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## **Project Title: City of Milwaukee Waste Hauler Retrofit Project**

### **Goal:**

To replace conventional muffler on 90+ refuse trucks with more efficient Diesel Oxidation Catalyst (DOC's) mufflers.

### **History:**

The City operates over 200 of these trucks for both residential refuse collection and recycling collection. These trucks have a significant emissions impact as they operate in residential areas, are stop-and-go type vehicles, and idle for long periods. By nature these trucks have to remain running as they pick up 400-600 carts per day in the city.

### **Emissions Reductions:**

With DOC mufflers, the City will achieve reductions of about 20-30% in particulate matter and 40-90% for carbon monoxide and hydrocarbons. In terms of volume, we estimate reductions of 10.4-11.6 tons/year of criteria pollutants, namely particulate matter, hydrocarbons, and carbon.

### **Cost:**

Each DOC installation will cost between \$900-\$1400 parts and labor, for the muffler and all piping to the muffler, which now needs to be converted to stainless steel.

### **Future Costs:**

There are no future costs or maintenance requirements with DOC's.

### **Experience, Sustainability, and Likelihood of Success:**

The City's partnership with DNR will allow the City to benefit from DNR's experience in retrofits. Along with the City's connections to local manufacturer representatives, DNR has established relationships with other manufacturers, health groups, EPA, and other significantly sized fleets. The City can replicate the successful processes from these similar projects.

# Diesel Oxidation Catalyst

Simple. Proven. Effective particulate matter reduction.

- Flow through design
- Easy to retrofit on existing vehicles
- No maintenance required
- Easily applied to a wide variety of applications
- Can be utilized in a catalytic exhaust muffler for additional sound attenuation benefits
- Can activate at lower temperature for carbon monoxide and hydrocarbon reductions

## Oxidation Catalyst Emission Control Capabilities:

- 20-50% reduction in particulate matter depending on soluble organic fraction content
- Greater than 90% reduction in carbon monoxide and hydrocarbons

## Oxidation Catalyst Operating Experience:

- More than 30,000 urban buses in the U.S. and Europe
- More than 8,000 HD vehicles in Mexico
- More than 250,000 off-road engines
- More than 1,000,000 midrange trucks and pickup trucks
- More than 50,000 medium-duty diesel vehicles and 2,000 urban buses in Hong Kong

## Maintenance and Application Guidelines

- No maintenance
- Cannot be used with lube oil blending systems
- Works with high sulfur fuel

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