Asthma and PM 2.5 Consideration for Hennepin Energy Recovery Center

Asthma

- The cause of Asthma is not known but is thought to be a combination of genetic predisposition and environmental factors. Once an individual has acquired this sensitivity, airborne allergens (e.g., house dust, pet dander, mites, and cockroaches) and irritants (e.g., tobacco smoke and ozone pollution) can trigger an asthma episode.

- One of the most recent and thorough reviews of the health effects associated with Energy from Waste (EfW) titled “Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Waste” was prepared by Enviros Consulting Ltd and Birmingham University for the Department of Environment and Rural Affairs (DEFRA), the UK equivalent of the US EPA. It concluded:

  - Overall, there is little evidence to suggest that waste incinerators are associated with increased prevalence of respiratory symptoms in the surrounding population.

  - The published epidemiological studies of the health of communities living in the vicinity of incinerators have failed to establish any convincing links between incinerator emissions and adverse effects on public health; specifically, no impact was demonstrated on the incidence of cancer, respiratory health symptoms or reproductive outcomes. (page 149)

- In Massachusetts, the Department of Public Health examined the degree to which the incidence of asthma in children in the Merrimack Valley, location of a number of EfW facilities, was related to the emissions from those facilities and transportation-related emissions. The findings of this study entitled “Air Pollution and Pediatric Asthma in the Merrimack Valley” were:

  - “Asthma prevalence was not found to be associated with potential exposure to PM10 (NOTE-PM10 includes the PM 2.5 size fraction) emissions from stationary sources. Geographic areas estimated to receive the lowest concentrations of PM10 (0-1.5 ug/m3), regardless of season, were consistently those that were areas with the highest prevalence of asthma.”

  - “Asthma prevalence was not found to be associated with potential exposure to VOC emissions from stationary sources.”

  - “Proximity to traffic (i.e., automobile, truck, and bus) was assessed for students with and without asthma. At each distance category from a student’s residence to roadways (25, 50, 100, 150, and 200 meters), students with a diagnosis of pediatric asthma were consistently found to live near a greater
volume of traffic than students who did not. The findings were statistically significant.”

- It is interesting to note that while asthma rates have been increasing, national and local trends in air pollution have been decreasing.

- As stated by the U.S. EPA, “Nationwide, emissions of criteria pollutants (or the pollutants that form them) due to human activities have decreased. Between 1990 and 2005, emissions of carbon monoxide, volatile organic compounds (which lead to the formation of ozone), particulate matter, sulfur dioxide, and nitrogen oxides (which lead to the formation of ozone and particulate matter) decreased by differing amounts, ranging from 25 to 48 percent. For lead, emissions have decreased by 99 percent, but this reduction is based on data that span a longer time frame (1970 to 2002).” See http://oaspub.epa.gov/hd/home

- As stated by the U.S. NIH, “The prevalence of asthma has been increasing since the early 1980s for all age, sex, and racial groups. The overall age-adjusted prevalence of asthma rose from 30.7 per 1,000 population in 1980 to a 2-year average of 53.8 per 1,000 in 1993-94. This represents an increase of 75 percent.” See http://www.nhlbi.nih.gov/health/prof/lung/asthma/asthstat.pdf

**PM2.5**

- PM2.5 is the fraction of the particles and droplets emitted from manmade and natural source that are 2.5 micrometers and smaller.

- The U.S. EPA has, through field monitoring, determined what areas do and do not achieve the concentration that they believe “protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.”

- Hennepin County and Minneapolis are areas that are in PM2.5 attainment. That is, the concentrations of PM2.5 are below the standard set by the U.S. EPA (about 30% below).

- Modeling done for the Hennepin Resource Recovery Facility for the Environmental Impact Statement associated with the construction of Target Field, the adjacent sports stadium, showed that HERC’s contribution to actual ambient air quality is about 1% of EPA’s 24 hour average standard and 0.2% of the annual average standard when measured at the facility’s point of maximum impact. At any other location the impact is less. The emissions assumed to be coming from the Hennepin facility for this modeling were twice its actual emissions.

- This study also showed that for all criteria pollutants (i.e., SOx, NOx, lead, carbon monoxide, the maximum HERC impact is well below the ambient monitored concentrations and an extremely small fraction of (less than 1%) of Minnesota Ambient Air Quality Standards.

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