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My name is Beth Weinberger. I am a research consultant to Environment and Human Health, Inc. (EHHI). I was hired to help implement a study of the effects of outdoor wood furnaces (OWFs) on the inside air of neighboring homes.

There are two important facts about outdoor wood furnaces that overshadow everything else. They are: (1) Wood smoke from outdoor wood furnaces enters people's homes and is inhaled into residents' lungs on a continuous basis over long periods of time; and (2) It has been established that wood smoke can cause serious health problems.

Based on preliminary results from EHHI's study, we recommend that outdoor wood furnaces be banned in the state of Connecticut. These furnaces produce enormous amount of dense smoke that enters neighboring homes on a continuous basis, even those homes with well-sealed doors and windows. Wood smoke can cause asthma attacks, bronchitis, sinusitis, pneumonia, and myocardial infarctions. Wood smoke particles also contain many known carcinogens as well as carbon monoxide.

Outdoor wood furnaces are very different from indoor wood stoves – the two should *not* be confused. Outdoor wood furnaces are housed in small, insulated sheds and are generally sold with short smokestacks. This wood-burning shed sits outside the owner's house as an accessory structure and heats water which then passes through underground pipes to provide the heat for the owner's home.

Outdoor wood furnaces are flawed in their design and therefore their functioning. Outdoor wood furnaces employ a technology that leads to incomplete combustion causing dense and dangerous smoke, which can travel for up to half a mile.

Many people who live near outdoor wood furnaces have contacted Environment and Human Health, Inc. (EHHI) with complaints that they have been made sick from the smoke from outdoor wood furnaces. They have explained that the smoke enters their homes on an almost continual basis. As a result of these complaints, EHHI has conducted and completed a study of the air quality in some of the impacted homes.

EHHI studied the indoor air of four homes that are near outdoor wood furnaces. The study sought to measure the level of smoke particulates in these affected houses and to see if these levels were high enough to pose a danger.

We measured the presence of particulate matter in the affected homes over a three-day period. These measurements were then compared to the particulate levels in seven control houses that were not near outdoor wood furnaces.

Particulate matter that is 10 micrometers or smaller can pass through the throat and nose and enter the lungs. We measured the presence of even smaller particles: those of 2.5 and 0.5 micrometers, which can travel even further into the respiratory system. Gases also accompany wood smoke particles, including carbon monoxide.

The four affected homes we studied had *much* higher levels of particulates than the background houses - and the spikes in particulate matter levels were even higher, posing an even greater danger. The data suggest, quite powerfully, that smoke was not only entering these houses but at levels that could cause illness.

I would like to direct you to Graph A. The line on the top shows the levels of particulates on an hourly basis averaged over all four affected homes. The lower line shows the levels of particulates in the non-affected houses. Not only are particulate levels much higher in the affected houses but the levels are also significantly higher than the yellow line, which represents the point at which the EPA says health effects begin to be seen.

The first house we evaluated had high spikes of particulate matter two out of the three days, with nearly one whole day at elevated levels. The second house showed a series of spikes well above particulate levels where the EPA says health problems are produced. It is also notable that spikes are seen at times when children tend to be home – early morning and in the evening when everyone is home for dinner and then during the nighttime hours when the families are asleep.

The graphs of two of the four impacted houses are in my written testimony are in Litchfield and Fairfield Counties. Both of these houses have families with children and are deeply concerned about the health impacts of the smoke they can smell inside their homes on a continual basis is having on their families.

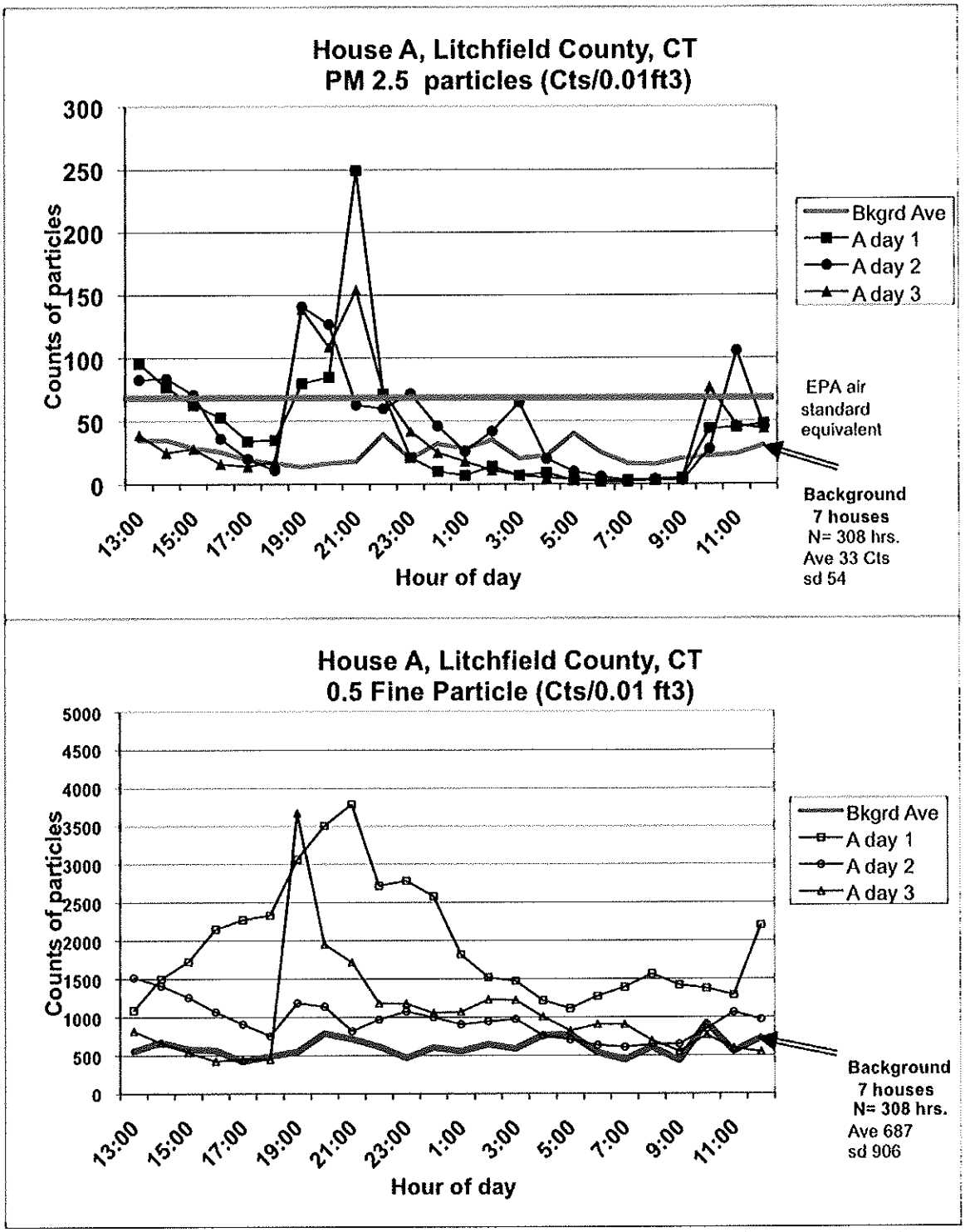
My colleague, Celia Lewis, is presenting the study data from the two other impacted houses.

The state of Washington has determined that outdoor wood furnaces present a significant risk to the public's health and, as a result, have banned them in their state. In Connecticut, nine towns have come to the same conclusion. The towns of Granby, Haddam, Hebron, Norfolk, Portland, Ridgefield, South Windsor, Tolland, and Woodbridge have banned them.

The science is conclusive that wood smoke poses serious health risks to those who breathe it on a continual basis. In the four homes we studied, our data suggests that these families are being consistently exposed to wood smoke within the walls of their own homes.

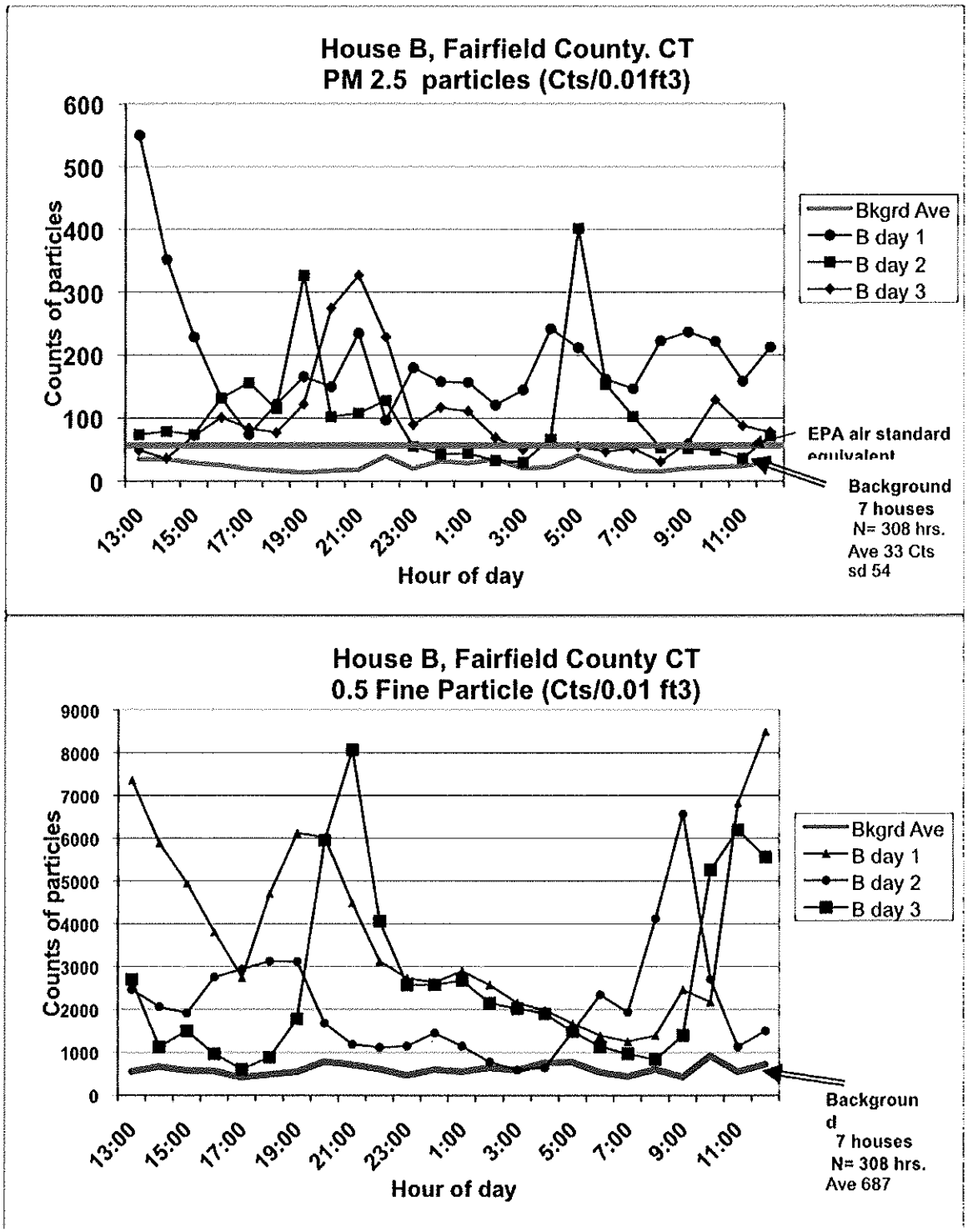
This is not a problem that these families can avoid. If the state does not act, the risk of short and long term illnesses are very real for these citizens and many others who are either affected now by wood smoke exposures or will be in the future if the state does not ban these outdoor wood burning appliances.

Beth I. Weinberger, MPH, PhD.



The charts above show hourly measurements over three consecutive days at House A (subjected to OWF smoke) as well as the average hourly measurements in houses *not* near OWFs. The straight horizontal line on the PM 2.5 chart (top) is equivalent to the EPA's ambient air quality standard. Levels of PM 2.5 that exceed the EPA standard are associated with asthma or COPD attacks and hospitalizations, and are also associated with increased risk of cardiac attacks.

These charts show dangerously high levels of smoke particulates <u>inside</u> the OWF impacted house at all hours of the day, especially at night, compared to normal houses.



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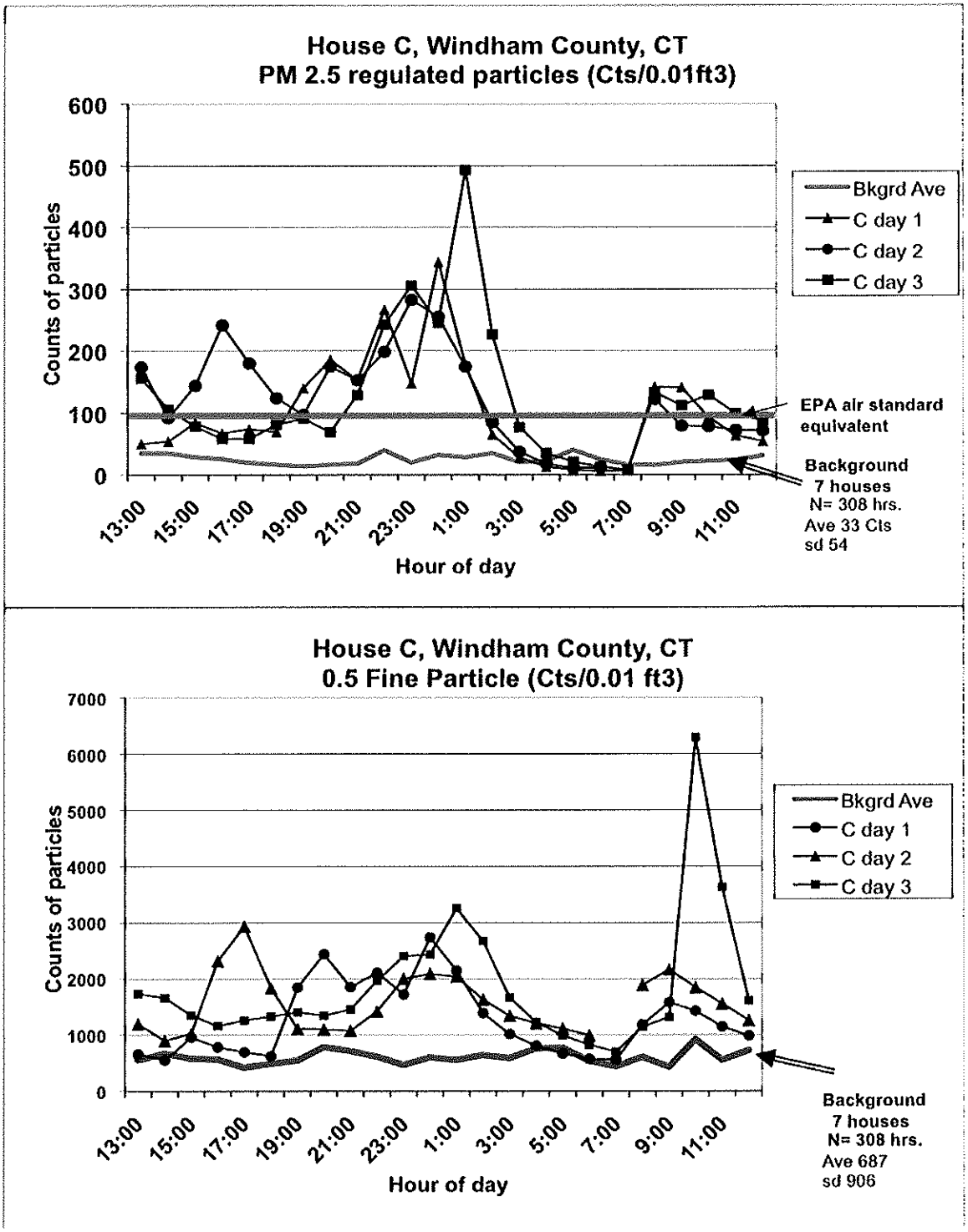

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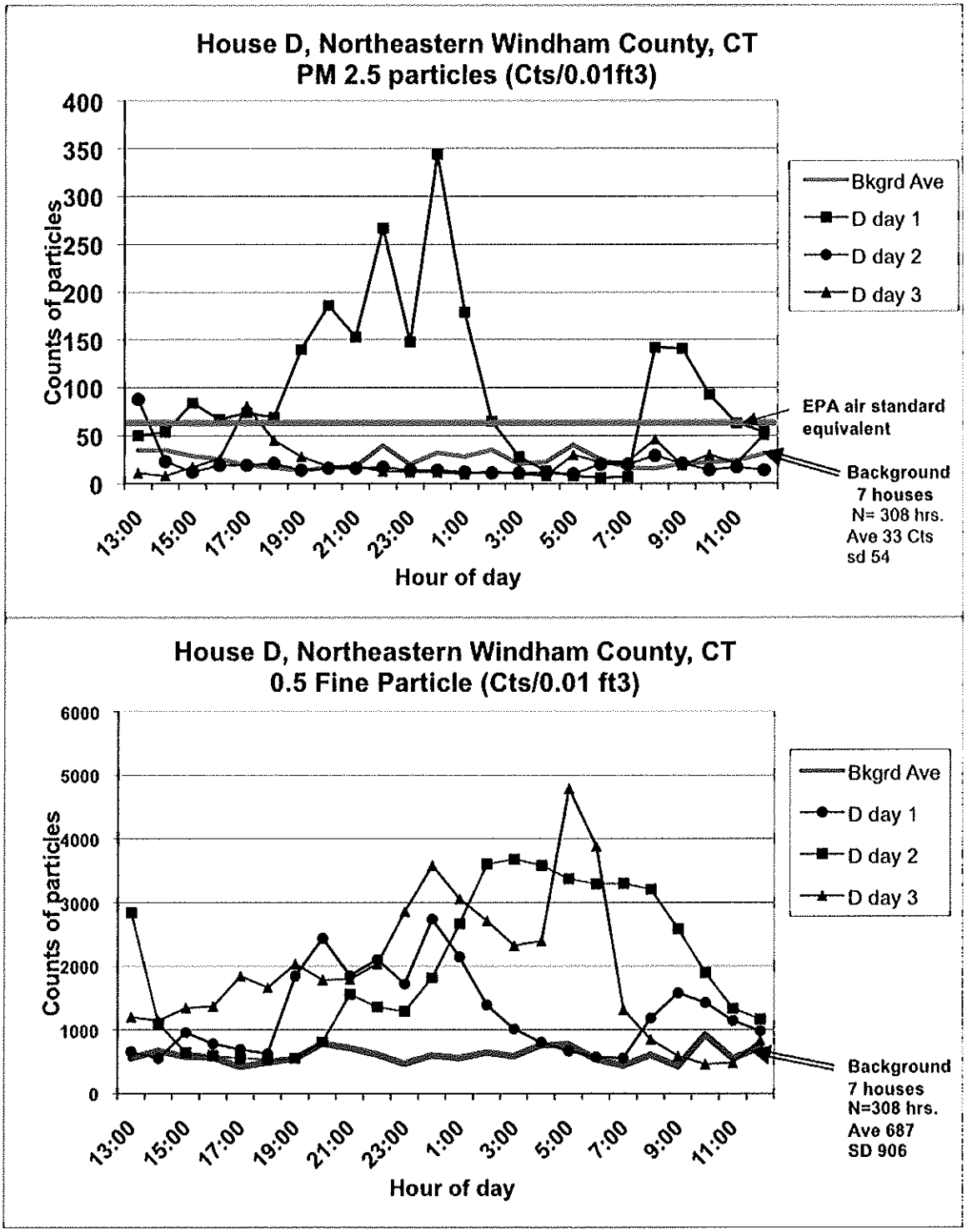

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