

# Alexandria/Arlington Waste-to-Energy Facility Fiscal Year 2019 Annual Report



## Background

In 1984, an agreement was entered into between the Alexandria Sanitation Authority and the Arlington Solid Waste Authority to develop and construct a solid waste disposal facility having the capacity to handle 975 tons per day of waste from the City of Alexandria and Arlington County (the Jurisdictions). Waste-to-Energy was determined to be the most environmentally sustainable means of disposing of waste, after reduction, reuse and recycling. The waste-to-energy facility (the Facility), located at 5301 Eisenhower Avenue, Alexandria, is operated by Covanta Alexandria/Arlington Inc. (Covanta), and has been in operation since 1988. Over the years a number of enhancements and improvements have been made to the Facility primarily to meet the increasingly stringent air pollution requirements of the Clean Air Act, and the Facility has continued to reliably handle the waste from the Jurisdictions since it opened.

In 2012, both Jurisdictions entered into a new Waste Disposal Service Agreement, which became effective January 1, 2013, and in

December 2013 agreed to extend the site lease for the continued operation of the Facility by Covanta to the year 2038, and in return the Jurisdictions received a favorable rate for disposing of the Jurisdictional waste at the Facility. This Annual Report summarizes the operation of the Facility during Fiscal Year 2019 (FY19). For more information on the history of the Facility and details of its operation, go to:

<https://www.alexandriava.gov/tes/info/default.aspx?id=82377>.

HDR Inc. (HDR) was engaged to monitor the Facility performance and to perform regular inspections of the Facility on behalf of the Jurisdiction's Facility Monitoring Group (FMG). On a quarterly basis, HDR meets with the management of the Facility to discuss operational and maintenance issues, to acquire data, to perform an independent visual inspection of the Facility, and issue a detailed report of quarterly performance. Covanta is ultimately responsible for the operation, maintenance, environmental performance and safety issues at the Facility.



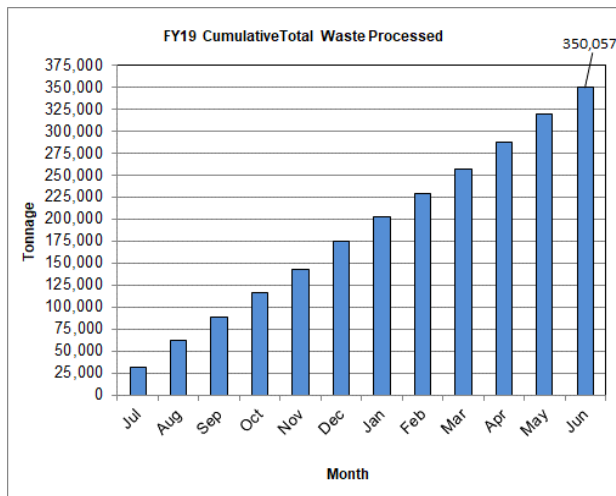
Photo: Facility Scale House and Scales

# Facility Performance

## The Process

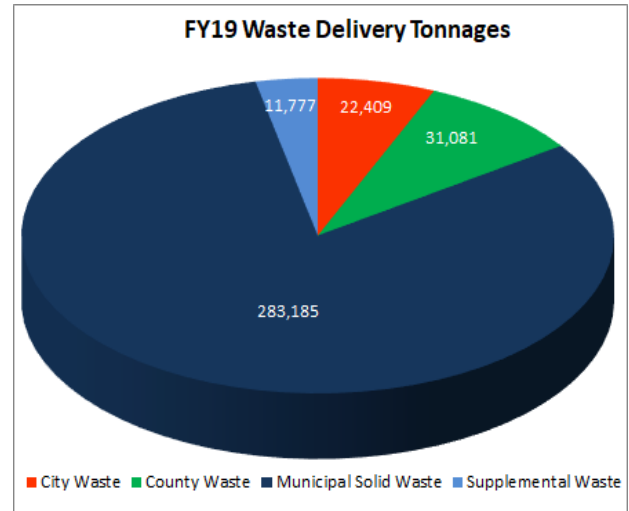
Household waste that is collected by the two Jurisdictions is brought to the Facility and discharged into a large pit. Operators at the Facility screen the incoming material to keep inappropriate wastes out of the combustion process. The waste is then moved by cranes to the combustion chambers, where the waste is burned at high temperatures, heating water to create steam which drives turbine generators to create electricity. The ash residue from the process is screened and ferrous metals are extracted via a magnet and recycled. The remaining ash is then sent to an approved ash disposal facility.

## Quantities of Waste



In FY19, the Facility processed a total of 350,057 tons of Municipal Solid Waste (MSW). The quantity of waste brought in by the City over the past several years, has remained fairly steady, and was 6.40% of total waste deliveries, while quantities of waste brought in from the County accounted for 8.88% of total waste deliveries. In FY19, 22,409 tons were delivered by the City, which is 5.7% more than the prior year, and an additional 31,081 tons were delivered by the County, which is an increase of 2.4% over FY18. The remainder of capacity at the Facility was filled with waste

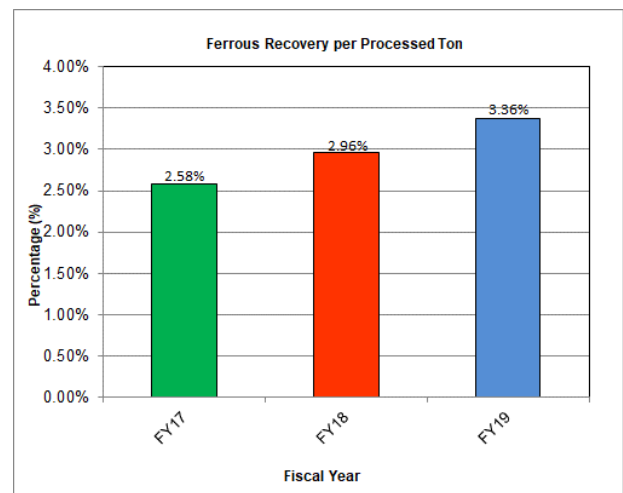
collected by commercial haulers, and with Supplemental Waste, which constitutes about 3.4% of the total amount.



Supplemental Waste is primarily confidential documents, pharmaceuticals and similar non-hazardous materials which require secure destruction. The amount of Supplemental Waste received at the Facility in FY19 totaled 11,777 tons, which is 28.3% less than last year.

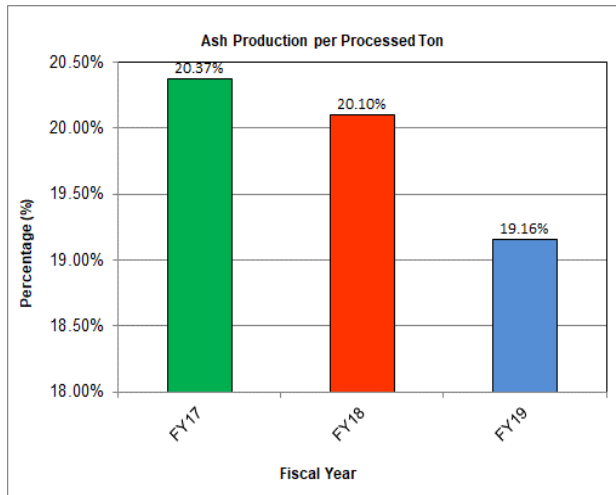
## Ferrous Metal Recycled

In FY19, 11,756 tons of ferrous metals were recovered from the ash and recycled. This is an increase of approximately 12.8% from the amount recovered in FY18, which is an excellent rate, but can vary with the waste stream.



## Ash Disposed

In FY19, 67,068 tons of ash generated at the Facility were disposed. The ash production rate, i.e. the tons of ash produced per ton of waste processed was 19.2%, and has remained in the range of about 20 percent for a number of years, which is excellent compared to other facilities.



## Steam

The Facility is regulated by its Title V permit with the Virginia DEQ, which has set an annual facility steam production limit of 1,170,400 tons, which is based upon an assumption that each pound of waste processed generates 3.34 pounds of steam. The facility was in compliance with this permit limit during all of FY19. In order to compare boiler performance on a year-to-year basis, when the actual waste content varies, steam production is also analyzed by converting raw waste tonnages to a “reference ton basis”. This metric in FY19 was 2.80 tons of steam per reference ton of waste, which is 0.6% higher than FY18 and indicates a slight improvement in boiler performance. The turbine generator performance is evaluated in terms of the quantity of steam that it takes to generate one kWhr of electricity, where a lower steam rate indicates better performance. In FY19, this metric was higher (1.4%) than the previous year, which indicates a slight decline in performance. It is worth noting that one of the

turbine generators requires some repair work to restore its original capacity and improve its efficiency.

## Facility Maintenance

Significant and routine maintenance was performed at the Facility throughout FY19, with each of the three boilers and two turbine generators experiencing downtime for the completion of various maintenance items. Covanta has been implementing an effective maintenance regimen, and is performing routine and preventative maintenance and selected equipment replacements in a timely manner.

## Operational Performance

As a result of routine maintenance activities, the average availability of the boilers was 96.4%, and the average availability of the turbine generators was 99.9% during FY19. This is considered to be excellent and comparable to that of mature, well-run waste to energy facilities.

## Housekeeping

Routine inspections have shown that Covanta is performing facility housekeeping and maintaining plant cleanliness in accordance with acceptable industry practices. Housekeeping ratings for each major area of the facility, both internally and externally, have been found to be acceptable during each of the quarterly inspections. HDR also identifies deficiencies during its inspections, and maintains a running list of the deficiencies and removes them from the list as they are corrected. In general, the deficiencies identified have been minor and don't require immediate attention. Throughout FY19, 10 deficiencies were reported by HDR and 12 new and existing deficiencies were addressed by Covanta. At the end of FY19, 9 items remained on the list requiring attention.

# Environmental Performance

## Air Emissions

Emissions from the facility are controlled by the combination of good combustion practices, and by use of gas scrubbers and fabric filter baghouses. Ammonia injection and activated carbon systems are also used to control oxides of nitrogen and mercury emissions, respectively. Key emissions variables are continuously monitored with state of the art emissions monitoring equipment, supplemented by annual stack testing.

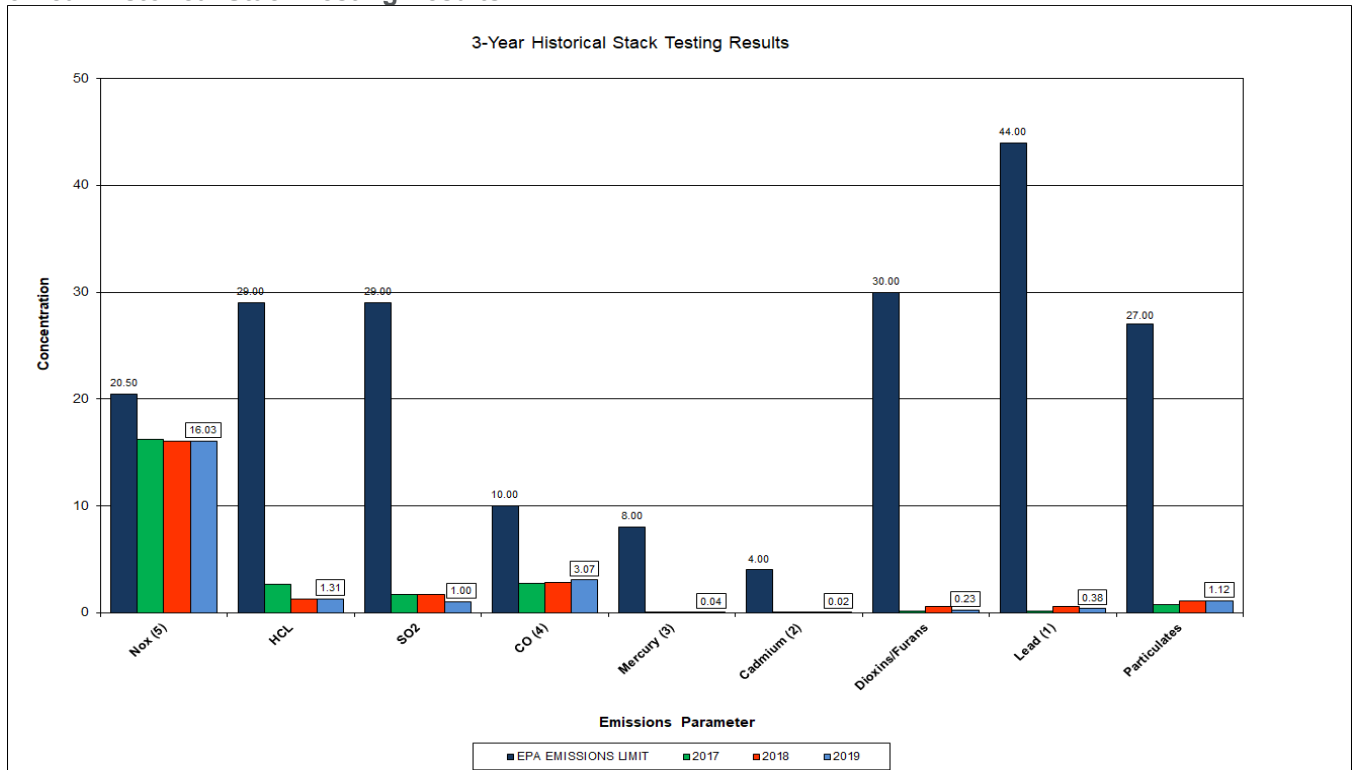
Throughout FY19, the air pollution control equipment maintained emission concentrations well within the established regulations, and no permit deviations were reported to the Virginia Department of Environmental Quality by the

Facility during FY19. The facility has operated for 621 consecutive days without a permit violation. Annual stack testing is conducted, generally in March of each year, and these results demonstrate compliance well within the permit limits for all parameters.

## Ash Conditioning

Dolomitic lime had been added to the ash to maintain a pH level within a range of 8.0 to 11.0, but Covanta has discontinued the use of dolomitic lime and is currently only using pebble lime to control SO<sub>2</sub>. Additionally, the ash is periodically sampled and tested for its potential to leach toxic compounds, using ash toxicity (TCLP) procedures. This testing, which occurred in August 2018 and April/May 2019 showed that the TCLP results were well below the regulatory threshold.

### 3-Year Historical Stack Testing Results



- Note (1): Lead emissions have been decreased by a factor of 10 for trending purposes
- Note (2): Mercury emissions have been decreased by a factor of 10 for trending purposes
- Note (3): CO emissions have been decreased by a factor of 10 for trending purposes
- Note (4): NOx emissions have been decreased by a factor of 10 for trending purposes

## Safety & Environmental Training

The Facility did not have any OSHA recordable accidents in FY19 and as of June 30, 2019, has operated 461 days without an OSHA recordable accident. Each month, Covanta conducts training for its employees covering a number of varying safety and environmental issues, including confined space entry and rescue, ladder safety and accident prevention.

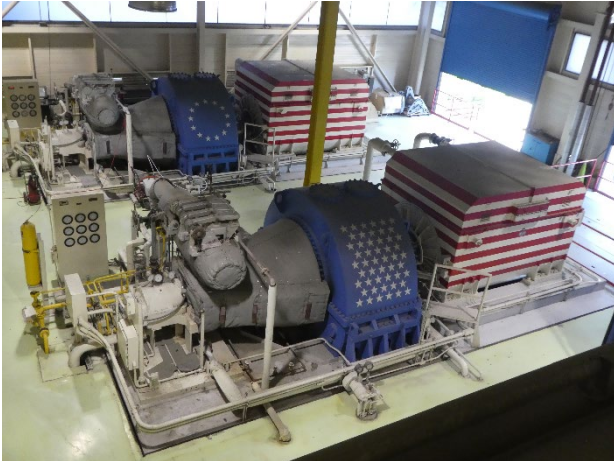


Photo: Turbine Generators



Photo: Cooling Towers

## Facility Enhancements

The Virginia Department of Environmental Quality has issued final permits for the installation and operation of LN<sup>®</sup> technology at the Facility. This technology will significantly reduce the amount of NO<sub>x</sub> emitted, with installation of the first unit occurring in FY20 and the other two units in the next two years, ultimately reducing NO<sub>x</sub> to less than 90 ppmvd on an annual basis.

## Outreach

### Facility Tours

In FY19, Covanta provided tours of the Facility to over 250 individuals representing numerous governmental entities, educational and civic groups and professionals from other countries.



Photo: Ash Trailers and Canopy



Photo: North Side of Facility and Tipping Floor Entrance

Overall, Covanta is performing needed repairs and replacements of equipment as required, to overcome wear, tear, obsolescence and end of life of equipment and materials. These efforts will need to continue and even accelerate going forward if the 31 year old Facility is to continue to operate reliably, efficiently, and safely for the next twenty years.

