# *Report*

# Onondaga County
# Resource Recovery Facility

**NYSDEC Part 360 Permit ID No. 7-3142-00028/00011**
**Title V Air Permit ID No. 7-3142-00028/00009**

## Annual Report of Facility Performance
## Operating Year 2008


**Onondaga County**
**Resource Recovery Agency**
*WWW.OCRRA.ORG*


**October 2009**


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# Section 1 – Introduction

In the late 1980s and early 1990s, the Onondaga County Resource Recovery Agency (OCRRA) carefully evaluated the alternatives for managing non-hazardous, non-recyclable trash generated by the local community. The alternatives considered back then are the same alternatives that exist today – namely landfilling and waste-to-energy (WTE), neither without environmental impacts. In abiding by OCRRA's mission to provide the community with environmentally sound, highly efficient, safe, and innovative solutions, OCRRA embarked on the construction of a $148 million WTE facility. In 1995 the Onondaga County Resource Recovery Facility (the "Onondaga County WTE Facility" or the "Facility) became operational.

Today, after 14 years of operation, the Onondaga County WTE Facility continues to be an integral part of OCRRA's solid waste management system, or perhaps more aptly termed, OCRRA's resource recovery system. With a recycling rate of roughly 65%, and additional OCRRA programs in the works to further increase the recycling rate, a significant portion the waste is recycled into new products. The non-recyclable, non-hazardous portion of household waste goes to the WTE Facility, which recovers valuable energy and metal from our trash and generates enough electricity to power 32,000 homes. Only a small percentage of household waste ends up in a landfill in the form of non-hazardous ash residue from the WTE Facility.

The Onondaga County WTE Facility uses a mass burn combustion system that safely and efficiently converts non-hazardous, non-recyclable solid waste into electricity that is sold to National Grid. The Facility also recovers ferrous metals, and beginning in 2008, non-ferrous metals, for recycling. The by-product of the combustion process is a non-hazardous ash residue, which is about 10% of the original volume, and 25% of the original weight, of the trash processed at the Facility. The ash residue is then sent to a landfill for final disposal.

Incorporated into the operations of the Facility is an air pollution control system, which helps the Facility comply with one of the strictest air permits in the nation, meeting federal and state emissions requirements. Emissions from the Facility are carefully monitored through continuous emissions monitors (CEMs) and annual stack testing.

This report presents a summary of operational, environmental, and financial performance of the Onondaga County WTE Facility, located at 5801 Rock Cut Road (Town of Onondaga), Jamesville, New York for calendar year 2008. The Facility operates in accordance with NYSDEC Part 360 Permit ID No. 7-3142-00028/00011 (issued 11/16/01) and USEPA Title V Air Permit ID No. 7-3142-00028/00009 (issued 1/8/02). 2008 was the $14^{th}$ full year of Facility operation since initial start-up on November 10, 1994. Commercial operation began on February 25, 1995.

The report is organized as follows:

- Section 2 of the report presents an Executive Summary.
- Section 3 presents a summary of the Facility's operational performance.
- Section 4 presents a summary of the Facility's environmental performance.
- Section 5 presents a summary of the Facility's financial performance.
- Section 6 provides a list of references.

## 2008 Operational Performance

- The Facility has been for the past 14 years, and continues to be, well operated and maintained by Covanta Onondaga. In 2008, the Facility was named Large Solid Waste Combustion Facility of the Year by the American Society of Mechanical Engineers (ASME).

- The Facility processed 348,263 tons of non-hazardous, non-recyclable trash (enough to overfill the Syracuse Carrier Dome) or 96% of capacity and, in doing so, generated 252,149 MWh – enough electricity to power approximately 32,000 homes, as well as the Facility itself.

- The Facility had a net electricity production of 630 kilowatt-hours per ton (kWh/ton) of refuse processed. This rate is consistent with the Facility's 14-year average of 631 kWh/ton and is higher than the net kWh/ton for many other comparable facilities.

- In 2008, a non-ferrous metal recovery system was installed to recover aluminum, copper, and other high-value non-ferrous metals. This system complements the existing ferrous recovery system. In total, the Facility's metal recovery systems recovered about 12,000 tons of metal for recycling.

- Overall boiler availability for 2008 was 93.9% – the best performance over the 14-year history of the Facility. This value reflects less downtime for scheduled maintenance and equipment malfunctions. Turbine-generator availability for 2008 was 99.8% with only 15.4 hours of downtime.

## 2008 Environmental Performance

- The 2008 annual stack testing results indicate that the Facility is performing strongly. With the exception of zinc for Unit #2, all parameters met the corresponding air permit limits. The Unit #2 zinc result was well below the acceptable level determined by the Facility's Health Risk Assessment (HRA).

- Levels of mercury in the incoming waste stream continue to trend downward, indicating that OCRRA's mercury removal programs are effective. Furthermore, the Facility demonstrates high mercury removal efficiency. Mercury emissions from the Facility are less than 5% of permit limit.

- For 2008, the estimated annual total dioxin toxic equivalence (TEQ) emissions are 0.00007 lbs (70 millionths of a pound) – an amount equivalent to 3% of the weight of a standard paper clip.

- In 2008, Onondaga County's WTE Facility was named as one of the top five renewable energy plants in the world by Power Magazine.

- By sending the community's non-recyclable trash to the WTE Facility, rather than to a landfill, greenhouse gas emissions are avoided. As a general rule of thumb, approximately 1 ton of trash processed prevents 1 ton of carbon dioxide emissions. So in 2008, the WTE Facility avoided 348,263 tons of carbon dioxide emissions, which is the equivalent of taking about 58,000 passenger vehicles off the road.

- The WTE Facility utilizes a locally-generated renewable feedstock – the community's non-recyclable trash to generate a significant amount of electricity; this not only reduces dependence on fossil fuels, it also achieves goals of energy independence. In 2008 alone, the WTE Facility generated enough energy to displace nearly 418,000 barrels of oil or 104,500 tons of coal – enough energy to satisfy the needs of approximately 32,000 homes in OCRRA's service area.

- With one of the highest recycling rates in New York State, Onondaga County demonstrates that WTE facilities and recycling are highly compatible; it also supports many studies that have concluded communities with WTE facilities often have higher rates of recycling.

## 2008 Financial Performance

- OCRRA's 2008 Facility-related revenues and expenses roughly offset each other. Total operating revenues were approximately $31 million and total (operating and bond) expenses were $29 million.

- 2008 was a volatile year for electricity and commodity prices. Electricity and metal prices reached historical highs mid-year and historical lows at the year's end. The 2008 annual cumulative average electricity rate was $0.06827 per kWh, which exceeded the contract floor pricing of $0.06 per kWh.

# Section 3 – Operational Performance

## 3.1 Summary of Operations

Based on 2008 operating data, overall Facility operations continued at high levels for the 14th year of continuous operation. The Facility processed 348,263 tons of municipal solid waste (MSW), 96.4% of the Facility's permitted throughput limit of 361,350 tons. Overall boiler availability for 2008 was 93.9%, the best performance over the 14-year history of the Facility. Turbine-generator availability was 99.8%.

The average higher heating value (HHV) of waste processed in 2008 was 5,441 British thermal units per pound (Btu/lb). The 2008 HHV, which indicates the energy embodied in the incoming waste stream, was slightly above the Facility's 14-year average (1995-2008) average HHV of 5,372 Btu/lb. The Facility had a net electricity production of 630 kilowatt-hours per ton (kWh/ton) of refuse processed. This rate is consistent with the Facility's 14-year average of 631 kWh/ton.

In 2008, the WTE Facility generated 88,726 tons of combined ash residue, which were hauled by OCRRA to Seneca Meadows Landfill in Waterloo, NY. Based on waste processed, this amount of ash was 25.5% of the waste combusted; therefore the Facility reduced the volume of the refuse by 74.5%. The 2008 ash ratio is slightly less than the 14-year Facility average of 25.9%

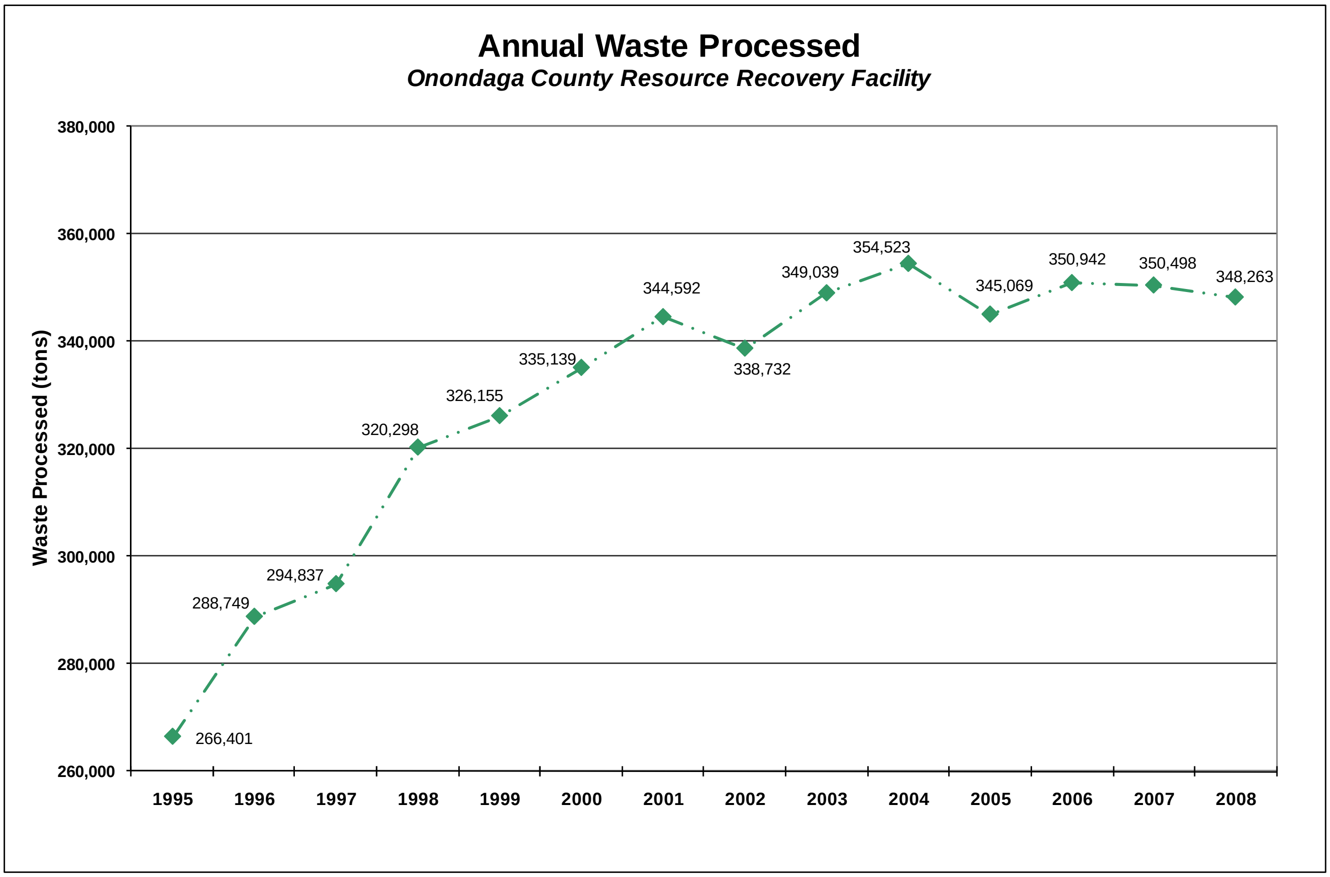
In 2008, the Facility recovered approximately 11,775 tons of ferrous metal, or 3.38% of the refuse processed, for shipment to recycling markets. In addition to recovering ferrous metals, in mid-2007, the Agency and Covanta entered into a contract amendment for the installation of a non-ferrous metal recovery system. The non-ferrous metal recovery system, which uses an eddy-current magnet separator, became operational on June 24, 2008. The non-ferrous system recovered 252 tons of metal between June 24, 2008 and the year's end, with an average of 40-45 tons per month or about 0.14% of the refuse processed.

For 2008, the average boiler steam capacity utilization was 97.5%, a value consistent with previous years, indicating that while the boilers were operational, they operated at near full design levels. This operating scenario represents the most efficient mode of Facility operation, and will maximize steam production and thus electrical energy generation. Another term, steam capacity, is also used to compare boiler utilization, and is defined as the ratio of actual steam to the maximum amount of steam that could be generated if the unit were running full time. For 2008, the Facility's average steam capacity was 86.5%.

## 3.2 Refuse Processed

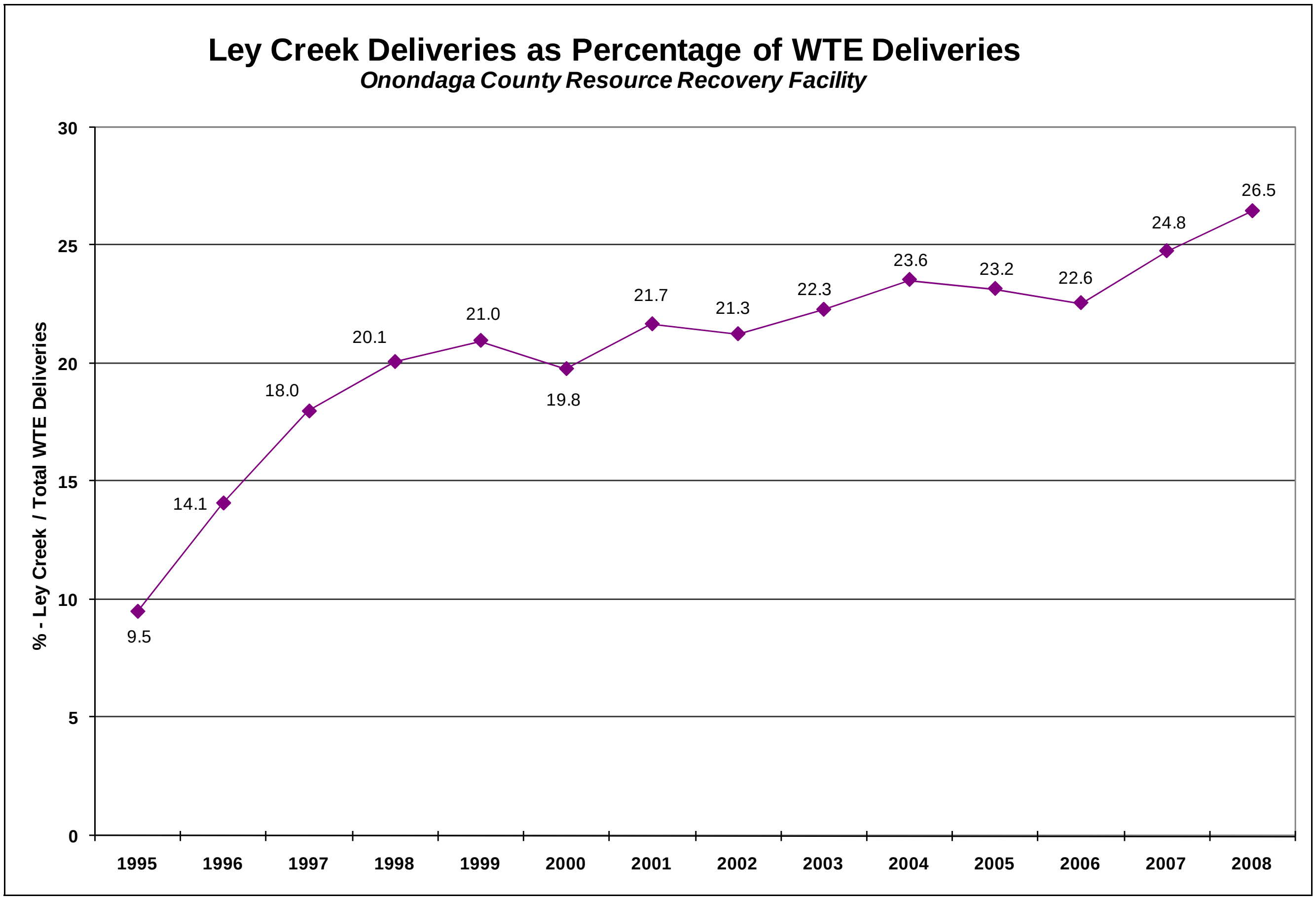
The WTE Facility received 348,613 tons of refuse during 2008, or 95% of OCRRA's total system tonnage. Approximately 18 tons, or less than 0.01% of the incoming waste stream, were rejected as non-processable waste. Taking into consideration the refuse received and the beginning and ending refuse pit inventory, 348,263 tons of solid waste were processed in 2008. This represents 96.4% of the Facility's permitted throughput limit of 361,350 tons, leaving 13,087 tons of unused processing capacity.

Waste processed in 2008 was slightly less than the amount processed in 2007 (0.6% decrease), however, the quantity of waste processed over the past six years has remained fairly stable – with tonnage between 345,000 and 355,000 tons. The figure below shows the annual waste processed at the Facility.

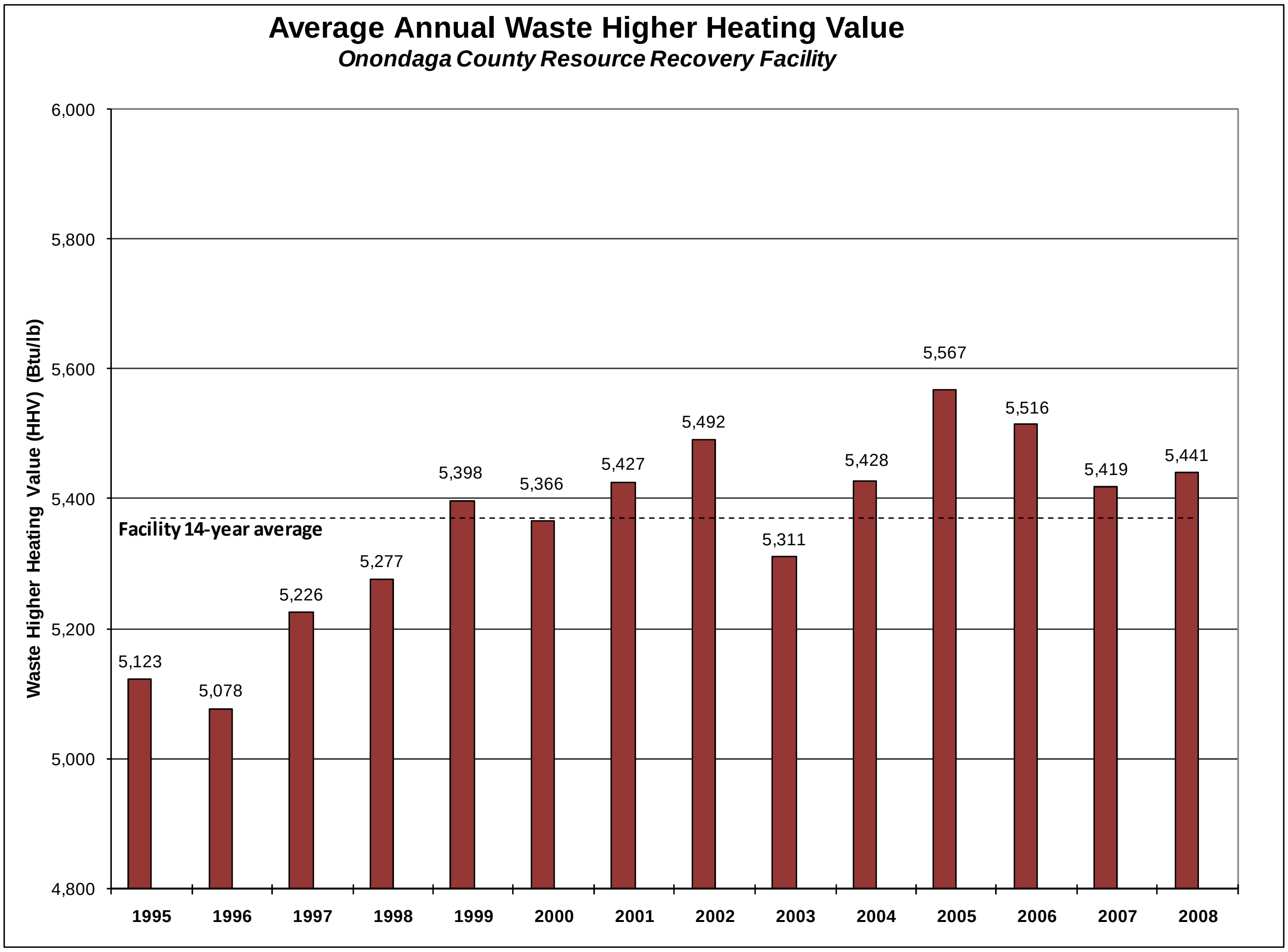



The refuse delivered to the Facility consists primarily of MSW and processable construction and demolition debris (C&D), including roofing. Licensed haulers collect Onondaga County (with the exception of the Town and Village of Skaneateles) MSW and deliver it directly to the Facility. Direct hauler deliveries generally account for 70-75% of the tonnage processed. 2008 MSW tonnage from direct hauler deliveries was down approximately 3.25% as compared to 2007.

In addition to direct hauler MSW deliveries, OCRRA delivers MSW and processable C&D to the Facility from the Ley Creek and Rock Cut Road transfer stations (with the majority from Ley Creek). These deliveries generally account for 25-30% of the tonnage processed at the Facility. The 2008 MSW and C&D tonnage delivered to the Facility from OCRRA's transfer stations was up about 6% as compared to 2007. Ley Creek deliveries as a percentage of total deliveries are shown below.




The average higher heating value (HHV) of waste processed in 2008 was 5,441 British thermal units per pound (Btu/lb). The 2008 average HHV was slightly above the Facility's 14-year average (1995-2008) average HHV of 5,372 Btu/lb (see figure on next page). HHV, which is mainly determined by waste composition and moisture content, is a measure of the amount of energy contained in the waste being combusted. If other boiler operating parameters remain the same, the net effect of a greater waste HHV is increased steam production and, in turn, increased electricity generation.




For 2008, Covanta Energy reported an average HHV of 5,066 Btu/lb for all of its domestic WTE facilities (Hoefler, 2009). Similarly, the average HHV over the past six years for 13 mass burn facilities (including the Onondaga Facility) stagnated around 5,200 Btu/lb over the past five years (LoRe and Oswald, 2009).

OCRRA's average HHV is likely higher than the other averages for two main reasons – 1) the proportion of processable C&D materials and 2) OCRRA's high recycling rate. Other facilities may not process C&D materials, which generally have a higher heating value than MSW, and therefore, if present, tend to increase a facility's average HHV. In contrast, some recyclable materials, such as glass and metal, tend to have a low heating value. By removing these materials from the waste stream, a facility's average HHV will increase. Therefore, OCRRA's highly effective recycling program also plays a role in the Facility's higher-than-average HHV.

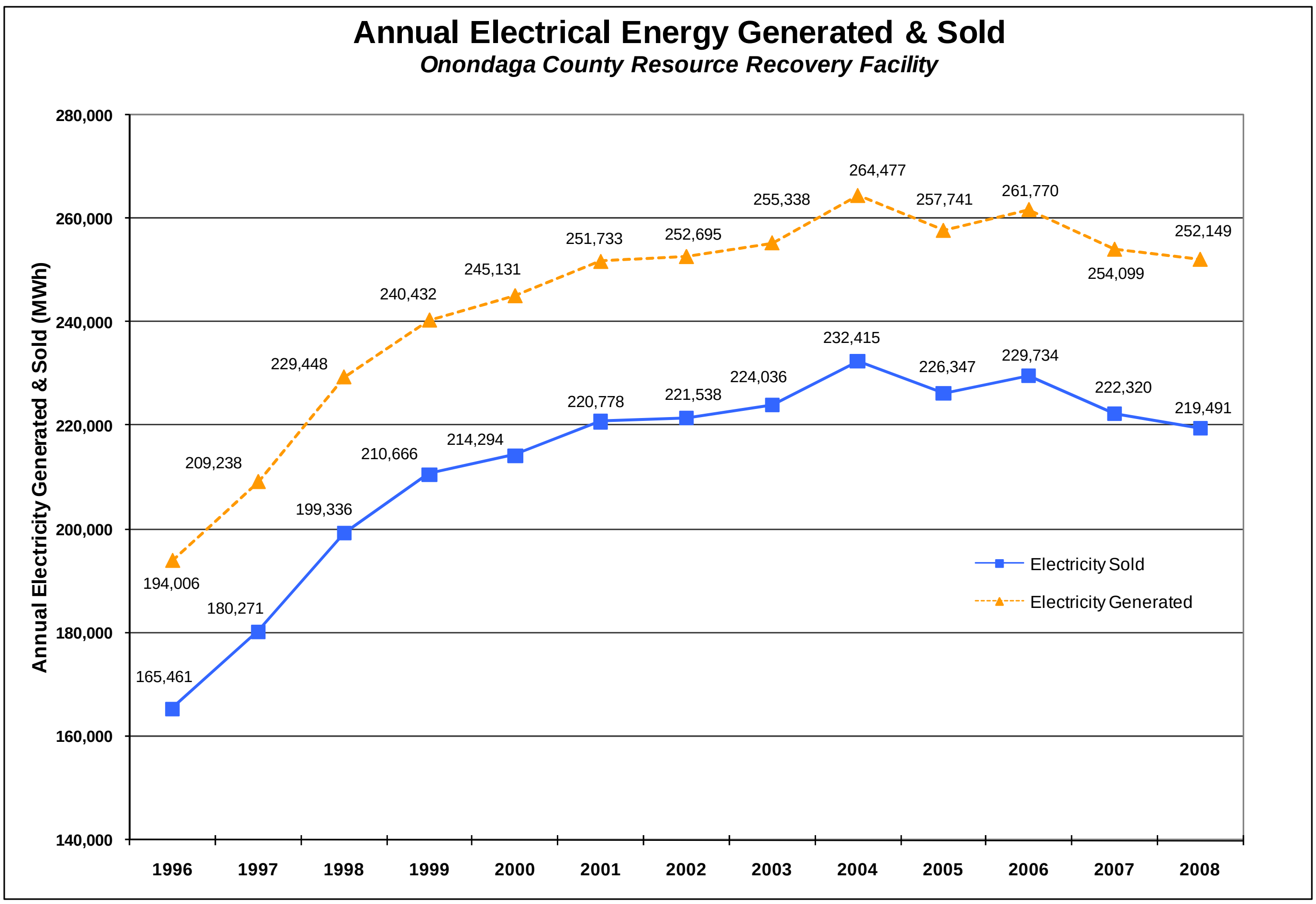
## 3.3 Steam Generated

Steam generated in 2008 was 2,367,790 kilopounds (klb), or 3.4 pounds of steam per pound of refuse processed. The amount of steam generated depends on the boiler efficiency and HHV of the waste being combusted. Of the total amount of steam generated, 72,820 klb of steam, or 3%, was consumed for the Facility's internal needs, such as preheating combustion air and heating boiler feedwater. The remaining 2,294,970 klb were used by the Facility's turbine-generator for electricity production.

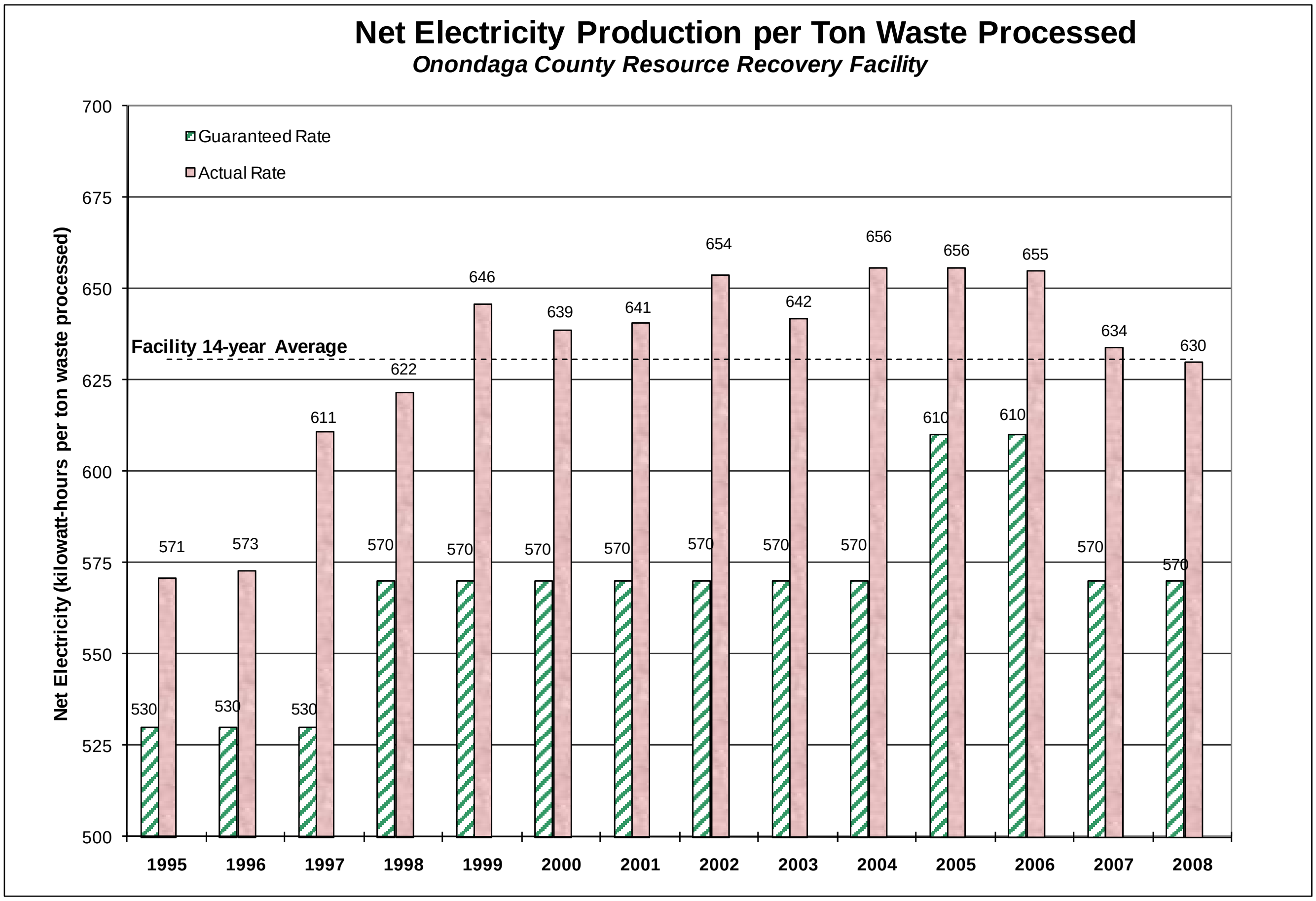
Boiler efficiency, in simplest terms, is the difference between the energy input (HHV of waste being combusted) and energy output (quantity of steam generated). Using monthly data, the 2007 overall boiler efficiency was 71.0%, a value consistent with historical levels and reported literature values.

## 3.4 Electricity Production

Total (gross) electricity generated for 2008 was 252,149 megawatt-hours (MWh). Of this amount, 219,491 MWh, or 87%, was sold to National Grid (net electricity). The balance, or 13%, was used for the Facility's electrical needs. The amount of electricity generated and sold in 2008 decreased by 0.8% and 1.3% over 2007 levels, respectively, with the decreases resulting primarily from decreased tonnage.



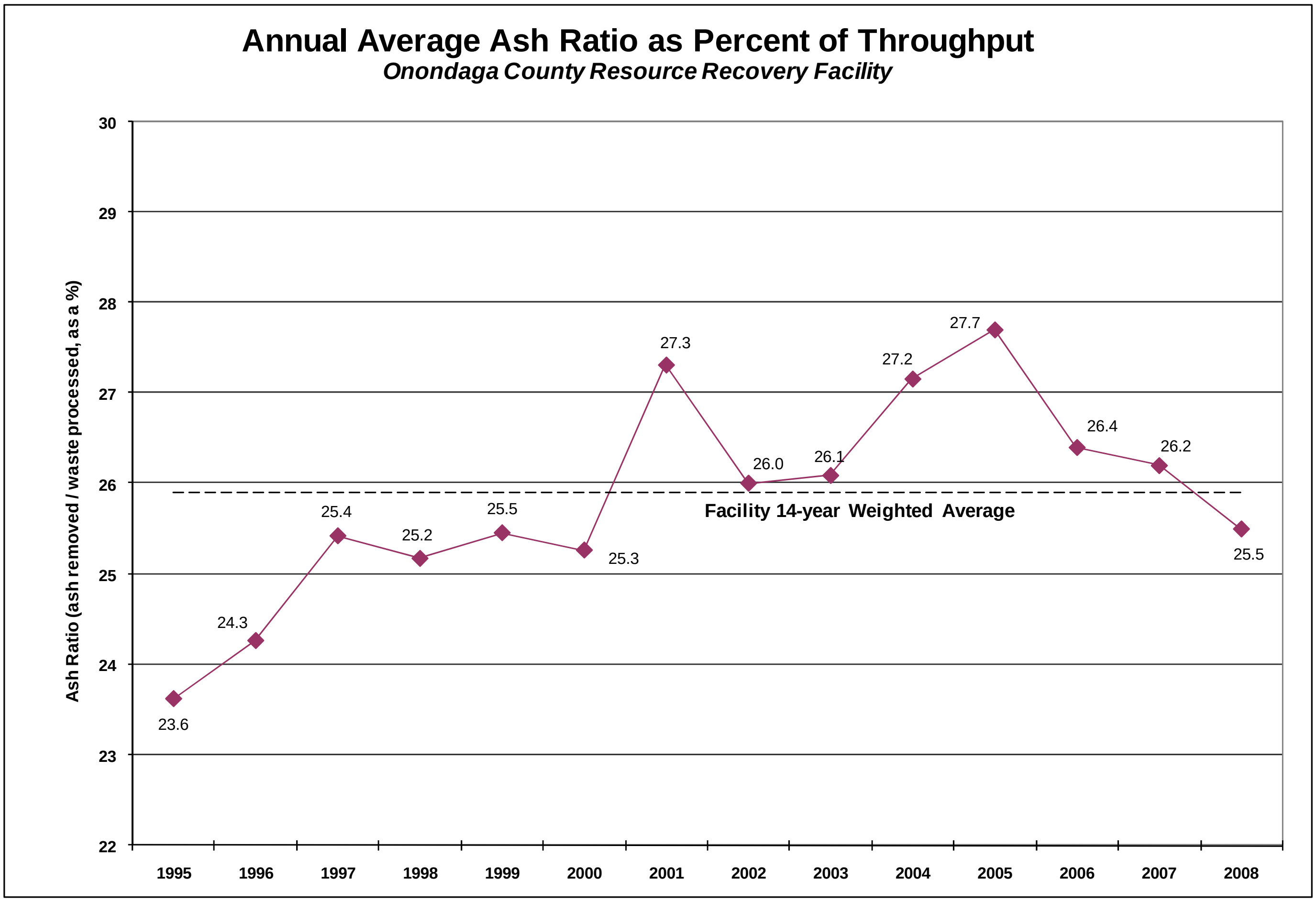
The Facility had a net electricity production of 630 kilowatt-hours per ton (kWh/ton) of refuse processed. This rate is consistent with the Facility's 14-year average of 631 kWh/ton and significantly higher than that for other similar facilities. Furthermore, this rate exceeds the net electricity production guarantee of 570 kWh/ton (based on the average annual HHV of the waste processed, which was 5,441 Btu/lb for 2008). In their benchmarking report, LoRe and Oswald (2009) suggest an average 14-facility (including Onondaga County) net electricity production of 500 kWh/ton.




During normal Facility operation, the Facility's electrical demand is satisfied by the Facility's turbine-generator system, with the excess electricity being exported to the grid. Thus, the difference between the gross electricity produced by the turbine-generator and the net electricity sold to the grid is the Facility's electrical demand. In 2008 the Facility used an average of 91.3 kWh per ton of refuse. This is consistent with the Facility's long-term average, as well as that for other similar facilities. Lore and Oswald (2009) suggest a 14-facility average electricity usage of 90.4 kWh per ton.

## 3.5 Ash Residue Generation

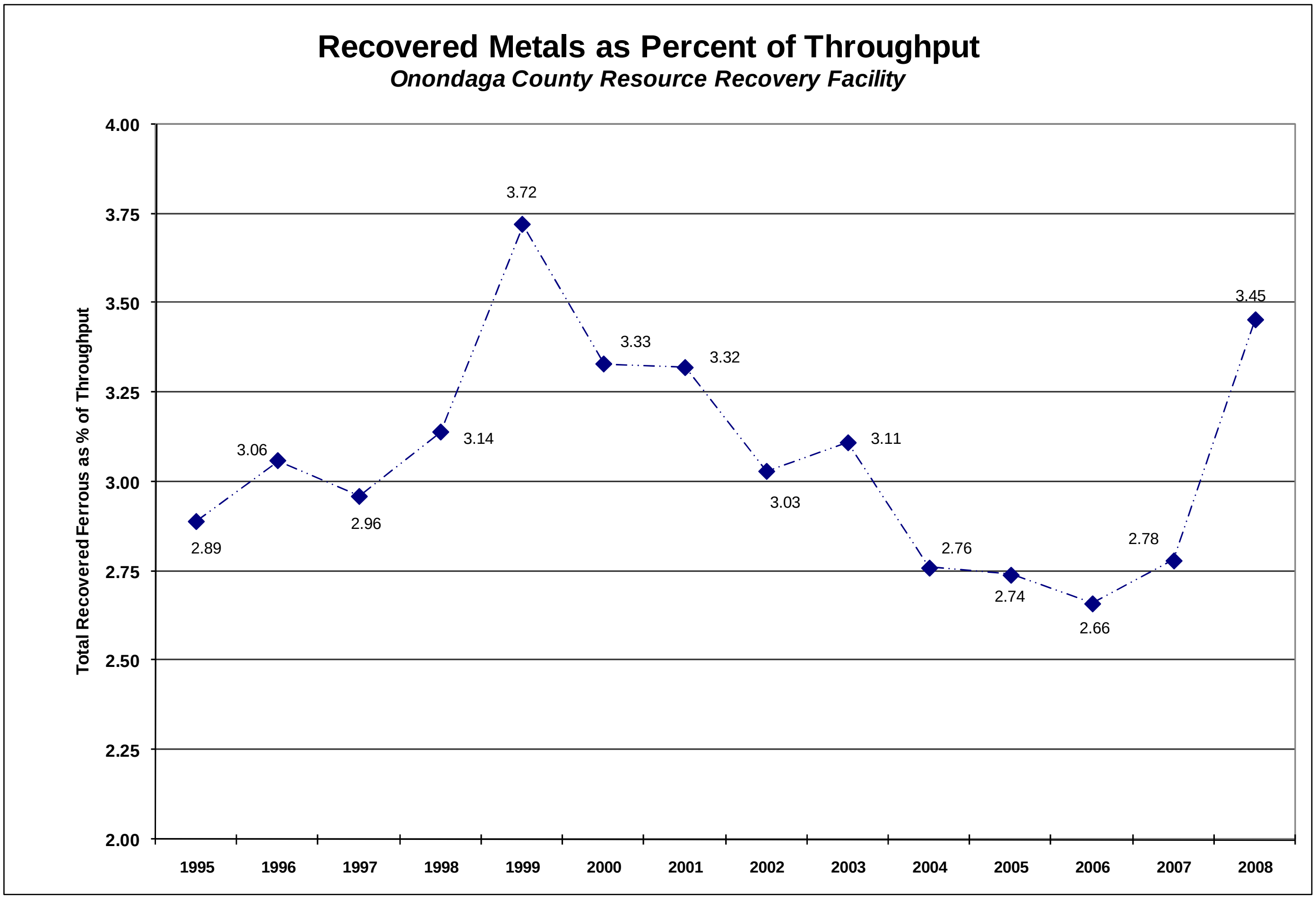
In 2008, the WTE Facility generated 88,726 tons of combined ash residue, which were hauled by OCRRA to Seneca Meadows Landfill in Waterloo, NY. Based on waste processed, this amount of ash was 25.5% of the waste combusted; therefore the Facility reduced the volume of the refuse by 74.5%. The 2008 ash ratio is slightly less than the 14-year Facility average of 25.9% and well below the annual contractual limit of 32% (see figure below).




## 3.6 Metal Recovery

In 2008, the Facility recovered approximately 11,775 tons of ferrous metal, or 3.38% of the refuse processed, for shipment to recycling markets. In addition to recovering ferrous metals, in mid-2007, the Agency and Covanta entered into a contract amendment for the installation of a non-ferrous metal recovery system. The non-ferrous metal recovery system, which uses an eddy-current magnet separator, became operational on June 24, 2008. The non-ferrous system recovered 252 tons of metal between June 24, 2008 and the year's end, with an average of 40-45 tons per month or about 0.14% of the refuse processed.

The graph on the next page shows the metal recovery over the life of the Facility.




As shown, for the first five years of plant operation, the average annual ratio of recovered ferrous increased from 2.89% in 1995 to a high of 3.72% in 1999. For the next six years, 2000 through 2006, the recovered ferrous ratio exhibited a steady decline reaching a Facility annual low of 2.66% in 2006. Recovery of ferrous is dependent upon the amount of metals in the incoming waste stream, as well as on the effectiveness of the Facility's magnetic separation system.

To explain the observed decrease in the ferrous ratio, OCRRA first reviewed its 2005 Waste Quantification & Characterization Study to evaluate whether there was less metal in the waste stream; no significant changes in the amount of ferrous in the waste stream were noted. OCRRA also verified that the strength of the rotating magnet removing ferrous metals from the ash residue does not markedly decrease over time, and that no material changes in the operation of the magnetic separation conveyance system have been made. Based on this review, OCRRA could not definitively explain the decline in the recovered ferrous ratio 2000-2006. The Lancaster WTE Facility did not exhibit a similar pattern during the same period.

In 2007, the recovered ferrous ratio increased to 2.78% and, in 2008, to 3.38%. The 2007 increase was due to discontinuance in the use of a rotating trommel screen that removed residual ash from the magnetically-separated ferrous metals. As such, the recovered metal has an increased amount of ash residue, which accounts for a marked increase in the recovered ferrous ratio. The increase from 2007 to 2008 was due to the addition of the non-ferrous metal recovery system.

## 3.7 Boiler and Turbine-Generator Availability

Though the boilers and turbine-generator are designed to operate 24 hours a day, 365 days per year, a WTE facility cannot realistically achieve 100% boiler availability because of necessary and required routine and periodic maintenance. Boiler and turbine-generator availability are generally defined as the percentage of hours that the boiler/turbine-generator is available for operation, taking into account downtime related to scheduled and unscheduled maintenance. Downtime related to low refuse deliveries is not generally counted against availability. This is consistent with industry standards (LoRe and Oswald, 2009).

Facility boiler and turbine-generator availability are reported monthly and annually. 2008 availability information is presented below:

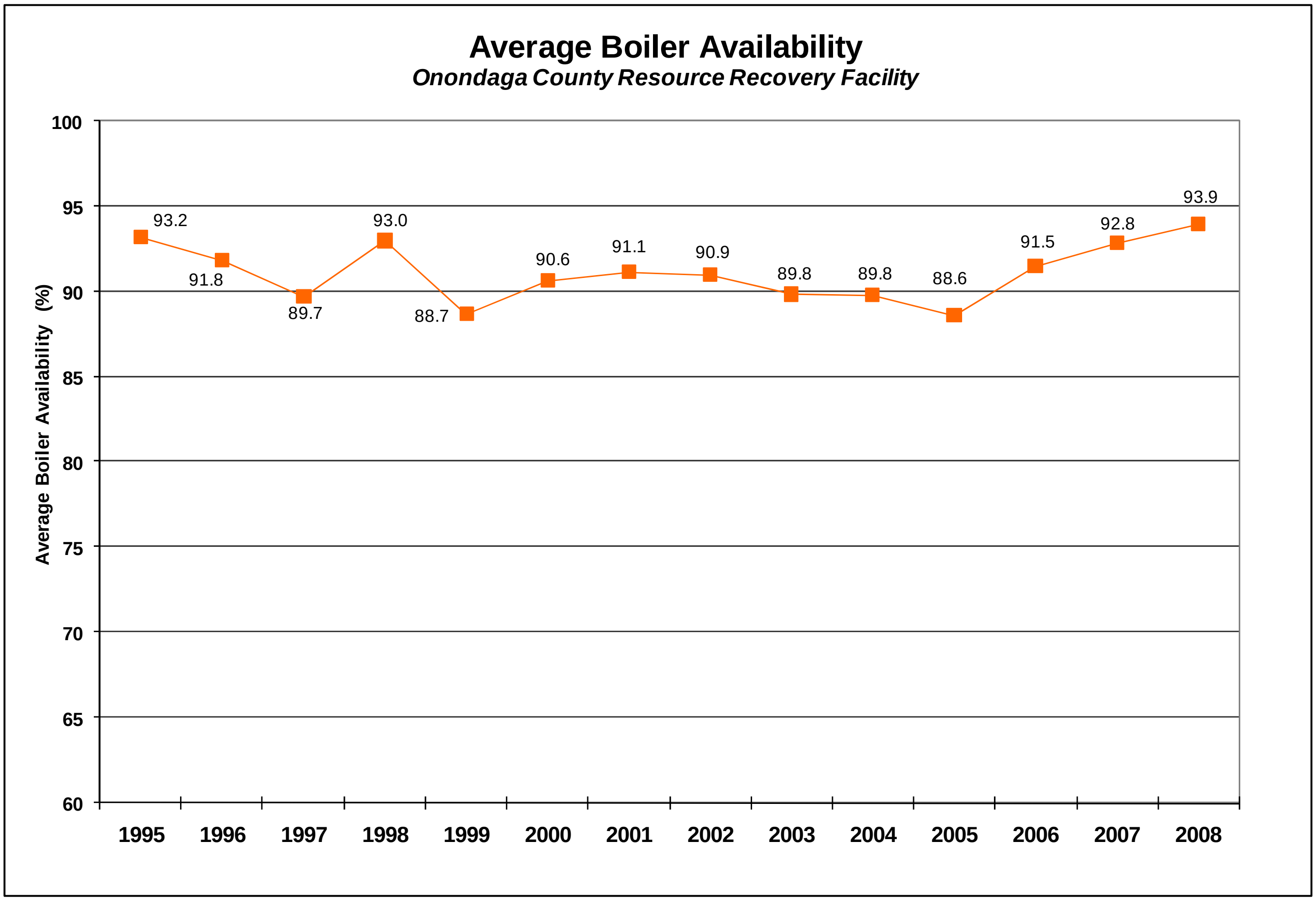
| | Boiler Unit #1 | Boiler Unit #2 | Boiler Unit #3 | Turbine/Generator |
|---|---|---|---|---|
| *Total Scheduled Downtime (hr)* | 486.9 | 423.9 | 425.8 | 2 |
| *Total Unscheduled Downtime (hr)* | 26.7 | 126.1 | 111.1 | 13.4 |
| *Total Downtime (hr)* | 513.6 | 550.0 | 536.9 | 15.4 |
| *Total Downtime (days)* | 21.4 | 22.9 | 22.4 | 0 |
| *Availability (%)* | 94.2 | 93.7 | 93.9 | 99.8 |

Overall boiler availability for 2008 was 93.9%; the best performance over the 14-year history of the Facility. This value is significantly higher than the Facility's 13-year (1995-2007) average of 90.9%, and reflects less downtime for scheduled maintenance and equipment malfunctions. For comparative purposes, Covanta reported in 2008 that their domestic WTE facilities have an average boiler availability of 91.2% (Hoefler, 2009) and LoRe and Oswald (2009) suggest a 15-facility average (including Onondaga County) of 90.3%.

The Facility has historically performed, and continues to perform, necessary boiler maintenance consistent with industry standards. Performing preventative maintenance remains critically important in prolonging the useful life of the boiler; replacing and repairing worn components prevents unscheduled downtime, thereby increasing boiler availability. Scheduled maintenance accounted for 95%, 77%, and 79% of downtime for Unit 1, 2, and 3, respectively.

Unscheduled boiler downtime in 2008 resulted from miscellaneous issues including waterwall and superheater tube leaks, ash hopper pluggages, broken grate bars, and lime accumulation in the spray dryer absorber. Boiler Units 2 and 3 experienced the greatest amount of unscheduled boiler downtime, accounting for 23% and 21% of total downtime, respectively. Boiler Unit 1 had only 26.7 hours of unscheduled downtime, or 5% of total downtime.

The figure on the next page shows the Facility's historical average boiler availability.




The table below presents a summary of historical scheduled and unscheduled total boiler downtime.

*Historical Boiler Operating Data (total hours for three boilers)*

| Year | Scheduled Maintenance (hours) | Unscheduled Maintenance (hours) | Total Maintenance (hours) | Total Maintenance Downtime* (%) | Downtime due to low trash deliveries (hours) | Low Trash Downtime* (%) | Total Downtime (hours) | Total Downtime* (%) |
|---|---|---|---|---|---|---|---|---|
| 1996 | 1,964 | 196 | 2,160 | 8.2 | 6,954 | 26.5 | 9,114 | 34.7 |
| 1997 | 2,124 | 586 | 2710 | 10.3 | 5,985 | 22.7 | 8,695 | 33.0 |
| 1998 | 1,262 | 588 | 1850 | 7.0 | 3,541 | 13.5 | 5,391 | 20.5 |
| 1999 | 1,873 | 1,101 | 2974 | 11.3 | 3,585 | 13.6 | 6,559 | 25.0 |
| 2000 | 1,728 | 745 | 2473 | 9.4 | 1,652 | 6.3 | 4,125 | 15.7 |
| 2001 | 1,991 | 338 | 2329 | 8.9 | 2,011 | 7.6 | 4,340 | 16.5 |
| 2002 | 1,998 | 383 | 2381 | 9.1 | 1,052 | 4.0 | 3,433 | 13.1 |
| 2003 | 1,958 | 714 | 2672 | 10.2 | 1,034 | 3.9 | 3,706 | 14.1 |
| 2004 | 1,954 | 738 | 2692 | 10.2 | 777 | 3.0 | 3,469 | 13.2 |
| 2005 | 2,373 | 790 | 3163 | 12.0 | 218 | 0.8 | 3,381 | 12.8 |
| 2006 | 1,688 | 551 | 2239 | 8.5 | 171 | 0.7 | 2,410 | 9.2 |
| 2007 | 1,321 | 565 | 1886 | 7.2 | 151 | 0.6 | 2,037 | 7.8 |
| 2008 | 1,337 | 264 | 1,601 | 6.1 | 920 | 3.5 | 2,521 | 9.6 |

* Total Maintenance Downtime, Low Trash Downtime, and Total Downtime computed as a percentage of total unit-hours in calendar year.

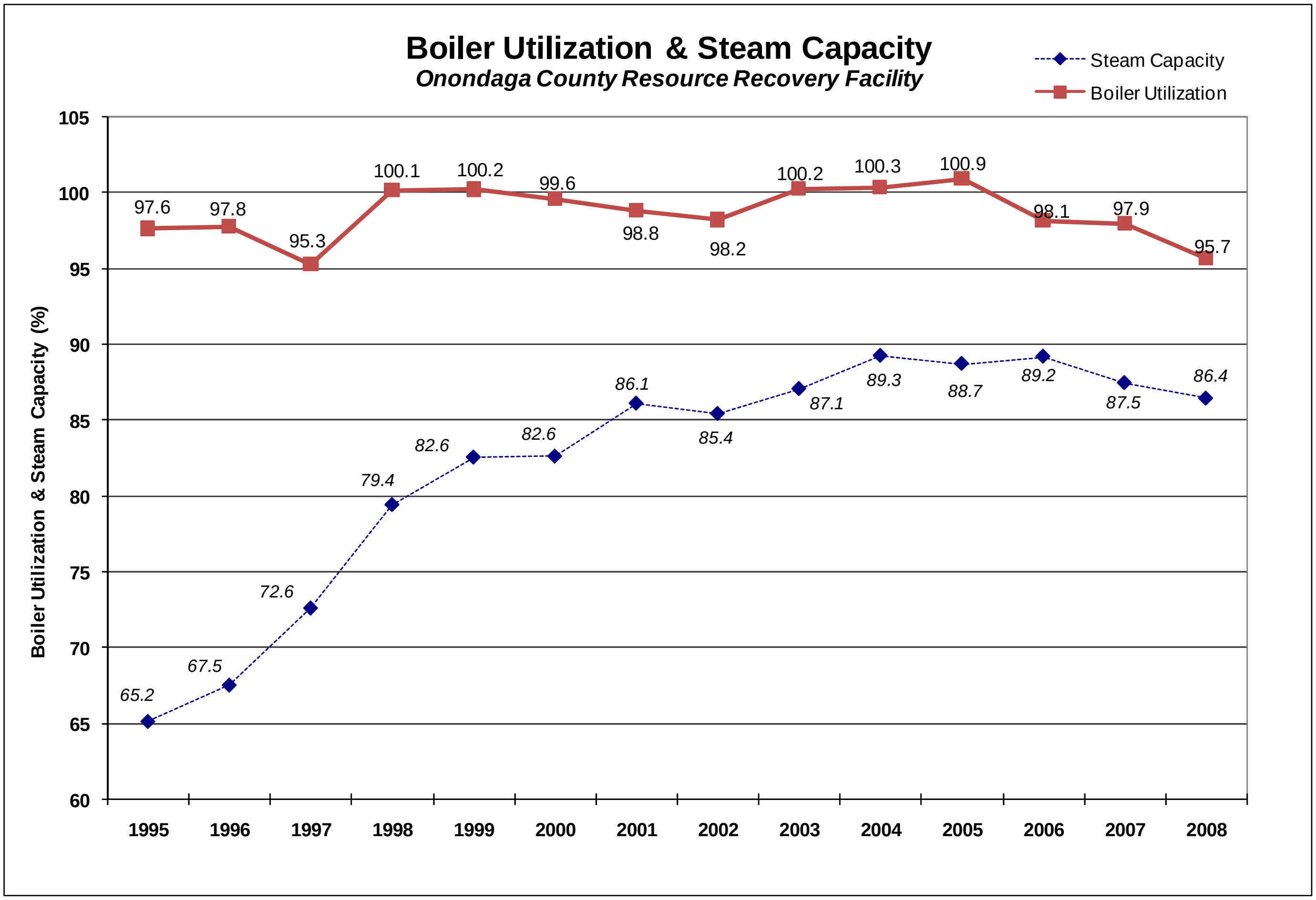
The 2008 unscheduled and scheduled downtime represented only 6.1% of total annual hours. The downtime due to low trash levels represents an additional 3.5%. Total boiler downtime, including downtime due to low trash deliveries, for 2008 was 2,521 hours, or 9.6% of the unit-hours in the calendar year. Though not as low as 2007's 7.8%, a total downtime of 9.6% is significantly less than even the contractually allowable scheduled maintenance downtime of 14.2% and means the boilers were operated 90.4% of the time.

Turbine-generator availability for 2008 was 99.8% with only 15.4 hours of downtime. Unscheduled outages accounted for 13.4 hours and scheduled maintenance accounted for the other 2 hours. For comparative purposes, LoRe and Oswald (2009) suggest a 14-facility average (including Onondaga County) of 96.6%. According to the Service Agreement between OCRRA and Covanta, turbine-generated outage days cannot exceed 21 days on a 3-year rolling average basis. For 2008, this total turbine-generator outage time was 17.4 hours (2006-2008).

## 3.8 Boiler Utilization and Steam Capacity

Another metric used to evaluate Facility efficiency is boiler utilization. Each boiler is designed with a maximum steam rate (pounds per hour) at which the unit is intended to be operated. This is referred to as the "maximum continuous rating" (MCR). The maximum design steam rating for the Onondaga Facility is 103,950 klb of steam per hour per boiler, or 311,850 klb of steam per hour for all three boiler units. Boiler utilization is the ratio of actual steam generated by the boilers to the MCR. It is important to note that boiler utilization only takes into account boiler operating time; that is, it does not include boiler downtime. Another term, steam capacity, is also used to evaluate Facility efficiency, and is defined as the ratio of actual steam to the maximum amount of steam that could be generated if the unit were running full time.

For 2008, the average boiler utilization was 95.7%, a value within the range of historical data, but slightly less than the historical average. A boiler utilization of 100% represents the most efficient mode of Facility operation, and will maximize steam production and thus electrical energy generation. For comparative purposes, LoRe and Oswald (2009) suggest a 14-facility average (including Onondaga County) boiler utilization of 96.0%. For 2008, the Facility's average steam capacity was 86.4%. Historical data for boiler utilization and steam capacity are shown in the figure on the next page.



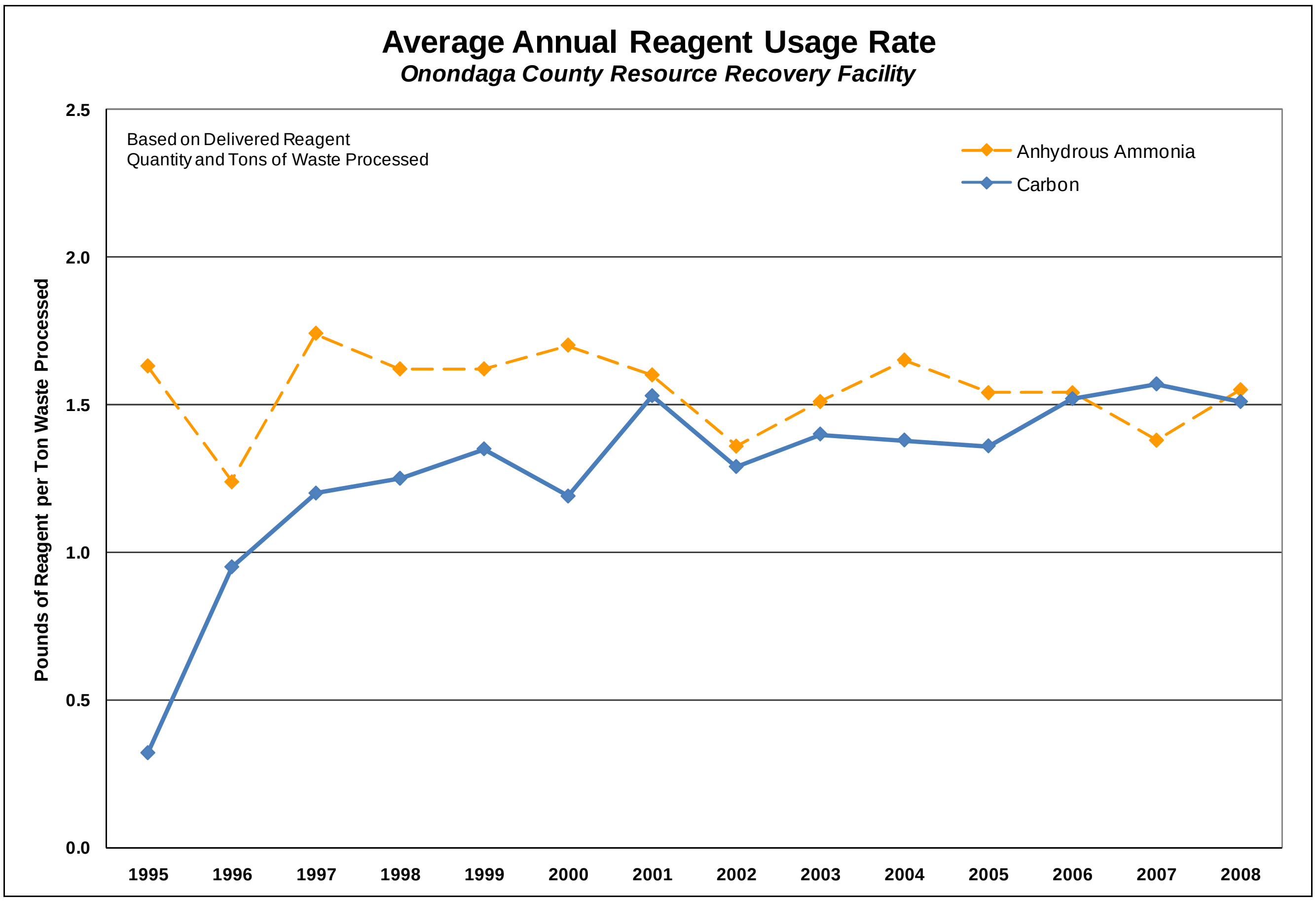

In 2008, the Facility processed 348,263 tons of solid waste, or 96.4% of its annual permitted throughput limit of 361,350 tons at an average steam capacity of 86.5%. This difference between throughput capacity and steam capacity is related to the actual waste HHV. The Facility's combustion units were designed for a waste HHV of 6,000 Btu/lb, and a throughput capacity of 330 tons per day each. The 2008 average annual waste HHV of 5,441 Btu/lb was 9.3% lower than design. Thermodynamically, as the waste HHV decreases, throughput increases. Thus, without a permit throughput limit, for an average annual waste HHV of 5,441 Btu/lb, the Facility could theoretically combust about 395,000 tons per year, excluding downtime for maintenance, or just at about the permit limit with 10% downtime.

NYSDEC originally permitted the Facility in 1992 on the basis of throughput, rather than steam capacity. In fact, even though 330 tons per days per unit equates to 361,350 tons per year, the original annual throughput processing limit was initially set at 295,000 tons, or about 82% of theoretical throughput. In 1998, NYSDEC approved an increase in throughput capacity to 336,000, and subsequently to 361,350 tons per year in 2001. During the permitting phase of Facility development, some critics of the plant claimed that it was over-designed from a processing standpoint. Waste deliveries, however, have steadily grown over the years with plant throughput capacity currently averaging 96-98%.

## 3.9 Pollution Control Reagent Consumption

The Facility uses several reagents for pollution control including anhydrous ammonia for control of nitrogen oxides ($NO_x$), carbon for mercury and dioxin/furan control, and lime for control of acid gases (as well as ash conditioning).

To control $NO_x$ emissions, anhydrous ammonia is injected into the combustion chamber of each boiler unit. To control mercury emissions, as well as dioxin and furan emissions, powdered activated carbon is mixed into slurry and injected into the spray-dry scrubbers through the rotary atomizer. The rotary atomizer creates tiny droplets for optimal reaction. The average annual 2008 reagent usage rates for ammonia and carbon were 1.55 lb and 1.51 lb per ton of waste processed, respectively. As evident in the chart below, anhydrous ammonia and carbon usage rates have been consistent with historical rates. According to Lore and Oswald (2009), the Facility's anhydrous ammonia usage rate is consistent with other facilities that use anhydrous ammonia and the carbon usage is a bit higher than a 12-facility average (including Onondaga County) of 1.01 lb per ton.




To neutralize acid gases, namely sulfur dioxide ($SO_2$), hydrogen chloride (HCl), hydrogen fluoride (HF), and sulfuric acid ($H_2SO_4$), a calcium-based lime, referred to as pebble lime, is injected into the spray-dry scrubbers through the rotary atomizer. In 2008, the average reagent application rate was 28.4 lb of pebble lime per ton of waste processed. This is consistent with 2002 (31.0 lb of pebble lime per ton of waste processed) and 2007 (29.2 lb of pebble lime per ton of waste processed) when pebble lime was the only form of lime used.

Prior to making the decision to solely use pebble lime, dolomitic lime, a lime with a higher magnesium content than pebble lime, was added to the fly ash prior to combining with the bottom ash to provide additional conditioning of the fly ash. In August 2006, dolomitic lime use was discontinued and the reagent application rate for pebble lime increased above that needed for acid gas control. While still providing satisfactory ash conditioning, this change was implemented to improve housekeeping conditions, reduce OCRRA's overall ash conditioning costs, and produce a drier, more manageable combined ash residue for disposal.

## 3.9 Electricity, Natural Gas, and Water Utilization

During normal Facility operation, the Facility's electrical demand is satisfied by the Facility's turbine-generator system, with the excess electricity being exported to the grid. During those times when the turbine-generator is off-line due to maintenance or malfunction, electricity is purchased from National Grid (NG) to operate the Facility and continue combusting the incoming MSW. In 2008, 52,956 kWh of electricity was purchased from National Grid for in-plant needs during two unscheduled outages and one scheduled maintenance outage. The amount of electricity purchased during 2008 is generally consistent with their long-term averages.

Natural gas is an auxiliary fuel used for boiler start-ups and shutdowns, and for maintaining minimum furnace temperatures when processing overly wet waste. 2008 natural gas usage was 129,471 therms. This was the least amount of gas used annually and was due to considerably fewer shutdowns and start-ups following boiler tube leaks or other equipment malfunctions.

City water satisfies all potable and process needs of the Facility, with the majority being for process use. However, the Facility is a zero discharge plant relative to process wastewater; meaning that only sanitary sewage is discharged off-site. 31,720,000 gallons were used in 2008. This amount of water translates into about 91 gallons per ton of waste combusted or approximately 60 gallons per minute. 2008 water usage remained consistent with historical levels and design parameters following initial start-up. The Onondaga Facility's water use is much lower than that of similar facilities because it is a zero-process water discharge Facility, meaning that all process water gets treated and reused thereby requiring less potable water. According to LoRe and Oswald (2009), a ten-facility average water consumption rate is 422 gallons per ton of waste processed.

## 3.10 Facility Inspections

In accordance with NYSDEC Part 360 regulations, an annual general Facility inspection must be undertaken to determine the operating condition of the safety, emergency, security, process, and control equipment. Covanta must have this inspection performed under the direction of a New York State licensed professional engineer. With the approval of the NYSDEC, Covanta performed the required Facility annual inspection on October 22, 2008.

The summary report was prepared through discussions with plant personnel during inspection. Covanta's Regional Operations Manager concluded: "*Based upon the above inspections and information, the safety, emergency, security, process and control equipment at the Onondaga County Resource Recovery Facility operated by Covanta Onondaga at 5801 Rock Cut Road, Jamesville, NY 13078 are considered to be in acceptable operating condition.*" This annual inspection report was submitted to the NYSDEC on February 23, 2009 as part of the Facility's 2008, 4$^{th}$ Quarter & Annual Solid Waste Report.

In 2008, OCRRA had its independent consultant, CDM, conduct three comprehensive 2-day site inspections. These visits focused on all various aspects of plant operations and maintenance. A March site visit coincided with the Unit #1 spring boiler outage, which based on the extent of maintenance performed, represented the Facility's major annual outage. A September site inspection was conducted during the fall Unit #3 outage. An August site visit was conducted to evaluate the overall Facility condition, as well as the newly operational non-ferrous metal recovery system.

Based on the results of their visual inspections and experience at other WTE facilities, CDM opined that the Onondaga Facility continues to be well maintained, and is in overall good operating condition. The routine preventative maintenance and major repairs performed during the spring and fall outages were consistent with the type and level of repairs observed at other facilities. The majority of the systems inspected were in good operating condition, and all equipment appeared to be operating properly. The level of daily repair and preventative maintenance observed was considered normal for facilities of the same type and age.

In addition to Facility inspections, CDM performed oversight for the annual air emissions stack testing and semi-annual ash residue testing. CDM concluded that testing was conducted in accordance with required procedures and protocols.

# Section 4 – Environmental Performance

## 4.1 Summary of Environmental Performance

Each day, the Onondaga County WTE Facility turns non-recyclable trash into energy. Over 15 million dollars worth of air pollution control equipment is in place to make sure this is done safely. While operating under one of the strictest WTE air permits in the country, results of the Facility's annual air emissions and ash residue test results continue to demonstrate its exemplary environmental performance. Coupled with Onondaga County's nationally high recycling rate of approximately 66% for 2008 (double the national average), the Onondaga County WTE Facility generates enough renewable energy to satisfy the needs of approximately 32,000 homes in OCRRA's service area while also reducing the volume of trash that needs to be landfilled by 90%.

In fact, POWER Magazine's December 2008 issue showcased the Onondaga County WTE Facility as one of the top renewable energy projects in the world, alongside a solar electric (photovoltaic) system in California, two wind turbine farms in Spain and the Galapagos Islands, and a geothermal power plant in Utah.

The article underscored national interests in renewable energy and discussed the benefits of WTE, "Recently, there has been renewed emphasis on the need for energy sources that promote U.S. energy independence, avoid fossil fuel use, and reduce greenhouse gas (GHG) emissions. Waste-to-energy (WTE) is well-positioned to deliver these benefits while also providing for safe and reliable disposal of household trash."

According to the article, Americans generate 278 million tons of MSW annually. With less than 30 million tons going to WTE facilities, the majority of the non-recyclable trash ends up in landfills. POWER Magazine states, "Since 1995, the Covanta Onondaga WTE Facility has succeeded in turning garbage into green energy. The plant reroutes non-hazardous solid waste normally destined for landfills and gives the refuse a second productive life as a fuel source for generating electricity."

It also discusses an important advantage of WTE over other types of renewable energy, "Additionally, unlike power plants that use wind or solar energy, this 39-MW WTE Facility operates 24/7, making it and similar WTE plants among the most continuously reliable sources of renewable electricity generation currently in operation."

Dispelling a common misconception about WTE facilities, the POWER article emphasizes that WTE facilities do not jeopardize recycling efforts, citing Onondaga County's impressive recycling rate of about 65%. It also highlights the Onondaga County WTE Facility's ferrous and non-ferrous recovery systems, which remove metals that would otherwise go to a landfill.

Respectfully, the article addresses the air pollution control challenges of WTE facilities, stating, "Air emissions from municipal waste combustors can contain organics, metals, and acid gases. These emissions can cause or contribute to air pollution that may endanger public health and the environment. Therefore, to better control such emissions, the EPA has promulgated regulations under the Clean Air Act to establish operating practices and emission limitations."

With respect to the Onondaga County WTE Facility's air pollution control technology, the article adds, "When it opened in 1995, the Covanta Onondaga plant was the first WTE Facility in the state of New York to be designed and equipped with air pollution control (APC) technology that anticipated the EPA's maximum achievable control technology (MACT) standards that were later promulgated in 1998. The Facility has consistently exceeded the most stringent standards issued by the EPA and NYSDEC subsequent to commencing commercial operation and has not needed to retrofit additional APC technology."

The article clearly describes how the Onondaga County WTE Facility monitors its air emissions, "The Facility's air emissions are checked by a continuous emission monitoring system (CEMS) that measures equipment performance and stack emissions. The CEMS monitors carbon monoxide, carbon dioxide, oxygen, sulfur dioxide, and nitrogen oxides (NOx) as well as ammonia, opacity, and combustion temperatures. Annual air emission testing is also conducted for up to 33 constituents, including organics, heavy metals, acid gas, and particulates."

POWER Magazine's article about the Onondaga County WTE Facility is a powerful testament to the renewability of WTE, as well as a well-deserved acknowledgment of the impressive operational and environmental performance of the Facility. The entire article is available at: www.powermag.com/renewables/waste_to_energy.

## 4.2 2008 Stack Test Results

Stack testing is an important tool that measures the amount of regulated pollutants being emitted from the Facility. Stack testing consists of a series of sampling events, in which a probe is inserted into the stack gases to collect a representative sample, over a defined amount of time. Sampling and laboratory analysis are conducted in accordance with NYSDEC and USEPA protocols. NYSDEC oversees stack testing at the WTE Facility.

In addition to annual stack testing, the Facility has a continuous emission monitoring system (CEMS) that measures equipment performance and stack emissions in order to constantly track Facility performance. The CEMS tracks carbon monoxide, carbon dioxide, oxygen, sulfur dioxide, and NOx as well as ammonia, opacity, and combustion temperatures.

The 2008 stack testing included 14 parameters that are tested every 5 years, in addition to the 10 parameters that are tested annually. The results from the 2008 stack testing indicate that the Facility is operating acceptably and that the air pollution control devices are functioning properly. As shown by the summary data on the next page, many of the parameters were considerably below the permit limit. One of the parameters tested every five years had a result above the permit limit, as indicated by the "fail" for zinc. The zinc result for boiler Unit #2 was above the permit limit; however the results for boiler Units #1 and #3 were below the permit limit. Furthermore, the Unit #2 average result was well below the level determined as acceptable in the Facility's Health Risk Assessment. Additional discussion about the zinc result is provided in Section 4.2.5.

# 2008 ANNUAL STACK TEST RESULTS

| | | Constituent | Average Measured Emissions[1] Unit 1 | Unit 2 | Unit 3 | Permit Limit[2] | Pass/Fail? P/F |
|---|---|---|---|---|---|---|---|
| TESTED ANNUALLY | FEDERAL | Cadmium (mg/dscm @ 7% $O_2$) | 1.09E-03 | 1.05E-03 | < 8.68E-04 | 4.00E-02 | P |
| | | Cadmium (lb/hr) | 1.70E-04 | 1.88E-04 | < 1.34E-04 | 1.90E-03 | P |
| | | Carbon Monoxide (lb/hr) | 1.30E+00 | 7.30E-01 | 7.10E-01 | 8.04E+00 | P |
| | | Dioxins/Furans (ng/dscm @ 7% $O_2$) | 1.41E+00 | 9.83E-01 | 9.07E-01 | 3.00E+01 | P |
| | | Hydrogen Chloride (ppmdv @ 7% $O_2$) | 4.50E+00 | 8.27E-01 | 3.55E+00 | 2.50E+01 | P |
| | | Hydrogen Chloride (lb/hr) | 1.06E+00 | 2.23E-01 | 8.58E-01 | 5.24E+00 | P |
| | | Hydrogen Chloride Removal Efficiency (%) | 99.4 | 99.9 | 99.5 | >=95 | P |
| | | Lead (mg/dscm @ 7% $O_2$) | 5.19E-02 | 2.97E-02 | 5.10E-03 | 4.40E-01 | P |
| | | Lead (lb/hr) | 8.08E-03 | 5.31E-03 | 7.82E-04 | 3.81E-02 | P |
| | | Mercury (lb/hr) | 2.10E-04 | 2.27E-04 | 2.04E-04 | 1.20E-02 | P |
| | | Nitrogen Oxides (lb/hr) | 5.31E+01 | 5.34E+01 | 5.18E+01 | 5.80E+01 | P |
| | | Particulates (gr/dscf @ 7% $O_2$) | 1.57E-03 | 1.60E-03 | 1.55E-03 | 1.00E-02 | P |
| | | $PM_{10}$[3] (gr/dscf @ 7% $O_2$) | 1.57E-03 | 1.60E-03 | 1.55E-03 | 1.00E-02 | P |
| | | $PM_{10}$[3] (lb/hr) | 5.62E-01 | 6.06E-01 | 5.43E-01 | 3.16E+00 | P |
| | | Sulfur Dioxide (lb/hr) | 3.30E-01 | 2.50E-01 | 4.12E+00 | 1.62E+01 | P |
| | STATE | Ammonia (ppmdv @ 7% $O_2$) | 2.12E+00 | < 7.38E-01 | < 8.48E-01 | 5.00E+01 | P |
| | | Ammonia (lb/hr) | 2.33E-01 | < 9.30E-02 | < 9.60E-02 | 4.88E+00 | P |
| | | Dioxins/Furans-2,3,7,8 TCDD TEQ (ng/dscm @ 7% $O_2$) | 2.09E-02 | 1.66E-02 | 1.46E-02 | 4.00E-01 | P |
| | | Dioxins/Furans-2,3,7,8 TCDD TEQ (lb/hr) | 3.20E-09 | 2.55E-09 | 2.22E-09 | 1.29E-07 | P |
| | | Mercury (µg/dscm @ 7% $O_2$) | 1.34E+00 | 1.27E+00 | 1.32E+00 | 2.80E+01 | P |
| | | Mercury Removal Efficiency (%) | 98.8 | 99.4 | 98.3 | >=85 | P |
| TESTED EVERY 5 YEARS | FEDERAL | Arsenic (lb/hr) | 1.76E-04 | 8.88E-05 | 2.27E-04 | 7.80E-04 | P |
| | | Beryllium (lb/hr) | < 4.99E-06 | < 7.26E-06 | < 6.70E-06 | 1.15E-05 | P |
| | | Hydrogen Fluoride[4] (lb/hr) | < 1.98E-02 | < 2.50E-02 | < 1.94E-02 | 1.65E-01 | P |
| | | VOCs - Total Hydrocarbons (ppmdv @ 7% $O_2$) | 1.8E+00 | 2.8E+00 | 2.1E+00 | 3.00E+01 | P |
| | | VOCs - Total Hydrocarbons (lb/hr) | 1.9E-01 | 2.9E-01 | 2.2E-01 | 2.76E+00 | P |
| | STATE | Chromium (lb/hr) | 1.02E-03 | 1.13E-03 | 3.32E-04 | 1.93E-03 | P |
| | | Copper (lb/hr) | 1.10E-03 | 9.52E-04 | 3.79E-04 | 4.00E-03 | P |
| | | Formaldehyde (µg/dscm @ 7% $O_2$) | < 1.46E+01 | < 1.60E+01 | < 1.45E+01 | 5.00E+01 | P |
| | | Hexavalent Chromium - $Cr^{+6}$ [5](lb/hr) | 1.51E-04 | 1.34E-04 | 1.24E-04 | 3.00E-04 | P |
| | | Manganese (lb/hr) | 1.55E-03 | 2.21E-03 | 1.80E-03 | 2.30E-02 | P |
| | | Nickel (lb/hr) | 1.06E-03 | 7.84E-04 | 4.18E-04 | 4.00E-03 | P |
| | | PAHs[6] (µg/dscm @ 7% $O_2$) | < 2.89E-01 | < 3.57E-01 | < 1.98E-01 | 1.00E+00 | P |
| | | PAHs[6] (lb/hr) | < 4.51E-05 | < 5.48E-05 | < 3.04E-05 | 1.40E-04 | P |
| | | PCBs (µg/dscm @ 7% $O_2$) | < 7.06E-03 | < 5.96E-03 | < 1.28E-02 | 5.30E-02 | P |
| | | Vanadium (lb/hr) | < 9.98E-05 | < 3.13E-05 | < 1.34E-04 | 6.00E-04 | P |
| | | Zinc [7] (lb/hr) | 1.55E-02 | 2.22E-02 | 3.73E-03 | 1.88E-02 | F |

**NOTES:**

[1] Based on three test runs

[2] NYSDEC Title V Permit Number 7-3142-00028/00009

[3] Based on total particulate analysis

[4] Based on total fluorides analysis

[5] Results are based on 12/2008 retesting (BIF Method 0013)

[6] Results do not include naphthalene/naphthalene derivatives

[7] Unit 2 results are based on December 2008 retesting event

**UNITS:**

gr/dscf = grains per dry standard cubic foot

ppmdv = parts per million dry volume

lb/hr = pounds per hour

ng/dscm = nanograms per dry standard cubic meter

µg/dscm = micrograms per dry standard cubic meter

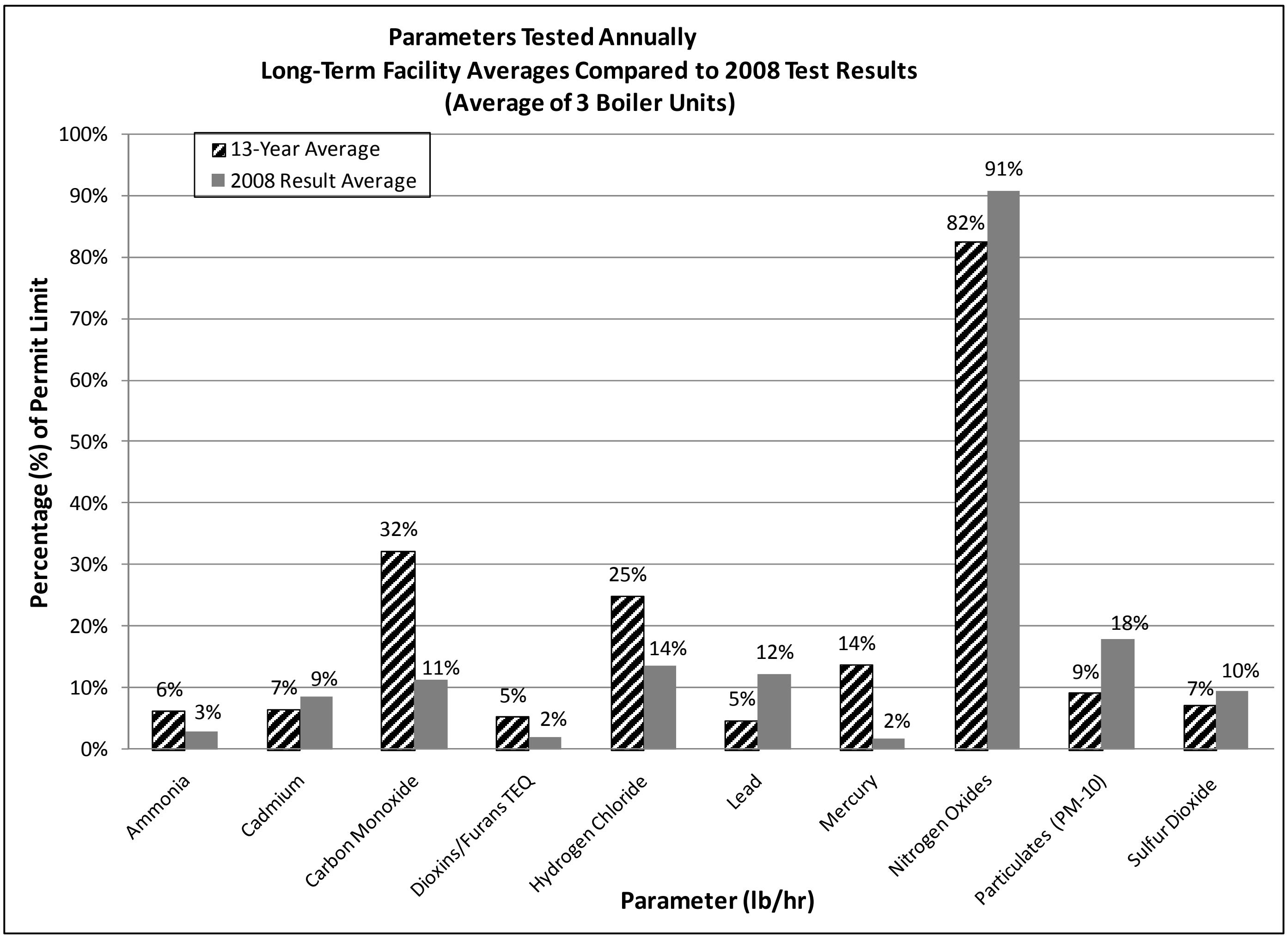
mg/dscm = milligrams per dry standard cubic meter

@ 7% $O_2$ = concentration corrected to 7% oxygen

### 4.2.1 Parameters Tested Annually

The figure below presents a comparison of the 2008 stack test results with their respective long-term (13-year) Facility averages (1995 through 2007) for the parameters tested annually. The results are graphed as a percentage of their respective permit limits. The graph shows that the 2008 results are consistent with historical results and that results continue to be well below regulatory limits. These results indicate that the Facility's air pollution control system continues to operate effectively, and that OCRRA's efforts in screening the incoming waste continue to be effective.

Compared to the other parameters, $NO_x$ emissions are much closer to the permit limit. This is because $NO_x$ emissions are controlled via injection of ammonia into the boiler. Ammonia injection is continuously optimized to ensure emissions stay below the $NO_x$ and ammonia permit limits.




WTE facilities have significantly reduced emissions over the past decade. In 1997 a memorandum by the United States Environmental Protection Agency (USEPA) documented this progress. The table from USEPA's memorandum is provided on the following page.

## Emissions From Large and Small MWC Units

| *Pollutant* | *1990 Emissions (tpy)* | *2005 Emissions (tpy)* | *Percent Reduction* |
|---|---|---|---|
| CDD/CDF, TEQ basis* | 4400 | 15 | 99+ % |
| Mercury | 57 | 2.3 | 96 % |
| Cadmium | 9.6 | 0.4 | 96 % |
| Lead | 170 | 5.5 | 97 % |
| Particulate Matter | 18,600 | 780 | 96 % |
| HCl | 57,400 | 3,200 | 94 % |
| $SO_2$ | 38,300 | 4,600 | 88 % |
| $NO_x$ | 64,900 | 49,500 | 24 % |

(*) dioxin/furan emissions are in units of grams per year toxic equivalent quantity (TEQ), using 1989 NATO toxicity factors; all other pollutant emissions are in units of tons per year.

Source: USEPA Memorandum dated 1997

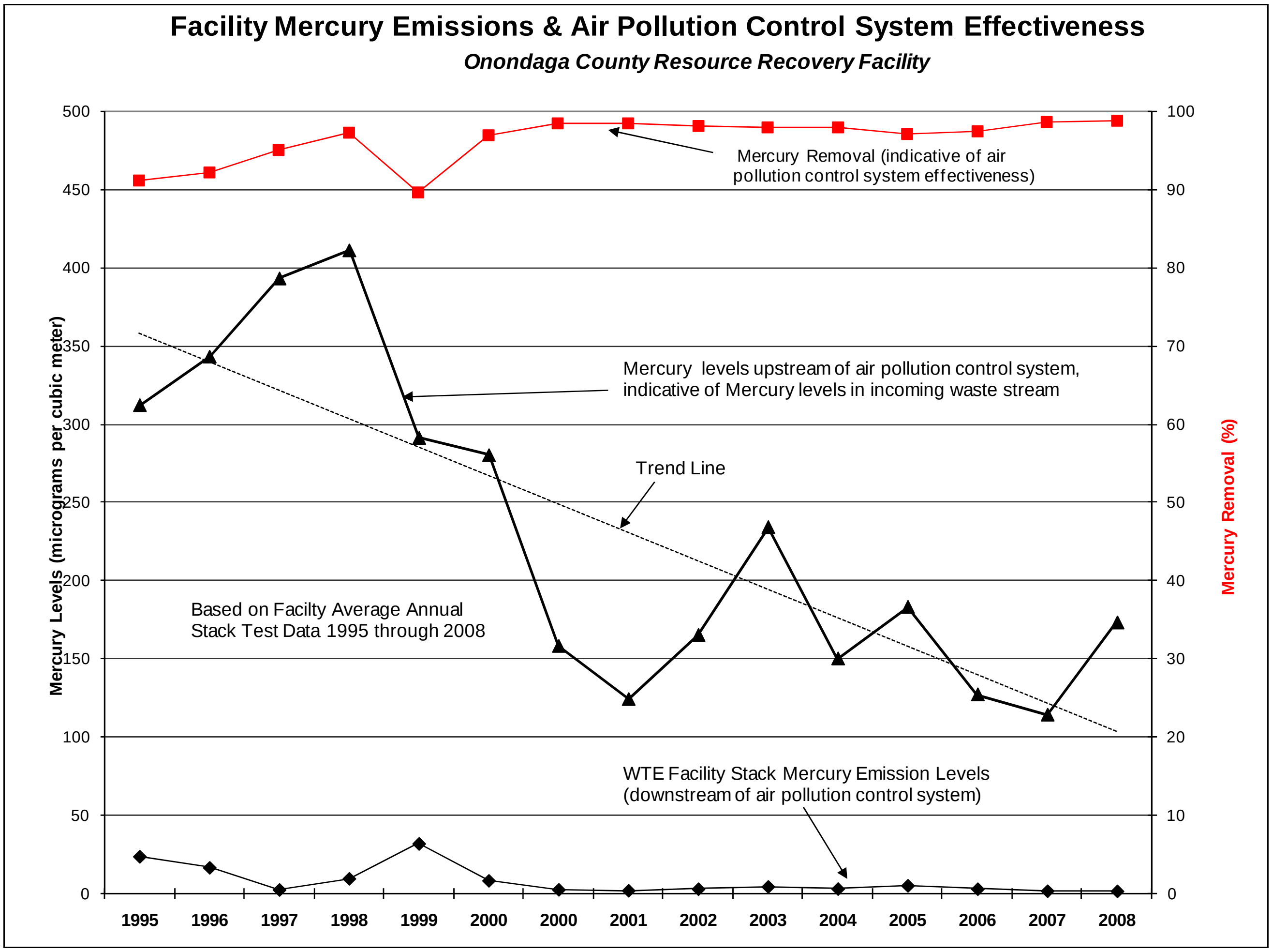
Some of these parameters will be discussed in further detail the following sections.

### 4.2.2 Mercury

To control mercury emissions, powdered activated carbon is mixed into slurry and injected into the spray-dry scrubbers through a rotary atomizer, which creates tiny droplets. The activated carbon reacts with the mercury in the gas exiting the boiler and forms particles that are captured in the baghouse. Still considered the most highly advanced control technology, activated carbon injection has been used at WTE facilities for the past decade; however activated carbon injection is just beginning to be used at coal-fired power plants.

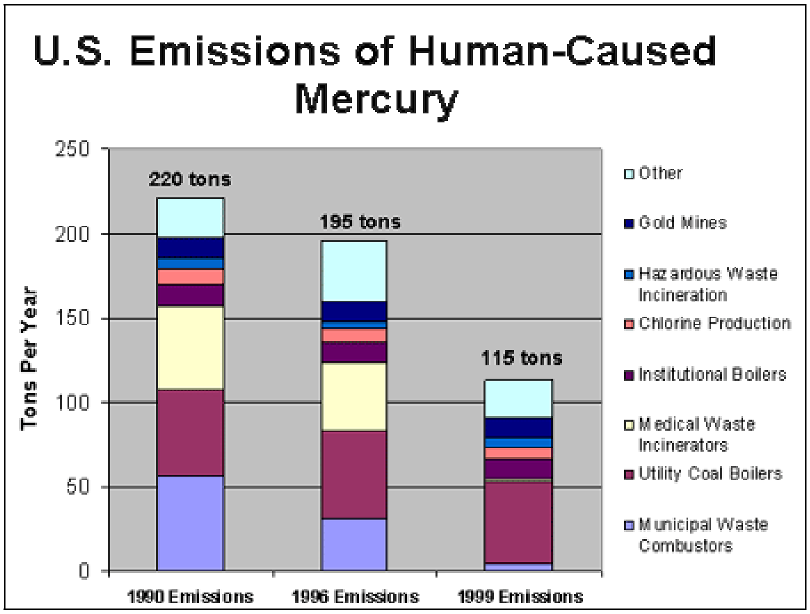
In addition to advanced control technologies, it's important to limit the amount of mercury in the incoming waste stream. OCRRA has multiple programs in place to do just that. These programs include household hazardous waste collection events, an ongoing mercury-containing thermostats and thermometer exchange at OCRRA's Rock Cut Road Transfer Station (a joint program with Covanta), OCRRA's Community Collection Center and partnerships with local businesses for electronic waste and household fluorescent collections, active daily sorting activities at OCRRA's transfer stations, and active daily screening at the Facility itself. Coupled with extensive public education efforts, these programs have had a significant impact.

The figure on the following page shows the effectiveness of the Facility's mercury control system, as well as the inlet and outlet (stack) average mercury concentrations. Inlet concentrations indicate the level of mercury in the incoming waste stream. As shown, inlet mercury levels since 1995 have exhibited a dramatic decrease, which has been the result of OCRRA's programs to remove mercury from the local waste stream, as well as restrictions on the mercury content of many products, most notably, alkaline batteries.




Average mercury emissions measured during 2008 annual stack testing event were less than 5% of the Facility's current permit limit of 28 micrograms per dry standard cubic meter and the average effectiveness of the Facility's carbon injection system for removing mercury was 98.8 % (85% removal efficiency is required).

In 1990, the contribution of atmospheric mercury from coal-fired power plants and WTE facilities were similar and substantial. During the following decade Maximum Achievable Control Technology (MACT) emission standards were imposed on municipal waste combustors (MWCs) and the contribution to atmospheric mercury from MWCs relative to coal-fired power plants dropped dramatically. According to the USEPA Memorandum mentioned previously, mercury emissions from MWCs were reduced by 96% from 1990 to 2005. While coal-fired plants still contribute over 40% of all domestic human-caused mercury emissions in the U.S., according to the USEPA, mercury emissions from WTE plants have decreased to about 4% of the total. The following chart has been provided from USEPA's website.



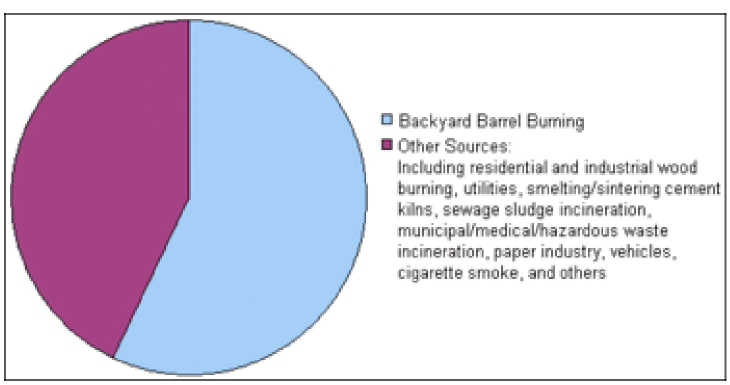

Source: USEPA website: www.epa.gov/mercury/control_emissions/emissions.htm

### 4.2.3 Dioxin/Furan

Like mercury emissions, dioxin and furan emissions constitute considerable environmental concern. The Onondaga County WTE Facility has several permit limits associated with dioxin/furan emissions. The 2008 results were all at least 95% below the associated permit limits (actual percentage below permit limit are 95%, 96%, and 98%). These levels are exceptionally small and indicative of effective combustion and air pollution controls.

2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) is the most toxic congener of dioxin. The total dioxin toxic equivalence (TEQ) value expresses the toxicity as if the mixture were pure TCDD. For 2008, the estimated annual TEQ dioxin/furan emissions (calculated using an average of the 2008 lb/hr TEQ emission rates for Units 1, 2, and 3) are 0.00007 lbs (70 millionths of a pound), the equivalent of 3% of the weight of a standard paper clip.

Over the past 20 years, the WTE industry has drastically reduced dioxin/furan emissions –by more than 99% (see table from referenced EPA memo). Today, backyard burn barrels emit more dioxins and furans than all other sources combined. The pie chart below is from NYSDEC's website and it provides data from an EPA study during 2002 to 2004.



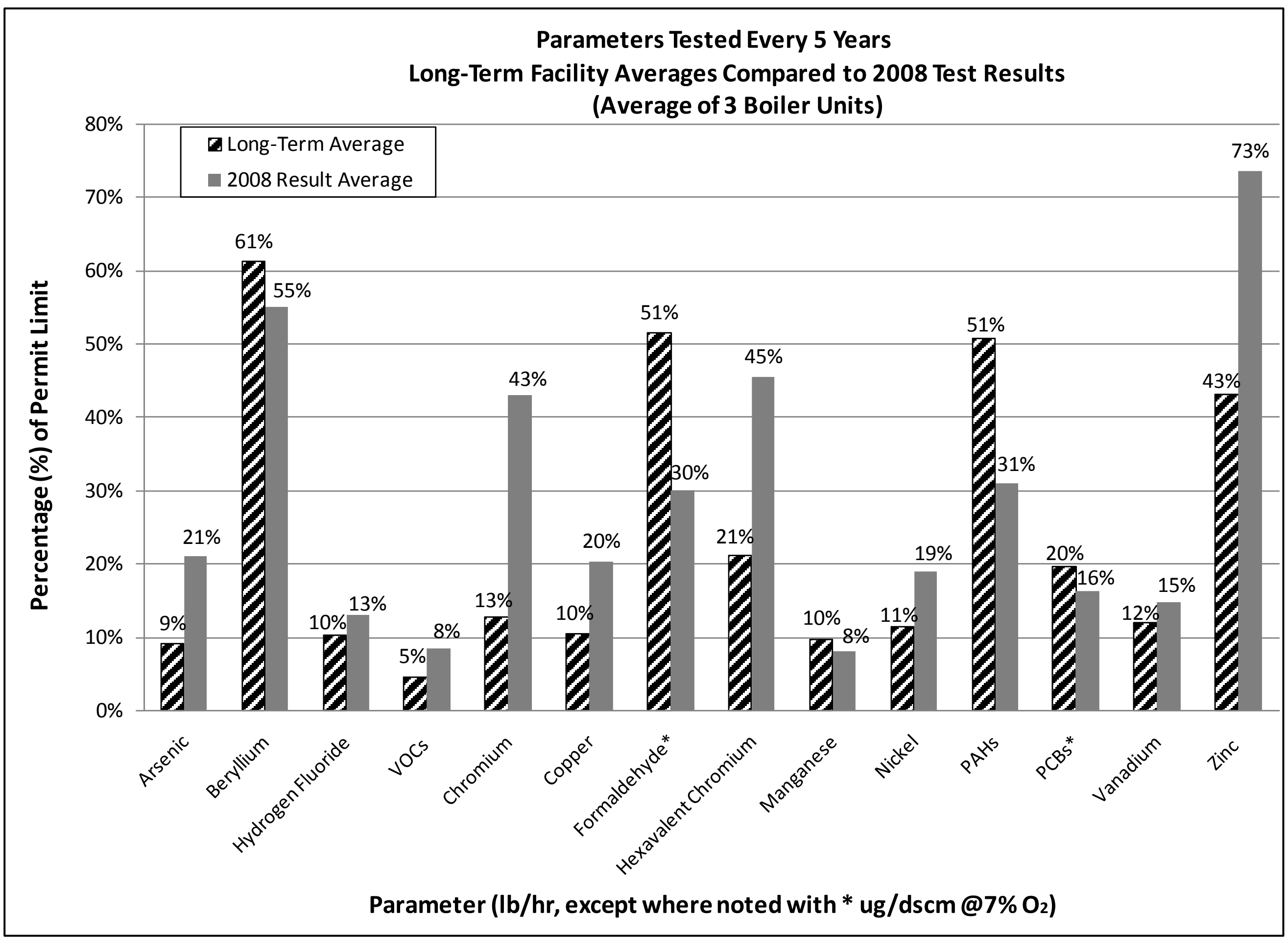

Source: NYSDEC website - http://www.dec.ny.gov/chemical/32065.html

Some good news is that NYSDEC recently passed new open burning regulations that are effective October 14, 2009. The new regulations prohibit burning household trash in burn barrels or piles statewide, with few exceptions, and should substantially reduce atmospheric dioxin/furan emissions.

### 4.2.4 Parameters Tested Every Five Years

In addition to the ten annually tested parameters, 14 additional parameters were tested in 2008. These 14 parameters are subject to five-year testing and were last tested in 2003. Four of the parameters are federal requirements – arsenic, beryllium, hydrogen fluoride, and volatile organic compounds (VOCs), while the ten others are NYSDEC requirements. The permit limits associated with the NYSDEC requirements are Facility-specific permit limits that are based on the Facility's 1995-2000 stack testing data.

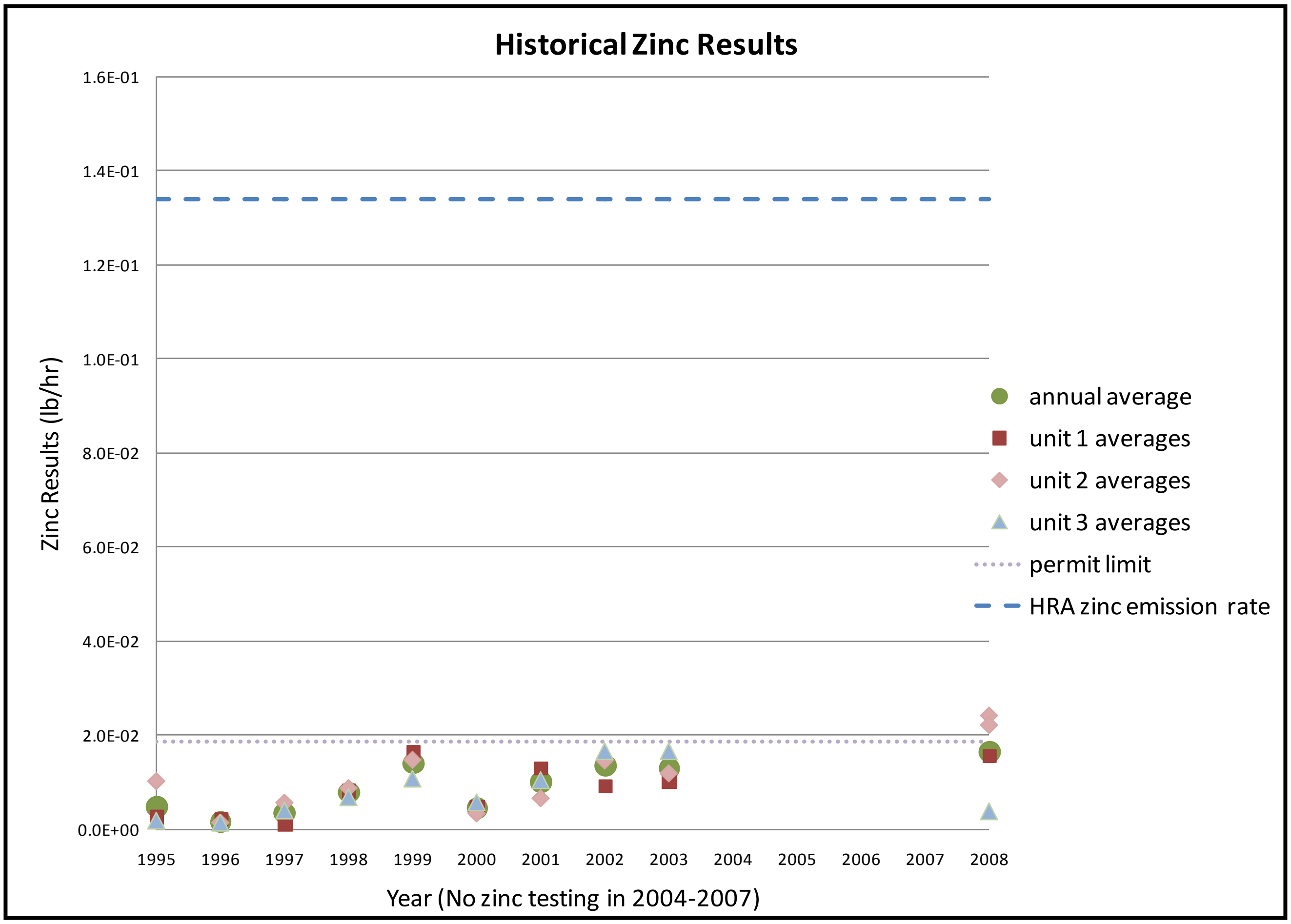
The figure below presents a comparison of the 2008 stack test results with their respective long-term Facility averages (1995 through 2007) for the parameters tested every five years (however, these parameters were tested annually through 2003). The results are graphed as a percentage of their respective permit limits. The 2008 results are generally consistent with historical results and continue to be below regulatory limits. Although these results are closer to their respective permit limits, the results indicate that the Facility's air pollution control system continues to operate effectively, and that OCRRA's efforts in screening the incoming waste are effective.



### 4.2.5 Zinc

The average zinc result for boiler Unit #2 was above the permit limit; however the results for boiler Units #1 and #3 were below the permit limit. Historically, the Facility has never had a zinc result above the permit limit. To determine if this event was an anomaly, Unit #2 was retested in December 2008. The results again indicated a zinc result above the permit limit.

Since other parameters indicated the air pollution control equipment was properly functioning, the 2008 Unit #2 zinc result could have been due to increased levels of zinc in the incoming waste stream. However, if that was the case, it is surprising that the results for Units #1 and #3 were below the permit limit. Perhaps the specific waste being processed during the Unit #2 testing simply had higher than normal zinc content. To gain a better understanding, zinc will now be tested annually rather than every five years. The chart below indicates the historical zinc results.




Zinc emissions are caused by zinc in the incoming waste stream. Unfortunately, the exact source is difficult to target, as zinc is used in a wide variety of everyday products – from galvanized metal and alkaline batteries to shampoos and deodorants. You may even have zinc in your pocket right now – a penny is 97.5% zinc.

It's critical to note that the Unit #2 zinc result was well below the levels determined as acceptable in the Facility's Health Risk Assessment, which was part of the detailed permitting process required prior to building the WTE Facility. Zinc is a naturally occurring mineral, required for human health. However, like almost all essential minerals, excess exposure to zinc may be harmful.

The current permit limit for zinc is not a health-based limit. It is based on very limited information available during the early 1990s from other out-of-state WTE facilities. NYSDEC used a total of twelve stack test data points to develop this limit, which was incorporated into the Facility's original Certificate to Operate. NYSDEC's intent was to generate Facility-specific data over the first four years of operation and then replace the permit limit with a Facility-specific permit limit. However, a provision in the permit stated that the permit limit could not increase. Later on, when Facility-specific data was available, it indicated that an appropriate zinc permit limit for the Facility would be an increase to the original permit limit.

Due to the permit provision, the limit was never revised, despite the fact that data indicated future testing would likely result in a permit exceedance. In retrospect, it is evident that a Facility-specific permit limit should have been established. As such, OCRRA and Covanta are appropriately requesting that the current permit limit be revised to reflect Facility-specific data, but at a level below the Health Risk Assessment level.

There are currently ten WTE facilities in New York State. Six out of the ten facilities do not have a zinc permit limit and therefore those facilities do not test for zinc. This is due to the fact that zinc is not generally considered to be a significant contaminant of concern. The other three facilities have a permit limit much higher than the Onondaga County WTE Facility's zinc permit limit. This information is presented in the table below.

| *Facility Name* | *Permit Issued* | *Permit Expires* | *Emission Limits for Zinc?* | *Permit Limit (lb/hr per boiler)* | *Individual Boiler Capacity (tons per day)* | *Number of Boiler Systems* | *Energy Generation at Rated Capacity (MW)* |
|---|---|---|---|---|---|---|---|
| BABYLON RESOURCE RECOVERY FACILITY | Aug 26 2008 | Mar 22 2009 | NO | NA | 375 | 2 | 17 |
| COVANTA NIAGARA LP | Aug 27 2008 | Jun 4 2012 | YES | 0.0858 | 1125 | 2 | 50 |
| DUTCHESS CO RESOURCE RECOVERY FACILITY | Jul 28 2006 | Jul 27 2011 | NO | NA | 228 | 2 | 9.2 |
| HEMPSTEAD RESOURCE RECOVERY FACILITY | Aug 27 2008 | Nov 23 2009 | NO | NA | 835 | 3 | 72 |
| HUNTINGTON RESOURCE RECOVERY FACILITY | Aug 27 2008 | Dec 21 2010 | YES | 0.086 | 250 | 3 | 27.5 |
| ISLIP MCARTHUR RESOURCE RECOVERY FACILITY | Apr 30 2008 | Apr 3 2011 | NO | NA | 242.5 | 2 | 12 |
| ONONDAGA CO RESOURCE RECOVERY FACILITY | Mar 24 2003 | Jan 8 2007 | YES | 0.0188 | 330 | 3 | 39.5 |
| OSWEGO CO ENERGY RECOVERY FACILITY | Sep 25 2007 | Sep 24 2012 | NO | NA | 50 | 4 | 4 |
| WHEELABRATOR HUDSON FALLS | Aug 27 2008 | Aug 31 2009 | YES | 0.75 | 275 | 2 | 14.5 |
| WHEELABRATOR WESTCHESTER LP | Aug 27 2008 | Jan 29 2012 | NO | NA | 750 | 3 | 60 |

## 4.3 2008 Ash Testing Results

Semi-annual ash testing determines whether residual ash, the byproduct of turning non-recyclable trash into energy, should be managed as a non-hazardous or hazardous material. A representative sample of residual ash is collected according to NYSDEC and USEPA protocols. The sample is then analyzed by an independent laboratory for leachable metals, according to USEPA's Toxicity Characteristic Leaching Procedure (TCLP). TCLP analysis simulates landfill conditions (the final disposal site for the ash) and determines whether the ash exhibits hazardous characteristics. Over the life of the Facility (including 2008 results), TCLP analysis has always indicated that the ash is non-hazardous. A summary of the ash residue test results for 2008 is provided below.

| 2008 ASH RESIDUE CHARACTERIZATION TEST RESULTS | | | |
|---|---|---|---|
| **Semi-Annual Test Results - May 2008** | | | |
| ***Constituent*** | ***Test Result*** | ***Permit Limit*** | ***Pass or Fail*** |
| Cadmium | 0.35 mg/L | 1 mg/L | Pass |
| Lead | 1.175 mg/L | 5 mg/L | Pass |
| **Semi-Annual Test Results - December 2008** | | | |
| ***Constituent*** | ***Test Result*** | ***Permit Limit*** | ***Pass or Fail*** |
| Cadmium | 0.32 mg/L | 1 mg/L | Pass |
| Lead | 0.5 mg/L | 5 mg/L | Pass |
| ***Conclusions*** | | | |
| *Ash residue does NOT exhibit a hazardous characteristic. As such, it should continue to be managed as a non-hazardous solid waste.* | | | |

In 2008, 88,726 tons of combined ash residue (consisting of mixed fly and bottom ash) was sent to Seneca Meadows Landfill in Waterloo, NY for final disposal. This is just about 25% of the original weight of the material and approximately 10% of the original volume.

## 4.4 Combustion versus Landfilling

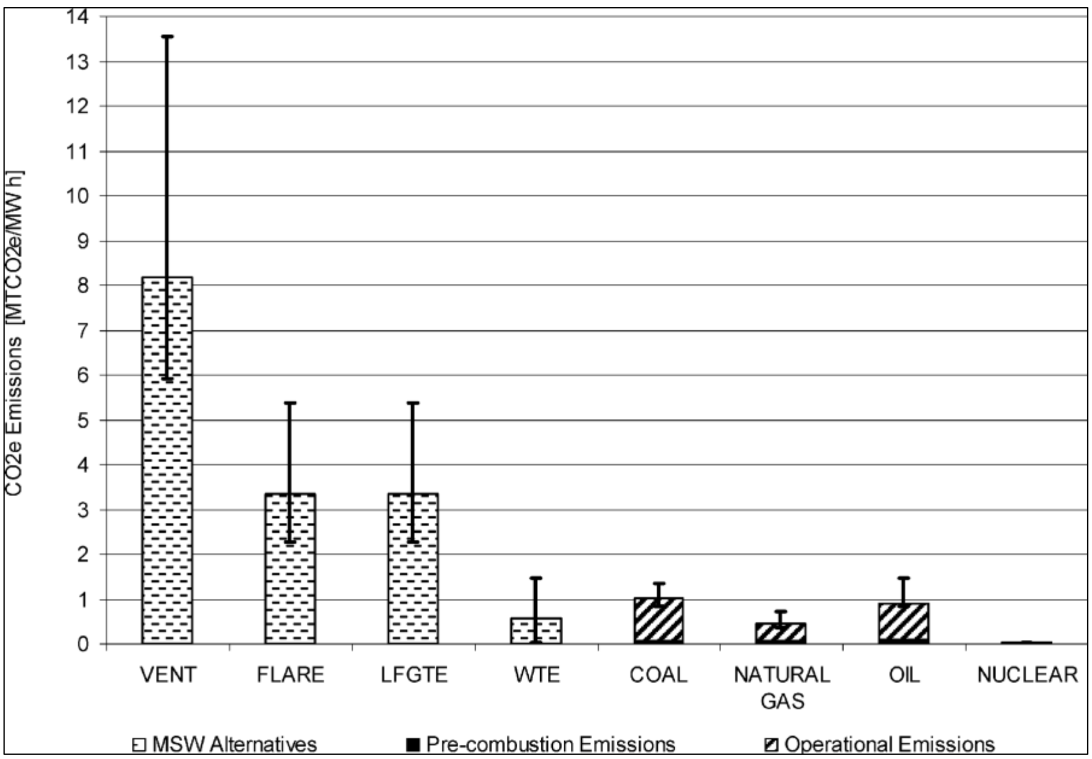
A recent USEPA-authored journal article published in Environmental Science and Technology applies a life-cycle analysis model to evaluate whether it's better to burn or bury MSW. The article is titled, "Is It Better to Burn or Bury Waste for Clean Energy Generation?" and the analysis compares greenhouse gas emissions and emissions of other pollutants for WTE and landfill gas-to-energy (LFGTE), using a life-cycle analysis model. The study states that MSW is a viable source for electricity generation and finds that WTE is a better option than LFGTE because WTE generates significantly more electricity from the same amount of waste, with fewer emissions. Though not immediately intuitive, emissions from LFGTE are due to fugitive methane emissions in a landfill, as well as emissions from combusting landfill gas in an internal combustion engine. The last paragraph of the article provides a good summary and is provided on the following page (Kaplan, Decarolis, and Thornloe, 2009):

*"Despite increased recycling efforts, U.S. population growth will ensure that the portion of MSW discarded in landfills will remain significant and growing. Discarded MSW is a viable energy source for electricity generation in a carbon constrained world. One notable difference between LFGTE and WTE is that the latter is capable of producing an order of magnitude more electricity from the same mass of waste. In addition, as demonstrated in this paper, there are significant differences in emissions on a mass per unit energy basis from LFGTE and WTE. On the basis of the assumptions in this paper, WTE appears to be a better option than LFGTE. If the goal is greenhouse gas reduction, then WTE should be considered as an option under U.S. renewable energy policies. In addition, all LFTGE scenarios tested had on the average higher NOx, SOx, and PM emissions than WTE. However, HCl emissions from WTE are significantly higher than the LFGTE scenarios."* -

-Last paragraph from Kaplan, Decarolis, and Thornloe, 2009

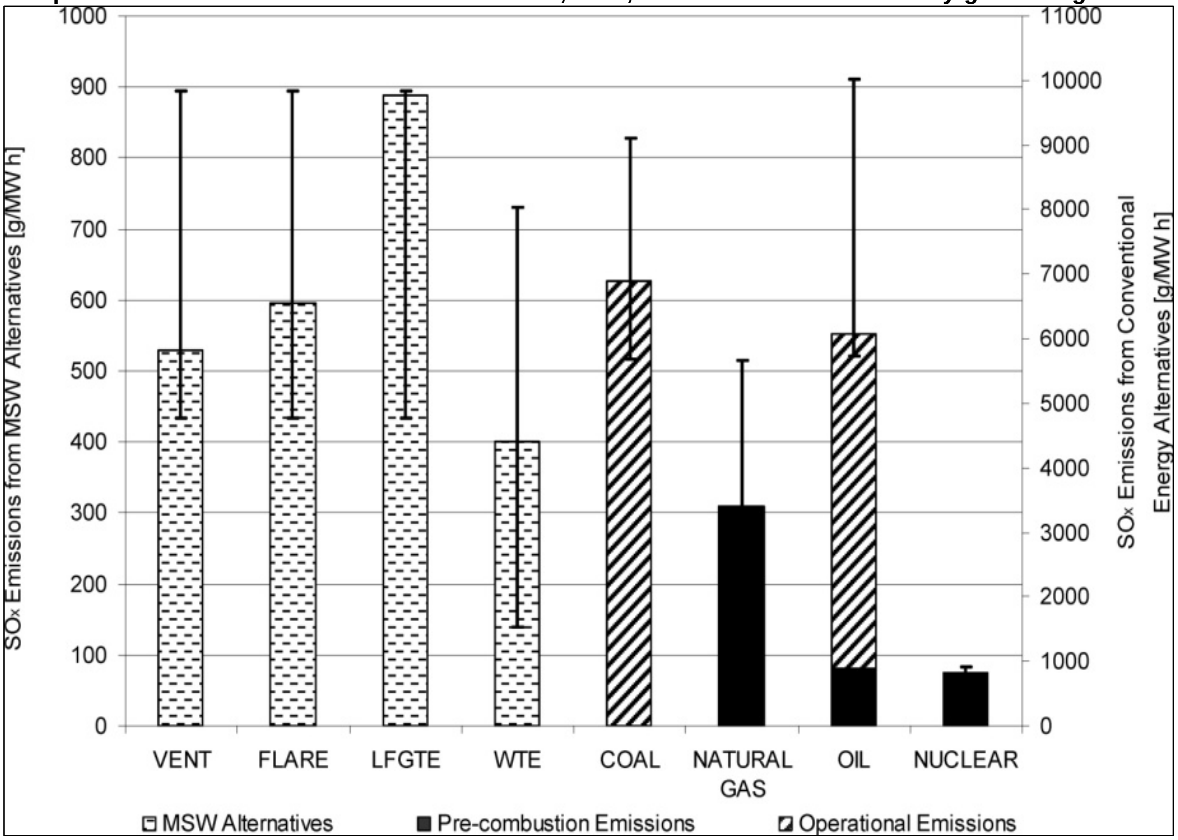
Several graphs from the article are provided below and on the next page. These graphs compare the relative emissions of greenhouse gas emissions, $NO_x$, and sulfur oxide ($SO_x$) for WTE, LFGTE, and conventional electricity generating technologies.

**Comparison of greenhouse gas emissions for LFGTE, WTE, and conventional electricity-generating technologies**



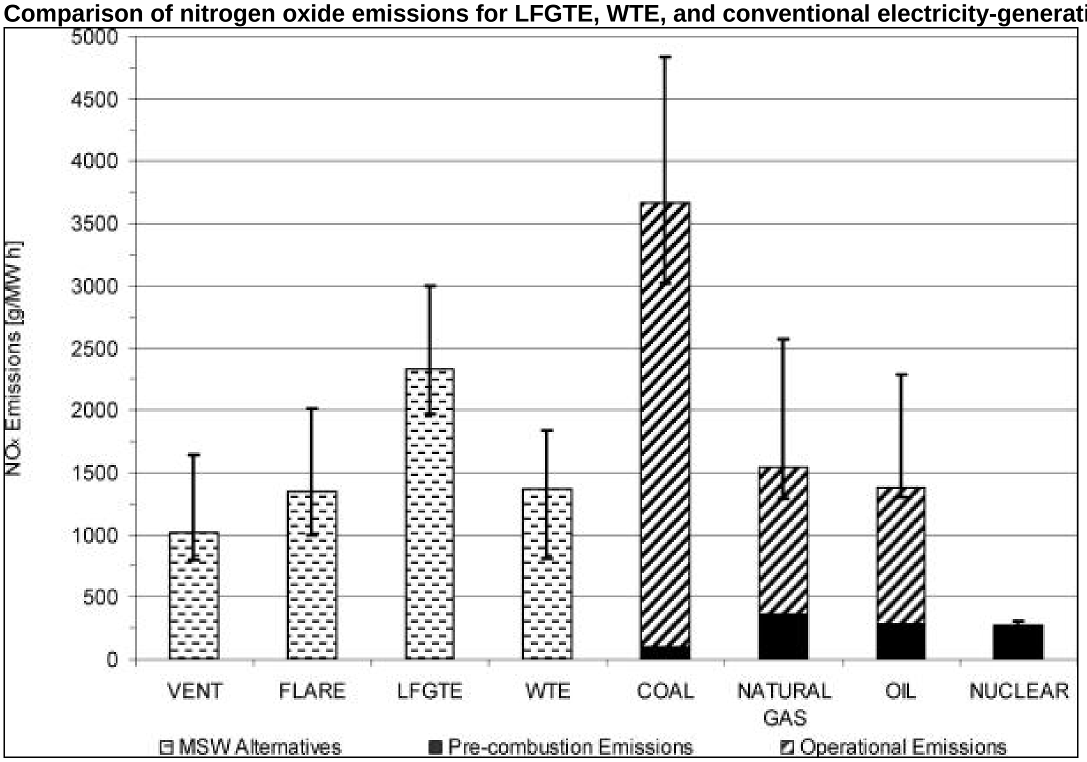

Source: Kaplan, Decarolis, and Thornloe, 2009 (Figure 2)

**Comparison of sulfur oxide emissions for LFGTE, WTE, and conventional electricity-generating technologies**




Source: Kaplan, Decarolis, and Thornloe, 2009 (Figure 3)

**Comparison of nitrogen oxide emissions for LFGTE, WTE, and conventional electricity-generating technologies**




Source: Kaplan, Decarolis, and Thornloe, 2009 (Figure 4)

## 4.5 Greenhouse Gas Emissions

Managing what happens to the County's non-recyclable trash is about choices. If Onondaga County did not have a WTE Facility, the County's non-recyclable trash would be destined for a landfill. Landfills generate methane (a potent greenhouse gas) as the trash degrades anaerobically. Although many landfills now have landfill gas collection systems and, ultimately, flare the landfill gas (and convert the methane to carbon dioxide), or preferably, generate electricity from the gas (landfill gas-to-energy), there are still fugitive landfill gas emissions because the landfill gas collection systems are not 100% effective. Although the Onondaga County WTE Facility generates carbon dioxide as a result of the complete combustion processes, when compared to emissions associated with landfilling, the emissions from the WTE Facility are significantly less.

In addition to having lower emissions (in terms of carbon dioxide equivalents), the WTE Facility offsets electricity that would have otherwise been generated using coal, natural gas, or nuclear fuels. According to the latest 2007 USEPA eGRID data (for 2004), New York's electricity generation resources (with associated percentages) are nuclear (29.6%), natural gas (19.6%), hydropower (16.9%), coal (16.6%), oil (15.4%), biomass (1.5%), other fossil (0.4%), and wind (0.07%). The carbon dioxide emissions associated with this profile are 907 lb/MWh. So in addition to reducing greenhouse emissions associated with disposal of non-recyclables (as compared to the alternative of landfilling), the WTE Facility recovery energy and generates electricity that would have otherwise by generated by an alternative source.

Lastly, every year the WTE Facility recovers about 12,000 tons of metals that would have otherwise gone to a landfill. The recovered metal is then recycled, which saves considerable energy and prevents greenhouse emissions that would have resulted from virgin metal production.

When all of these considerations are combined, the Onondaga County WTE Facility reduces greenhouse gas emissions (in carbon dioxide equivalents) by one ton for every ton of waste processed. Thus, in 2008, the Facility prevented 348,263 tons of carbon dioxide equivalent greenhouse gas emissions, which is the equivalent of taking nearly 58,000 cars off the road!

USEPA recently released a study entitled, "Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices" (September 2009). The study highlights several waste management practices, including waste prevention (source reduction), reuse/recycling, and WTE (energy recovery), that can lead to significant reduction in the country's greenhouse gas emissions. The study indicates there is significant GHG reduction potential associated with WTE facilities (*i.e.,* energy recovery).

## 4.6 Renewable Energy and Energy Independence

The Facility utilizes a locally-generated feedstock – the community's non-recyclable trash to generate a significant amount of electricity. This not only reduces dependence on fossil fuels, it also achieves goals of energy independence. In 2008 alone, the WTE Facility generated enough energy to displace nearly 418,000 barrels of oil or 104,500 tons of coal – enough energy to satisfy the needs of approximately 32,000 homes in OCRRA's service area. That is in addition to reducing the volume of non-recyclable trash by 90% and recovering ferrous and non-ferrous metal for recycling.

In many European countries and about half of the U.S. states, WTE (or energy from waste, as it is referred in Europe), is considered a renewable energy source. Most recently, President Barack Obama signed an Executive Order on October 5, 2009 that sets sustainability goals for Federal Agencies and defines WTE (*i.e.,* energy produced by MSW) as a renewable energy source. WTE was also highlighted as one of eight "key renewable energy sectors" by the World Economic Forum's recent (January 2009) report, "Green Investing – Towards a Clean Energy Infrastructure."

In a February 2003 letter to the Integrated Waste Services Association (IWSA) (currently the Energy Recovery Council), USEPA assessed WTE as "…clean, reliable, renewable power…"; "These plants produce 2,800 megawatts of electricity with less environmental impact than almost any other source of electricity." The Onondaga County Resource Recovery Facility is leading the way in providing an environmentally sound and cost-effective method of solid waste disposal while partially providing the energy needs of a community of 450,000 people.

## 4.7 Preservation of Landfill Capacity and Greenfields

In the United States, landfills are the predominant disposal alternative for MSW, with 54% of MSW ending up in landfills, 13% going to WTE facilities, and 33% being recycled or composted (Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2007, USEPA). Over the past couple of decades, the number of landfills has decreased dramatically, however the size of the remaining landfills is substantially larger. Due to economies of scale, these "mega-landfills" are becoming the norm. However, as you can imagine, "mega-landfills" take up massive amounts of open space.

WTE facilities preserve existing landfill capacity by reducing the volume of MSW by 90%. This means that the current landfill capacity will last longer, and that "greenfields" will not be utilized for landfill expansion projects. Had the 348,263 tons of waste processed at the Facility in 2008 been landfilled, it would have utilized nearly 1.5 million cubic yards of landfill space. To put this into perspective, if the waste was compacted to a 20-foot height, the landfilled waste would consume about 28 acres of land.

## 4.8 Compatibility with Recycling

In Onondaga County, which has one of the highest recycling rates in the State and perhaps in the nation, it seems it is trivial to question the compatibility of WTE and recycling. However, WTE facilities are often thought to compete with recycling. Interestingly, study after study, it has been shown that communities with WTE facilities often have higher recycling rates than communities that landfill their non-recyclable trash, both in Europe and the United States. A recent study (June 2009) entitled "A Compatibility Study: Recycling and Waste-to-Energy Work in Concert, A 2009 Update" again indicates the same conclusion.

## 5.1 Waste-to-Energy Facility Financial Summary

A simplified financial summary of OCRRA's revenues and expenses associated with the WTE Facility for 2008 is provided below. Please note that the presentation of information in this report is different from the presentation in OCRRA's financial statements. The information in this report should not be used for financial accounting purposes and is only intended to provide a simplified perspective on OCRRA's costs and expenses associated with the WTE Facility. It should be emphasized that the revenues and expenses described in this report pertain specifically to OCRRA; Covanta Onondaga also has Facility-related operating revenues and expenses that are not described in this report.

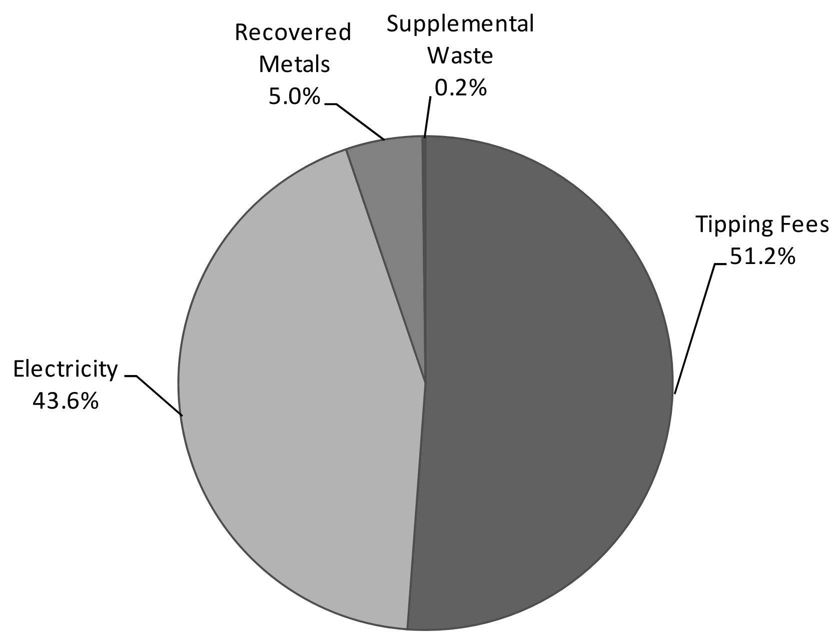
| | | |
|---|---|---|
| ***Operating Revenues*** | | |
| | Tip Fee for MSW Delivered Directly to Facility.................. | 15,845,445 |
| | OCRRA's Electricity Share........................................ | 13,505,510 |
| | OCRRA's Recovered Metals Share.............................. | 1,551,970 |
| | Supplemental Waste Tip Fee...................................... | 62,382 |
| | ***Total*............................................................** | **30,965,307** |
| | | |
| ***Operating Expenses*** | | |
| | Operations and Maintenance Service Fee | 10,516,938 |
| | Ash Transportation and Disposal | 4,139,068 |
| | Excess Waste Fee | 801,558 |
| | Pollution Control Reagents | 702,939 |
| | Taxes/Fees | 345,014 |
| | Utilities | 245,563 |
| | Other Expenses | 685,709 |
| | ***Total*............................................................** | **17,436,789** |
| ***Bond Expenses*.......................................................** | | **11,480,717** |
| ***Total Expenses*.......................................................** | | **28,917,506** |

As evident, OCRRA's operating revenues roughly balance with the total expenses (with net gain of just more than $2 million). These Facility-related revenues and expenses constitute a significant portion of OCRRA's total Agency revenues and expenses. To provide some perspective, in the 2008 budget, WTE Facility-related operating and bond expenses accounted for 63.1% of OCRRA's total Agency expenses. Similarly, WTE Facility-related operating revenues accounted for roughly 75% (estimated assuming 75% of tipping fee revenues are associated with the Facility) of OCRRA's total Agency revenues.

In 2008, total cost per ton of MSW processed was approximately $83 and total revenue per ton of MSW processed was approximately $89. As evident, WTE facilities like the local Facility have tremendous fixed costs. If those fixed costs are not offset by sufficient electricity revenue and tipping fees, there may be facility-related net losses. In 2008, the annual cumulative average electricity rate was $0.06827 per kWh, which exceeded the contract floor pricing of $0.06 per kWh.

## 5.2 Waste-to-Energy Facility Operating Revenues

OCRRA's operating revenues associated with the WTE Facility include tipping fees for waste delivered *directly* to the Facility (not including tipping fees for waste delivered to OCRRA's transfer stations), sale of electricity generated by the Facility, the sale of metals recovered by the Facility, and revenue derived from the supplemental waste program. A summary of the relative contribution of these revenues is provided in the pie chart below. It should be emphasized that the revenues described in this report are revenues that pertain to OCRRA. Covanta Onondaga also receives Facility-related operating revenues that are not described in this report.



Facility Operating Revenues

Although MSW and C&D from OCRRA's transfer stations are delivered to the WTE Facility, tipping fees are collected at the transfer stations and are therefore not included in this financial summary. Similarly, the cost of processing MSW and C&D at the transfer stations is not included in this report. However, it should be noted that electricity generated from the transfer station MSW and C&D is included in the electricity revenue.

### 5.2.1 Tip Fee for MSW Delivered Directly to Facility

Tipping fees for MSW delivered directly to the Facility account for more than half (51.2% or $15,845,445) of the revenues associated with the WTE Facility. OCRRA receives the full tipping fee for MSW delivered directly to the Facility. In 2008, tipping fees were $65 per ton, with a $4 prompt payment discount. Most haulers take advantage of the prompt payment discount; therefore OCRRA generally received revenues of $61 per ton. OCRRA's office staff is responsible for billing and collecting payments from haulers.

### 5.2.2 OCRRA's Electricity Share

Electricity sales represent the other major revenue component (43.6%) associated with the WTE Facility. OCRRA receives 90% of the electricity revenues, with Covanta Onondaga receiving the remaining 10%.

For 2008, the total amount of electricity sold was 219,491 MWh. Based on the OCRRA/National Grid (formerly Niagara Mohawk) contract, electricity payments are calculated using the greater of $0.06 per kWh (minimum floor pricing effective through February 2009) or National Grid's reported "avoided cost" market pricing. The 2008 annual cumulative average electricity rate was $0.06827 per kWh, which exceeded the floor pricing of $0.06 per kWh. Total energy revenues were $15,006,122, with OCRRA's 90% share generating $13,505,512 in revenue.

### 5.2.3 OCRRA's Recovered Metal Share

Although revenue from recovered metal sales represents only 5.1% of OCRRA's total Facility-related revenues, $1,551,970 is still a significant source of revenue. In late June 2008, the Onondaga County WTE Facility's non-ferrous metal recovery system became operational, thereby boosting the Facility's metal revenues. OCRRA and Covanta Onondaga spilt metal recovery revenues, each receiving 50%. A breakdown of tonnage and revenues for the non-ferrous and ferrous recovery systems is provided below.

| | *Tonnage* | *OCRRA's Revenue* |
|---|---|---|
| *Ferrous Metal* | 11,775 | $1,440,591 |
| *Non-Ferrous Metal* | 252 | $111,379 |

Average ferrous and non-ferrous pricing for 2008 were about $250 and $1000 per ton, respectively. Prices were volatile over the course of the year, reaching historical highs in July ($389 per ton for ferrous and $1384 per ton for non-ferrous) and then declining until November ($15 per ton for ferrous and $463 per ton for non-ferrous) with a slight rebound in December ($91 per ton for ferrous and $689 per ton for non-ferrous).

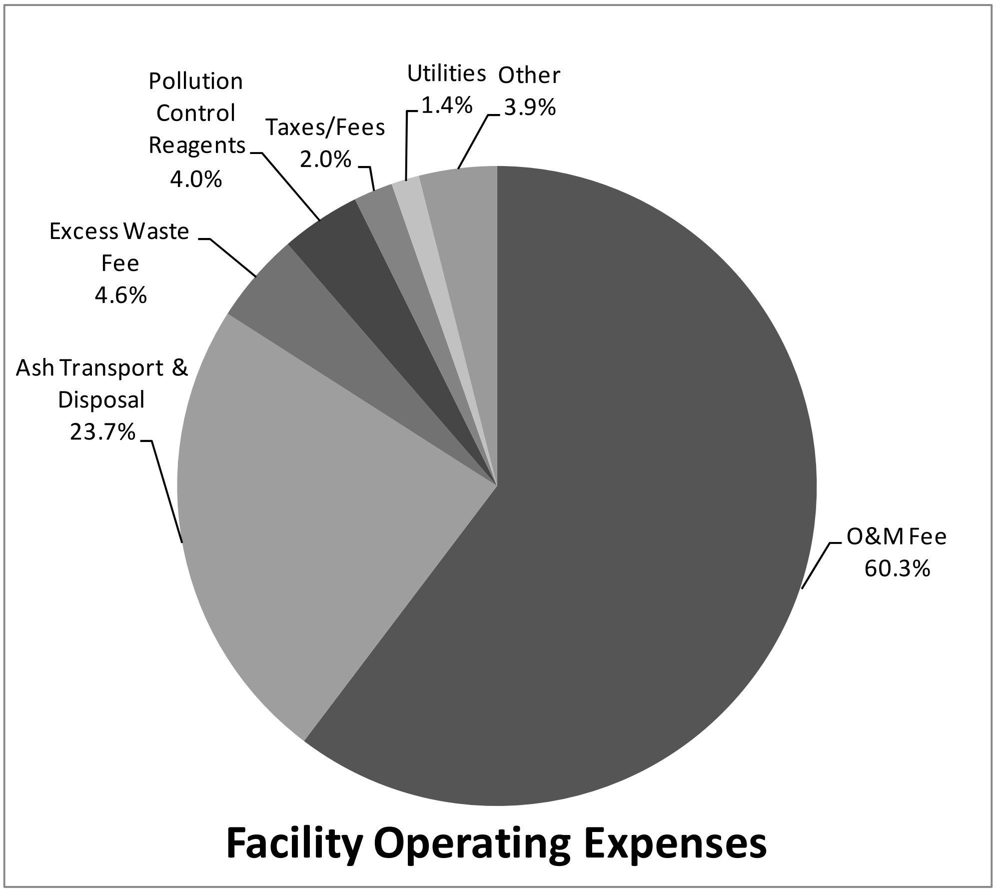
### 5.2.4 Supplemental Waste Tip Fee

The supplemental waste program is in place to provide proper disposal for waste streams other than MSW that may need special handling, secure destruction, or other special provisions. These wastes are carefully screened and evaluated to ensure that they will not impact Facility operations, including air emissions. Covanta Onondaga administers the supplemental was program with oversight from NYSDEC and OCRRA. As such, Covanta receives the established tipping fee for the first 500 tons of waste and thereafter Covanta receives the established tipping fee less OCRRA's tipping fee, which OCRRA receives.

In 2008, 1,522.66 tons of supplemental waste was processed, generating $62,382 in revenue for OCRRA. The types of waste processed in 2008 include pill bottles with labels (which under the HIPAA regulations require secure destruction); confiscated drugs, uniforms, and other paraphernalia from drug enforcement agencies; and pharmaceutical laboratory debris.

## 5.3 Waste-to-Energy Facility Operating Expenses

The operating expenses associated with the WTE Facility include an operations and maintenance (O&M) service fee paid to Covanta to maintain the Facility, the costs to transport and dispose of ash generated by the Facility, an excess waste fee payment to Covanta if more than 310,000 tons of MSW is processed at the Facility, costs associated with pollution control reagents, taxes/fees, utilities, and other miscellaneous expenses (described further below). A summary of the relative contribution of these expenses is provided in the pie chart below. It should be emphasized that the operating expenses described in this report are expenses that pertain to OCRRA. Covanta Onondaga also has Facility-related operating expenses that are not described in this report.




### 5.3.1 Operations and Maintenance Service Fee

OCRRA pays an operations and maintenance (O&M) service fee for Covanta Onondaga to operate, repair, and maintain the Facility in accordance with the 2003 Service Agreement between OCRRA and Covanta Onondaga. OCRRA also pays an O&M fee for Covanta Onondaga to operate, repair, and maintain the newly installed non-ferrous metal recovery system. Each calendar year the O&M fees are adjusted according to several indices (skilled labor index, producer price index, and employment cost index) and OCRRA's annual tipping fee. However, in 2008, OCRRA and Covanta Onondaga agreed upon an escalation factor of 3.73% over the 2007 base O&M service fee because the original employment index was discontinued. Since the non-ferrous metal recovery system began operation in 2008, an adjustment factor was not applied. In 2008, the base O&M service fee was $10,498,044 and the non-ferrous O&M fee was $18,894, for a total of $10,516,938.

### 5.3.2 Ash Transportation and Disposal

OCRRA is responsible for transporting and disposing of ash residue generated at the Facility. The associated costs were estimated from a unit cost report and include all costs associated with handling and disposal of ash residue (salaries, fuel, tolls, tip fees, social security, insurance, and maintenance). The average unit cost for 2008 was approximately $46.65 per ton, with 88,726 tons of ash being managed. Therefore, the total ash transportation and disposal costs for 2008 were approximately $4,139,068.

### 5.3.3 Excess Waste Fee

According to the 2003 Service Agreement between OCRRA and Covanta, OCRRA is required to pay Covanta an excess waste fee if the Facility processes more than 310,000 tons of material in the calendar year. The unit fee per ton of waste greater than 310,000 is adjusted annually, based on the same indices as the O&M Service Fee adjustment. For 2008, the unit fee was $21.61. The excess waste fee is not applicable for supplemental waste; therefore the quantity of supplemental waste is subtracted from the amount of waste processed in excess of 310,000 tons. In 2008 the Facility processed 36,741 tons of excess waste, resulting in an excess waste fee payment to Covanta of $793,965.

### 5.3.4 Pollution Control Reagents

The Facility uses several reagents for pollution control including anhydrous ammonia for control of $NO_x$, carbon for mercury and dioxin/furan control, and lime for control of acid gases. The cost of these reagents is generally a pass-through cost to OCRRA, with the exception of lime for which OCRRA only pays a portion of the cost.

To control $NO_x$ emissions, anhydrous ammonia is injected into the combustion chamber of each boiler unit. There are no contractual maximum levels for ammonia usage, so OCRRA is solely responsible for the expense of all ammonia used. In 2008, the cost for ammonia reagent was $234,620 for 270 tons of anhydrous ammonia at an average cost of about $870/ton. The average cost of anhydrous ammonia, which is directly proportional to the cost of natural gas, increased by 64% over the 2007 average cost. Given the 2008 waste tonnage processed, these figures translate into an application rate and unit cost for $NO_x$ control of 1.55 lb and $0.67 per ton of waste processed, respectively. The application rate is consistent with those of previous operating years; however the unit cost is significantly higher due to historically high natural gas prices in 2008.

To control mercury emissions, as well as dioxin and furan emissions, powdered activated carbon is mixed into slurry and injected into the spray-dry scrubbers through the rotary atomizer. The rotary atomizer creates tiny droplets for optimal reaction. There are no contractual maximum levels for carbon usage, so OCRRA is solely responsible for the expense of all carbon used. In 2008, the cost for activated carbon was $303,415 for 264 tons of activated carbon at an average cost of $1,151 per ton. The average carbon reagent application rate for 2008 was 1.51 lb per ton of waste processed, a rate within the historical range, and the unit cost was $0.87 per ton of waste processed. The 2008 average unit cost for activated carbon was nearly 70% over the 2007 unit cost.

To neutralize acid gases, namely sulfur dioxide ($SO_2$), hydrogen chloride (HCl), hydrogen fluoride (HF), and sulfuric acid ($H_2SO_4$), a calcium-based lime, commonly referred to as pebble lime, is injected into the spray-dry scrubbers through the rotary atomizer. According to an agreement between OCRRA and Covanta, OCRRA is responsible for the cost associated with the pebble lime usage in excess of 21 pounds of pebble lime per ton of waste processed, up to a maximum of 32 lb per ton of waste processed. Covanta is responsible for pebble lime reagent costs up to 21 lb per ton of waste processed and above 32 lb per ton of waste processed. In 2008, OCRRA's cost for pebble lime was $166,814 and the average reagent application rate was 28.4 lb of pebble lime per ton of waste processed. The cost of the lime reagent for 2008 averaged about $130 per ton including the fuel surcharge.

Prior to making the decision to solely use pebble lime, dolomitic lime, a lime with a higher magnesium content than pebble lime, was added to the fly ash prior to combining with the bottom ash to provide additional conditioning of the fly ash. In August 2006, dolomitic lime use was discontinued and the reagent application rate for pebble lime increased above that needed for acid gas control. While still providing satisfactory ash conditioning, this change was implemented to improve housekeeping conditions, to reduce OCRRA's overall ash conditioning costs since pebble lime is a third less costly than dolomitic lime, and to produce a drier, more manageable combined ash residue for disposal.

### 5.3.5 Taxes/Fees

OCRRA is contractually responsible for the cost of the following taxes/fees:

- State and local sales taxes on Facility-related purchases – $42,439 in 2008
- Regulatory operating permit annual fees – $27,334 in 2008
- Host Community Agreement payments to the Town of Onondaga – $141,002 in 2008
- Special fire district tax assessments – $129,216 in 2008
- Special water district tax assessments – $5,023 in 2008

### 5.3.6 Utilities

During normal Facility operation, the Facility's electrical demand is satisfied by the Facility's turbine-generator system, with the excess electricity being exported to the grid. During those times when the turbine-generator is off-line due to maintenance or malfunction, electricity is purchased from National Grid (NG) to operate the Facility and continue combusting the incoming MSW. OCRRA is financially responsible for paying for the electricity purchased during these periods. The contractual threshold levels beyond which Covanta is responsible for such costs are as follows:

| | |
|---|---|
| Electrical Energy | 3,348,000 kWh/rolling 3-year period (maximum) |
| Electrical Demand | 4,400 kW (maximum per billing period) |

In 2008, 52,956 kWh of electricity was purchased from National Grid for in-plant needs during two unscheduled outages and one scheduled maintenance outage. The amount of electricity purchased during 2008 is generally consistent with their long-term averages. The only exception was in 2001 when a scheduled 11-day turbine-generator outage associated with the first major overhaul on this equipment since plant start-up in November 1994. The next major turbine-generator overhaul is scheduled for the spring of 2010.

The 3-year rolling period total for 2008 was 65,948 kWh, significantly less than the contractual maximum amount stated above. For 2008, the maximum monthly metered electrical demand was 3,888 kW. The cost of purchased power paid by OCRRA for 2008, including electrical usage and demand charges, was $85,216.

City water satisfies all potable and process needs of the Facility, with the majority being for process use. 31,720,000 gallons, representing 79% of the contractual maximum (40 million gallons per year) for which the Agency is financially responsible, were purchased in 2008. This amount of water translates into 91 gallons per ton of waste combusted or approximately 60 gallons per minute. 2008 water usage remained consistent with historical levels and design parameters following initial start-up. Total 2007 water costs were $52,552, or $1.66 per 1,000 gallons, an 8% increase from 2007.

Natural gas is an auxiliary fuel used for boiler start-ups and shutdowns, and for maintaining minimum furnace temperatures when processing overly wet waste. 2008 natural gas usage was 129,471 therms. This was the least amount of gas used annually and was due to considerably fewer shutdowns and start-ups following boiler tube leaks or other equipment malfunctions. The contractual maximum amount of natural gas OCRRA is financially responsible for is 110,000 therms per year, with Covanta being responsible for usage over 110,000 therms.

In 2008, natural gas was purchased under a contract with UGI Energy Services at an average rate of $0.86 per therm. A transportation charge from National Grid added an additional $0.12 per therm. Total natural gas costs were $126,202, with OCRRA's payment totaling $107,795.

### 5.3.7 Other Expenses

In 2008, OCRRA was financially responsible for several other Facility-related expenses including:

- Facility-related insurance premiums ($335,645);
- System telecommunications between Facility and National Grid ($6,152);
- Traffic signalization for the hauler entrance to the Facility ($1,326);
- OCRRA’s WTE engineering consulting services related to providing technical assistance and annual stack and ash testing on-site observations ($37,876); and
- Capital costs for the installation of the non-ferrous metal recovery system ($304,710).

In 2008, these “other expenses” totaled $685,709 with the non-ferrous system capital costs accounting for the majority of the expense.

## 5.4 Bond Expenses

Until May 2015, OCRRA is responsible for paying debt service on the bonds for the Facility. At that point, the Series A bonds will have been paid off and the responsibility of the Series B bonds will be transferred to Covanta Onondaga. OCRRA pays a set amount for the principal and interest on the Series A bonds; however the amount paid on the Series B bonds depends on the profitability of OCRRA in any given year. In 2008, OCRRA had a profitable year, therefore OCRRA made payments on the principal of the Series B bonds. The total payment on the Series A and B bonds in 2008 was $11,480,717.

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