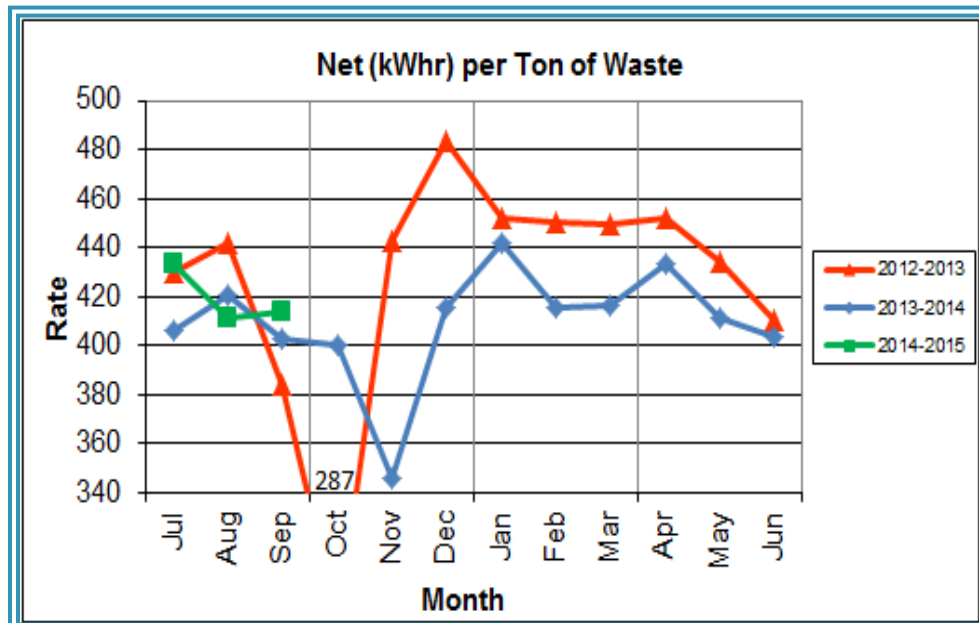
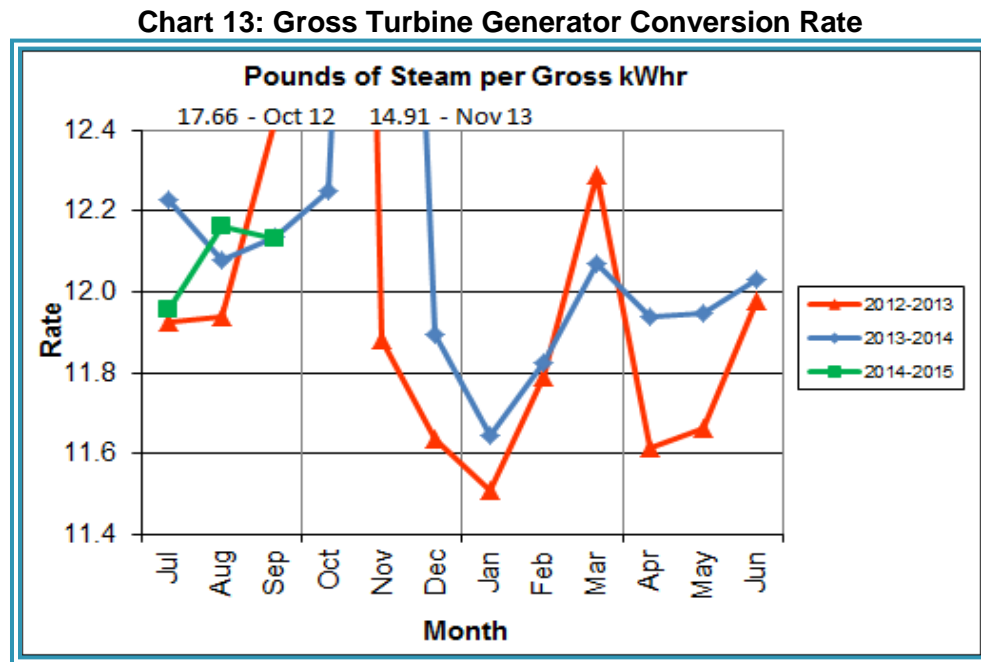


Chart 12 depicts the net power generation per processed ton. The net electrical generation per processed ton in Q1FY15 was 419 kWhr, which is 2.3% higher than the corresponding quarter in FY14.

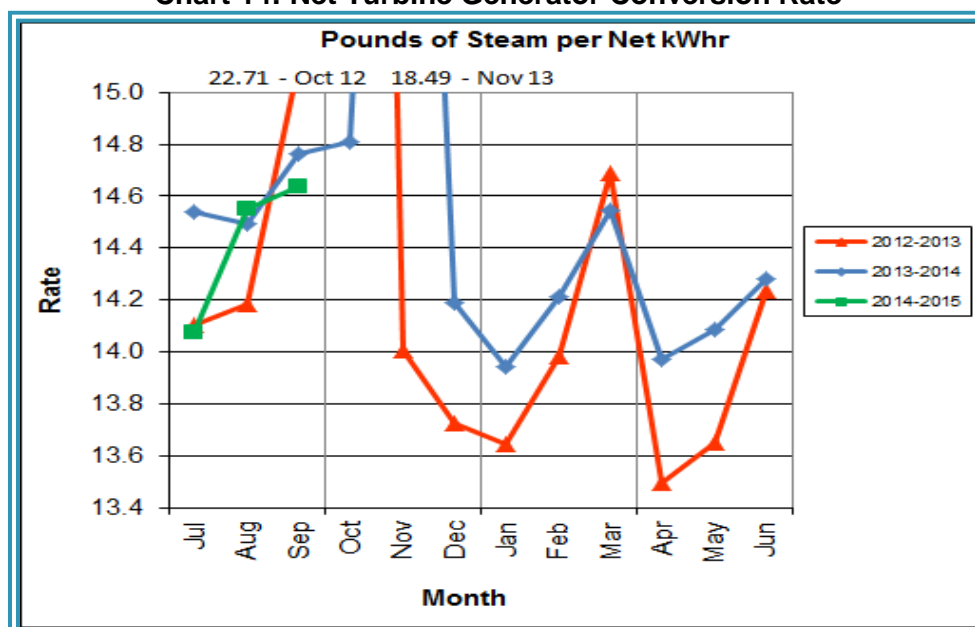


Charts 13 and 14 illustrate the quantities of steam required to generate one kWhr of electricity, gross and net respectively. This measure is a turbine generator performance indicator, where lower steam rates indicate superior performance. For simplification, this calculated rate is based on the average for the two turbine generators. In Q1FY15 the average lbs of steam consumed per gross kWhr was 12.1, which is lower (0.6%) than the corresponding quarter Q1FY14, and indicative of slightly improved turbine generator performance. The average lbs of steam consumed per net kWhr was 14.4, which is lower (1.3%) than the corresponding quarter in FY14. The average steam temperature during the quarter was 684.2° F, which is 1.3% lower than the average steam temperature of the corresponding quarter last year and 15.8° F lower than design temperature of 700° F.

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 indicated

that a new set of blades will be manufactured and installed during a Turbine Generator No. 2 Outage in 2016.

**Chart 14: Net Turbine Generator Conversion Rate**



#### 4.1 Utility and Reagent Consumptions

**Table 4: Facility Utility and Reagent Consumptions**

Utility	Units	Q1FY15 Total	Q1FY14 Total	Q1FY15"Per Processed Ton" Consumption	Q1FY14"Per Processed Ton" Consumption
Purchased Power	MWhr	5,549	5,664	0.06	0.07
Fuel Oil	Gal.	7,660	12,000	0.09	0.14
Boiler Make-up	Gal.	2,459,000	2,195,000	28.05	25.26
Cooling Tower Make-up	Gal.	40,727,344	39,639,291	464.61	456.23
Pebble Lime	Lbs.	1,182,000	1,226,000	13.48	14.11
Ammonia	Lbs.	172,000	157,000	1.96	1.81
Carbon	Lbs.	104,000	104,000	1.19	1.20
Dolomitic Lime	Lbs.	264,000	382,000	3.01	4.40

Fuel oil usage during the quarter represents approximately 0.13% of the total heat input to the boilers, which compares favorably with industry averages, and lower than the percentage of heat input in Q1FY14 which was 0.21%. 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 3.9% of steam flow, and is acceptable. Pebble lime usage, at 1,182,000 lbs. is lower (3.6%) than the corresponding quarter last year, and the quarterly consumption rate of 13.5 lbs/ton is below historical levels (16-18 lbs/ton).

In comparing Q1FY15 to Q1FY14 on a per processed ton consumption basis:

- the purchased power consumption rate was 2.9% lower
- the total fuel oil consumption rate was 36.7% lower
- the boiler make-up water consumption rate was 11.0% higher
- the cooling tower make-up water consumption rate was 1.8% higher
- the total pebble lime consumption rate was 4.4% lower
- the ammonia consumption rate was 8.6% higher
- the carbon consumption rate was 0.9% lower
- the total dolomitic lime consumption rate was 31.5% lower

#### 4.2 **Safety & Environmental Training**

The Facility had no recordable accidents during the quarter and has operated 1,412 days without an OSHA recordable incident through the end of September 2014. Safety and Environmental training was conducted during the quarter with themes as follows:

##### **July 2014**

- Safety:
  - Outages and Hazard Recognition
  - Shared Accountability – Contractors
  - Lock-out Tag-out – Group and Personal
- Environmental:
  - Regulatory Requirements
  - Recordkeeping
  - Reporting and Walk-downs

##### **August 2014**

- Safety:
  - Electrical Safety Awareness
  - OSHA – Employee Engagement and Rights
  - VPP Requirements



- Personal Protective Equipment (PPE)
  - Corrosives and Bulk Chemical Unloading
- Environmental:
  - Stack Testing

### **September 2014**

- Safety:
  - Behavior Based Safety
  - Ergonomics
  - Pushing Vs. Pulling Techniques
  - Electrical Safe Body Positioning
- Environmental:
  - Air Quality Upsets

In July 2014 CAAI reports that it received an Industry Leader Award from the National Safety Council (NSC). The NSC awarded 46 organizations the NSC 2014 Industry Leader Award for safety performance in their industries. The Industry Leader Award is one component of the NSC Occupational Awards Program, which recognizes outstanding safety achievements of NSC members and represents the top 5 percent of member companies that have qualified for the NSC 2014 Occupational Excellence Achievement Award (based on 2013 calendar year data). Winners are selected based on North American Industry Classification System code, lowest total incidence rate and employee work hours. Congratulations to CAAI for their ongoing safety program's effectiveness and recognition.

## 5.0 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 on September 20, 2014, Boiler No. 1 experienced 109.5 hours of downtime for scheduled maintenance. Some significant maintenance activities conducted during the outage include:

- Replacement of the Boiler No. 1 Superheater Safety Valve
- Replacement of Run No. 2 Side Hydraulic Cylinder on the ash discharger.
- Adjustment of No.1 Ammonia Valve (FV-1101) to repair leak
- Replacement of Boiler No. 1 Under Fire Air Fan Motor Bucket, and termination of the control power wiring
- Installation of a new low-low furnace pressure switch to correct the Boiler No. 1 Induced Draft Fan tripping
- Replacement and alignment of Boiler No. 1 Over Fire Air Fan Motor and Coupling
- Replacement and alignment of Boiler No. 1 Induced Draft Fan Motor
- Replacement of Sootblower lance tubes (G9B Nos, 3,4,7, and 15)

In addition maintenance activities conducted during the Boiler No. 1 Outage in September 2014, CAAI reports that 1,054 preventative maintenance actions were completed during the quarter.

### 5.1 Availability

Facility availabilities for Q1FY15 are shown in Table 5. According to CAAI reports, the average unit availabilities for Boiler Nos. 1, 2, and 3 for Q1FY15 were 93.8%, 100.0%, and 96.2%, respectively. The three-boiler average availability during the quarter was 96.7%, which is good.

During Q1FY15, the average availability for Turbine Generator Nos. 1 and 2 was 100.0%, which is excellent. Note that the reported unit availability percentages exclude standby time.

**Table 5: Quarterly Facility Unit Availabilities**

Availability	Q1FY15 Average
Boiler No. 1	93.8%
Boiler No. 2	100.0%
Boiler No. 3	96.2%
<b>Avg.</b>	<b>96.7%</b>
Turbine No. 1	100.0%
Turbine No. 2	100.0%
<b>Avg.</b>	<b>100.0%</b>

## 5.2 Downtime Summary

During Q1FY15, the Facility experienced four (4) instances of unscheduled downtime for the boilers totaling 109.1 hours, and no unscheduled downtime for the turbine generators. Beginning September 20, 2014, Boiler No. 1 experienced 109.5 hours of downtime for scheduled maintenance. The boilers experienced six (6) instances of standby time totaling 204.1 hours, and no standby time was experienced by the turbine generators during the quarter. All of the boiler standby time was reported to be a preventative measure to avoid exceeding the steam permit limit on a monthly basis. Details of downtime events experienced during the quarter are portrayed in Tables 6 and 7:

**Table 6: Boiler Downtime – Q1FY15**

Boiler Number	Outage Begin Date	Outage End Date	Hours Unavailable	Downtime Classification	Reason Unavailable
1	7/30/14	7/31/14	25.0	Unscheduled	Repair of Boiler tube leak in the Furnace Section
1	8/1/14	8/1/14	1.0	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
3	8/13/14	8/16/14	54.1	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
2	8/19/14	8/21/14	54.2	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
3	8/21/14	8/21/14	6.2	Unscheduled	Repair of Boiler tube leaks in Economizer Section – Fireside Corrosion/Erosion
3	8/22/14	8/22/14	7.8	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
3	8/27/14	8/28/14	39.6	Unscheduled	Repair of Boiler tube leaks in Economizer Section – Fireside Corrosion/Erosion
3	9/4/14	9/6/14	38.3	Unscheduled	Repair of waterwall tube leak – Inconel Area
1	9/11/14	9/14/14	76.0	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
1	9/20/14	9/25/14	109.5	Scheduled	Boiler No. 1 Scheduled Maintenance – Fall 2014
1	9/25/14	9/25/14	11.0	Standby	Preventative measure taken to avoid exceeding 350,000 ton rolling 12-month process limit
<b>Total Unscheduled Downtime</b>			<b>109.1 Hours</b>		
<b>Total Scheduled Downtime</b>			<b>109.5 Hours</b>		
<b>Total Standby Downtime</b>			<b>204.1 Hours</b>		
<b>Total Downtime</b>			<b>422.7 Hours</b>		

**Table 7: Turbine Generator Downtime – Q1FY15**

Turbine Generator Number	Outage Begin Date	Outage End Date	Hours Unavailable	Downtime Classification	Reason Unavailable
<b>No Downtime was experienced by the Turbine Generators During Q1FY15</b>					
<b>Total Unscheduled Downtime</b>			<b>0.0 Hours</b>		
<b>Total Scheduled Downtime</b>			<b>0.0 Hours</b>		
<b>Total Standby Downtime</b>			<b>0.0 Hours</b>		
<b>Total Downtime</b>			<b>0.0 Hours</b>		

### 5.3 Facility Housekeeping

CAAI is performing Facility housekeeping and maintaining plant cleanliness in accordance with acceptable industry practices. A site inspection was conducted in August 2014. 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 August 2014 inspection are presented in Table 8.

**Table 8: Facility Housekeeping Ratings – August 2014**

Facility Area	Highly Acceptable	Acceptable	Needs Improvement	Unacceptable
Tipping Floor			√ <sup>(1)</sup>	
Citizen's Drop-off Area			√ <sup>(2)</sup>	
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			√ <sup>(3)</sup>	
Electrical Room		√		

**Note (1): Tipping Floor – Needs Improvement**

- Wall panels damaged (See Figure 4 in Appendix B)
- Multiple leaks observed in roof at entrance (See Figure 5 in Appendix B)
- Roof drain not properly supported (See Figure 6 in Appendix B)

**Note (2): Citizen's Drop-off Area – Needs Improvement**

- Spider cracking (2010 Deficiency) and pothole (2012 Deficiency)

**Note (3): Turbine Room – Needs Improvement**

- Multiple roof leaks observed (See Figure 1 in Appendix B)
- Ceiling panels corroded (See Figures 2 and 3 in Appendix B)

## 6.0 Environmental

The retrofit 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 Q1FY15 are summarized in Appendix A. The Facility experienced no environmental exceedances during the quarter.

On August 8, 2014, CAAI requested via letter to the Virginia Department of Environmental Quality (VADEQ) 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 steam to waste ratio, the result of which is a reduction in MSW throughput than would be the case with different value(s) for this established ratio. The FMG, which had not been consulted prior to this regulatory action by CAAI, is evaluating options and input to the permitting process related to this action.

### 6.1 Nitrogen Oxide Emissions

During Q1FY15, the monthly emission concentrations of nitrogen oxides (NO<sub>x</sub>) averaged 167.7 ppmdv, 159.3 ppmdv and 160.7 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.

### 6.2 Sulfur Dioxide Emissions

During Q1FY15 the monthly emission concentration of stack sulfur dioxide (SO<sub>2</sub>) averaged 1.0 ppmdv, 1.3 ppmdv, and 1.0 ppmdv for Boiler Nos. 1, 2, and 3, respectively. All of these stack SO<sub>2</sub> concentrations are significantly below the 40 CFR Subpart Cb requirement of 29 ppmdv @ 7% O<sub>2</sub>.

### 6.3 **Carbon Monoxide Emissions**

During Q1FY15, the average CO emission concentrations on Boiler Nos. 1, 2, and 3 were 31.7 ppm<sub>dv</sub>, 36.0 ppm<sub>dv</sub>, and 26.7 ppm<sub>dv</sub>, respectively, and all are well within permit limits (100 ppm<sub>dv</sub>, hourly average).

### 6.4 **Opacity**

During Q1FY15, the average opacity for Boiler Nos. 1, 2, and 3 was 0.6%, 0.0%, and 0.0% respectively. All of these averages are significantly below the 10% (6-minute) average permit limit.

### 6.5 **Daily Emissions Data**

Appendix A, Tables 10, 11, and 12 tabulate the monthly average, maximum, and minimum emissions data for each unit during Q1FY15. 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.

### 6.6 **Ash System Compliance**

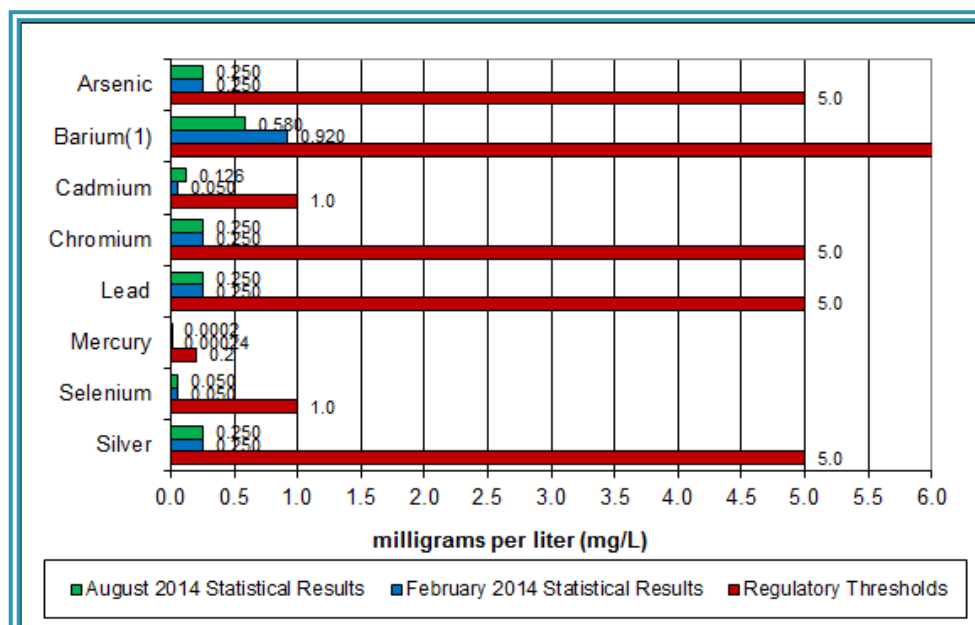
The dolomitic lime feed rate is adjusted periodically in order to maintain a desired ash pH level in the range of 8.0 to 11.0. Since initial startup, the feed rate has varied from between 4 to 9 lbs per ton. Ash Toxicity (TCLP) tests were performed for field samples collected over a seven (7) day period in August 2014, and results indicate that the average pH during testing was 8.7. Results from the TCLP testing conducted in August 2014 are depicted in Table 9 and Chart 15 below.



**Table 9: Comparison of Statistical Results and Regulatory Thresholds for Metal Analytes**

Metals	90% Upper Confidence (August 2014)	90% Upper Confidence (February 2014)	Regulatory Threshold (mg/L)	% of Threshold (August 2014)	% of Threshold (February 2014)
Arsenic	0.250	0.250	5.0	5.00%	5.00%
Barium	0.580	0.920	100.0	0.58%	0.92%
Cadmium	0.126	0.050	1.0	12.60%	5.00%
Chromium	0.250	0.250	5.0	5.00%	5.00%
Lead	0.250	0.250	5.0	5.00%	5.00%
Mercury	0.0002	0.00024	0.2	0.10%	0.12%
Selenium	0.050	0.050	1.0	5.00%	5.00%
Silver	0.250	0.250	5.0	5.00%	5.00%

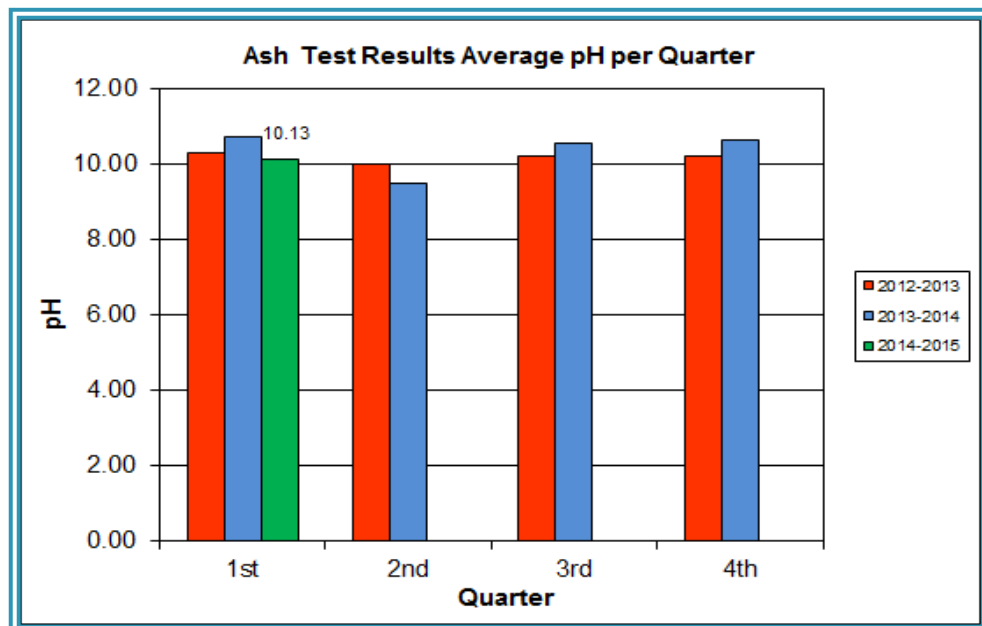
**Chart 15: Ash Toxicity Characteristic Leaching Procedure (TCLP) Results**



Note: The regulatory threshold for Barium is 100 mg/L

CAAI also 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 16 where each quarter is represented by the average of the respective monthly readings. During Q1FY15, the average ash pH for in-house tests was 10.1.

Chart 16: Quarterly Ash Test Results



## **APPENDIX A FACILITY CEMS DATA**

**Table 10: 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.		SteamFI	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	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
Jul-14	AVG	85.2	28.0	1.0	34.0	168.0	0.6	302.0	16.7	3.0
	Max	88.8	47.0	3.0	46.0	184.0	1.0	306.0	18.2	3.3
	Min	76.3	15.0	0.0	25.0	163.0	0.2	301.0	16.2	2.8
Aug-14	AVG	83.2	22.0	1.0	33.0	165.0	0.6	302.0	16.2	3.0
	Max	86.7	34.0	4.0	44.0	174.0	1.3	306.0	16.3	3.5
	Min	71.8	11.0	0.0	24.0	161.0	0.2	302.0	16.1	2.6
Sep-14	AVG	77.9	35.0	1.0	28.0	170.0	0.6	302.0	16.3	3.0
	Max	84.9	71.0	4.0	42.0	188.0	0.9	304.0	16.7	3.1
	Min	66.1	11.0	0.0	14.0	164.0	0.2	302.0	16.2	2.8
Quarter Average		82.1	28.3	1.0	31.7	167.7	0.6	302.0	16.4	3.0
Quarter Max Value		88.8	71.0	4.0	46.0	188.0	1.3	306.0	18.2	3.5
Quarter Min Value		66.1	11.0	0.0	14.0	161.0	0.2	301.0	16.1	2.6
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 (ie., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

**Table 11: 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	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	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
Jul-14	AVG	90.5	40.0	1.0	34.0	160.0	0.0	297.0	16.3	3.0
	Max	92.3	52.0	4.0	40.0	178.0	0.0	298.0	16.5	3.2
	Min	88.7	29.0	0.0	26.0	158.0	0.0	296.0	16.1	2.7
Aug-14	AVG	87.6	30.0	1.0	36.0	159.0	0.0	297.0	16.2	2.9
	Max	91.9	38.0	5.0	43.0	164.0	0.3	297.0	16.7	3.1
	Min	73.4	18.0	0.0	28.0	143.0	0.0	293.0	16.1	2.3
Sep-14	AVG	87.1	25.0	2.0	38.0	159.0	0.0	297.0	16.2	2.9
	Max	92.4	38.0	4.0	51.0	160.0	0.2	298.0	16.3	3.2
	Min	75.2	11.0	1.0	28.0	157.0	0.0	296.0	16.2	2.7
Quarter Average		88.4	31.7	1.3	36.0	159.3	0.0	297.0	16.2	2.9
Quarter Max Value		92.4	52.0	5.0	51.0	178.0	0.3	298.0	16.7	3.2
Quarter Min Value		73.4	11.0	0.0	26.0	143.0	0.0	293.0	16.1	2.3
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 (ie., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

**Table 12: 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	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	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
Jul-14	AVG	89.9	27.0	1.0	30.0	161.0	0.0	303.0	16.3	3.1
	Max	92.1	45.0	4.0	35.0	179.0	0.1	306.0	17.0	3.4
	Min	87.2	20.0	0.0	22.0	159.0	0.0	302.0	16.1	2.9
Aug-14	AVG	83.9	50.0	1.0	26.0	161.0	0.0	302.0	16.4	3.1
	Max	92.7	102.0	5.0	40.0	183.0	0.3	303.0	18.5	3.4
	Min	69.1	14.0	0.0	15.0	154.0	0.0	300.0	16.1	2.5
Sep-14	AVG	86.8	49.0	1.0	24.0	160.0	0.1	303.0	16.3	3.2
	Max	92.1	72.0	4.0	36.0	163.0	1.2	304.0	16.4	3.6
	Min	74.6	27.0	0.0	16.0	157.0	0.0	303.0	16.2	2.9
Quarter Average		86.9	42.0	1.0	26.7	160.7	0.0	302.7	16.3	3.1
Quarter Max Value		92.7	102.0	5.0	40.0	183.0	1.2	306.0	18.5	3.6
Quarter Min Value		69.1	14.0	0.0	15.0	154.0	0.0	300.0	16.1	2.5
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 (ie., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

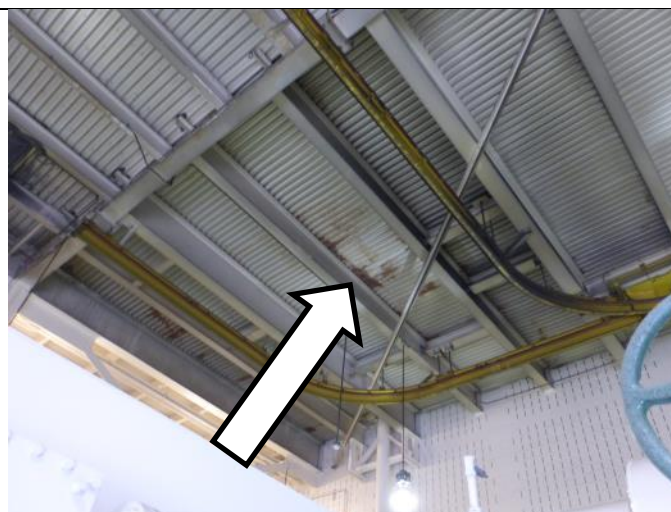
## APPENDIX B

### SITE PHOTOS – AUGUST 2014

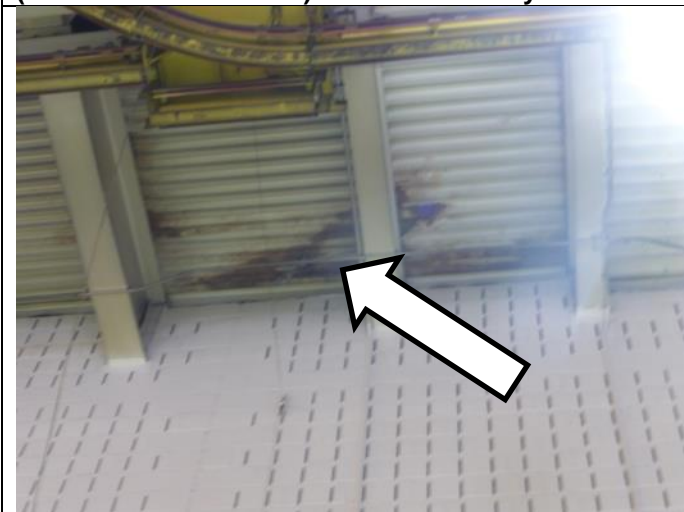




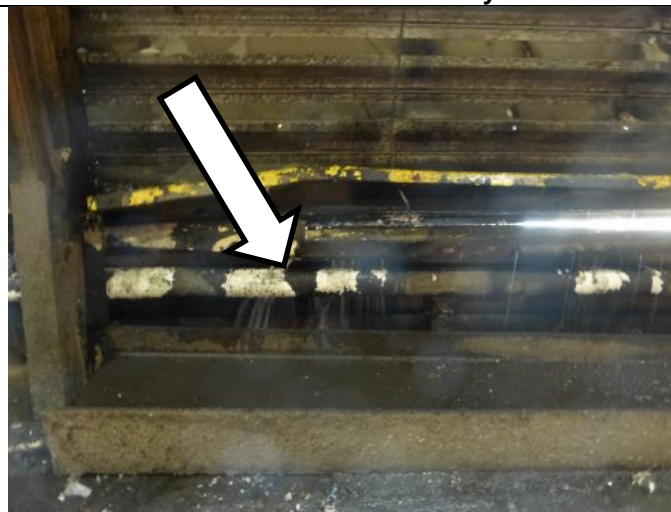
**Figure 1: Turbine Generator Enclosure Roof Leaking (3 Locations Observed) – New Deficiency**



**Figure 2: Corrosion on ceiling panels in Turbine Generator Enclosure – New Deficiency**



**Figure 3: Corrosion on ceiling panels in Turbine Generator Enclosure (Alternate Location)**



**Figure 4: Damaged Tipping Floor wall panels – Rainwater running from outside to inside – New Deficiency**



**Figure 5: Tipping Floor Enclosure roof leaking at truck entrance – New Deficiency**



**Figure 6: Tire supporting PVC drain pipe at Tipping Floor Entrance – New Deficiency**





**Figure 7: Exterior siding discolored outside Charging Floor louver above Administration Entrance – New Deficiency**



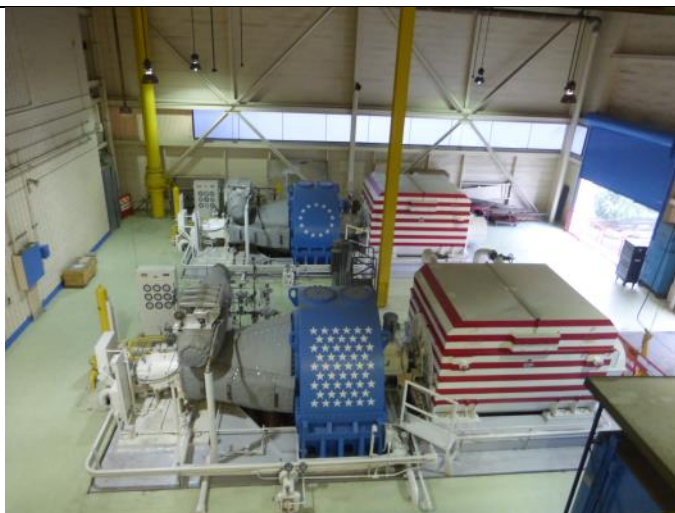
**Figure 8: New Ash Trailer Canopy – View from SDA Penthouse**



**Figure 9: Dolomitic Lime Silo**



**Figure 10: MSW Pit – View from south end of Charging Floor**



**Figure 11: Turbine Generators**



**Figure 12: New Ash Trailer Canopy – View from Turbine Generator Deck**





**Figure 13: Firing Aisle – Painting In Progress**



**Figure 14: Ferrous Magnet – No Issues Observed**



**Figure 15: Main Vibrating Conveyor – No Issues Observed**



**Figure 16: Ash Load-Out Ramp – No Issues Observed**



**Figure 17: Supplemental Load-Out Dock**



**Figure 18: Truck Scales – No Issues Observed**





**Figure 19: Entrance road degradation – Citizen's Drop-off Area**



**Figure 20: Citizen's Drop-off Roll-Off**



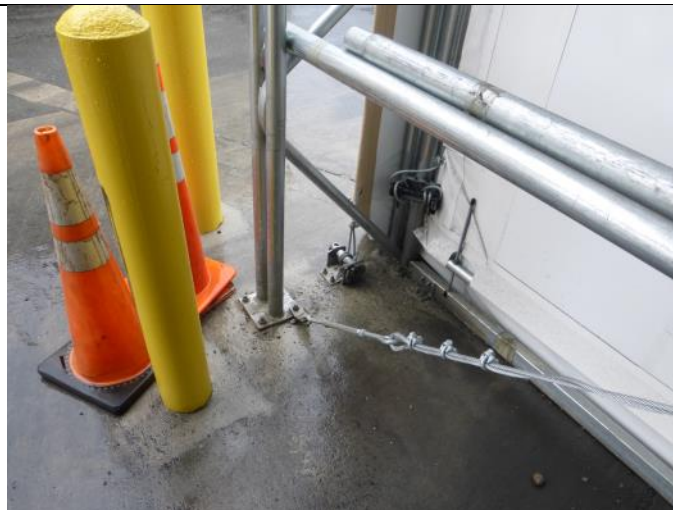
**Figure 21: General Facility View – View from Southwest Corner of Property**



**Figure 22: General Facility View – View From Across Eisenhower Avenue**



**Figure 23: General Facility View – View from south side of Cooling Towers**



**Figure 24: Protective Bollards and Anchor System to New Ash Trailer Canopy**