



**6:45 PM: Ceremonial
Presentation in honor
of Independence Day**

**TOWN OF MANSFIELD
TOWN COUNCIL MEETING
June 27, 2016
COUNCIL CHAMBERS
AUDREY P. BECK MUNICIPAL BUILDING
7:00 p.m.
AGENDA**

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ROLL CALL	
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EXECUTIVE SESSION

- 12. Strategy and Negotiations with Respect to Pending Claims or Litigation, in accordance with CGS §1-200(6)(B)**

ADJOURNMENT

REGULAR MEETING – MANSFIELD TOWN COUNCIL
June 13, 2016
DRAFT

Mayor Paul M. Shapiro called the regular meeting of the Mansfield Town Council to order at 7:00 p.m. in the Council Chamber of the Audrey P. Beck Building.

I. ROLL CALL

Present: Keane, Kochenburger, Moran, Raymond, Ryan, Shaiken, Shapiro
Excused: Marcellino, Sargent

II. APPROVAL OF MINUTES

Mr. Ryan moved and Ms. Keane seconded to approve the minutes of the May 23, 2016 meeting as presented. The motion passed unanimously.

Mayor Shapiro paused the meeting and asked all present to reflect and remember those affected by the shooting in Orlando.

III. OPPORTUNITY FOR PUBLIC TO ADDRESS THE COUNCIL

Gary Bent, Mansfield Hollow Road, urged the Council to ask the DOT for a safety study of Route 6 given the co-infusion station proposed for Andover. Mr. Bent stated that 5 to 10 trucks per hour, carrying high pressure natural gas, are expected to navigate Route 6. He is concerned that an accident will cause a dangerous rupture and explosion. Patricia Taylor, Deputy Outreach Director for Environment and Human Health, Inc., urged the Town to enact regulations that would prohibit outdoor wood furnaces. (Statement attached)

Brian Coleman, Centre Street, agreed with Mr. Bent that Route 6 is a terrible place to add truck traffic. Mr. Coleman stated that, according to people that he has talked to, the crumbling foundation problem in Mansfield is larger than reported and that he feels the Town has not been as proactive as other towns in addressing the problem.

Lois Happe, Olsen Drive, reported that the proposed Andover infusion station is the first in the country and therefore there is no history or experience with mitigating possible outcomes.

Amy Gorin, Michele Lane, thanked the Council for their efforts regarding the possible building project at E.O. Smith and urged members to stay involved in the discussion. Ms. Gorin would like the downtown to remain part of Mansfield not an extension of UConn. Steve Bacon, Wormwood Hill Road resident and attorney for the Mansfield Historical Society, commented on Item 3, Lease Agreement with Mansfield Historical Society. Mr. Bacon stated that the proposed lease has been reviewed by the Town Attorney and is supported by the Society.

Kelly Bourquin, Jonathan Lane, spoke in support of Ms. Gorin's comments and questioned how regional boards work with town government to make sure everyone is on the same page.

IV. REPORT OF THE TOWN MANAGER

In addition to his written report the Town Manager offered the following comments:

June 13, 2016

- The issue of crumbling foundations is the first item of business on this evening's agenda.
- If the Council wishes, the subject of outdoor wood furnaces could be added to a future agenda. The issue is a Planning and Zoning Commission matter but the Council could review the information provided and refer the matter to Eastern Highlands Health District or the Conservation Commission for comments.

V. REPORTS AND COMMENTS OF COUNCIL MEMBERS

Mayor Shapiro reported that the Memorial Day event, moved to the Middle School because of rain, was terrific and thanked Sara-Ann Chaine, Executive Assistant to the Town Manager, for her nimble work.

Ms. Moran noted that last Monday Main Street Connecticut presented an award to the Downtown Partnership for the development of the Town Square. The Partnership was recognized both for the public participation process followed in the creation of the Square and for its use as a public facility. Ms. Moran itemized some of the concerts and events to be held this summer.

Mr. Shaiken reported that both he and Mr. Kochenburger attended the Region 19 Board of Education meeting last week and offered his thanks to the Board for postponing any decisions on building process.

Mr. Ryan and Ms. Raymond attended the Four Corners Water and Sewer Committee meeting and asked that the proposed sewer agreement between the Town and UConn be forwarded to its members.

Mr. Kochenburger noted that the UConn baseball had a very successful season reaching the American Athletic Conference Tournament semifinals. He also announced that Jack Sundberg, team captain and resident of Mansfield, has been drafted by the Washington Nationals.

VI. OLD BUSINESS

1. Crumbling Foundations in Eastern Connecticut

Town Manager Matt Hart reviewed some of the steps the Town has taken and are currently pursuing regarding crumbling foundations including, hosting and organizing the public information session, meeting with colleagues to discuss ways to help residents, and encouraging the State to provide interim relief and take additional steps as outlined in a June 9, 2016 letter to the Governor.

Ms. Moran moved and Mr. Ryan seconded to authorize the Mayor to sign the aforementioned letter with all due haste.

The motion passed unanimously.

PA 1645 will be posted on the Town's website.

VII. NEW BUSINESS

2. Fair Housing Policy and Resolution

Mr. Shaiken moved and Ms. Moran seconded, effective June 13, 2016, to adopt the attached Fair Housing Resolution

Motion passed unanimously.

Staff will make sure the current fair housing information on the website has been updated.

June 13, 2016

3. Lease Agreement with the Mansfield Historical Society
Mr. Ryan moved and Ms. Raymond seconded, effective June 13, 2016, to authorize the Town Manager to execute the attached Lease Agreement between the Town of Mansfield and the Mansfield Historical Society, Inc.
Motion passed unanimously.
4. Special Fare Agreement with Windham Region Transit District (WRTD)
Ms. Moran moved and Mr. Shaiken seconded, effective June 13, 2016, to authorize the Town Manager to execute the Memorandum of Agreement between the Town of Mansfield and the Windham Transit District to provide a Special Fare Program for qualifying Mansfield residents for FY 2016/17.
Motion passed with all in favor except Ms. Keane who voted in opposition.
5. Agreement Between the Town of Mansfield, the Mansfield Board of Education and the Regional School District No. 19 Board of Education for Employee Benefits, Financial Management, Information Technology and Risk Management Services
Director of Finance Cherie Trahan and Director of Information Technology Jaime Russell reviewed the new cost analysis methodology used to determine the allocation of expenses for shared financial and informational technology services.
Ms. Trahan will provide a direct of comparison of FY2016/17 incurred costs and figures for the proposed cost sharing agreement for FY2017/18.
In Section III A (page 63) change the work "management" in the last paragraph to "principles".
6. Graduate Student Intern Presentation
Kevin Filchak, Graduate Student Intern for the last year and a half, talked about his experience working in Mansfield and described some of his major accomplishments. Council members thanked Kevin for his work and wished him success in his future endeavors.
7. Independence Day Ceremonial Presentation Planning Subcommittee
Ms. Moran and Ms. Raymond volunteered to serve on the Subcommittee. Mr. Marcellino will also be asked to serve.

VIII. REPORTS OF COUNCIL COMMITTEES

Mr. Ryan, Chair of the Finance Committee, reported on the May 26, 2016 meeting at which the Fraud Risk Assessment was reviewed. Mr. Ryan also reported on tonight's meeting at which the Committee approved the ability of the Town to purchase street lights, update to LED bulbs, and with the savings in electricity pay for the purchase in about five years.

Ms. Moran will contact members regarding the June 20, 2016 Personnel Committee meeting. Ms. Moran also noted the information in the packet on page 173 regarding the schedule for the Town Manager's evaluation and that the Police Services Ad Hoc Committee meeting has been postponed.

June 13, 2016

IX. DEPARTMENTAL AND COMMITTEE REPORTS

No comments offered.

X. PETITIONS, REQUESTS AND COMMUNICATIONS

8. Letter from 250+ community members regarding EO Smith High School project –
Mr. Shaiken commented that petitions pages for names “H thru L” and “R thru Z” are missing and will be emailed to staff.
9. Petition to Ensure the Safety of Route 6
10. I. Hanka (5/30/16)
11. A. Kotula (6/13/16)
12. R. Shafer (5/23/16)
13. P. Taylor re: EHHI Outdoor Wood Furnaces
14. M. Capriola re: Timeline – Town Manager Performance Review Process
15. M. Hart re: United Services proposed Windham Region Clinical Center
16. Capitol Region Council of Governments Annual Report 2015-2016
17. CRCOG Inter-town Cooperation Award
18. CRCOG Regional Sustainability Award

XI. FUTURE AGENDAS

Councilors agreed to add outside wood burning stoves and a Route 6 safety study to the next agenda.

Mr. Kochenburger requested a discussion of paperless meetings be added to a future agenda.

XII. ADJOURNMENT

Ms. Keane moved and Mr. Shaiken seconded to adjourn the meeting at 9:20 p.m.

Paul M. Shapiro, Mayor

Mary Stanton, Town Clerk

June 13, 2016

Town of Mansfield Town Council Meeting – June 13, 2016

Item 13 – Proposed Zoning Regulation Prohibiting Outdoor Wood Furnaces (OWFs)

By Patricia Taylor, Deputy Outreach Director, Environment and Human Health, Inc.

To the Mansfield Town Council:

My name is Patricia Taylor. I am Deputy Outreach Director for Environment and Human Health, Inc. (EHHI).

(EHHI) is a science-based organization composed of physicians, public health professionals and policy experts. We are dedicated to protecting human health from environmental harms.

Thank you for this opportunity to provide information encouraging Mansfield to prohibit outdoor wood furnaces (OWFs) in your community. Mr. Hart and Ms. Capriola have provided documents in your packet including health information, a list of Connecticut towns that prohibit OWFS, a model zoning regulation from Tolland, and a Connecticut Department of Environmental Protection (CT DEEP) Fact Sheet on the state statute regulating these appliances. The Fact Sheet discusses local rights and responsibilities – including your right to prohibit.

I met with Mr. Miller - your Director of Health at Eastern Highlands Health District. I hope you'll seek his advice on the health information I've shared.

The CT DEEP describes an OWF as "essentially a wood-fired boiler in a small, insulated shed with a smoke stack. OWFs heat water that is carried through underground pipes to heat a home or building, domestic hot water, a swimming pool, a Jacuzzi or a hot tub," and has cautioned that OWFS are harmful to the environment and human health.

These appliances are now being marketed to residential users. In the past, there were primarily installed on farms or heavily wooded areas "off the grid." Industry now targets suburban home owners in densely populated areas, calling them environmentally friendly and carbon-neutral biomass burners. In new homes, they are even being installed to heat driveways!

OWFs produce a lot of thick, cool smoke dense with fine particles. Our health study showed a house as far away as 850 feet from an OWF had 6 times the levels of PM 2.5 as the houses not near an outdoor wood furnace and 4 times above the levels of the EPA air standards.

Large amounts of wood smoke, like the plumes from OWFs, cannot be kept out of neighboring houses, even those with tight windows and doors. **The amount of wood smoke inhaled determines the health risk.** Wood smoke has many of the same components as **cigarette smoke** and, therefore, these exposures pose a real health risk for families living in the vicinity.

Short-term and immediate effects are burning eyes and throat, sinusitis, bronchitis, and pneumonia. Long-term effects are cancer, cardiovascular disease, carbon monoxide poisoning, and complications to COPD and asthma.

The harm that OWFs do to neighboring homeowners' health and the inadequacy of the new wood smoke standards for OWFs are the reasons why EHHI is asking towns and cities to ban them. Outdoor wood furnaces are a flawed technology that not only harm the health of neighboring homeowners but also ruin the real estate value of their homes.

OWFs are the only wood burning appliance we seek to ban. I hope Mansfield will join 19 Connecticut towns that already prohibit OWFS and, by doing so, protect the health of your residents and the value of their homes.

Thank you for your attention this evening.



**Town of Mansfield
Agenda Item Summary**

To: Town Council
From: Matt Hart, Town Manager *MH*
CC: Maria Capriola, Assistant Town Manager; Curt Vincente, Director of Parks and Recreation; Jay O'Keefe, Assistant Director of Parks & Recreation
Date: June 27, 2016
Re: Proclamation Designating the Month of July as National Parks and Recreation Month in the Town of Mansfield

Subject Matter/Background

Attached please find a proposed Proclamation Designating the Month of July as Parks and Recreation Month in the Town of Mansfield. Staff requests that the Town Council consider issuing the proposed proclamation in order to help promote parks and recreation in the community.

Recommendation

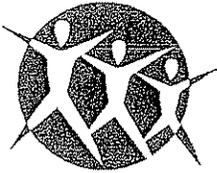
Staff requests that the Town Council authorize the Mayor to issue the proclamation as proposed.

If the Town Council supports this request, the following motion is on order:

Move, effective June 27, 2016, to authorize the Mayor to issue the attached proclamation designating the Month of July as National Parks and Recreation Month.

Attachments

- 1) Communication from Assistant Director of Parks and Recreation
- 2) Proposed Proclamation designating the Month of July as National Parks and Recreation Month.
- 3) 111th Congress House Resolution 288
- 4) Mansfield Parks and Recreation Department July 2016 Activity Calendar
- 5) National Recreation and Parks Association Fact Sheet – Why Parks and Recreation are Essential Public Services
- 6) Press Release



Mansfield
Community
Center

Town of Mansfield
Parks and Recreation
Department



Jay M. O'Keefe, CPRP
Assistant Director of Parks and Recreation

10 South Eagleville Road
Storrs/Mansfield, Connecticut 06268
Tel: (860) 429-3015 Fax: (860) 429-9773
Email: OKeefeJM@MansfieldCT.org
Website: www.MansfieldCT.org

June 8, 2016

Dear Members of the Town Council:

On behalf of the Mansfield Parks and Recreation Department I would like to make you aware that the U.S. House of Representatives with support from the National Recreation and Parks Association has designated July as *National Parks and Recreation Month*.

Our department plans to promote awareness of these events during the month of July through distribution of web based and in-house promotions, press releases and small special events. Along with our professional organization, the Parks and Recreation Department will be encouraging folks to spend time with family and friends, visit outdoor recreation areas, participate in a favorite hobby, and take advantage of the quality recreation resources right here in Mansfield.

We are requesting the consideration of the Mansfield Town Council to support the attached proclamation in recognition of *National Parks and Recreation Month*. If in agreement, we ask that you please sign and return the proclamation to the Town Manager Office so that it may be displayed for the public at the Mansfield Community Center.

Thank you for your consideration.

Sincerely,

Jay M. O'Keefe, CPRP
Assistant Director of Parks and Recreation



Designation of July 2016 as Parks and Recreation Month
Town of Mansfield, Connecticut

WHEREAS parks and recreation programs are an integral part of communities throughout this country, including the Town of Mansfield, Connecticut; and

WHEREAS our parks and recreation are vitally important to establishing and maintaining the quality of life in our communities, ensuring the health of all citizens, and contributing to the economic and environmental well-being of a community and region; and

WHEREAS parks and recreation programs build healthy, active communities that aid in the prevention of chronic disease, provide therapeutic recreation services for those who are mentally or physically disabled, and also improve the mental and emotional health of all citizens; and

WHEREAS parks and recreation programs increase a community's economic prosperity through increased property values, expansion of the local tax base, increased tourism, the attraction and retention of businesses, and crime reduction; and

WHEREAS parks and recreation areas are fundamental to the environmental well-being of our community; and

WHEREAS parks and natural recreation areas improve water quality, protect groundwater, prevent flooding, improve the quality of the air we breathe, provide vegetative buffers to development, and produce habitat for wildlife; and

WHEREAS our parks and natural recreation areas ensure the ecological beauty of our community and provide a place for children and adults to connect with nature and recreate outdoors; and

WHEREAS the U.S. House of Representatives has designated July as Parks and Recreation Month; and

WHEREAS the Town of Mansfield, Connecticut recognizes the benefits derived from parks and recreation resources

NOW THEREFORE, BE IT RESOLVED BY the Mansfield Town Council that July is recognized as Parks and Recreation Month in the Town of Mansfield, Connecticut.

Paul Shapiro, Mayor

Date

HRES 288 IH

111th CONGRESS

1st Session

H. RES. 288

Recognizing the importance of park and recreation facilities and expressing support for the designation of the month of July as 'National Park and Recreation Month.'

IN THE HOUSE OF REPRESENTATIVES

March 26, 2009

Mr. BARROW (for himself and Mr. THOMPSON of Pennsylvania) submitted the following resolution, which was referred to the Committee on Natural Resources.

RESOLUTION

Recognizing the importance of park and recreation facilities and expressing support for the designation of the month of July as 'National Park and Recreation Month'.

Whereas public parks and recreation systems are dedicated to enhancing the quality of life for residents in communities around the country through recreation programming, leisure activities, and conservation efforts;

Whereas parks, recreation activities, and leisure experiences provide opportunities for young people to live, grow, and develop into contributing members of society; create lifelines and continuous life experience for older members of the community; generate opportunities for people to come together and experience a sense of community; and pay dividends to communities by attracting businesses, jobs, and increasing housing value;

Whereas parks and recreation services play a vital role in creating active and healthy communities, and the majority of older adults who visit parks report moderate or high levels of physical activity during their visit and 50 percent of older adults who participated in light to moderate aerobic park activity report being in a better mood after visiting parks;

Whereas parks and recreation facilities foster a variety of activities that contribute to a healthier United States, such as introducing injured military veterans and those with physical disabilities to physical activity, mobilizing urban communities to use chronic disease prevention practices, working with local school systems to develop science-based curricula to educate children on nutrition and activity, connecting children with nature, and combating obesity in youth;

Whereas the creation of places for physical activity, combined with information outreach, produced a 48.4 percent increase in the frequency of physical activity;

Whereas more than 75 percent of United States citizens use park and recreation facilities to maintain fitness and to remain socially interactive, which are critical to maintaining community cohesion and pride;

Whereas community recreation programs at park and recreation facilities provide children with a safe refuge and a place to play, which helps to reduce at-risk behavior such as drug use and gang involvement;

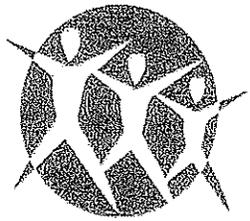
Whereas 69 percent of the United States population believes in local park and recreation services, which supports the idea that such parks and services should be funded by taxes and user fees;

Whereas public parks and recreation facilities create enormous economic value through increased partnership, which improves the job base and the economic viability of the local economy, including business relocation and expansion in the community and increased tourism; and

Whereas parks and recreation facilities reduce fuel costs and commute times by providing a place close to home to relax, exercise, and reduce stress: Now, therefore, be it

Resolved, That the House of Representatives—

- (1) recognizes the great societal value of parks and recreation facilities and their importance in local communities across the United States;
- (2) recognizes and honors the vital contributions of employees and volunteers in park and recreation facilities; and
- (3) supports the designation of a 'National Park and Recreation Month'.



Mansfield
Community Center
Family, Fitness & Fun
www.mansfieldcc.com

July 2016

Celebrate!
July is National
Parks and Recreation
Month!

-12-

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<p>Celebrate National Park and Recreation Month! See our calendar for great events and opportunities all month long!</p>					<p>1 Light up the summer sky! Find a fireworks show this weekend and enjoy with family and friends!</p> 	<p>2 Puppet Performances @Ballard Puppet Museum Canteen Tales: Quest for the Golden Spork 11am & 2pm shows</p>
<p>3 Cool off with a swim by visiting Bicentennial Pond Open 12-6pm \$2/residents \$3/non-residents Season passes are available</p>	<p>4 The MPRD staff wants to wish everyone a Happy 4th of July and a fun & safe summer season! MCC Hours 9am-5pm</p>	<p>5 Drop-in Pickleball @MCC Gymnasium 9:30am-Noon FREE for members</p> 	<p>6 Brain Power & Balance Seminar FREE for Members \$10 for Non-Members @MCC Community Room 1-2pm</p>	<p>7 FREE Concert @ Mansfield Town Square Jan Jungden Trio 6:30-8pm</p> 	<p>8 FREE Art Exhibit! Blow Up: Inflatable Contemporary Art Exhibit at the Benton Museum in Storrs Downtown 10am-4:30pm</p>	<p>9 Family Fun Night at Bicentennial Pond 4-7 p.m. FREE for Residents \$5 per carload for Non-Residents</p>
<p>10 Wilton Cake Decorating Modeling 101 Ages 8+ or 6-7 w/a parent @MCC Community Room 2-4pm, Advanced Reg. Req.</p>	<p>11 Session II Swim Lessons Begins! Parent/Infant thru Adult Lessons are available. Pre-Registration Required</p>	<p>12 FREE Concert/Storytelling This-a-way Mezudio with Minstrel Mary Jo Maichack @Mansfield Library 6:30-7:30pm</p>	<p>13 FREE Mansfield Day @ MCC 6-9 pm *Proof of residency may be required.</p>	<p>14 FREE Concert @ Mansfield Town Square Amy & The Engine 6:30-8pm</p> 	<p>15 Day and overnight kayak rentals available at the MCC! \$10/day and \$15 overnight fee.</p> 	<p>16 5K RUN FOR THE PLAYGROUND for the Playground 5K Road Race! 8am race start at the MCC! Stay in shape and support the community!</p>
<p>17 See a play! Westside Story is at the Jorgenson on UConn's Campus. Showtime today is at 2pm. Ticket prices vary.</p>	<p>18 Star Wars Jedi Engineering Camp Begins! 9am-Noon or 1-4pm @MCC Pre-Registration Required</p>	<p>19 Give your CAR a vacation day and ride your bike to work! A great start to your work day! Don't forget your helmet!</p>	<p>20 Parent Tot Time in the Gym from 9:30am-12pm. Bring your little one and play in the MCC gym. FREE for members!</p>	<p>21 FREE Concert @ Mansfield Town Square Ghost of Paul Revere 6:30-8pm</p> 	<p>22 Family Fun Night at BCP 4:30pm-7:30pm Swimming, Inflatable Slide, activities, new playground! Bring the whole family!</p>	<p>23 Eat locally! Visit the Storrs Farmers Market! Open every Saturday from 3-6pm at the Mansfield Town Hall lawn.</p>
<p>24 Walk through beautiful downtown Storrs! Enjoy the outdoor seating at the local restaurants and shops!</p>	<p>25 Sports Squirts Begins! Ages 3-K Mon-Fri, 4:30-5:30pm @Farrell Fields Pre-Registration Required</p>	<p>26 Visit Mansfield Hollow State Park for fishing, hiking or bike riding.</p> 	<p>27 Take a walk with us! Visit www.mansfieldct.org/trailguides/ to download trail maps of our beautiful local parks. Hit the trails!</p>	<p>28 FREE Concert @ Mansfield Town Square Wise Old Moon 6:30-8pm</p> 	<p>29 FREE Moonlight Movie @ Mansfield Town Square Star Wars: The Force Awakens Fun begins @ 7pm, movie begins @ dusk.</p>	<p>30 Family Fun Night @ MCC 4:30-7:30pm</p> <p>31 Challenge a friend to a game of tennis at the EO Smith courts!</p>



National Recreation
and Park Association

22377 Belmont Ridge Road
Ashburn, VA 20148-4501
703.858.0784
Fax 703.858.0784
www.nrpa.org

Why Parks and Recreation are Essential Public Services

Parks and recreation have three values that make them essential services to communities:

1. Economic value
2. Health and Environmental benefits
3. Social importance

Just as water, sewer, and public safety are considered essential public services, parks are vitally important to establishing and maintaining the quality of life in a community, ensuring the health of families and youth, and contributing to the economic and environmental well-being of a community and a region.

There are no communities that pride themselves on their quality of life, promote themselves as a desirable location for businesses to relocate, or maintain that they are environmental stewards of their natural resources, without such communities having a robust, active system of parks and recreation programs for public use and enjoyment.

Economic Value

- Parks improve the local tax base and increase property values. It is proven that private property values increase the value of privately owned land the closer such land is to parks. This increase in private property value due to the proximity to parks increases property tax revenues and improves local economies.
- A Texas A&M review of 25 studies investigating whether parks and open space contributed positively to the property values of surrounding properties found that 20 of the 25 studies found that property values were higher. "The real estate market consistently demonstrates that many people are willing to pay a larger amount for property located close to parks and open space areas than for a home that does not offer this amenity,"
- American Forests, a national conservation organization that promotes forestry, estimates that trees in cities save \$400 billion in storm water retention facility costs.
- Quality parks and recreation are cited as one of the top three reasons that business cite in relocation decisions in a number of studies.

- Parks and recreation programs produce a significant portion of operating costs from revenue generated from fees and charges
- Parks and recreation programs generate revenue directly from fees and charges, but more importantly, provide significant indirect revenues to local and regional economies from sports tournaments and special events such as arts, music, and holiday festivals. Economic activity from hospitality expenditures, tourism, fuel, recreational equipment sales, and many other private sector businesses is of true and sustained value to local and regional economies.

Health and Environmental Benefits

- Parks are the places that people go to get healthy and stay fit.
- Parks and recreation programs and services contribute to the health of children, youth, adults, and seniors.
- According to studies by the Centers for Disease Control and Prevention, creating, improving and promoting places to be physically active can improve individual and community health and result in a 25 percent increase of residents who exercise at least three times per week.
- A study by Penn State University showed significant correlations to reductions in stress, lowered blood pressure, and perceived physical health to the length of stay in visits to parks.
- Parks and protected public lands are proven to improve water quality, protect groundwater, prevent flooding, improve the quality of the air we breathe, provide vegetative buffers to development, produce habitat for wildlife, and provide a place for children and families to connect with nature and recreate outdoors together.

Social Importance

- Parks are a tangible reflection of the quality of life in a community. They provide identity for citizens and are a major factor in the perception of quality of life in a given community. Parks and recreation services are often cited as one of the most important factors in surveys of how livable communities are.
- Parks provide gathering places for families and social groups, as well as for individuals of all ages and economic status, regardless of their ability to pay for access.
- An ongoing study by the Trust for Public Land shows that over the past decade, voter approval rates for bond measures to acquire parks and conserve open space exceeds 75%. Clearly, the majority of the public views parks as an essential priority for government spending.

- Parks and recreation programs provide places for health and well-being that are accessible by persons of all ages and abilities, especially to those with disabilities.
- In a 2007 survey of Fairfax County, VA, residents of 8 of 10 households rated a quality park system either very important or extremely important to their quality of life.
- Research by the Project on Human Development in Chicago Neighborhoods indicates that community involvement in neighborhood parks is associated with lower levels of crime and vandalism
- Access to parks and recreation opportunities has been strongly linked to reductions in crime and to reduced juvenile delinquency.
- Parks have a value to communities that transcend the amount of dollars invested or the revenues gained from fees. Parks provide a sense of public pride and cohesion to every community.

National Recreation and Park Association

For more information on the value and benefits of parks go to www.nrpa.org



National Recreation
and Park Association



Mansfield Parks & Recreation
Family, Fitness & Fun!

FOR IMMEDIATE RELEASE

Contact Person: Jay O'Keefe

Town of Mansfield Parks and Recreation
10 South Eagleville Road, Mansfield/Storrs, CT. 06268
860-429-3015, 6104
OKeefeJM@mansfieldct.org

This July the Town of Mansfield will have a *month-long celebration highlighting the essential value of local parks and recreation.*

Mansfield Parks and Recreation is celebrating Park and Recreation Month, an initiative of the National Recreation and Park Association (NRPA), and all the ways parks and recreation has the power to transform our daily lives. From providing us places to get fit and stay healthy to fostering new relationships and forging a connection with nature, our close-to-home community park, trails and recreation facilities provide essential services and improve quality of life.

Mansfield Parks and Recreation is proud to offer residents numerous recreation, health and wellness options, being a leader in conservation and a partner in creating a viable and desirable community. This summer alone, Mansfield Parks and Recreation will provide opportunities for residents to enjoy spending time in 15 passive and active parks, indoor and outdoor swimming, hiking, biking, summer camps, concerts, family events, and over 75 youth and adult programs.

Mansfield Parks and Recreation encourages people to spend time with family and friends, visit outdoor recreation areas, participate in a favorite hobby, and take advantage of the quality recreation resources in the local area. Visit www.mansfieldcc.com for a July activity calendar and information on Mansfield Parks and Recreation facilities, programs and resources.

About The National Recreation and Park Association

The National Recreation and Park Association is a national not-for-profit organization dedicated to advancing park, recreation and conservation efforts that enhance quality of life for all people. Through its network of more than 50,000 recreation and park professionals and citizens, NRPA encourages the promotion of healthy and active lifestyles, conservation initiatives and equitable access to parks and public space. For more information, visit NRPA.org. For digital access to NRPA's flagship publication, *Parks & Recreation*, visit ParksAndRecreation.org.



**Town of Mansfield
Agenda Item Summary**

To: Town Council
From: Matt Hart, Town Manager *MWH*
CC: Maria Capriola, Assistant Town Manager; Linda Painter, Director of Planning and Development
Date: June 27, 2016
Re: Outdoor Wood Furnaces

Subject Matter/Background

At the June 13, 2016 Town Council meeting, Patricia Taylor, Deputy Outreach Director for Environment and Human Health, Inc. (EHHI) spoke in favor of Mansfield banning the use of Outdoor Wood Furnaces (OWFs). Ms. Taylor provided the Council with a number of resources that were published in the June 13th Town Council packet.

An Outdoor Wood Furnace is a structure located on residential property that is used primarily for home heating. The owner burns untreated wood in the furnace, which heats water that runs between the OWF and the home. The energy expended from this heats the home.

At this time OWFs are permitted in Connecticut and are regulated by Connecticut General Statute (CGS). In 2005 the General Assembly passed CGS §22a-174k which requires that all OWFs built after 07/08/2005 meet certain construction standards. All land use issues related to OWFs are left to the discretion of the local municipality, under the purview of the appropriate local land use agency. Currently 19 Connecticut communities ban OWFs.

According to information provided by EHHI, there is concern that the smoke produced by OWF burning wood is detrimental to a person's health and to the health of the neighborhood. According to studies conducted by EHHI, the smoke produced as a by-product of an OWF is known to contain a number of carcinogens and other toxins. EHHI cites a further concern that such OWFs located in neighborhoods could inhibit home sales due to potential buyers wishing to avoid the smoke byproducts.

Recommendation.

If the Town Council wishes explore the subject further, staff recommends that the Town Council refer this matter to the Planning and Zoning Commission (PZC) for further review and consideration. Any local regulations concerning OWFs would need to be adopted by the PZC.

If the Town Council agrees with this recommendation, the following motion is in order:

Move, effective June 27, 2016, to refer the consideration of a ban against outdoor wood furnaces to the Planning and Zoning Commission for its review and consideration.

Attachments

- 1) EHHI re Outdoor Wood Furnaces
- 2) CT DEP Fact Sheet – Conn. Gen. Stat. 22a-174k and Outdoor Wood Burning Furnaces
- 3) CT Towns Banning OWFs
- 4) EHHI 2010 Report – The Dangers to Health from OWFs
- 5) EHHI Short Overview of OWFs
- 6) Tolland Zoning Regulation Prohibiting Outdoor Wood Furnaces

From: Patricia Taylor <ptaylor.ehhi@gmail.com>
Sent: Thursday, May 05, 2016 5:50 PM
To: Town Mngr
Cc: Virginia D. Walton
Subject: EHHI - Outdoor Wood Furnaces
Attachments: OWF 3.jpg; CT Towns Banning OWFs.pdf; Tolland Zoning Regulation Prohibiting Outdoor Wood Furnaces (Mayors, Town Managers.pdf; EHHI Short Overview of OWFs.pdf; CT DEEP Fact Sheet - Conn. Gen. Stat. 22a-174k and Outdoor Wood Burning Furnaces.pdf; Case 2 - Converse, Weston, CT.pdf; EHHI 2010 Report - The Dangers to Health from OWFs.pdf

Mr. Hart,

I spoke briefly on the phone today with Assistant Town Manager Capriola.

Thank you for this opportunity to reach out with the attached information from Environment and Human Health, Inc. (EHHI). **We encourage Mansfield to pass an ordinance or zoning regulation prohibiting outdoor wood furnaces (OWFs).**

I've shared this information with Rob Miller, your Director of Health at Eastern Highlands Health District Health, so you may seek his advice on the health information enclosed. **CT DEEP and DPH are very pleased with our effort.**

Currently, 2 towns in your county – Hebron and Tolland – prohibit these appliances.

While Connecticut General Statute 22a-174k limits setbacks and restricts stack heights and what may be burned in OWFs, it is left to local leadership to regulate or to ban their use in your community.

Wood smoke contains many of the same toxic compounds that are found in cigarette smoke.

OWFs are one area of study and policy for EHHI because of their harm to human health. Neighbors who live near an OWF suffer illness and injury. Their homes lose value. When they decide the only solution to their health problems is to sell and move, they can't find a buyer because inspection uncovers the nearby furnace and the sale falls apart.

See www.ehhi.org/woodsmoke/ for an overview.

Only Mansfield can guarantee clean air and good health for its residents, when it comes to OWFs – by banning them. Please be assured it is ONLY OWFs that we seek to ban. The 19 Connecticut towns that have already passed bans will verify that fact.

On Tuesday May 10, I will drop a hard copy of the (large attachment) 2010 EHHI report entitled *The Dangers to Health from Outdoor Wood Furnaces* to your office. The study it reports was peer-reviewed and published in 2014 in the *Journal of Inhalation Toxicology*.

If you'd like to meet me then, please let me know. I'd love to speak with you or any member of your team about whether you support this effort

Regards,

Tricia Taylor

About EHHI:

Environment and Human Health, Inc. (EHHI) is a ten-member, science-based organization composed of physicians, public health professionals and policy experts. The organization is dedicated to protecting human health from environmental harms through research, education and the promotion of sound public policies.

EHHI is not a membership organization and therefore all of its support comes from foundations and committed individuals. EHHI does not receive any funds from businesses or corporations.

--

Patricia Taylor
Deputy Outreach Director
Environment & Human Health, Inc.

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Mobile: (203) 856-3544

ptaylor.ehhi@gmail.com

Case number 2 - Suzan Converse, Weston, CT

My neighbor across the street has a wood-burning furnace and it has become an extreme disturbance and problem in our lives. Once he begins using his furnace in the fall I can no longer open my windows to get fresh air, in fact, my house is always contaminated by his wood smoke.

I found out that indoor air is 70% of what is outdoors...that no windows or doors can keep the smoke out. I also cannot hang any laundry out on my line because it will get completely smoked out and thus I am forced to use more energy with my clothes dryer. We are very health conscious and environmentally conscious people who make decisions carefully so that we don't leave much of a footprint.

We feel extremely frustrated that we are defeated in our efforts by someone else's lack of consideration. One of my children recovered from a serious autoimmune disease before we moved into our house (3 years ago) and had we known the circumstance with my neighbor we would never have bought it.

No one in my family had ever suffered any upper respiratory illness until three years ago. At that time I was very ill and had borderline pneumonia. The following year my entire family spent a day outdoors on our property doing yard work and playing and 3 days later we were all sick with bad coughs and I again was close to pneumonia.

We are very careful not to go out anymore when his furnace is in use and try to have our property cleaned up in the fall before he begins using his furnace. There are times when the smoke is at ground level. I can never even feel comfortable letting my own children out to play for fear of their breathing the toxic wastes. If we could afford to move we would.

We feel trapped and defeated not only by our neighbor but by our town and the illogical grandfather laws allowing someone to harm others if they have been doing it already before a certain time. Why aren't people protected from wood smoke like this automatically? The people who sold us this house moved because one of the owners had a terminal lung condition and had difficulty going up and down stairs (he used oxygen tanks). Was it exacerbated by my neighbor's furnace? I feel afraid for our future health and will do anything to stop this man from using his furnace not just for my family's health but my neighbors' health and that of the wildlife and plant life that still exists in our area.

From: Suzan Converse, Weston, CT
Phone number 203-587-1023
szan@optonline.net



CT DEP Fact Sheet

Produced Sept 2005, revised 2011

Conn. Gen. Stat. 22a-174k and Outdoor Wood Burning Furnaces

During the 2005 session of the General Assembly Public Act 05-227, now codified as Connecticut General Statute 22a-174k, concerning the siting of Outdoor Wood Burning Furnaces (OWFs) was signed into law.

The Conn. Gen. Stat. 22a-174k requires that any OWF constructed, installed, established, or modified after July 8th, 2005:

- Must operate only on wood that has not been chemically treated.
 - Any other material burned in the OWF would constitute a violation of the statute.
 - Additionally, installation and operation must be conducted in accordance with the manufacturer's written instructions provided they do not conflict with the statute.
 - Must be located not less than 200 feet from the nearest residence not being served by the unit. (If the unit will be closer than 200 feet to the nearest residence not being served by the unit, then the OWF must not be installed).
- Must have a chimney that is more than the height of the roof peaks of residences located within 500 feet of the OWF, provided the chimney height is not more than 55 feet (This is to the actual roof peak, not the mid-line of the slope).
 - A chimney's height is limited to no more than 55 feet, from ground level, at its installed location. (If this is not more than the height of the roof peaks of residences located within 500 feet of the OWF, then the OWF must not be installed).
 - A licensed Land Surveyor or Professional Engineer would be able to provide appropriate mapping, showing both the horizontal and the vertical control measurements to all residences within the 500 foot radius required by law in order to demonstrate compliance with Conn. Gen. Stat. 22a-174k.
- Is subject to an infraction, not to exceed \$90/day, for every day of operation not in compliance with Conn. Gen. Stat. 22a-174k. Violation of this statute is listed under miscellaneous in the Judicial Infraction Schedule.

Connecticut municipalities continue to have local control of land use in and around areas with OWFs, for instance:

- Some municipalities institute summer bans, complete bans, or limit installation of OWFs within their jurisdictions. Local municipalities may choose to limit installations near schools, churches, and commercial areas as the statute only addresses set back requirements from residences.
- The installation of an OWF requires a building permit.

- While not required by the statute, some municipalities may choose to require a submittal from a licensed surveyor or professional engineer documenting the location of the OWF, distances to residences, and comparative heights of the stack and residential rooflines, as required by the statute, as part of the local zoning or building permit process.
 - This could ensure the local municipality limits its potential liability by not issuing a permit granting authorization to a resident to install an OWF unit in a non-compliant manner.
 - Property owners, local officials, and state officials do not have jurisdiction to allow variances or exception for any of these regulatory requirements.
 - As with any tall narrow structure, adequate foundation and guying support should be installed as needed to meet applicable codes and ensure public safety.

- Municipalities affected by operation of an OWF, along with DEP, have authority to enforce the provisions of Conn. Gen. Stat. 22a-174k.

Other Obligations

In addition to the provisions of Conn. Gen. Stat. 22a-174k and local ordinances, Sections 22a-174-18 and 22a-174-23 of the Regulations of Connecticut State Agencies for the abatement of air pollution also apply to the owner or operator of an OWF.

- The provisions of subsection (b) of 22a-174-18 provide that an owner or operator of any fuel burning source shall not exceed 20% opacity during any six-minute block average and 40% opacity during any one-minute block average.

- The provisions of subsection (c) of 22a-174-18 provide that no person shall cause or allow the emission of visible particulate matter beyond the legal boundary of the property on which such emission occurs that either; remains near ground level beyond such property boundary, or diminishes the health, safety or enjoyment of people using a building or structure located beyond the property boundary. Additionally, no person shall emit particulate matter into the ambient air in such a manner as to cause a nuisance.

- The provisions of subsection (a) of 22a-174-23 provide that no person shall cause or permit the emission of any substance or combination of substances which creates or contributes to an odor, in the ambient air, that constitutes a nuisance. Additionally, an odor constitutes a nuisance if present with such intensity, characteristics, frequency and duration that; it is, or can reasonably be expected to be, injurious to public health or welfare, or it unreasonably interferes with the enjoyment of life or the use of property.

For More Information

The CT DEP operates an **Air Pollution Complaint Line at 860-424-3436**. This line is open to all citizens with concerns regarding smoke and other air pollution. It is operated from 8:00 am - 4:30 pm, Monday through Friday; voice mail is available for complaints made during evening and weekend hours or you can e-mail a complaint to dep.aircomplaints@ct.gov

THE 19 TOWNS in Connecticut that have now banned outdoor wood furnaces are:

Avon

Bethel

Cheshire

Clinton

Granby

Haddam

Hamden

Hebron

Norfolk

North Haven

Plainville

Portland

Ridgefield

Rocky Hill

Simsbury

South Windsor

Tolland

West Hartford

Woodbridge

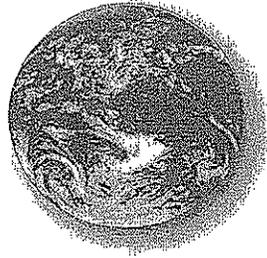
January 26, 2016

THE DANGERS TO HEALTH FROM Outdoor Wood Furnaces



ENVIRONMENT & HUMAN HEALTH, INC.

OUTDOOR WOOD FURNACES



THE DANGERS TO HEALTH FROM **Outdoor Wood Furnaces**

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possible by The Tortuga Foundation and
The William C. Bullitt Foundation.*



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Introduction

This study investigates how homes are affected by neighboring outdoor wood furnaces, as well as the health implications for the families living inside homes impacted by wood smoke.



When the weather forecast includes a warning of poor air quality, many people reduce their levels of activity and stay inside. However, many homes that are impacted by neighboring outdoor wood furnaces have air quality *inside* that is poor all the time. What can people do? This study investigates how homes are affected by neighboring outdoor wood furnaces, as well as the health implications for the families living inside homes impacted by wood smoke.

In this report, Environment and Human Health, Inc. (EHHI) explains its study, which measured potential wood smoke inhalation by people living in homes in the vicinity of outdoor wood furnaces (OWFs), also known as outdoor wood boilers (OWBs). EHHI's study monitored levels of PM_{2.5} and PM_{0.5} particles in each house for 72 hours.

The U.S. Environmental Protection Agency (EPA) has shown that PM_{2.5} and PM_{0.5} are the most common size particles in wood smoke. PM_{2.5} and smaller cause the greatest health impacts because they are small enough to go deep inside the lungs, where they can not only damage the lungs, but also pass through into the blood stream,

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delivering their toxins throughout the body. EHHI's study was performed over three days, for 72 hours per house, in each house that was monitored. This is the only study of its kind to date.

People have a long association with burning wood as a fuel, and because of that fact, one could easily believe that wood smoke is a natural part of our environment and is quite benign. This, however, would be wrong. Wood smoke has many of the same components as cigarette smoke, now heavily regulated because of its harmful health effects. Not only is wood smoke harmful to health, but there are currently almost no regulations restricting it or protecting neighbors who are harmed by it.^{1,2}

OWFs use a heating technology that has grown in popularity, especially in the northern United States. In most cases, OWFs look like small sheds with short stacks. They are self-contained, and are connected to the building or house that they heat through underground insulated water pipes. The wood-burning shed contains a metal combustion chamber for a wood fire, surrounded by a water jacket. The fire heats the water, which is then circulated through the insulated water pipes into the house or building for heat.³

People have a long association with burning wood as a fuel, and because of that fact, one could easily believe that wood smoke is a natural part of our environment and is quite benign. This, however, would be wrong.

THE DANGERS TO HEALTH FROM



The components of cigarette smoke and wood smoke are very similar, and some components of both are carcinogenic.

Outdoor wood furnace emission problems are exacerbated by the fact that these devices cycle between oxygen-deficient and oxygen-rich burning. This causes the smoke that leaves the stack to be cool. Irrespective of the stack's height, the wood smoke will fall toward the ground and will then travel in a plume for up to one-half mile, impacting houses in its wake.⁴

Wood smoke contains particles that are so small they cannot be kept out of homes, even tightly built homes. The smoke particles enter through the windows and the doors and remain in the homes for long periods of time, impacting a family's health.⁵

As the use of outdoor wood furnaces has increased, so has the number of complaints. Neighbors have reported serious health impacts, including reduced lung function, increased asthma attacks, headaches, sinusitis, bronchitis and pneumonia. Many of the components of wood smoke are carcinogenic—and wood smoke as a whole can aggravate heart disease.⁶

According to the Environmental Protection Agency (EPA), wood smoke includes toxic air pollutants and can cause coughs, headaches, and eye and throat irritation in otherwise healthy people.⁷ Scientific literature further demonstrates that wood smoke exposure can depress the immune system and damage the layer of cells in the lungs that protect and cleanse the airways. Wood smoke interferes with normal lung development in infants and children. It also increases children's risk of lower respiratory infections, such as bronchitis and pneumonia. The components of cigarette smoke and wood smoke are very similar, and some components of both are carcinogenic.

Why outdoor wood furnaces (OWFs) emit far more smoke than other wood-burning devices

The design of an outdoor wood furnace does not allow for complete combustion, and thus generates large amounts of dense smoke. When it leaves the stack, the smoke is much cooler

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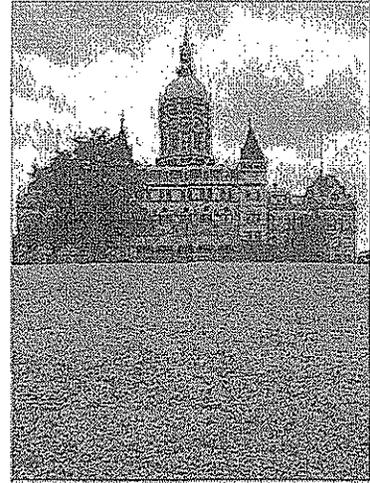
than smoke from other wood-burning appliances. The firebox inside the shed of most OWFs is fully surrounded by a water jacket. This causes the wood fire to remain well below the needed 1000° F temperature for a complete burn. The slower, cooler fire is inefficient and creates a great deal of smoke, carbon monoxide and creosote.^{8,9}

The Northeast States for Coordinated Air Use Management (NESCAUM) found that the average fine particle emissions from one OWF are equivalent to the emissions from 22 EPA-certified wood stoves, 205 oil furnaces, or as many as 8,000 natural gas furnaces. The report notes, to put these numbers in perspective, that a single outdoor wood-burning boiler can emit as much fine particulate matter as four heavy duty diesel trucks, on a grams per hour basis.¹⁰ The smallest OWF has the potential to emit almost one and one-half tons of particulate matter every year.¹¹

Why Environment and Human Health, Inc. undertook this study

In 2008, Environment and Human Health, Inc. (EHHI) began receiving requests for help from people whose neighbors were using outdoor wood furnaces to heat their homes. These people had sought help from their town and state officials, and only called EHHI after they had been unable to obtain any help to stop wood smoke emissions from entering their homes and making them sick. Because of the harmful effects of wood smoke on health and because federal and state agencies were not stepping in to protect health, Environment and Human Health, Inc. felt that it needed to act to try to protect the families being adversely impacted by OWFs.

Many states have materials on their websites citing the dangers of OWFs, as well as the harmful effects of wood smoke in general. Some states have passed “set-back” regulations and stack height regulations for OWFs—but none of these measures has been able to protect human health. To date, only the state of Washington has banned OWFs throughout the state.

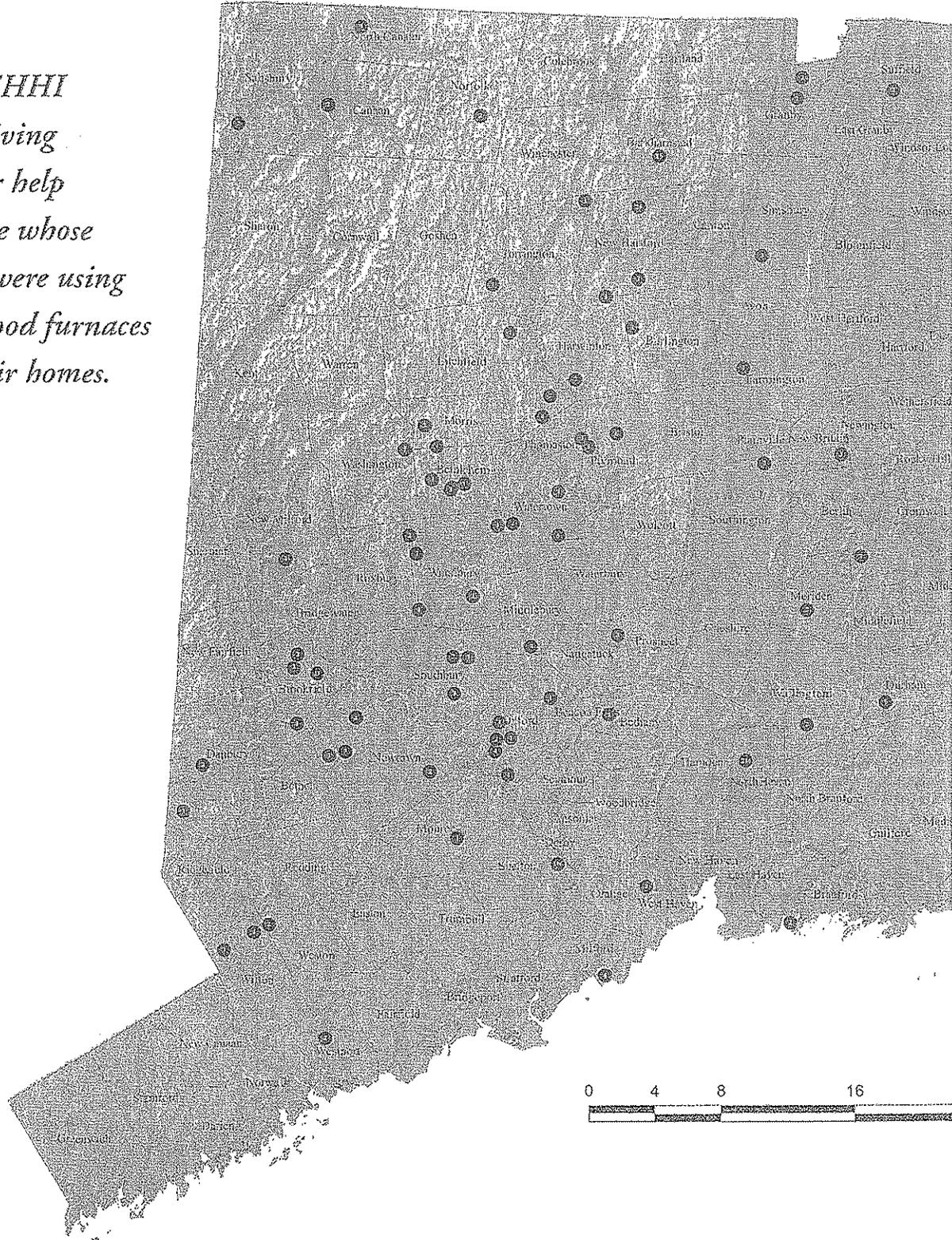


Some states have passed “set-back” regulations and stack height regulations for OWFs—but none of these measures have been able to protect human health.

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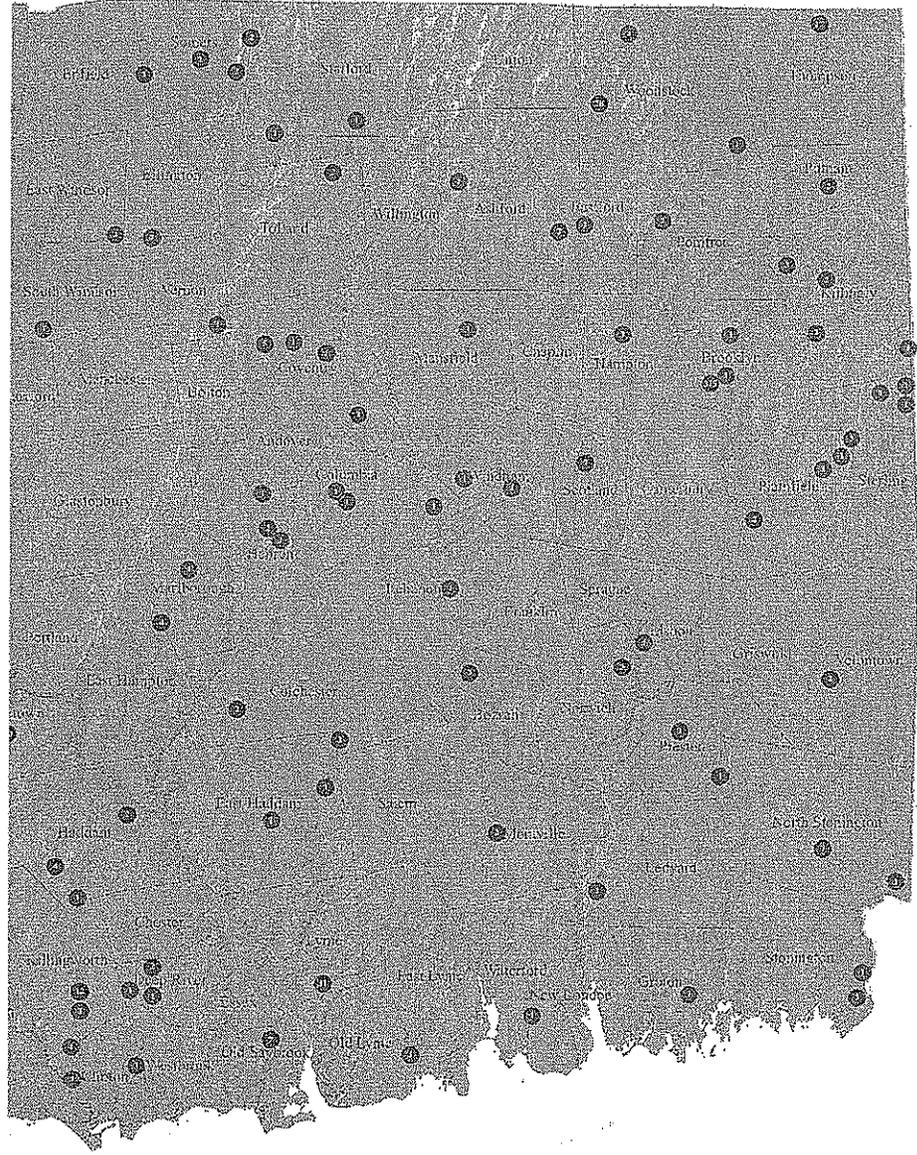
Outdoor Wood Smoke: Number of Complain

In 2008, EHHI began receiving requests for help from people whose neighbors were using outdoor wood furnaces to heat their homes.

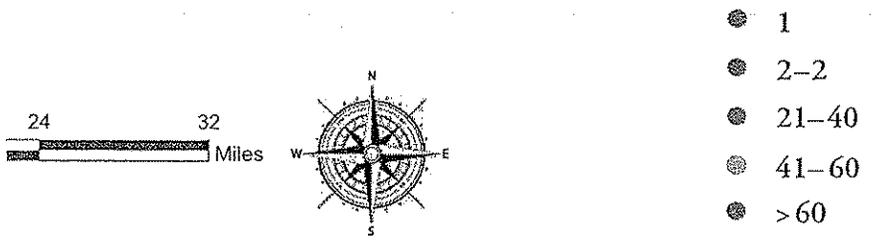


OUTDOOR WOOD FURNACES

Counts by Location in the State of Connecticut



Unless states take decisive action to protect their citizens, confusion and inaction will remain with regard to who has jurisdiction over wood smoke problems—and who will actually enforce wood smoke regulations.



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Emissions from a smoldering fire, with incomplete combustion, contain more carbon monoxide, carcinogens, organic toxicants and irritants than smoke emissions from a very hot fire that is supplied with high levels of air and oxygen.

Although some individual towns across the country have banned new installations of OWFs, this is a very cumbersome way to address the problem, as there are thousands of towns. In addition, bans by towns, going forward, do not address the problems created by “grandfathered” OWFs. In the meantime, new OWFs are being installed across the northern states in this country, creating more and more problems for people living near them (*see map, preceding page*).

When neighbors complain to the state about an outdoor wood furnace that is *in compliance*, but is causing them harm, they are often referred back to their town officials. Unless states take decisive action to protect their citizens, confusion and inaction will remain with regard to who has jurisdiction over wood smoke problems — and who will actually enforce wood smoke regulations.

Wood smoke contains unhealthy amounts of:

- particulate matter
- dioxin
- carbon monoxide
- nitrogen dioxide
- sulfur dioxide
- hydrochloric acid
- formaldehyde
- other toxic air pollutants

Exposure to these pollutants is associated with a diverse range of harmful health effects, some of them short-term and others long-term.

How can the risks to residents’ health in a home impacted by wood smoke be determined?

The amount of wood smoke inhaled determines the health risk.

The amount of contaminated air inhaled inside a house determines the health risk. In the case of complex mixtures of toxins, such as those present in wood smoke, the health effects are determined by the chemical components of the smoke emissions. Thus, the health

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effects from smoldering fires are not the same as from hot "oxygen-rich" fires. Mixtures that include particulates that can be inhaled deep into the lungs put individuals at high risk. Certain gaseous toxins may be adsorbed onto the surfaces of the particulates and carried to the most sensitive regions of the lungs, where they are readily absorbed into the body. Normally, such gases would be removed in the nose and upper respiratory tract and would not reach the sensitive areas of the lungs.

The small respirable particles, 0.1 to 5 microns¹² in size, are present in all wood smoke. The particles remain suspended in the air for several hours and readily flow into houses. Thus, the particulates in the 0.1 to 5 micron size range are a surrogate for measuring the presence and intensity of wood smoke inhalation risk. Other sources of particulates in this size range include tobacco smoke, cooking particles and combustion gases from industrial sources found in ambient air.¹³ Therefore, the indoor measures must be compared with background levels in the ambient air.

The inhalation of wood smoke is hazardous. Wood smoke contains irritants, systemic toxins and carcinogens. All wood smoke emissions are not the same. The levels of irritants and carcinogens are determined by the type of wood, its source and the method of burning. Emissions from a smoldering fire, with incomplete combustion, contain more carbon monoxide, carcinogens, organic toxicants and irritants than smoke emissions from a very hot fire that is supplied with high levels of air and oxygen.

Almost all burning wood and biomass release a range of particulate matter, from dense smoke to fine particulates that readily penetrate the deep lungs. Levels of particulates can be used as a surrogate for the amount of smoke emissions that enter a building. According to the EPA, toxics in the wood smoke emissions from outdoor wood furnaces include carbon monoxide, $PM_{2.5}$, PM_{10} , methane, volatile organic compounds, benzene, sulfur dioxide, nitrogen oxides, ammonia, formaldehyde, acetaldehyde, phenol, naphthalene, cresols, acrolein, 1,3-butadiene, benzopyrene, mercury, dioxins and furans.¹⁴



According to the EPA, toxics in the wood smoke emissions from outdoor wood furnaces include carbon monoxide, $PM_{2.5}$, PM_{10} , methane, volatile organic compounds, benzene, sulfur dioxide, nitrogen oxides, ammonia, formaldehyde, acetaldehyde, phenol, naphthalene, cresols, acrolein, 1,3-butadiene, benzopyrene, mercury, dioxins and furans.

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Until Environment and Human Health, Inc. conducted this study, very little was known about how much wood smoke was actually inside homes located near outdoor wood furnaces.

Until Environment and Human Health, Inc. conducted this study, very little was known about how much wood smoke was actually inside homes located near outdoor wood furnaces. EHHI has now evaluated the indoor air quality inside a number of homes near outdoor wood furnaces. EHHI also evaluated a number of homes that were not near outdoor wood furnaces, which served as the control houses.

The critical question is the safety of those who continue to inhabit a house that has accumulated wood smoke emissions.

In order to understand the risk from the exposures occurring inside houses impacted by wood smoke emissions, it is necessary to monitor the hourly concentrations over several days to establish the patterns of air changes. To establish the added risk from wood smoke, it is necessary to compare the measurements to concentrations in control, or background, houses.

How outdoor wood smoke enters the inside of neighboring homes and the resulting health effects

The amount of smoke emissions that enter a house is dependent on the concentration of the smoke emissions outside of the house, as well as the rate at which the house exchanges outside and inside air. Typical houses in the Northeast exchange one total volume of air each hour, but can vary from one air change every two hours for "tight" houses to one air change every half-hour for a very drafty house.

Over a period of several hours, the amount of smoke emissions inside the house will reach the same concentration as in the air that surrounds the house. As a rule of thumb, it can be assumed that after one hour—in a house with good interior circulation to mix the emissions entering the house with the clean air inside it—the concentration of emissions inside a house is approximately half of that outside. The concentration inside the house will increase hourly,

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until after a period of six to nine hours, the concentrations of emissions inside and outside of the house are essentially the same.¹⁵

Once a house is contaminated with wood smoke emissions, several hours are required to totally remove the contaminated air. The rate of removal is again determined by the number of air changes per hour. If the outside air is absolutely clean, after one air change the interior contamination is reduced by about one-half. After three to four hours, about 10 percent of the contamination is still present inside of the house. The house retains the contamination after the emissions surrounding the house have been diluted.

A study by the University of Washington in Seattle showed that 50 to 70 percent of the outdoor levels of wood smoke was entering homes that were not burning wood.¹⁶ The EPA performed a similar study in Boise, Idaho, with similar results. The data in the charts on pages 23–27 demonstrate that similar exposures are occurring in Connecticut.

Key background information about wood smoke:

- Large amounts of wood smoke, like the plumes from OWFs, cannot be kept out of neighboring houses, even those with tight windows and doors.
- Wood smoke has many of the same components as cigarette smoke and, therefore, these exposures pose a real health risk for families living in the vicinity of OWFs.
- Wood smoke is a complex mixture of chemicals and particulates. It contains carbon monoxide and other organic gases, particulate matter, chemicals and some inorganic gases. Some of these compounds are toxic (aldehydes and phenols) and some are known carcinogens (benzopyrene and cresols).
- Wood smoke contains carbon monoxide (CO) gas, which at low levels can lead to serious health problems for individuals with compromised heart and circulatory conditions.



Large amounts of wood smoke, like the plumes from OWFs, cannot be kept out of neighboring houses, even those with tight windows and doors.

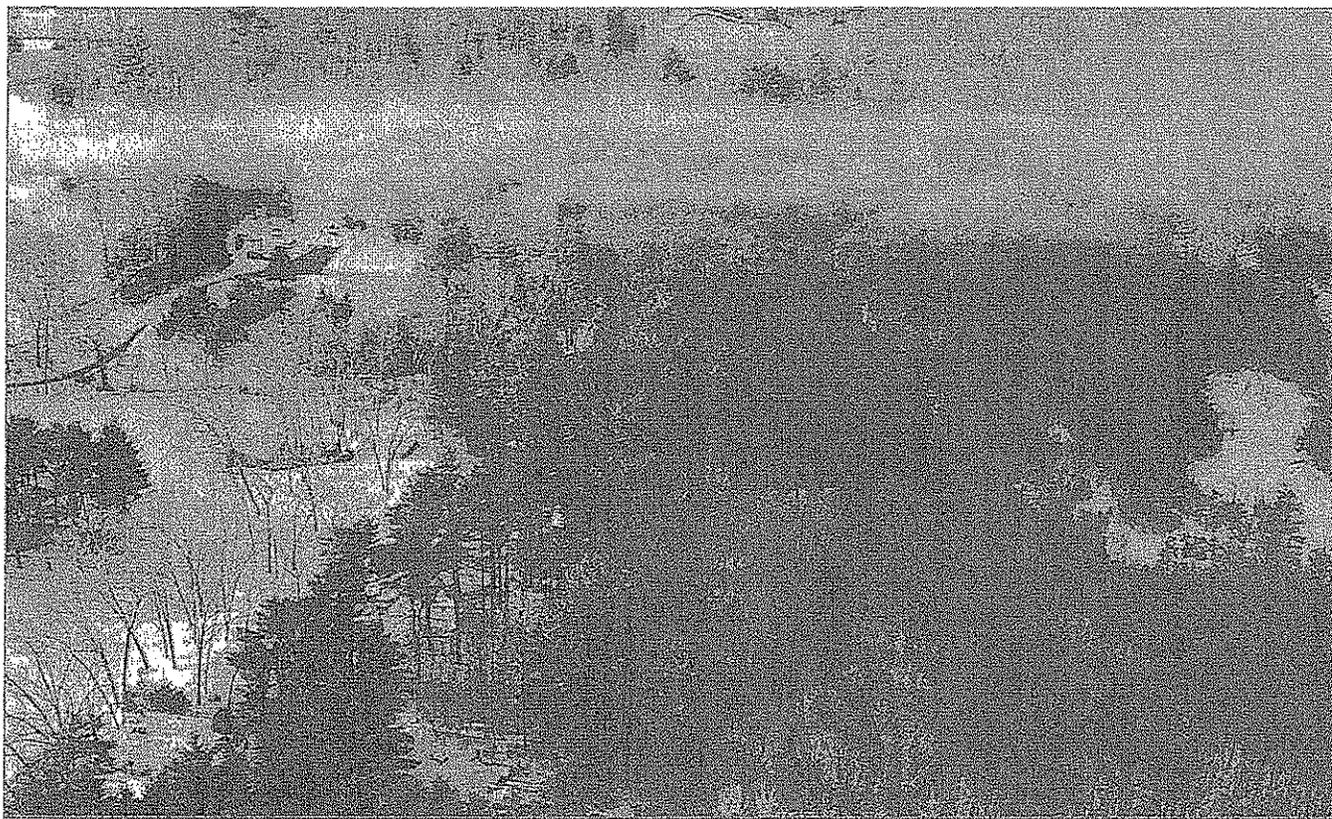
THE DANGERS TO HEALTH FROM



A study by the University of Washington in Seattle showed that 50 to 70 percent of the outdoor levels of wood smoke were entering homes that were not burning wood. The EPA performed a similar study in Boise, Idaho, with similar results.

- Particulate matter in wood smoke that is less than 10 microns in diameter finds its way into the alveoli in the lungs. Once in the alveoli, the particulate matter can cause structural and chemical changes, which interfere with oxygen uptake. As well, the toxic compounds and carcinogens enter into the bloodstream by way of the alveoli of the lungs.
- Episodes of short-term exposures to extreme levels of fine particulates from wood smoke and other sources, for periods as short as two hours, produce significant adverse health effects.^{17, 18, 19}
- Wood smoke interferes with normal lung development in infants and children. The components of smoke increase children's risk of lower respiratory infections, such as bronchitis and pneumonia. Wood smoke exposure can depress the immune system and damage the layer of cells in the lungs that protects and cleanses the airways.
- Wood smoke causes coughs, headaches, and eye and throat irritation in otherwise healthy people. For vulnerable populations, such as people with asthma, chronic respiratory disease and those with cardiovascular disease, wood smoke is particularly harmful—even short exposures can prove dangerous.
- Children and the elderly have the highest sensitivity to wood smoke. However, no age group is without risk for respiratory problems, including asthma and chronic obstructive pulmonary disease (COPD), that result from breathing wood smoke. The effects are cumulative.
- The air impact of health exposure to wood smoke is increased two-fold during periods with stagnant air. Under such conditions, the inhaled dose levels of particulates within houses approach the hazardous level found in regulated work sites by OSHA. EHHI found smoke entering houses, every day, at even higher levels.

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- The particulate matter and gases in wood smoke are so small that windows and doors cannot keep them out—even the newer energy-efficient, weather-tight homes cannot keep out wood smoke. This is consistent with reports from people in the EHHI study who say their children awaken in the middle of the night having difficulty breathing.
- In 2009, the state of Massachusetts commissioned a study on the environmental impacts of burning wood for electricity. That study, conducted by the Manomet Center for Conservation Sciences, has now been released. The Manomet study shows that, per unit, wood releases more climate-damaging gases than coal.²⁰

The Manomet study shows that wood burning releases more heat-trapping carbon dioxide into the atmosphere per unit of energy than oil, coal or natural gas.

Wood burning has been promoted as a “green” energy source because growing forests can absorb the same amount of greenhouse gases that are emitted from burning wood, essentially canceling out the pollutants. The Manomet study shows that wood burning releases more heat-trapping carbon dioxide into the atmosphere per unit of energy than oil, coal or natural gas.

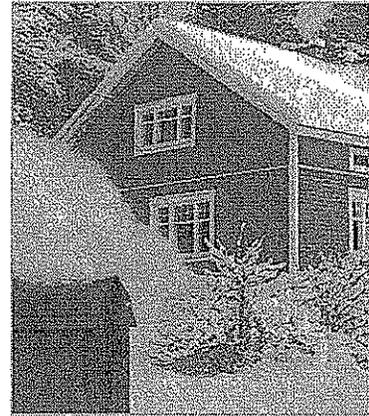
Summary of the Study's Findings

States have tried to control the harmful effects of outdoor wood furnaces by legislating set-back regulations. Some states have set-back regulations of 100 feet from the nearest neighbor, while other states have set-back regulations of 200 feet. This study shows that none of the regulations that have been put in place protect the neighboring properties or the health of the families living in the homes on those properties.

- EHHI measured the two particle sizes—PM_{2.5} and PM_{0.5}—designated by EPA to be the most dangerous to human health. Both of these particulates were continuously recorded in each of the impacted homes for a period of three days. Both hourly averages and minute-by-minute data were collected.
- Two of the most hazardous components of wood smoke, particulate matter (PM) measuring 2.5 and 0.5 μ (u) microns in size, were significantly elevated inside homes neighboring outdoor wood furnaces. High levels were present in every 24-hour period tested, in every home.
- A look at the hours of peak exposures to PM_{2.5} particles in both the background houses and the impacted houses shows that House A had peak levels that were six times higher than the control houses; House B had peak levels 14 times higher than the control houses; House C had peak levels 12 times higher than the control houses; and House D had peak levels more than eight times higher than the control houses (see charts showing Houses A, B, C and D on pages 23–26, where the blue line represents background levels in control houses).
- Comparing the derived equivalent PM_{2.5} particle count to the estimated EPA 24-hour air standard of 35 micrograms per cubic meter (ug/m³) shows that House A had four times the EPA air standard; House B had nine times the EPA air standard; House C had eight times the EPA air standard; and House D had six times the EPA air standard.
- Every impacted home had many hours when PM_{2.5} particles were significantly above both the levels found in the background houses and the EPA air standards.
- All impacted houses had particulate exposures well above the EPA air 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 cardiovascular problems.
- An impacted house 100 ft. from an OWF had 14 times the levels of PM_{2.5} compared to the background houses, and nine times the levels of PM_{2.5} in the EPA's air standards.

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- An impacted house 120 feet from an OWF had more than eight times the levels of $PM_{2.5}$ compared to the background houses, and six times the levels of $PM_{2.5}$ in the EPA's air standards.
- An impacted house 240 feet from an OWF had 12 times the levels of $PM_{2.5}$ compared to the background houses, and eight times the levels of $PM_{2.5}$ in the EPA's air standards.
- An impacted house 850 feet from an OWF had six times the levels of $PM_{2.5}$ compared to the background houses, and four times the levels of $PM_{2.5}$ in the EPA's air standards.
- The study shows that regulating a 200-foot setback is not protective, and does not keep wood smoke from entering neighbors' homes.
- Even the impacted house as far away as 850 feet from the OWF had levels six times that of the background houses, and four times higher than the EPA air standards, showing that a 200-foot set-back regulation in no way protects property values or human health.
- EHHI's study shows that emissions from the OWFs enter neighboring homes at all hours of the day—and it takes several hours for the particulates to clear out of the homes.
- This study shows that $PM_{0.5}$ particle exposures are also high throughout the 24-hour period, yet state and federal standards are only based on $PM_{2.5}$ particulates.
- The state and federal governments regulate particulate exposures by averaging them over a 24-hour period. Yet this study shows that the exposure peaks can be very high, and these peaks can cause health effects. The peak exposures should be examined and regulated, as well as the average exposure.
- The study confirms that windows and doors, even tight ones, cannot keep wood smoke out if it is close enough and dense enough.



Even the impacted house as far away as 850 feet from the OWF had levels six times that of the background houses, and four times higher than the EPA air standards, showing that a 200-foot set-back regulation in no way protects property values or human health.

Health Effects of Wood Smoke Exposures



Fine particulate matter is especially harmful to people with chronic obstructive pulmonary disease (COPD), increasing their hospital admission rates.²²

Wood smoke poses risks for healthy people who are physically active outdoors. Wood smoke contains gases and other respiratory irritants linked to allergies, inflammation of the throat and sinuses, or decreased lung function.²¹

Short-term and immediate effects

Burning eyes and throat, sinusitis, bronchitis, pneumonia²²

Long-term effects

Chronic Obstructive Pulmonary Disease

- Fine particulate matter is especially harmful to people with chronic obstructive pulmonary disease (COPD), increasing their hospital admission rates.²³

Asthma

- Currently, 19.2 million people (8.5 percent of adults) in the United States report that they have asthma.²⁴ New England states have some of the highest asthma rates in the country.

A nonprofit, public health and medical research funding organization, Health Resources in Action, produced a report entitled, *The Burden of Asthma in New England*. The report shows the very high and growing rates of asthma in both adults and children in the region. Asthmatic children are particularly sensitive to fine particulate matter and wood smoke.²⁵

Cancer

- OWFs emit a number of carcinogenic chemicals. Wood smoke contains benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs) and dioxin. Fine particulate matter also increases the risk of cancer. Analysis of data from an American Cancer Society

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cohort study found that for each 10 $\mu\text{g}/\text{m}^3$ elevation in fine particulate air pollution, the risk of lung cancer mortality increased by 8 percent.²⁶

Cardiovascular Disease

- Mortality and hospital admissions for myocardial infarction, congestive heart failure and cardiac arrhythmia increase with a rise in the concentrations of particulate and gaseous pollutants.

As concentrations of airborne particles increase, people with cardiovascular disease may experience increasing severity of symptoms, rates of hospitalization, and mortality.²⁷

Carbon Monoxide Poisoning

- The low-burning fires of OWFs emit larger amounts of carbon monoxide than high-combustion fires. Carbon monoxide exposure is not only an immediate health risk; continuous exposures, even at low levels, can lead to neurological effects.^{28, 29, 30}

Asthmatic children are particularly sensitive to fine particulate matter and wood smoke.

Methods Used in the Research Study

Environment and Human Health, Inc. (EHHI) designed its research with two goals in mind. The first goal was to measure, with precision, the air quality in homes near outdoor wood furnaces (OWFs). This entailed setting up a particle monitor in people's homes, and also taking into account other factors that might affect air quality, such as heating and hot water systems. Data on weather conditions were also collected. The second goal of the research was to design a protocol that would be easily replicable by citizens with similar smoke concerns.

EHHI chose four homes to study from the pool of individuals who had contacted EHHI about their problems with smoke from OWFs that had been installed in neighboring houses. These four impacted families were willing to have EHHI's researchers come into their homes and were willing to abide by the research protocol. Each of the four houses in the study was between 100 and 850 feet from an OWF. Each of the families had a series of health problems that they attributed to the smoke from a nearby OWF.

EHHI's researchers measured the presence of two sizes of particles in the indoor air of the four homes—those measuring 2.5 microns and those 0.5 microns and smaller. Particles of both sizes are two of the most hazardous components of wood smoke because they are inhaled deep into the respiratory system. The device used for measurement was a Dylos Air Quality Monitor 1100 Pro. This monitor provides counts of particles (both sizes) per 0.01 cubic feet of air.

Before the measurement process began in participants' homes, they were given a description of the project. They also completed a short questionnaire to provide background information about their homes, additional potential sources of particulate matter in the air, and their health concerns. In addition, forms were provided for participants to record outdoor conditions (air temperature, wind, cloud cover) and activities inside that might increase particles in the air (vacuuming, cooking, children's activities).

At each site the Dylos Air Quality Monitor 1100 Pro was set up and stationed out of the way of daily traffic, but in a room that residents said was both exposed to the smoke and frequented by the family. Since cooking increases particulate matter in the air, kitchens

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were not monitored. Depending on the house, the monitor was set up either in a bedroom or in a living room or study.

The monitor was hooked up to a laptop computer (either a Toshiba Portégé 7100 or a Presario laptop). As the monitor continuously counted the particles, minute-by-minute data were stored on the computer via its HyperTerminal. Due to recording limitations associated with the HyperTerminal, EHHI could record only about eight and a half continuous hours. The Dylos monitor itself, however, retains hourly average counts for 24 hours.

To obtain the most comprehensive array of readings possible, EHHI instituted the following data collection protocol:

- Participants were asked not to touch the monitor or the computer and to call the researchers any time they had concerns or questions. At each house, monitoring began at mid-day on the first day. Researchers then downloaded the minute-by-minute data and the hourly readings mid-day the following day (Day 2). This provided 24 hours of hourly average readings, as well as the preceding eight and a half hours of minute-by-minute data. After downloading both sets of data, the particle monitor was reset for the next 24-hour period. Day 3 followed the same protocol. On Day 4, the data were downloaded and the equipment was then removed from the home. By measuring the particles over a three-day period, EHHI was able to estimate the quality of the indoor air with confidence.
- In addition to measuring levels of both sizes of particles in the four affected homes, EHHI measured the presence of those size particles in seven homes that were not exposed to smoke from an OWF. The identical measurement protocol was followed for the non-affected houses. These measurements served as a set of comparison data. They helped to answer the question, "What would we normally expect to find in Connecticut houses during the winter season?" The data from the houses near OWFs were also compared to the EPA's Air Quality Index.
- After completing the data collection, each household was provided with two graphs reflecting its own hourly averages for the two particles sizes we measured. Both graphs also included the average hourly readings from the comparison houses that were not located near OWFs. With each family's permission, we made public the graphs representing the individual houses, but kept names and specific locations confidential.

Key Tables and Abbreviations

EPA Air Quality Index for PM_{2.5} (with particulate counts scale estimate)³¹

EPA developed the Air Quality Index to compare health risks from exposures of less than 24 hours.

EPA measures the particle load, PM_{2.5} particles in terms of weight (ug/cubic meter). Below is a table estimating the conversion between EPA's measures in mass and the measures in number of particles from the meter (cts/0.01 ft³).

Air Quality	Exposure (ug/m ³)	Exposure Particle (counts/0.01 ft ³)
Good	0-20	0-45
Moderate	21-40	45-95
Unhealthy for sensitive groups	41-60	95-140
Unhealthy for all	61-80	140-195
Very Unhealthy	81-120	over 195

Keys to Abbreviations in the Following Charts

Dylos = The Dylos measuring device was a Dylos Air Quality Monitor DC 1100 Pro used to measure the particulates. The readout is the number of particles counted in 0.01 cubic feet of air. The particles are drawn through the meter by an air fan at constant rate. As they pass through a laser beam, each particle is counted. There were two particle sizes counted: 2.5 microns in diameter and 0.5 microns in diameter. Wood smoke falls into the 2.5 and 0.5 range.

CT = Counts, actual number of particles counted in 0.01 cubic feet of indoor air. The (cts/0.01 ft³) refers to the number of particles in 0.01 cubic feet of air. That is the actual number of particles in 0.01 cubic feet exactly as it reads out on the meter dials. *(This method was used to explain the data so that a homeowner could understand the information exactly as it is shown on the meter, without doing mathematical conversions. Most scientists would have converted the data to the millions-of-particles-per-cubic-foot form. This study did not do so because it introduces another complex step and makes the information less user-friendly for the homeowners testing their own houses.)*

AVG. = The average or mean

SD = is the standard deviation of the sample. SD 54 is the average number of counts per 0.01 cubic feet of air in the background houses. SD is a measure of the variability of the hourly measurements. The data are not normally distributed, i.e., following a bell shaped curve; therefore the SD exceeds the mean.

Hours = The charts show the hourly average levels from noon to noon; e.g., 13:00 refers to 1:00 p.m.

N = 308 is the total number of hours measured in the control houses with no outdoor wood furnace in the area. There were seven control houses tested for 24 hours each, some for two and some for three days.

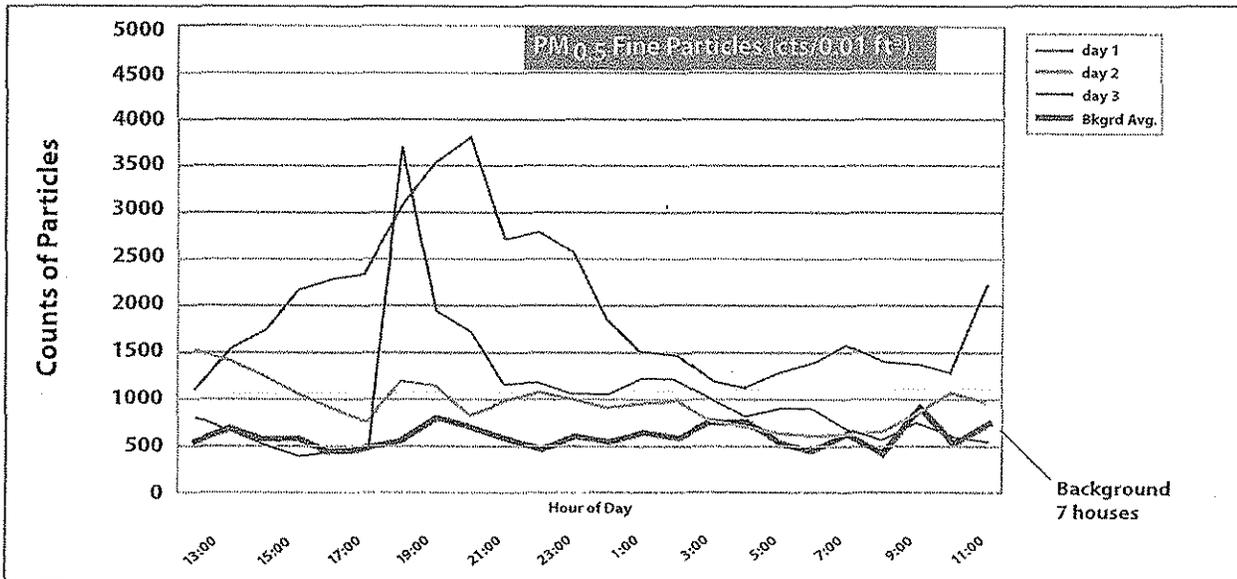
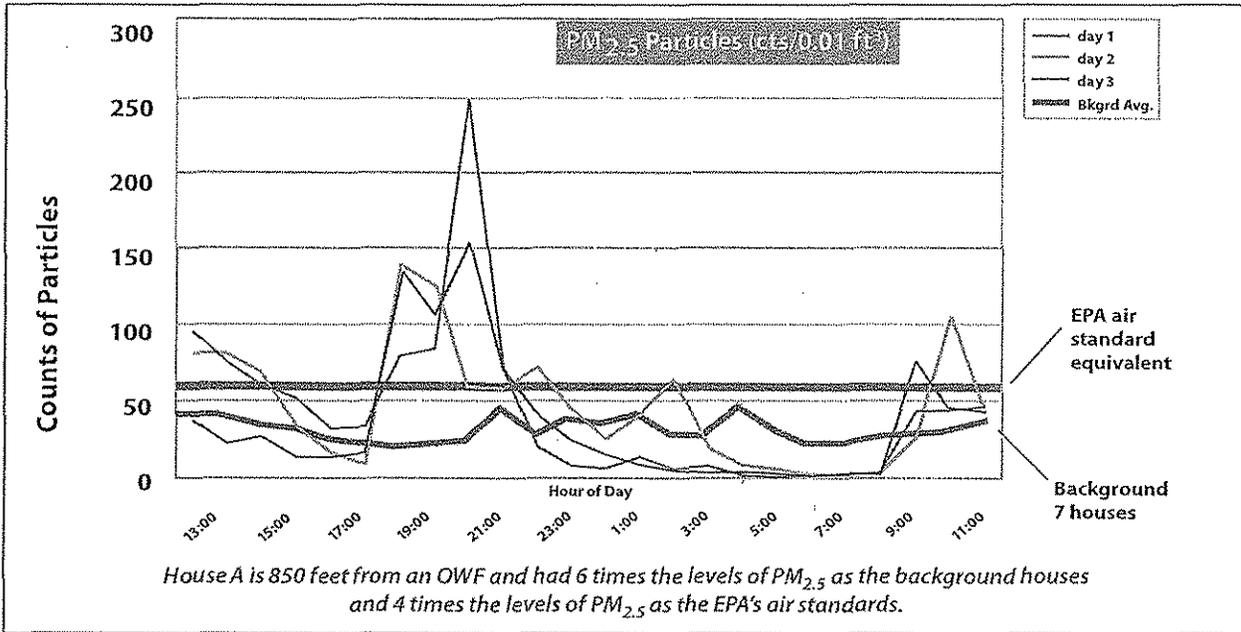
The charts on the following pages show the impacted houses designated A, B, C and D measured over three days. Periods of very high exposure were seen for both PM_{2.5} and PM_{0.5} particulates in every house on every day. There are some periods of the day when the particulate matter recedes in impacted houses, but most of the time there are elevated exposures that last for hours, tending to peak in the middle of the night when residents are sleeping.

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Graphic Presentation of the Study's Findings

House A

Distance = 850 feet from the neighboring Outdoor Wood Furnace, Litchfield County, Connecticut

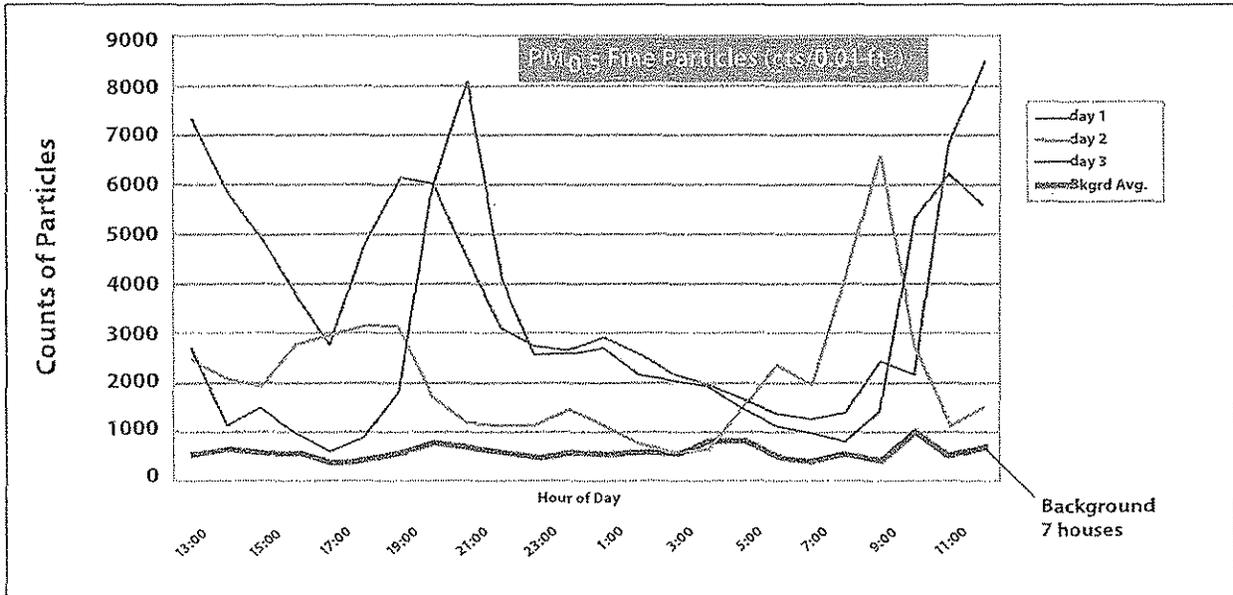
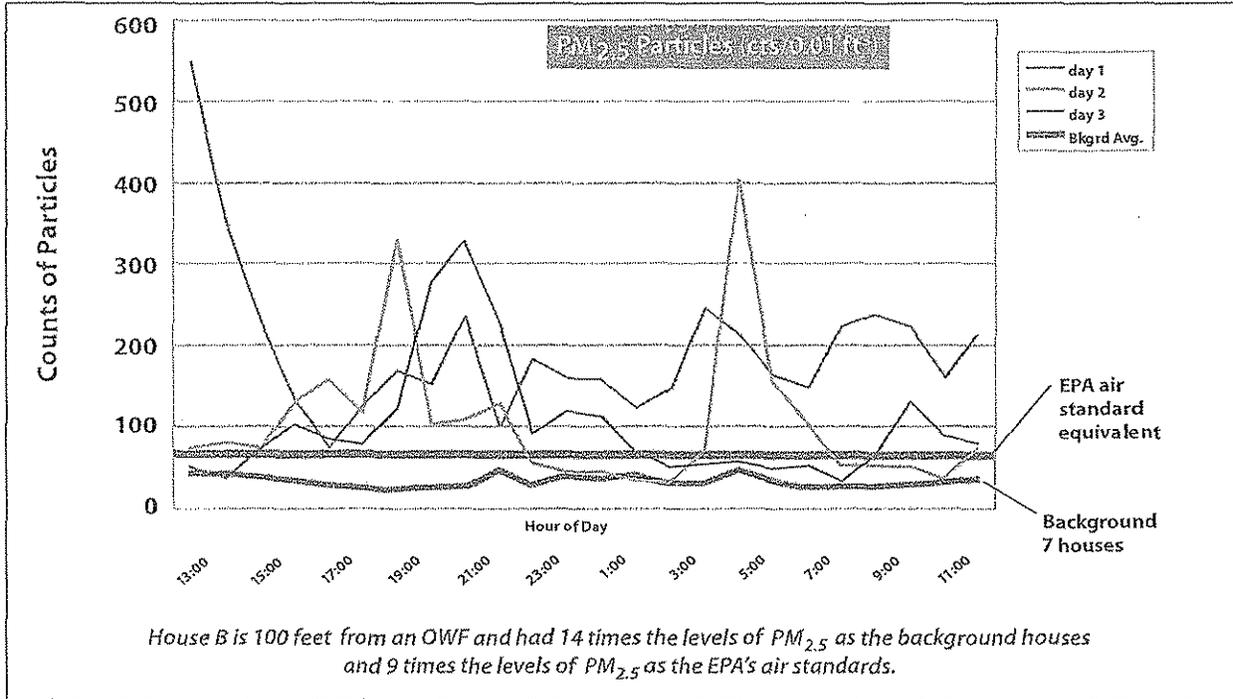


Red horizontal line = EPA federal standard for PM_{2.5} expressed in ug/m³ for outdoor air. It is used for regulatory purposes. There are no standards for the inside of houses.

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House B

Distance = 100 feet from the neighboring Outdoor Wood Furnace, Fairfield County, Connecticut
 (The OWF was grandfathered in before the Connecticut set-back regulation of 200 feet was instituted.)

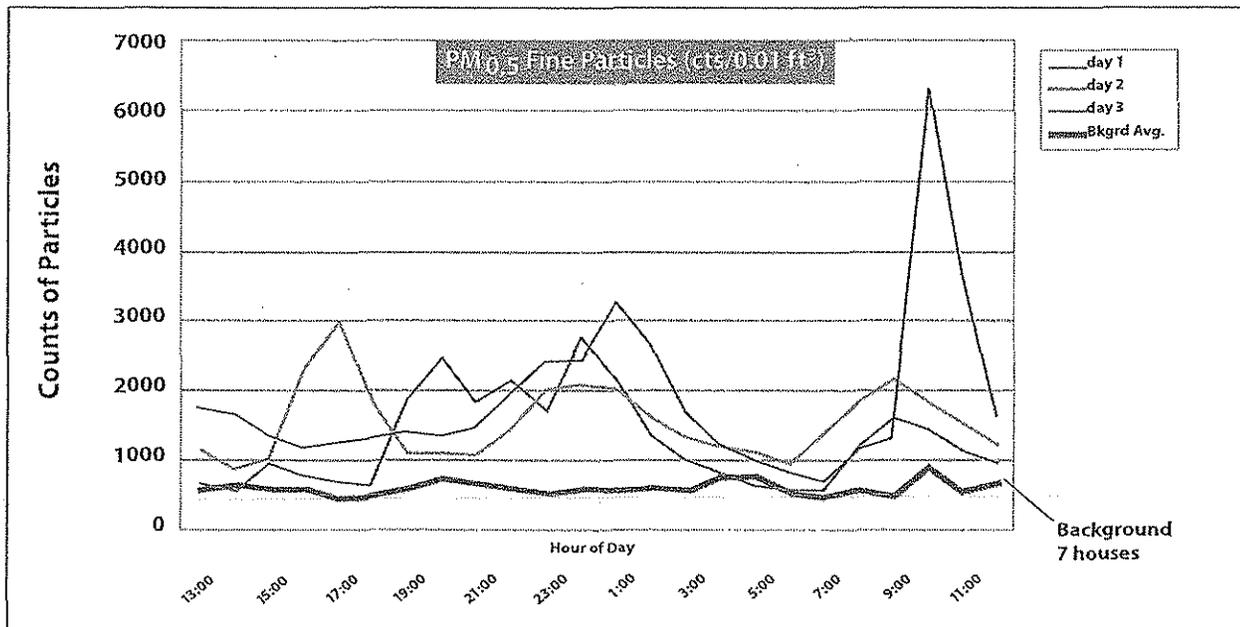
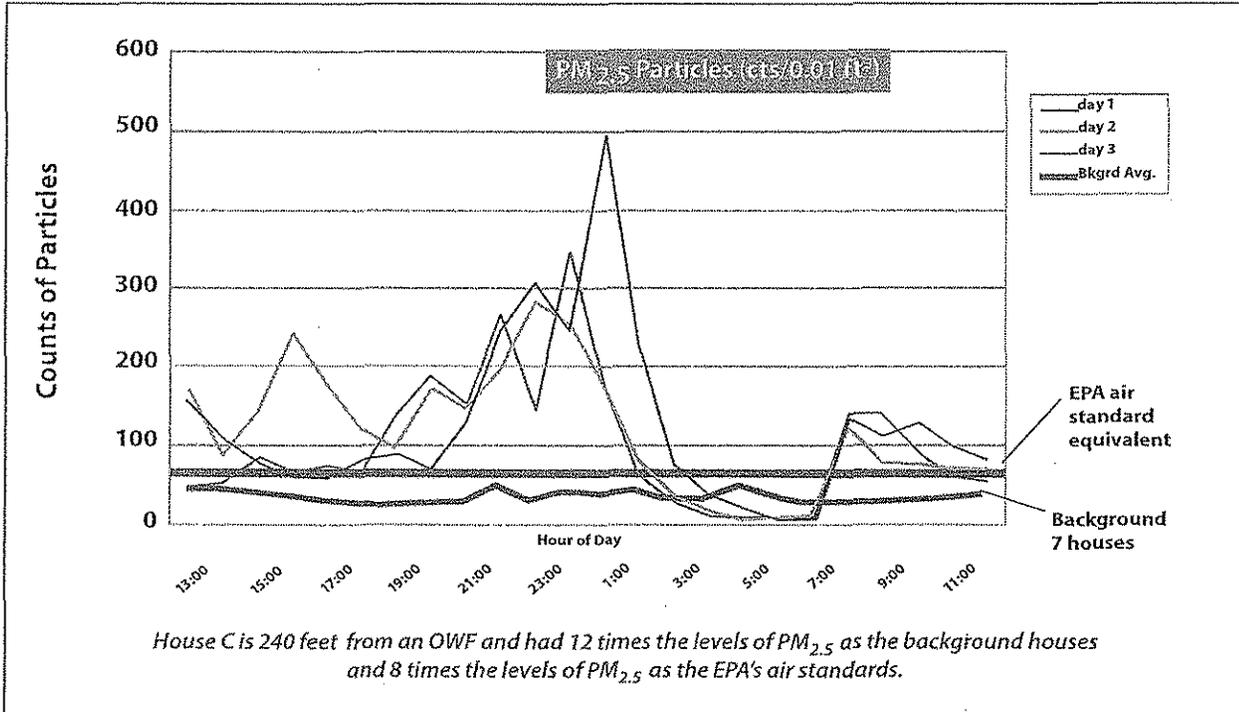


Red horizontal line = EPA federal standard for PM_{2.5} expressed in ug/m³ for outdoor air. It is used for regulatory purposes. There are no standards for the inside of houses.

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House C

Distance = 240 feet from the neighboring Outdoor Wood Furnace, Windham County, Connecticut



Red horizontal line = EPA federal standard for PM_{2.5} expressed in ug/m³ for outdoor air. It is used for regulatory purposes. There are no standards for the inside of houses.

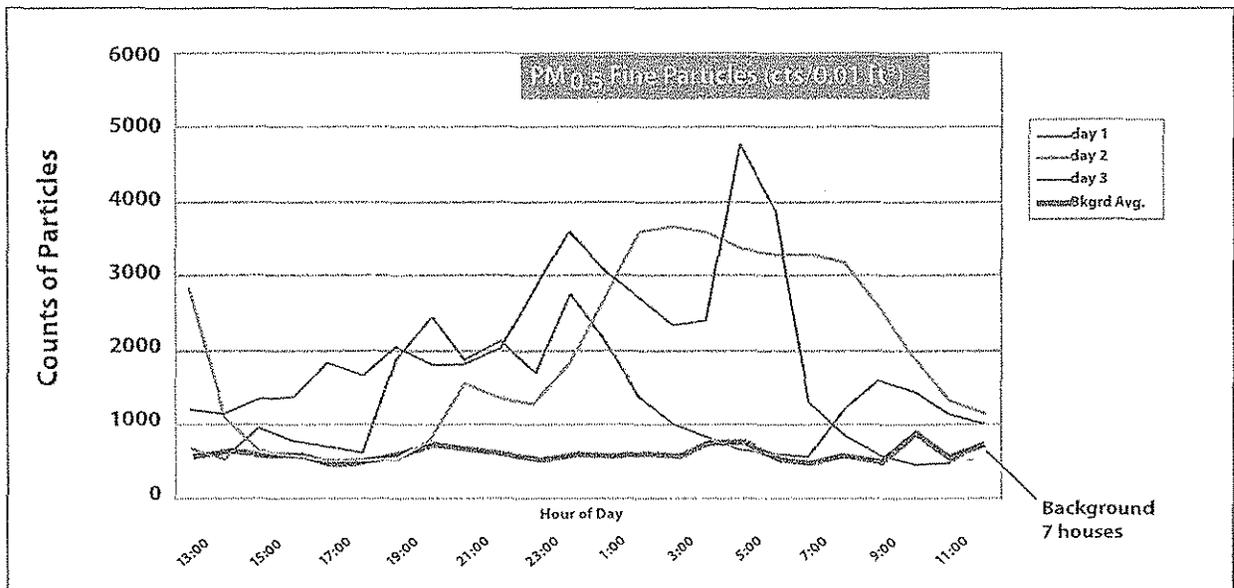
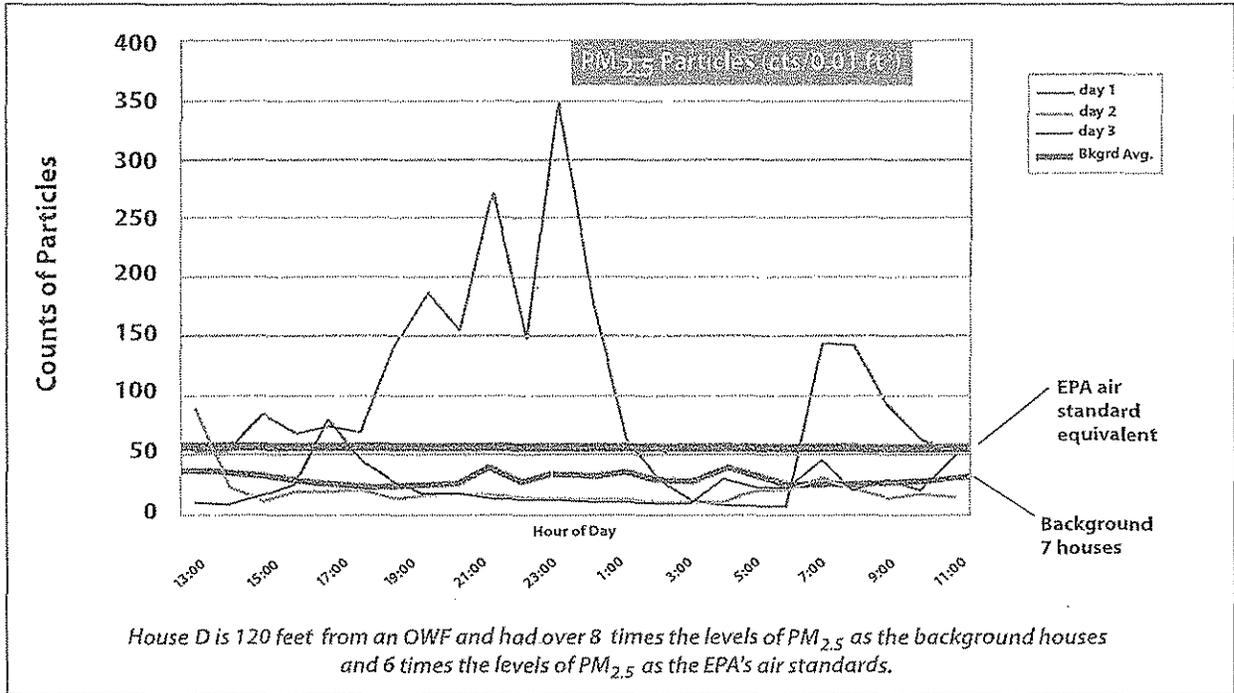
THE DANGERS TO HEALTH FROM

House D

Distance = 120 feet from the neighboring Outdoor Wood Furnace

Northeastern Windham County, Connecticut

(The OWF was grandfathered in before the Connecticut set-back regulation of 200 feet was instituted.)

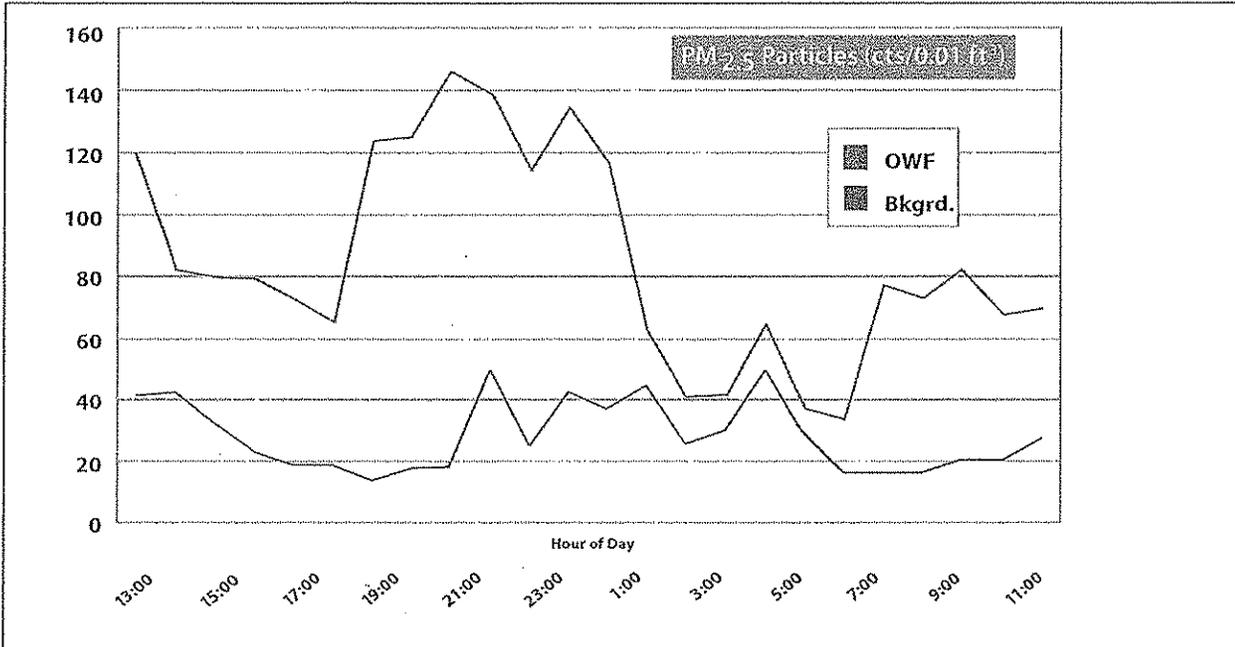


Red horizontal line = EPA federal standard for PM_{2.5} expressed in ug/m³ for outdoor air. It is used for regulatory purposes. There are no standards for the inside of houses.

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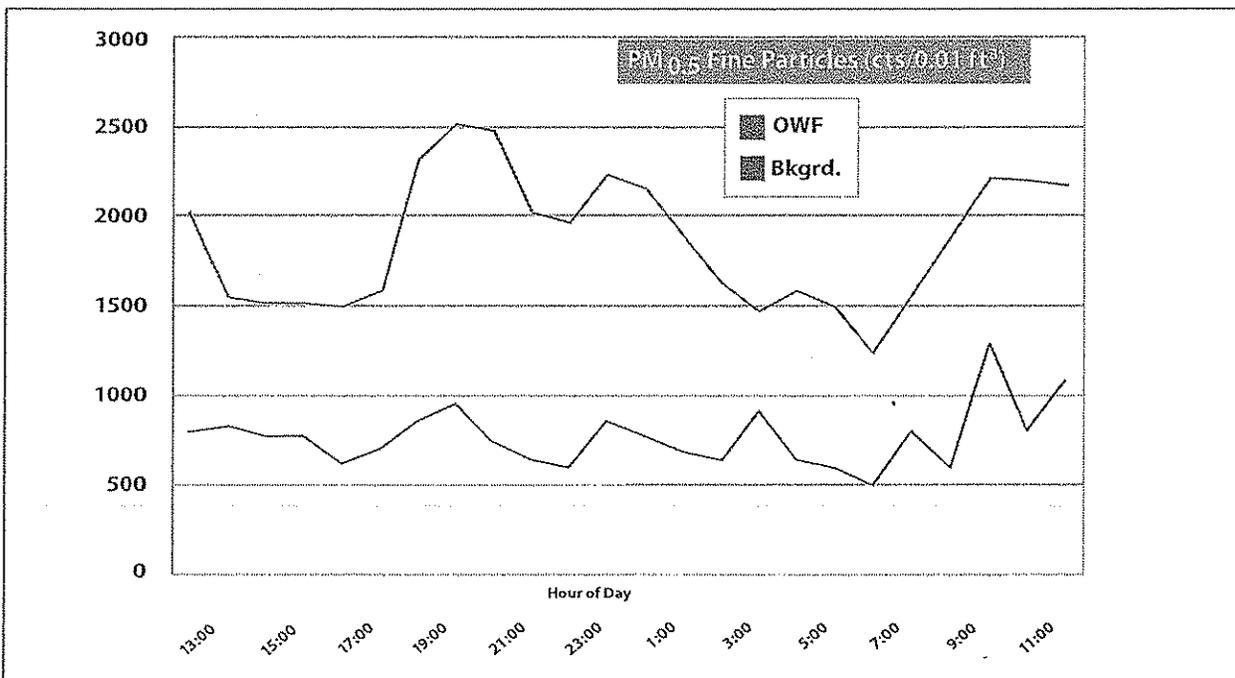
Average Hourly Particle Levels

Particulate levels inside houses near outdoor wood boilers



Red line shows impacted houses and blue shows control houses.

AVERAGE hourly PM_{2.5} levels (above) and fine particles PM_{0.5} (below) inside houses near outdoor wood boilers



The above two charts show dangerously high levels of smoke particulates inside houses near OWFs at all hours of the day, especially at night, compared to normal houses.³²

Government Response to Health Issues

The response from government to complaints about the smoke from outdoor wood furnaces (OWFs) has been completely inadequate to protect human health.



The response from government to complaints about the smoke from outdoor wood furnaces (OWFs) has been completely inadequate to protect human health. Federal and state governments have acknowledged that the wood smoke from outdoor wood furnaces can cause health problems, yet they continue to allow OWFs to be manufactured in ways that produce particularly dangerous smoke, and people continue to be allowed to buy and install them. The federal and state responses to regulations have been inadequate to protect homeowners' property values and their health.

In an effort to curb the dangers of OWFs, the EPA has developed a voluntary agreement with some OWF manufacturers. The agreement asks that OWF manufacturers make cleaner models with stricter emission standards than their original OWF models. These newer models are now in the marketplace and are called "Phase II" models. Although the Phase II models have somewhat reduced wood smoke emissions, they are still emitting more than 12 times the amount of wood smoke that an indoor wood stove is allowed to emit under EPA regulations. These Phase II models are still dangerous and in no way solve the human health problems that OWFs have created.³³

The EPA provided technical and financial support to the New England States for Coordinated Air Use Management (NESCAUM) to develop policy models that state and local governments could use to address OWF problems.

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NESCAUM reported that OWFs put out dangerous levels of particulates compared to other residential wood burning devices and found that current regulations did not provide neighbors the protection they needed.

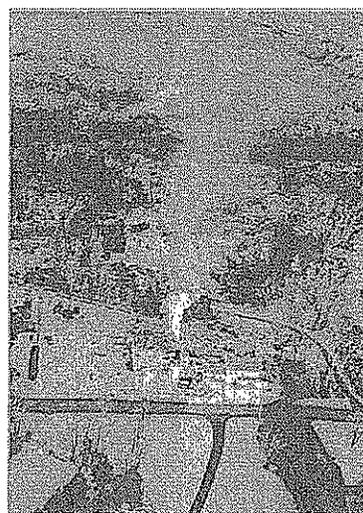
At present, much of the responsibility to address OWFs lies with the state and town governments. Some towns have acted boldly, although many have not. The state of Washington has banned the use of OWFs throughout the state. A few states, including Vermont, New Hampshire and Maine, have instituted air emission regulations. In Connecticut, only limited measures have been taken.

A look at the Connecticut Department of Environmental Protection's (CTDEP) fact sheet shows a blunt assessment of the harmful impacts of OWFs. The CTDEP asks, "Are OWFs harmful to the environment and human health?" The answer on the fact sheet is, "Yes." The CTDEP continues, "OWFs produce a lot of thick smoke, which in addition to being a nuisance to neighbors has serious health and air pollution impacts." In spite of this assessment, Connecticut has only instituted a set-back of 200 feet, with a chimney height that is higher than the roof peaks of residences located within 500 feet of the OWF.

Washington State has taken the lead in the nation by instituting a statewide ban. No other state has done so to date.

Vermont was the first state to adopt emission standards for outdoor wood furnaces in 2007. Some other states have now followed Vermont's lead and have instituted their own state standards and regulations as they try to make OWFs safer for neighbors' health. However, EHHI's research makes clear that even when OWFs are in compliance with their state regulations, the OWFs still pose a danger to the health of the families who live nearby.

In the absence of further federal or state actions, individual towns across the northern states have banned OWFs. For instance, as of the writing of this report, eleven towns in Connecticut have banned OWFs through their planning and zoning commissions. As well, many towns in New York State, Massachusetts, Wisconsin, Minnesota and New Jersey have banned them.



EHHI's research makes clear that even when OWFs are in compliance with their state regulations, the OWFs still pose a danger to the health of the families who live nearby.

Recommendations

Recommendations for the Federal Government

- The federal government should ban outdoor wood furnaces until safer technologies are found.
- If the federal government supports the idea of outdoor wood furnaces for the purpose of heating, then it should support research on how to make them safe. At the very least, the federal government should stop giving tax credits for their purchase.
- The government should determine the levels of particulates, carcinogens and carbon monoxide emanating from an outdoor wood furnace.
- The EPA's stated mission is "to protect human health and to safeguard the natural environment." With that as its mission, the agency should recommend a ban on outdoor wood furnaces until safer technologies are found.
- The federal government should set air safety standards for inside air, including PM_{0.5} particles, just as it has set standards for outside air.
- Healthful air emission standards should be applied to outdoor wood furnaces.

Recommendations for State Governments

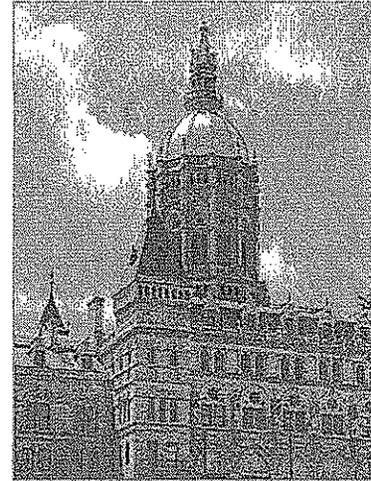
- States should ban outdoor wood furnaces until safer technologies are found.
- States should set air standards that are stringent enough to protect human health, and require OWFs to comply.
- States should add "wood smoke" to their Public Health Nuisance Codes so that state health departments and local health departments are required to enforce wood smoke nuisance cases.
- States should put outdoor wood furnace information on their websites and explain why OWFs are dangerous to human health.
- States' air standards should take into account peak exposures, as well as the current 24-hour average exposures.

Recommendations for Towns

- Towns should ban outdoor wood furnaces through their planning and zoning commissions or appropriate governmental agencies.
- Local health departments should enforce wood smoke public health issues in ways that protect an individual's health.

Recommendations for Individuals

- People should find other ways to heat their homes rather than installing outdoor wood furnaces, which harm neighbors' health and property values.
- People should work with their town planning and zoning commissions to have outdoor wood furnaces banned in their towns.
- People who are being harmed by an outdoor wood furnace should contact their state or local health department and ask to have the offending outdoor wood furnace closed down under their state or local public health nuisance code.
- Individuals living in homes impacted by wood smoke from outdoor wood furnaces might want to purchase an air monitor that measures and records the particulates inside their houses. Monitors such as this sell for about \$250. See pages 32–34, Appendix A, for instructions for using a monitor of this type. Having actual documentation of the smoke infiltration inside a home may cause state or local health departments, or other government agencies, to act in ways that will protect human health.
- Patients who are being treated for respiratory issues should discuss their exposures to an OWF when being evaluated by their physician, as other health issues related to these exposures might be involved.



*Healthful air
emission standards
should be applied to
outdoor wood
furnaces.*

Appendix A

Instructions for Home Monitoring with the Dylos 1100 Pro Air Quality Monitor

The Dylos monitor stores up to eight hours of minute-by-minute data, and up to 24 hours of hourly averages. It also stores daily averages for up to 30 days. To make the best use of the data, it is advisable to download it to a laptop computer on a regular basis. The following protocol requires downloading data once every 24 hours. *Note:* This monitor records data for 24 hours. If the data aren't downloaded, the monitor begins to record over the earlier data.

Be sure to begin your monitoring project at least 24 hours in advance of when you plan to download the first day of data (Day 1). The device records eight hours of minute-by-minute data for the most recent eight hours of monitoring. For example, let's say you set up your monitor to begin recording on Day 1 at noon. On Day 2, you download the data from the monitor onto your computer at noon. This will give you hourly averages for the past 24 hours, as well as minute-by-minute data beginning at about 4 a.m. that morning. This will occur again on Days 3 and 4.

Getting Started

Place the monitor and laptop computer in a room you think is affected by smoke, but not in a kitchen, a room with a woodstove or fireplace, or a room with lots of activity, such as a playroom. Cooking, heating and kids' play will create or stir up particulate matter and skew the data you get from the monitor. Place the instrument and laptop three to six feet off the floor, where they are easy to access but out of the way of foot traffic.

- Plug in the Dylos monitor.
- Attach monitor to the computer with the USB.
- Turn on computer. Log on.
- Go to: Start → Programs → Accessories → Communication → HyperTerminal.
- Open new HyperTerminal document.
- Save with name and date.
- Turn on the particle monitor.
- Open Excel spreadsheet. Label sheets Day 1, Day 2, Day 3. Name and save the spreadsheet.
- Monitor the house air for at least three days.

The monitor must remain connected to the computer and the computer left running with the "HyperTerminal" open. Because there is no time clock in the monitoring device, it is very important to record the time that the data are downloaded.

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Download to an Excel Spreadsheet

The eight hours of minute-by-minute data

- Open the Excel spreadsheet. (Once open, you can leave it open for the rest of the monitoring period.)
- On the HyperTerminal, click “select all.”
- Copy and paste the data in the Excel spreadsheet.

(Be SURE to record the time and date at the top of the column.)

The 24 hours of hourly data

- On the HyperTerminal, press “Capital D” and “Enter” at the same time.
The last hour of minute-by-minute data is downloaded to the HyperTerminal, the last 24 hours of hourly data are downloaded to the HyperTerminal, and the last several days of daily data are downloaded to the HyperTerminal. These are appended to the end of the minute-by-minute data already on the HyperTerminal.
- Select this set of data by highlighting.
- Copy and paste in the spreadsheet that is already open. Paste the data in one of the next columns on the spreadsheet and label it with time and date. Save the spreadsheet data.

For each consecutive day, repeat the process to open, label and save a new HyperTerminal document. There is no need to create a new Excel document. There is also no need to reset the Dylos monitor because it records over the last day's data every 24 hours.

For each day, copy and save the data on consecutive sheets in the Excel document, labeled Day 1, Day 2 or Day 3, or you may want to label the sheets with the time and date you downloaded.

Save the spreadsheet every time data are downloaded, because if the power to the computer is lost, the data will also be lost. The spreadsheet data can also be saved in a backup location.

Separate the Data into Two Columns

When the data are downloaded in Excel, two numbers, representing the two different sizes of particles ($PM_{2.5}$ and $PM_{0.5}$ microns), are recorded together in one column separated by a comma (for example: 2304,88). A few steps are required to separate the two into different columns.

- In Excel, select the data column.
- Click on “data.”
- Select “text to columns.”
- Choose “delimited,” then click “next.”
- Check the “comma” box, then click “finish.”

This will separate the data into two columns.

If the downloaded numbers contain more than one comma (for example: 11,820,49), there are additional steps to take. If there are just a few of these in the data, the numbers can be selected and separated one at a time, manually.

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If there are several in a row, do the following:

- Select "data."
- Select "text to columns."
- Choose "fixed width," then click "next."
- On the ruler that appears above the selected numbers, use the cursor to place a line between the two numbers to be separated.
- Click "finish."

The data will separate into two columns. Label the columns by particle size.

Prepare the Data for Charts (Using PM_{2.5} Data)

To convert the data to charts using Excel, it is necessary to create a corresponding column that notes "time of day." To convert the 24 hours of hourly averages for three consecutive days into a chart, as was done in this study, take the following steps:

- On a new Excel sheet, create a "time of day" column. Begin at the top with the hour at which the data was downloaded for the previous day. Going backward in time, enter the previous 24 hours (military time is recommended).
- Next, copy and paste into three consecutive columns the 24-hour data for PM_{2.5} microns from the three days of monitoring. Each hour in the "time of day" column should correspond with data for all three days. There should now be one column listing hours of the day and three columns of data stretching down 24 rows—one row for each hour monitored—three columns for the three days monitored.
- Highlight the time column and the columns containing the PM_{2.5} data. (Do not highlight headings if you have put them in.)
- Click "Insert."
- Click "Chart."
- Click "Line Chart."
- Click "Line with data markers."
- Click "Next."

The new window has two tabs: "Data Range" and "Series." Click the "Series" tab. This screen allows you to label the lines. *Series1* will be highlighted. Click the box for *Name*. Label the first series, for example, as Day 1, or with the start date of the first 24-hour period of monitoring. Highlight *Series2* and repeat with a new name, and repeat again for *Series3*.

- Click "Next."

In Chart Options, under "Title" you can title the chart, for example, "PM_{2.5} Readings."

In the box "Category X axis," enter "Time of Day."

In the box "Category Y axis," enter "PM_{2.5}/hr."

- Click "Finish."

You can now move and resize the chart.

Repeat the above instructions to produce a chart for the PM_{0.5} data.

Appendix B.

Ways to Interpret Indoor Air Assessments When Monitoring Homes Impacted by Wood Smoke

When assessing a house impacted by wood smoke, the first step is to characterize the duration and intensity of human exposure risks from particulates. The Dylos air monitor or a similar device analyzes the air inside the house to assess the emissions that have penetrated a wood smoke-impacted home.

The second step is to compare the risk from monitored indoor wood smoke exposures to risks from outdoor air, and also to compare the monitored house to indoor air in houses that are not near sources of outdoor wood smoke. (See pages 36-40.)

The three indicators used in this study to evaluate the levels of exposures are based on:

- Observations of the levels of hourly $PM_{2.5}$ and $PM_{0.5}$ particle counts in wood smoke-impacted houses compared to control houses.
- The maximum particulate counts in wood smoke-impacted houses compared to control houses.
- The six-hour inhaled dose of particulate $PM_{2.5}$. (See page 41.)

Methods of Comparison

- *Comparisons between hourly $PM_{2.5}$ and $PM_{0.5}$ particle counts in wood smoke-impacted houses and control houses*

The U.S. EPA Health-Based Standards

The EPA set a health-based standard for $PM_{2.5}$ in 2006. The EPA standard, which is based on interpretation of a series of health studies by expert panels, is primarily used for regulatory purposes as a component of the national air monitoring program. The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for particle pollution (also known as particulate matter). Primary standards set limits to protect public health, including the health of “sensitive” populations, such as asthmatics, children and the elderly.

The EPA revised the PM standards, setting separate standards for fine particles ($PM_{2.5}$), based on their links to serious health problems, ranging from increased symptoms, hospital

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admissions and emergency room visits for people with heart and lung disease, to premature death in people with heart or lung disease.

The EPA 24-hour standard for ambient air is 35 ug/m³. The EPA standard is a mass per unit volume measurement that is equivalent to 75 to 80 particle counts per 0.01 cubic feet (values are recorded in counts per 0.01 cubic feet in the Dylos monitor). See page 22 for conversion of EPA's measures in mass to the measures in number of particles from the meter.

■ *Comparison of exposures in OWF-impacted houses to the CONTROL houses*

This option for interpretation of indoor monitoring compares the 24-hour average to the EPA's 24-hour ambient air standard. It is based on an assumption that all health risks are directly related to the average 24-hour exposures to PM_{2.5}. While this demonstrates the impacts of indoor air contamination, it underestimates the significance of hourly peaks over the 24-hour period, and underestimates health risks.

The table below compares the 24-hour measurements in wood smoke-impacted houses to measurements in the control houses.

Comparison of the 24-hour averages for PM_{2.5} in control houses and OWF-impacted houses, from the EHHI study

# of 24-hour measurement periods	Control/background houses (cts/0.01ft ³)	OWF-impacted houses (Counts/0.01ft ³)
1	13.8	44.4
2	18.1	48.5
3	71	35.1
4	68	195.2 (exceeds EPA std.)
5	84 (exceeds EPA std.)	101.5 (exceeds EPA std.)
6	32	103.5 (exceeds EPA std.)
7	16.8	101.5 (exceeds EPA std.)
8	23	126.5 (exceeds EPA std.)
9	21.4	129.2 (exceeds EPA std.)
10	22.3	101.5 (exceeds EPA std.)
11	6.9	19.0
12	15	23.0

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In this analysis, when the EPA ambient air standard (75-80 cts/0.01 ft³) is used to estimate the risk to indoor air, it can be seen that excess exposures to PM_{2.5} occur consistently inside houses in areas impacted by OWFs, but not in the control houses. The levels of PM_{2.5} in OWF-impacted houses are substantially above the EPA's 24-hour standard. These levels are also significantly above both those in the control houses and the outside air measurements.

Thus, the comparison of 24-hour indoor air levels to EPA standards shows the impact of a neighborhood OWF. However, the intensity of the wood smoke exposures inside the houses at different times of the day is not observed for periods of less than 24 hours.

■ *Comparison to the EPA Air Quality Index scale for exposures of less than 24 hours*

The Air Quality Index (AQI) assesses the impact of exposures lasting less than 24 hours. The AQI focuses on health effects individuals may experience within a few hours or days after breathing polluted air, and provides a warning if the 24-hour average fine particle (PM_{2.5}) concentration is "*unhealthy for sensitive groups*" — above 40.5 ug/m³.

The EPA's table of break points for periods of less than 24 hours is shown below.

C_{low}^*	C_{high}	Category
0	15.4	Good
15.5	40.4	Moderate
40.5	65.4	Unhealthy for sensitive groups
65.5	150.4	Unhealthy
150.5	250.4	Very Unhealthy
250.5	350.4	Hazardous
350.5	500.4	Hazardous

* C = concentrations of PM_{2.5} in ug/m³

The EPA warns that both fine and coarse particles can cause a variety of serious health problems. When exposed to these particles, people with heart or lung diseases and older adults are more at risk for hospital and emergency room visits or, in some cases, even death. **These effects have been associated with short-term exposures lasting 24 hours or less.** Long-term exposures of a year or more have been linked to the development of lung diseases, such as chronic bronchitis.

Particles can aggravate heart diseases, such as congestive heart failure and coronary artery disease. If you have heart disease, particles may cause you to experience chest pain, palpitations, shortness of breath and fatigue. Particles have also been associated with cardiac arrhythmias and heart attacks.

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Particles can aggravate lung diseases, such as asthma and bronchitis, causing increased medication use and doctor visits. If you have lung disease, and you are exposed to particles, you may not be able to breathe as deeply or vigorously as normal. You may have respiratory symptoms, including coughing, phlegm, chest discomfort, wheezing and shortness of breath. You also may experience these symptoms even if you're healthy, although you are unlikely to experience more serious effects. Particles can also increase your susceptibility to respiratory infections.

The EPA's system of health warnings for different exposures

Air quality	ug/m ³	cts/0.01ft ³	Health Warning
Good	0 to 15.4	0 to 35.4	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	15.5 to 40.4	35.5 to 92.4	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	40.5 to 65.4	92.5 to 150.4	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy for All	65.5 to 150.4	150.5 to 345.9	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	150.5 to 250.4	346 to 575.9	Health alert: everyone may experience more serious health effects

The EPA's assessment in support of the Air Quality Index points out that exposures of less than 24 hours can have effects on the lungs and heart, and increase respiratory infections. Therefore, it is necessary to examine exposures of less than 24 hours.

- *Comparison of the hourly averages for PM_{2.5} in control houses and OWF-impacted houses during different periods of the day, from the EHHI study*

There are four distinct periods in the day: afternoon hours (12 to 5 p.m.); evening hours (6 to 11 p.m.); night hours (midnight to 5 a.m.); and morning hours (6 to 11 a.m.). When the wood smoke and particulate-induced physiological actions of clinical significance are applied to these periods, it gives a quantitative measure of the risk from PM_{2.5} exposures at different times of the day.

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PM_{2.5} levels during the different periods of the day in houses impacted by OWFs

House/Day	Afternoon	Evening	Night	Morning
A/1	59.7	86.2	7.2	24.6
A/2	50.8	84.3	28.2	31.7
A/3	23.3	90.3	7.8	29.8
B/1	243.2	164.3	173.7	200.2
B/2	105.0	127.2	121.7	60.8
B/3	69.8	193.3	65.8	73.2
C/1	66.3	206.3	49.3	83.3
C/2	159.3	193.8	56.3	84.4
C/3	89.5	180.7	144.3	94.6
D/1	66.3	206.3	49.8	83.3
D/2	30.3	15.2	12.5	19.7
D/3	31.1	16.8	15.5	31.7

■ = Very Unhealthy, EPA's health alert warning

PM_{2.5} levels during the different periods of the day inside control houses

House/Day	Afternoon	Evening	Night	Morning
Control 1/1	11.7	15.3	7.0	21.7
Control 1/2	25.3	15.3	17.0	15.3
Control 1/3	14.3	8.8	15.8	22.7
Control 2/1	60.3	83.3	120.5	21.0
Control 3/1	68.0	107.2	4.5	92.3
Control 3/2	81.0	195.7*	16.8	45.2
Control 3/3	21.2	35.2	32.2	42.0
Control 4/1	40.0	40.0	17.3	3.8
Control 4/2	16.8	45.0	46.8	6.0
Control 5/1	27.2	3.8	30.4	25.7
Control 6/1	32.7	21.7	4.8	6.5
Control 7/1	34.3	20.2	19.3	19.5
Control 7/2	12.7	4.0	4.7	6.5

* The homeowner burned food while cooking dinner

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The chart below shows the hourly averages of PM_{2.5} in *outdoor* air in the vicinity of the control houses, which can be compared to the PM_{2.5} levels in the *indoor* air in the control houses (see bottom chart on page 39).

PM_{2.5} levels in the ambient air in control area

House/Day	Afternoon	Evening	Night	Morning
24 Apr	59	37	42	73
25 Apr	82	34.5	39.0	57.7
26 Apr	52.7	74.7	40.0	40.3
27 Apr	53.5	21.3	19.8	30.7
28 Apr	33.2	38.7	39.2	36.8
29 Apr	17.8	10.8	13.0	9.7
30 Apr.	13.8	26.5	44.3	32.2
1 May	33.3	23.3	25.0	41.2
2 May	43.0	36.7	34.8	51.2
3 May	52.7	55.2	41.5	106.0
4 May	118.0	62.3	60.5	58.7
8 May	40.0	30.2	19.2	16.2
9 May	24.7	48.5	64.7	81.2
10 May	60.0	19.2	12.5	111.5
11 May	9.7	18.5	46.7	25.5
12 May	10.3	16.0	20.3	29.5
13 May	18.2	17.2	21.7	28.7
14 May	34.2	46.8	21.6	25.2
15 May	21.3	15.5	23.7	30.7
16 May	41.0	65.0	65.0	32.8
17 May	13.0	13.7	9.7	7.8
18 May	8.0	15.3	15.7	15.3
19 May	21.2	20.8	26.2	22.2

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■ *Comparison of the clinical effects associated with six-hour inhaled dose exposure to PM_{2.5}*

The PM_{2.5} particulate counts are viewed as surrogate measures for the presence of wood-burning emissions. Other toxics from wood-burning will also be present inside the houses, including carbon monoxide, oxides of nitrogen, and polyaromatic hydrocarbons (PAHs). These exposures could be included in the differential diagnosis.

At these six-hour average levels, susceptible people with asthma, chronic obstructive pulmonary disease (COPD) or chronic bronchitis may experience clinical effects (see chart on page 38 for the *Unhealthy for All* category). At the *Very Unhealthy* levels on the same chart, everyone may experience chronic bronchitis, and those who are susceptible may require medical support. Those with cardiovascular conditions may experience physiologic effects.

When evaluating health effects in individuals, the actual dose of air pollutants inhaled, including PM_{2.5}, is a clear determinant of the clinical response to acute respiratory and cardiovascular toxicants. The findings from the monitoring study permit the determination of actual dose levels for different people.

There are peer-reviewed literature articles that describe the effects of inhalation of increased doses of PM_{2.5}, notably a 2006 article published in the journal *Human and Ecological Risk Assessment*, "Assessment of Risk from Particulate Released from Outdoor Wood Boilers."³⁴ This report, by Brown *et al.*, recommends that the assessment of risks of individual health effects be based on the actual amounts of particulate matter inhaled. A reproducible measure of dose is the mass (micrograms) of particulate inhaled for a specified period of time (six hours or one-quarter of the day). The advantage of such a measure is that it is more directly linked to the target organ for the toxic material, and it incorporates activity differences that influence inhalation of the dose and variability inherent in ambient air measures.

Therefore, we recommend monitoring the hourly air concentrations over a minimum period of 72 hours in order to establish the structure of the exposure patterns. The 72 hours of one-hour monitoring data are divided into 12 units of six-hour intervals. The six-hour inhalation dose is calculated based on the assumption that 0.8 cubic meters of air is inhaled per hour. This can be altered to adjust for greater or lesser activity patterns, such as running or sleeping, and for the ages of the persons exposed. A scale of exposure is suggested in the Brown *et al.* report.

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The following six-hour doses* are linked to the following clinical outcomes:

- A dose of 96 ug or more is associated with an increase in the number of asthma attacks.
- A dose of 120 ug or more is associated with an increased need for medical intervention in cases of chronic obstructive pulmonary disease (COPD) in the elderly or asthma in children.
- A dose of 250 ug or more is associated with increased emergency room interventions and hospitalizations for ischemic heart attacks.

Dose risk evaluation for mixtures

Wood smoke emissions are a mixture of gases and particulates. In a local neighborhood setting, a number of other toxic compounds emitted from an outdoor wood furnace would enter the house in the same manner as the fine particulates. Therefore, the presence of particulate in the house is a surrogate measure of certain other toxic compounds from the OWF that would enter the house.

The burning of wood also introduces other toxic materials into the neighborhood. Data from the EPA were used to prepare the chart and graph on the following page, which show the relative concentrations of emission products from outdoor wood burning. Relative amounts of wood smoke emission products are shown in the chart. These graphics demonstrate that substantial amounts of carbon monoxide and other toxics emitted by outdoor wood furnaces, in addition to $PM_{2.5}$, would be expected to enter an OWF-impacted home.

Therefore, any evaluation of the health of persons exposed to wood smoke inside houses in the neighborhood of OWFs must also take into account exposures to all the agents shown by the EPA to be present in wood-fire emissions.

Wood smoke contains unhealthy amounts of particulate matter, as well as a number of unhealthy emissions, including carbon monoxide, volatile organic compounds, benzene, sulfur dioxide, nitrogen dioxide, formaldehyde and several other air pollutants. From the chart, it can be seen that finding $PM_{2.5}$ particulates in indoor air predicts that a number of other toxic compounds will also be present in the indoor air mixture.

* To obtain the six-hour dose, multiply cts/0.01 ft³ by 2.2

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Relative percentages of toxic emissions predicted to be emitted by OWFs in EPA's Model

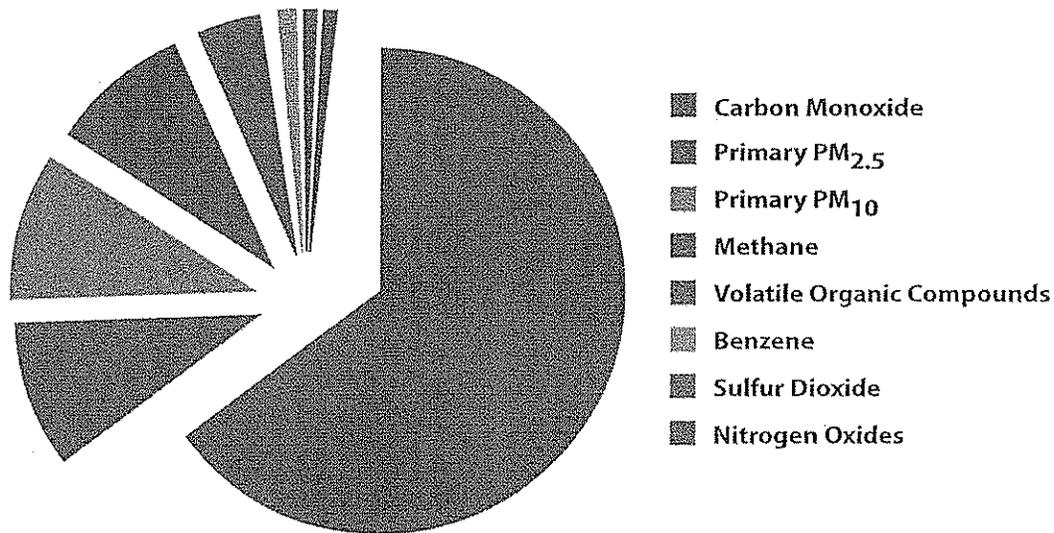


Chart showing relative percentages of toxic emissions predicted by EPA's Model

Carbon Monoxide	64.0249
Primary PM _{2.5}	9.6037
Primary PM ₁₀	9.6037
Methane	9.0818
Volatile Organic Compounds	4.0711
Benzene	0.9673
Sulfur Dioxide	0.7064
Nitrogen Oxides	0.6263
Ammonia	0.6263
Formaldehyde	0.2436
Acetaldehyde	0.2373
Phenol	0.0839
Naphthalene	0.0517
Cresols (Includes o, m, & p)/Cresylic Acids	0.0456
Acrolein	0.0152
1,3-Butadiene	0.0101
Benzo[a]pyrene	0.0010
Mercury	0.0000
Dioxins/Furans as 2,3,7,8-TCDD TEQs - WHO/98	0.0000

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Appendix C.

Findings from the Questionnaire Used in the Study

	House A	House B	House C	House D
Distance to OWF	850 ft.	100 ft.	240 ft.	120 ft.
Square footage	1,664	3,000	1,300	—
Floor plan	Open	Small Rooms	Open	Small Rooms
# of floors	2	2	1	2 plus basement
Style	Split level	Traditional	Ranch	Traditional
Attached garage	Yes	Yes	No	No
Car in attached garage?	No	Yes, but coasts in	N/A	N/A
Working fireplace or woodstove	1 propane, 1 wood	Woodstove	No	No
Burns wood?	No	Not during monitoring	No	No
Smokers	No	No	No	1 person, but not in the house
# of adults	2	2	2	2
# of children < age 5	1	0	0	0
# of children age 5-12	0	1	2	2
# of children 13+	0	1	0	0
Pets	1 dog	1 dog	No	3 cats
Type of Heat	Oil, baseboards	Oil, radiators, baseboards	Electric	Oil, forced air
Type of Hot Water Heat	Oil	Oil	Electric	Electric
Cooking Stove	Electric	Gas	Electric	Electric
Near Major Road?	No	15 minutes from highway	No	No, moderate traffic
How Situated Relative to OWF	OWF is W, house a bit lower than OWF	OWF is N across street, downhill from house, which has slope behind	OWF is NW and downhill from house	OWF is NNE and downhill
Health Effects	Asthma, sinus infection, ear infection, bronchitis, ongoing cough, child on inhaler	Winter sicknesses, "near pneumonia"	Decreased lung capacity, increased asthma symptoms, sore throat, dizzy, headaches, vision/hearing decline	Migraines, rash like sunburn, raspy breathing, heart palpitations, son with learning changes
When Health Problems First Noticed	Mother, winter 2003-04; child, 1 1/2 years ago	Past 3 years, not much this year	Over 5 years ago	Within last 2 years

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Appendix D.

Planning and Zoning Regulation Used to Ban OWFs in a Town

Below are the zoning regulations from the town of Tolland, Connecticut, which banned outdoor wood furnaces (OWFs), also known as Outdoor Wood Boilers (OWBs). These regulations provide a model for other towns, and planning and zoning commissions that might want to ban outdoor wood furnaces.

ZONING REGULATIONS, TOWN OF TOLLAND

Chapter 170, page 96

CODE of the TOWN OF TOLLAND, STATE OF CONNECTICUT

Zoning Regulations, Rev. July 20, 2009

ARTICLE XIV

Accessory Uses and Structures

Section 170-84. General Requirements.

Accessory uses and structures shall be subject to the following conditions:

A. Establishment of accessory uses.

1. Accessory buildings, structures and uses shall be located on the same lot as the principal building, structure or use to which they are accessory.

2. Accessory buildings, structures and uses shall not be located on a lot without the prior establishment of a permitted principal use, nor shall any new lot be created that has an accessory building, structure or use without a principal use.

B. Prohibited Accessory Uses and Structures.

The Commission feels that, by their very nature, the following uses and structures cannot be regulated in such a fashion as to protect the Health, Safety and Welfare of the general public and are prohibited in all zones.

Outdoor Wood Burning Furnaces, as defined by P.A. 05-227

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- ¹ <http://www.epa.gov/burnwise/healtheffects.html>
- ² <http://des.nh.gov/organization/divisions/air/cb/ceps/npsap/smoke.htm>
- ³ <http://www.ct.gov/dep/cwp/view.asp?a=2684&Q=321780>
- ⁴ <http://www.woodheat.org/technology/outboiler.htm>
- ⁵ <http://www.ecy.wa.gov/biblio/91br023.html>
- ⁶ <http://www.ecy.wa.gov/biblio/91br023.html>
- ⁷ <http://www.epa.gov/burnwise/healtheffects.html>
- ⁸ <http://www.ct.gov/dep/cwp/view.asp?a=2684&Q=321780>
- ⁹ <http://www.vtwoodsmoke.org/health.html>
- ¹⁰ <http://www.nescaum.org/documents/assessment-of-outdoor-wood-fired-boilers>
- ¹¹ <http://www.spokanecleanair.org/publications.asp> (Outdoor Wood-fired Boilers.pdf)
- ¹² For comparison, fine beach sand is about 90 microns, and the average human hair is 70 microns, in diameter. Thus, particles of 0.1 to 5 microns (very small) are carried in the same way as vapors or gases in the inhaled air stream, reaching the deep and most sensitive areas of the lung.
- ¹³ The United States Environmental Protection Agency (U.S. EPA) has established health-based standards for exposure to particulates in the 10 micron and 2.5 micron range (PM₁₀ and PM_{2.5}). The standards are used to evaluate the efficiency of air pollution control programs and to warn the public of impending health risk. Background PM_{2.5} 24-hour averages fall between 10 and 15 micrograms per cubic meter (ug/m³) of air, with high levels reaching 40 to 50 ug/m³.
- ¹⁴ <http://www.epa.gov/ttnchie1/net/2008inventory.html> — the Nonpoint section. Residential Heating: Wood.
- ¹⁵ Houses that are heated with oil, gas, and coal or wood stoves will draw more air into the house to support the combustion used to heat the house. As warmer air from the stove or furnace exits the house through the chimney, that air is replaced with air drawn from the outside. Thus, greater inflows of outside air increase the rate of contamination in houses with interior stoves and furnaces.
- ¹⁶ <http://des.nh.gov/organization/divisions/air/cb/ceps/npsap/smoke.htm>
- ¹⁷ <http://chestjournal.chestpubs.org/content/119/4/1260.full>
- ¹⁸ <http://oem.bmj.com/content/65/5/319.abstract>

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- ²⁰ <http://michiganmessenger.com/38678/study-finds-wood-burning-releases-more-greenhouse-gas-than-coal>
- ²¹ www.swcleanair.org/pdf/WoodSmokeHealthBrochure.pdf
- ²² http://www.yakimacleanair.org/woodstove_information.htm
- ²³ <http://www.epa.gov/burnwise/healtheffects.html>
- ²⁴ <http://www.ct.gov/dph/cwp/view.asp?a=3137&q=398480>
- ²⁵ <http://www.hria.org/services/environmental-health/cs-burden-of-asthma.html>
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- ²⁷ <http://oem.bmj.com/content/54/2/108.abstract>
- ²⁸ <http://www.epa.gov/iaq/co.html#Health%20Effects%20Associated%20with%20Carbon%20Monoxide>
- ²⁹ <http://www.health.state.mn.us/divs/eh/indoorair/co/index.html>
- ³⁰ <http://www.merck.com/mmhe/sec24/ch297/ch297d.html>
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- ³² Zanobetti A, Schwartz J, Gold D. Are there sensitive subgroups for the effects of airborne particles?
- ³³ <http://www.nescaum.org/documents/owbfactsheetfinal.pdf/>
- ³⁴ Brown, et al. "An Assessment of Risk from Particulate Released from Outdoor Wood Boilers." *Human Ecol Risk Assess* 13:191-208

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**Cover photo: smoke from an outdoor
wood furnace near Danielson, Connecticut,
by G. Leslie Sweetnam**

DESIGN & LAYOUT

BY JANE BRADLEY

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*Aerial photos of smoke from outdoor
wood furnaces in Connecticut on the
front cover, page 15 and page 29
were taken by G. Leslie Sweetnam*

*(specializing
in aerial art photos of the last green
valley, central Massachusetts and
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A recent study on outdoor wood furnaces (OWFs) shows that homes as far away as 850 feet from an outdoor wood furnace are impacted by enough smoke to cause illness. Connecticut has setbacks regulations for OWFs of only 200 feet.

- NESCAUM has estimated that each OWF emits 20 times the wood smoke as one certified indoor wood stove. NESCAUM is an association of air quality agencies in the Northeast. Their Board of Directors consists of the air directors of the six New England states - Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont - and New Jersey, and New York. Their purpose is to provide scientific, technical, analytical, and policy support to the air quality and climate programs of the eight Northeast states.
- Although many people associate tobacco smoke with certain health risks, research indicates that second hand wood smoke has potentially even greater ability to damage health. Tobacco smoke causes damage in the body for approximately 30 seconds after it is inhaled. Wood smoke, however, continues to be chemically active and cause damage to cells in the body for up to 20 minutes, or 40 times longer.
- A house as far away as 850 feet from an outdoor wood furnace (OWF) had 6 times the levels of PM 2.5 as the houses not near an outdoor wood furnace and 4 times above the levels of the EPA air standards.
- *EPA defines PM 2.5 as Particle Matter less than 10 micrometers in diameter. These small particles pose a health concern because they can be inhaled into and accumulate in the respiratory system. Health studies have shown a significant association between exposure to fine particles and premature mortality. Other important effects include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. Sources of fine particles include all types of combustion activities - motor vehicles, power plants and wood burning.*

A house 240 feet from OWF had 12 times the levels of PM 2.5 as the houses not near an outdoor wood furnace and 8 times above the levels of the EPA air standards.

- Both those heavily impacted homes were within the Connecticut setback regulations of 200 feet.

- For some homes that are near OWFs that have been grandfathered in – they have wood smoke levels as high as 14 times that of houses not near outdoor wood furnaces and 9 times above the levels of the EPA air standards.
- High levels of wood smoke were present in every 24-hour period tested inside homes neighboring outdoor wood furnaces.
- The particles of wood-smoke are so small that windows and doors cannot keep smoke out.
- Public Health Toxicologist David Brown, Sc.D., an expert on the health effects of wood smoke, states, "Episodes of short-term exposures to extreme levels of fine particulates from wood smoke and other sources for periods as short as two hours can produce significant adverse health effects."
- Oncologist D. Barry Boyd, MD, says, "Wood smoke contains a number of organic compounds that are both potential and recognized carcinogens. Exposure to wood smoke over time may raise the risk of both chronic lung disease and lung cancer."

Town of Tolland Zoning Regulation Prohibiting Outdoor Wood Furnaces

http://www.tolland.org/sites/tollandct/files/uploads/zoning_regulations_0.pdf

Article XVII Zoning Regulations Rev.: March 15, 2015

Page 131

Accessory Uses and Structures

Section 17-1. General Requirements

B. Prohibited Accessory Uses and Structures.

The Commission feels that, by their very nature, the following uses and structures cannot be regulated in such a fashion as to protect the Health, Safety and Welfare of the general public and are prohibited in all zones.

1. Outdoor Wood Furnaces as defined by P.A. 05-227

PAGE
BREAK



**Town of Mansfield
Agenda Item Summary**

To: Town Council
From: Matt Hart, Town Manager *MWH*
CC: Maria Capriola, Assistant Town Manager
Date: June 27, 2016
Re: Petition to Ensure the Safety of Route 6

Subject Matter/Background

Council has received a citizen petition regarding a proposal by Global CNG Holdings (also known as Pentagon Energy) to convoy high pressure, natural gas by truck and to pump it into the Algonquin Pipeline via an infusion station to be located on Route 6 in Andover, Connecticut. Residents are concerned with the implications such an operation may have on traffic and safety and are asking the Council to request the Connecticut Department of Transportation (CTDOT) to conduct a safety study. Additionally, the residents would like the Council to request that our local legislators make the same request to CTDOT.

Recommendation

Per the attached article printed in the Chronicle, Global CNG Holdings has withdrawn its most recent proposal. Since the printing of that article, legal counsel for Global CNG Holdings has confirmed with staff that the company intends to resubmit a revised proposal within a few weeks. Consequently, the petition remains relevant.

In my opinion, it would be prudent to ask the CTDOT to analyze the impacts of the proposed installation. Consequently, I recommend that the Council take the actions requested by the petition and refer the matter to the Town's Transportation Advisory Committee and Conservation Commission to monitor the issue.

If the Town Council agrees with this recommendation, the following motion would be in order:

Move, effective June 27, 2016, to:

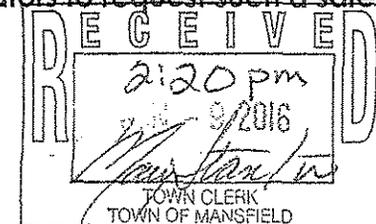
- 1) *request that the Connecticut Department of Transportation (CTDOT) conduct a safety study of the operation of the infusion station to be proposed by Global CNG Holdings (also known as Pentagon Energy);*
- 2) *request that Mansfield's state representatives request the same from the CTDOT; and*

Petition to Ensure the Safety of Route 6

Mansfield Town Council:

- Whereas Global CNG Holdings (also known as Pentagon Energy) plans to convoy high pressure, natural gas by truck from eastern Pennsylvania to Andover, CT, where it will be pumped into the Algonquin Pipeline, a natural gas transmission pipeline,
- Whereas the company plans to have 5 to 8 trucks an hour, 24 hours a day, 7 days a week coming into an infusion station on Rte. 6 where it will be pumped into the Algonquin Pipeline,
- Whereas the trucks will haul a trailer with four tubes filled with compressed natural that are 42 inches in diameter and 45 feet long,
- Whereas the gas in these tubes will be pressurized at 4500 pounds per square inch (psi).
- Whereas 4500 psi is a pressure much higher than the gas pressure in the Algonquin Pipeline which is between 600 and 800 psi,
- Whereas the company plans to run this operation for five months a year, November through March, which would increase truck traffic by over 120,000 loaded truck trips and over 120,000 empty truck trips on Rte. 6,
- Whereas Rte. 6 has several accidents per year. From 2010 to 2014, 190 accidents in Andover, 111 accidents in Columbia, and 211 accidents in Bolton,
- Whereas it is quite likely, with this increase in traffic, the accident rate will increase, and one or more of these trucks will be in an accident,
- Whereas transmission pipeline (600 to 800 psi) ruptures lead to explosions with a hazard radius of about 800 feet,
- Whereas a rupture of a trailer tube (4500 psi) would create a hazard radius well over 1000 feet,
- Whereas radioactive lead-210 and polonium-210 builds up inside the trailer tube over multiple trips,
- Whereas this radioactive material would be spread over the hazard area in an explosion,

We the undersigned ask the Town of Mansfield to request the Connecticut Department of Transportation to make a safety study of the effect of increased truck traffic on Rte. 6 because of the operation of an infusion station in Andover, particularly the explosive and radioactive hazards. Further that the Town ask our State legislators to request such a safety study.



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Name	Phone	Email	Address	Town
Daniel Rosado		drosado3@yahoo.com	Circle Dr.	Mansfield
Gordon Little		gordonkc1@yahoo.com	Echo Dr	Mansfield Ctr.
Pat Little	860-204-1352	peacereader1@yahoo.com	12 Echo Dr	Mansfield CT
Karen Bailey		kmbperfectly@gmail.com	135 Atwoodville Rd.	Mansfield CT
Lisa Peterson - Blinn	860-377-6132	lisajpb@gmail.com	STAFFORD Rd	STORRS CT.
Quinn Duches			Olson Pr.	Mansfield Center
Susan Sandall		susiesandall@charter.net	84 Crane Hill	Storrs, CT
Almat Ken Gardner			Edgewood Lane	Mansfield Ctr, CT
Gregory Noricz			Middle Tpke	Mansfield CT
Andrew Ames	860-942-0224	aandyames@rocketmail.com	12 Old Mill Court	Storrs CT
Mary Bent	860-423-8228	gdbent@earthlink.net	97 Mansfield Hollow	Mansfield

Petition to Ensure the Safety of Route 6

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Name	Phone	Email	Address	Town
Jay Amos	860 429 6925	jayamos@gmail.com	12 Old Mill Ct	Mansfield
Sammy Sanchez	860 333 1081	rsagan7@cup.hp.com	196 Stafford Rd	Mansfield
Paul Tanner	860 450 0530	ptanner563@hotmail.com	513 Mansfield St	Storrs CT 06268
Gretchen Hall	860-456-1027	garhall@snet.net	62 Crane Hill Rd	Storrs
Reynold Hall	860-456-1027	garhall@snet.net	62 Crane Hill Rd	Storrs
David Lutz	860-423-4674	lute_david@hotmail.com	387 Browns Rd	Storrs
Christa M... ..	846423-3656		19 Brown Rd Mansfield, CT	
Pamela Bridgeford	860-456-1058	pdb112@charter.net	112 Bassett's Bridge	Mansfield CT 06250
Jim McGaughey	860 992-8375	jdmcgaughey@sbcglobal.net	184 Browns Rd.	Storrs Mansfield CT 06268
Donna Hoge	860-423-6141	DonnaH@AOL.com	125A Bassett's Bridge	Mansfield CT 06250
George Rawitscher	860 429 3607	georgerawitscher@gmail.com	343 codfish falls rd	Storrs CT 06268

Petition to Ensure the Safety of Route 6

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Name	Phone	Email	Address	Town
<i>Est Ann</i>	487-1381		74 Knowlton	Mansfield
Laura Cisneros	734-678-3859	cisneros32@gmail.com	101 Forest Rd.	Mansfield
John Bennett	820-422-7725	john.bennett@charter.net	295 Wormwood Hill Rd	Mansfield
Margaret Rubega	860-487-3954		470 So. Eaglewille Rd	Mansfield
Wendy Van	862-432-5329		195 Highland Rd Andover Rd	Mansfield
Charlie Piccetti	860-456-1281	etc	98 Mansfield	Mansfield
John Clason			48 Fern Rd	Stony
George Bailey	423 8136		75 Grove Hill Rd	06268
Donna Clason	860-423-0638	d.clason@snet.net	48 Fern Rd	Mansfield
Allen L Booco	487-1136		1634 STAFFORD RD	"
Norbert B Hawkin	423 3656		79 Browns R	"

Petition to Ensure the Safety of Route 6

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Name	Phone	Email	Address	Town
Jerome Jzars	860-456-8149		293 Eastbrook Rd., Mansfield, CT	06250
Christina Walsh Brakeney	860-617-0207	brakeney@charter.net	30 Lorraine Dr Storrs	06268
PAULA SCHARPF	860-940-7178	PAULAVSCHARPF@gmail.com	154 HANES HILL RD STORRS 178 Country Rd Mansfield CT	06268
J. CONOVER	860 486 8338			06250
Jennifer Stone	860 429 8787	jstone77@charter.net	657 Chaffeeville Rd Storrs	06268
ROBERT PIRRIE	" "	rpirrie5784@charter.net	" "	" "
Lynne McPhee	860-456-2450	w.mcphee@charter.net	236 Puddin Lane + Mansfield, CT	06250
BETHANY JAVIDI	860 428 5029	bethany.javid@att.net	13 QUAIL RUN RD STORRS CT	06268
Ariana Javidi	860 617 8441	aejavidi@gmail.com	13 Quail Run Rd STORRS CT	06268
MONICA VAN BEUSEKOM	860 423 6857	monica.vanbeusekom@gmail.com	98 Cardide Lane STORRS CT	06268
Laurence Ash-Moyn	860-429-8664	lgln53@hotmail.com	377 Waverille Rd, Mansfield Center	06250

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Name	Phone	Email	Address	Town
JACK BOYKO	860 429-0051		119 Brookside Ln	Mansfield Ctr
Maureen Crowley	860 429-0051		119 Brookside Lane	Mansfield Center
SHARON STOKLAND	646-416-4257		135 Mansfield Hollow Rd	Mansfield Ctr
KARA FRANCO	860		68 Independence Dr Mansfield Ct	
Helen J Fried	860-933-3298	HJF205@earthlink.net		
Joan Buck	860-771-5252	luckj300@gmail.com	72 Independence Dr.	Mans. Center 06250
Shawn Santasera	860-428-4380	ssantasera@cosmith.org	11 Blaine Lane	Storrs
Kathy Fratani	860-477-0505	katie@myottmail.com	25 Valley View Dr	Storrs.

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Name	Phone	Email	Address	Town
David Vekem	860-423-6727	DAVIDVEKEM@CHARTER.NET	1 Ft. Griswold Lane	Mansfield Center
Cathleen M. White	860-423-6727	"	1 Ft. Griswold Ln.	Mansfield Ctr, 06250
Eva Csejteg		e_csejteg@hotmail.com	351 Browns Rd.	Mansfield CT 06268
Susan G. Brome	860-429-0490	susan.brome@gmail.com	70 Davis Rd.	Storrs/Mans. CT 06268
Ann Kouaty	860-423-2975	annkouaty@charter.net	98 Fern Rd	Storrs, CT 06268

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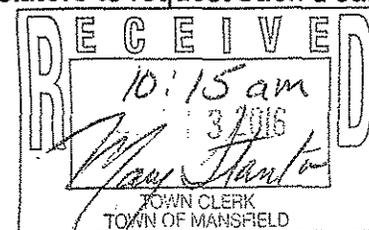
Name	Phone	Email	Address	Town
Laurie Cooper	800-423-4896	natchaug@earthlink.net	100 Mansfield Hollow Rd.	Mansfield Ctr, CT 06250
Dov Kuzelmas	860-428-6160	dkuzelmas@earthlink.net dkuzelmas6111@earthlink.net	100 Mansfield Hollow Rd.	Mansfield Ctr, CT 06250

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Name	Phone	Email	Address	Town
Galadriel Chilton	608-780-8556	galadriel.chilton@gmail.com	8 Mansfield Hollow Rd Ext Mansfield Center, CT	Mansfield Center
Mary Snyder	860-429-0293	rls.mary@gmail.com	82 Brookside Ln.	Mansfield Ctr.
David Morse	860 942-8692	dmorse@driveit-morse.com	150 Crane Hill Rd	Mansfield
<i>[Faded Name]</i>	<i>[Faded Phone]</i>	<i>[Faded Email]</i>	<i>[Faded Address]</i>	<i>[Faded Town]</i>
Joan Terry			4D Sycamore Dr Storrs, CT	Mansfield
Jane Jackman	860-429-2037	janejckymaker@gmail.com	23 Silo Rd w/ Storrs, Ct.	Mansfield.
Jeanne Haas	860-577-1152	jeannehaas85@gmail.com	10 B Sycamore Dr Storrs, CT	Storrs
Susanna M. Thomas	860-429-2522		7 C Sycamore Dr.	Storrs
Mary Dean	860 489-9172	maryfdean@gmail.com	11 Westwood Rd Storrs, CT	06268
Edith S Jones	860 487-3909		201 Separatist Rd Storrs, CT	06268
Loris Masterton	860- 429-5490		1 Pidgey Rd. Storrs, Ct.	06268

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Petition to Ensure the Safety of Route 6

Mansfield Town Council:

Name	Phone	Email	Address	Town
Yan Wu	860-423-6587	yanhwu@yahoo.com	15 Sawmill Brook Mansfield	Mansf. Tolland
Olya Rozman			Center CT 06030 697 Mansfield city	Storrs
William Plummer	860-417-2119		241 Mulberry Mansfield Center 283 Amherstville Rd Mansfield Center CT	Mansfield Center
Heike Breckner			439 North Eagle Village	Storrs, CT
Jennifer Squires			63E Eastbrook Heights	Mansfield ctr ct
Robert Branch			Philip Dr.	Storrs ct
Jay Wang			27 Clearview Dr.	Mansfield ctr, ct
Sarah McLaughlin		mclaughlinsa@my.easternct.edu	576 Browns Rd	Mansfield, CT

Petition to Ensure the Safety of Route 6

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Name	Phone	Email	Address	Town
Julia R. Sherman	860-423-8111	julsherman@hotmail.com	43 Pinewoods	Mansfield
Geoffrey M. Kern	860-423-8542	gkern@cosmith.org	58 Cemetery	MANSFIELD
David B. Strimple	860-429-7022	dstrimple@cosmith.org	3 Beebe Ln	Stam-Mansfield
Fizza Rada	860-456-1110	fizza_rada@lv.com	13 Derek Dr.	Mansfield

Gas infusion station proposal withdrawn

By COREY SIPE
Chronicle Staff Writer

While it now appears a controversial proposal to build a natural gas infusion station in Andover is on hold, some Mansfield residents have said they are fired up by the proposal fearing an explosion.

The project, proposed by Global CNG Holdings, would have included the installation of a gas line, gas metering station and other utility buildings so trucks can infuse natural gas into the existing Algonquin Distribution Line.

While the Andover Land Use Department reported Tuesday the application by Global CNG Holdings has been withdrawn, they believe it could be resubmitted in 60 to 90 days.

The department confirmed Tuesday that meetings canceled by the Andover Inland Wetland and Watercourse Commission and Andover Planning and Zoning Commission would be resched-

uled if the application is resubmitted.

At Tuesday's Mansfield Town Council meeting, council members reviewed a petition signed by about 60 residents asking the council to request the state Department of Transportation conduct a safety study regarding the effect the expected increase in truck traffic would have on Route 6.

Mansfield resident Gary Bent spoke during the public comment period Monday stating the facility will result in an increase in truck traffic using Interstate 84, Interstate 384 and Route 6 as trucks head from eastern Pennsylvania to Andover and then return to Pennsylvania.

It is believed Bolton and Andover will see most of the impact of increased truck traffic.

"It will lead to a big increase in truck traffic and sooner or later there will be a truck accident and an explosion," Bent said.

On Tuesday morning, Town Manager Matthew Hart said he could understand why some residents in town are concerned, adding he agreed a good number of residents travel Route 6 to Manchester for work and shopping.

The petition states the project would increase truck traffic by five to eight trucks an hour and each truck will have four tubes with compressed natural gas 42 inches in diameter and 45 feet long, pressurized at 4,500 pounds per square inch (psi).

According to the petition, the project would mean five to eight passing trucks an hour with the operation expected to run 24 hours a day, 7 days a week, from November to March.

The petition states, in regards to accidents on Route 6, from 2000 to 2014, 211 accidents were reported in Bolton, 190 accidents occurred in Andover and 111 accidents were reported in Columbia.

The petition states "transmission pipeline (600 to 800 psi) ruptures lead to explosions with a hazard radius of about 800 feet, whereas a rupture of a trailer tube (4,500 psi) would create a hazard radius well over 1,000 feet."

It also notes the possibility of the spread of radioactive lead-210 and polonium-210, which are found in the trailer tubes, in the case of an explosion.

Mansfield Mayor Paul Shapiro said, based on comments from town councilors during the meeting, the petition will be placed on the agenda of the next regular Mansfield Town Council meeting which is scheduled for June 27 at 7 p.m. at the council chamber of the Audrey P. Beck Municipal Building.

Town Manager Mary Stanton said Tuesday she still expects it to be listed on the agenda as a staff report for the June 27 council meeting.



**Town of Mansfield
Agenda Item Summary**

To: Town Council
From: Matt Hart, Town Manager *MH*
CC: Maria Capriola, Assistant Town Manager; Cherie Trahan, Director of Finance
Date: June 27, 2016
Re: Bus Garage Lease Agreement with M&J Bus, Inc.

Subject Matter/Background

Attached is a proposed Lease Agreement for the Town Bus Garage (located at the intersection of Route 195 and Route 32) with M&J Bus, Inc. The term of the proposed lease is for five years beginning on July 1, 2016 in order to make it consistent with the School Transportation Services Agreement that the Superintendent of Schools will execute with M&J, following a competitive request for proposals (RFP) process.

Some key provisions of the lease are as follows:

- *Term* – The proposed term shall commence on July 1, 2016 and expire on June 30, 2021.
- *Rent* – In order to reduce the costs of the bus transportation project, staff proposes no rent payment (see note below).
- *Utilities and Services* – As Lessee, M&J shall be responsible for all utilities and services, including grounds maintenance and snow removal
- *Exterior Repairs and Maintenance* – As Lessor, the Town shall remain responsible for exterior repairs and maintenance. However, the Lessee shall be responsible for maintaining the fuel storage tank, and pumping the floor drain, septic tank and oil-water separator.
- *Interior Repairs and Maintenance* – Lessee shall be responsible for interior repairs and maintenance.
- *Insurance* – Lessee shall maintain appropriate insurance coverage, as specified by the Town's insurance carrier, CIRMA.

Financial Impact

As stated above, staff does not recommend a rent payment on the part of M&J. Our expiring agreement with Durham Bus Transportation provided for a \$72,450 annual lease payment in order to provide funding for building repairs and maintenance. However, any rent payment will directly increase the cost of the bus transportation services contract. For the transportation contract, M&J has quoted a price of \$333.57 per bus per day, excluding rent; the next closest responsible bid came in at \$348.66 per bus per day, excluding rent.

The Management Services Fund account for the bus facility has a current balance of approximately \$957,000 including the value of the land and facilities (approximately \$372,000), hence there is sufficient funding for any needed repairs and maintenance at that location.

Legal Review

The Town Attorney has reviewed and approved the form of the proposed lease agreement.

Recommendation

Given the selection of M&J as the school district's new bus transportation vendor and its competitive bid, staff recommends that the Council authorize me to execute the proposed lease.

If the Town Council concurs with this recommendation, the following motion is in order:

Move, effective June 27, 2016, to authorize the Town Manager to execute the attached Agreement of Lease between the Town of Mansfield and M&J Bus, Inc., for a term to commence on July 1, 2016 and to expire on June 30, 2021.

Attachments

- 1) Agreement of Lease between the Town of Mansfield and M&J Bus, Inc.

AGREEMENT OF LEASE

BETWEEN

TOWN OF MANSFIELD

As Landlord,

and

M & J Bus, Inc.

As Tenant

Dated July 1, 2016

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TWENTY	LESSEE'S REMEDY LIMITED
TWENTY-ONE	INDEMNITY
TWENTY-TWO	MISCELLANEOUS
SCHEDULE A	DESCRIPTION OF PREMISES

LEASE

This AGREEMENT of Lease made as of the date hereinafter set forth is by and between the Town of Mansfield, a municipal corporation having its offices at 4 South Eagleville Road, Mansfield, Connecticut 06268 ("Lessor"); and M & J, INC., a Connecticut corporation having a place of business at 130 Ingham Hill Road, Old Saybrook, Connecticut 06475 ("Lessee").

ARTICLE ONE Premises and Term

Lessor, for and in consideration of the terms, covenants, conditions and guarantees herein reserved and contained, does hereby lease the Premises, as defined in Section 2.01, to Lessee, and Lessee does hereby hire the Premises from Lessor, for the Term as defined in Section 2.01 and Article Three, upon and subject to the terms, covenants, and conditions herein set forth.

ARTICLE TWO Definitions

Section 2.01 Definitions. The following terms shall have the meanings ascribed to them below:

- (a) "Commencement Date" shall mean July 1, 2016.
- (b) "Expiration Date" shall mean the earlier of (1) the date on which this Lease expires pursuant to Article Three, or (2) the date on which this Lease is terminated in accordance with either the terms of this Lease or applicable law.
- (c) "Governmental Authority" shall mean the United States of America, the State of Connecticut, agencies and officials of the Town of Mansfield, and any other governmental entity exercising authority or jurisdiction over the Premises.
- (d) "Hazardous Materials" include oil, gasoline, and other petroleum-derived materials, substances and wastes, as well as all materials, substances and wastes defined or referred to as hazardous or toxic in the Connecticut General Statutes, Regulations of Connecticut State Agencies, United States Code, or federal regulations.
- (e) "Lease Term" or "Term" shall mean the period from the Commencement Date to the Expiration Date.
- (f) "Premises" shall mean that certain real property know as and more particularly described in Section A, attached hereto, together with all buildings and improvements thereon.

ARTICLE THREE
Lease Term

The Term of this Contract shall commence on the Commencement Date and unless extended or terminated as provided herein, shall expire on June 30, 2021. If, for any reason, the agreement entitled "BUS SERVICE CONTRACT between TOWN OF MANSFIELD, CONNECTICUT and M & J BUS, INC.," dated as of the first day of July 2016 (referred to herein as the "Service Contract"), is terminated or extended, the Lessor or Lessee shall be entitled to terminate or extend this Lease effective as of or any time after the date of termination or extension of the Service Contract.

During the term of this Lease and any extension thereto, nothing in this agreement shall prevent the Lessor from selling the Premises to the Lessee on such terms and at such price as may be agreed between Lessor and Lessee, at which time upon successful completion of said transaction, this Lease Agreement shall be terminated, and all Lessor's obligations hereunder shall terminate

ARTICLE FOUR
Use

Section 4.01 Permitted Uses. Lessee shall use and occupy the Premises for the following purposes: (1) as a business office; and (2) as a facility for the maintenance, repair and storage of vehicles and equipment relating to the operation of Lessee's school transportation and school charter services provided to the Town of Mansfield pursuant to the aforementioned Bus Service Contract between the parties. No other use of the Premises may be made by Lessee without Lessor's written consent pursuant to a separate contract. Provided it does not interfere with the Lessee's proper and lawful conduct of the permitted uses, Lessor may lease portions of the Premises to any other person or entity for the purpose of erecting and maintaining a telecommunication tower. Any such portion leased to any other such party shall not remain part of the premises under this Lease. Once any such leasing occurs, this lease shall be modified to show any change in the dimension of the premises covered by this Lease.

Section 4.02 Governmental Matters. Lessor represents and warrants to Lessee that the uses permitted pursuant to this Lease may be lawfully carried on in accordance with the Zoning Regulations of the Town of Mansfield. If any governmental licenses or permits, other than those pertaining to zoning within the Town of Mansfield, are required for the proper and lawful conduct of the Permitted Uses or any part therefore, Lessee, at its expense, shall duly procure and thereafter maintain such licenses or permits and shall submit the same to Lessor for inspection. Lessee shall at all times comply with the terms and conditions of each such license and permit.

Section 4.03 Lessee's Responsibility. Lessee shall not at any time use or occupy, or suffer or permit anyone to use or occupy, the Premises, or do or permit anything to be done on the Premises, in any manner (a) that causes or is liable to cause injury to the Premises; or (b) that constitutes a violation of any applicable laws and requirements of any Governmental Authority or the requirements of insurance bodies. Notwithstanding anything herein contained to the contrary, Lessee shall not use, treat, store or dispose of any Hazardous Materials on the Premises, except that Lessee may use such amounts and types of substances as are customarily used for routine cleaning and maintenance, provided such substances are used and disposed of properly. Lessee shall notify the Town immediately of any discharge or suspected discharge on the Premises of any hazardous materials. Lessee shall defend, indemnify and hold Lessor harmless from and against all claims, damages, penalties, fines and expenses arising from discharge or suspected discharge of hazardous materials on or about the Premises. Lessee shall have no obligation to make any exterior or structural repairs or replacements to the Premises unless the need for such work results solely from the negligence or actions of Lessee or its agents, officers, employees, guests or visitors.

Section 4.04 Lessor's Responsibility. Lessor makes no warranty or representation regarding the suitability of the Premises for the Lessee's Permitted Uses. Lessor will be under no obligation nor have liability of any kind or character in connection with the operation or maintenance of the Lessee's Permitted Uses. Except as provided below or in Section 4.03, Lessor shall be obligated to make any exterior or structural repairs or replacements to the Premises that may be required by any applicable laws and requirements of any Governmental Authority or the requirements of insurance bodies. In the event any such exterior or structural repairs would require the Lessor to expend a sum greater than or equal to \$25,000 (Twenty-Five Thousand Dollars), the Lessor shall have the right to terminate this Lease by giving the Lessee written notice of its intention to terminate at least thirty (30) days prior to the date of termination. Any improvements to the Premises which the Lessor wishes to make during the Term of the Lease that might increase the taxes or insurance payable by the Lessee with respect to the Premises shall be submitted to the Lessee for its prior approval and shall not be implemented by Lessor without such approval unless the Lessor agrees to reimburse Lessee for such increased costs.

ARTICLE FIVE

Rent

Section 5.01 Rent. As the Lessee is providing school bus transportation services to the Mansfield School District from the Premises, no rent will be due to the Lessor from the Lessee.

ARTICLE SIX
Utilities and Services

Section 6.01 Lessee's Responsibility. Lessee shall arrange for, and shall promptly pay when due, all charges for gas, water, sewer, electricity, fuel, light, heat, power and all other utilities used by it on the Premises throughout the Term.

Section 6.02 Lessor's Responsibility. Lessor is not, nor shall it be, required to furnish to Lessee any water, sewer, gas, heat, electricity, fuel, light, power, telephone, or any other facilities, equipment, labor, materials or any services of any kind whatsoever. However, Lessee with the assistance of Lessor shall cause the meters for such utility services to be transferred to Lessee's name and account as soon as practical after the commencement of this Lease.

ARTICLE SEVEN
Condition of Premises

By taking possession of the Premises, Lessee acknowledges that Lessor has provided Lessee with a full opportunity to inspect and investigate the physical condition of the Premises in order to assure itself that there are no physical conditions that would prevent Lessee from conducting the Permitted Uses. Lessee also acknowledges that Lessor has not made, and that Lessee has not asked Lessor to make, any warranty or representation regarding the environmental or physical conditions of the Premises or the suitability of the Premises for the Permitted Uses, except as set forth in Section 4.02. Lessee and its employees and agents accept these premises 'as is'.

ARTICLE EIGHT
Repairs and Maintenance

Section 8.01 Exterior Repairs and Maintenance. Lessor shall, at its sole expense and cost, keep, repair, maintain and replace all of the exterior and structural components of the Premises and buildings including, without limitation, the roofs, floors, walls, exterior walls (but not windows) and foundations of the buildings, heating, air conditioning and electrical systems, all plumbing, and any fuel or storage tanks, in good order, condition and repair. Notwithstanding the foregoing provisions, Lessor shall have no obligation, and Lessee shall be obliged, to make any exterior or structural repairs or replacements to the Premises if the need for such work results solely from the negligence or actions of Lessee or its agents, officers, employees, guests or visitors. In addition, Lessee shall be responsible for the preparation and maintenance of daily inventory records for the fuel storage tank, as required by Section 22a-449(d)-1(g)(2) of the Regulations of Connecticut State Agencies. Lessee shall also be responsible for pumping out the septic tank and the holding tank from the floor drain on an as-needed basis, and for the annual pumping of the oil-water separator. Lessee shall notify the Town immediately upon taking any measurement, performing any reconciliation, or making any observation that indicates the possibility of an abnormal loss or gain of fuel to or from a fuel tank or any other problem with or failure of any underground or above ground tank. Lessee shall have a Spill, Prevention, Control and Countermeasure Plan (SPCC) per the federal Clean Water Act.

Section 8.02 Interior Repairs and Maintenance. Lessee shall keep and maintain the interior, including all windows, of the Premises in good order, repair and condition and shall surrender the same upon the termination of the term in the same condition as at the Commencement Date. Reasonable wear and tear, loss by fire or other casualty (except to the extent such casualty arises from the negligence or other actions of Lessee or its agents, officers, employees, guests or visitors), acts of God, repair obligations of the Lessor specified herein, eminent domain, and loss or damage caused by or resulting from the failure of the Lessor to make repairs as provided herein or from Lessor's negligent act or omission are excluded.

Section 8.03 Lessor's Right to Inspect and Repair. Lessor shall have the right to make periodic inspections of the interior and exterior spaces on the Premises without prior notice, provided such inspections do not unreasonably interfere with Lessee's permitted uses of the Premises. Lessor shall also have the right to inspect all maintenance and repair records and all documents pertaining to the use, maintenance, disposal or discharge of hazardous materials on the Premises. If Lessee fails to perform any repairs, restoration or other work which Lessee is obligated to perform under this Lease and such default is not remedied within the applicable grace period provided in this Lease, Lessor and its authorized representatives shall have the right to enter the Premises and to perform such work. Any amount paid by Lessor for any of such purposes, and all necessary costs and expenses of Lessor in connection therewith, shall be due and payable by Lessee to Lessor. Nothing in this Section shall imply any duty upon the part of Lessor to do such work or to make any alterations, repairs (including, but not limited to, repairs and other restoration work made necessary due to any fire or other casualty), additions or improvements to the Premises, except as otherwise provided herein. During the progress of any such work, Lessor shall not unreasonably interfere with the conduct of Lessee's business, but the obligations of Lessee under this Lease shall not thereby be affected in any manner whatsoever.

Section 8.04 Grounds Maintenance. The Lessee shall keep and maintain the grounds in good order, repair and condition and shall surrender the same upon the termination of the term in the same condition as at the commencement date.

ARTICLE NINE Lessee's Improvements

Lessee shall make no structural or exterior alterations, installations, additions or improvements (hereinafter individually and collectively referred to as "Lessee's Improvements") in or to the Premises without Lessor's prior written consent. Except with respect to alterations or improvements not necessary for the Permitted Use, such consent shall not be unreasonably withheld. Lessor's failure to respond to a written request by Lessee for consent any Lessee's Improvements shall, after ten days from Lessor's receipt of such request, be deemed an approval of such request. Notwithstanding the right of Lessor to approve any matter described in this Article, Lessor shall have no responsibility or liability for the performance or quality of work of any contractor, subcontractor, agent or consultant of Lessee. The approval by Lessor, whether express or implied, of Lessee's creation of Improvements in or to the Premises or the construction of any buildings or structures shall in no way affect Lessor's rights or Lessee's obligations relating to the restoration of the Premises.

ARTICLE TEN
Compliance With Laws and Requirements of Governmental Authorities

Lessee shall comply with all applicable laws and requirements of any Governmental Authorities relating to its possession and use of the Premises. Lessee shall pay all costs, expenses, fines, penalties and damages that may be imposed upon Lessor by reason of or arising out of any failure by Lessee to comply with and observe the provisions of this Section fully and promptly.

ARTICLE ELEVEN
Insurance

Section 11.01 Lessee's Required Insurance. During the Term hereof Lessee shall, at its own cost and expense, provide and keep in force for the mutual benefit of Lessor and Lessee, comprehensive general public liability insurance policies against claims for bodily injury, death or property damage occurring in or about the Premises (including, without limitation, bodily injury, death or property damage resulting directly or indirectly from any change, alteration, improvement or repair thereof, and assumed property damage coverage), with limits of not less than (i) one million dollars (\$1,000,000.00) for bodily injury or death to any one person; (ii) two million dollars (\$2,000,000.00) for bodily injury or death to any number of persons in respect of any one accident or occurrence; and (iii) one million dollars (\$1,000,000.00) for property damage (including environmental pollution or contamination) in respect of any one accident or occurrence. The Town of Mansfield and the Mansfield Board of Education shall be named an additional insured on such policies. Lessee's insurance shall be primary and non-contributory. Insurance coverage and limits of liability as specified herein are minimum coverage and limit of liability requirements only. They shall not be construed to limit the liability of Lessee or any insurer for any claim that is required to be covered under this Lease agreement.

Section 11.02 Personal Property. In respect of any personal property and trade or other fixtures owned by Lessee and located in, at or upon the Premises, Lessee hereby releases Lessor from any and all liability or responsibility to it or anyone claiming by, through or under it by way of subrogation or otherwise, for any loss or damage to such property caused by fire or any of the extended coverage casualties.

Section 11.03 Worker's Compensation. Lessee shall provide and keep in full force and effect worker's compensation insurance providing statutory Connecticut benefits for all persons employed by Lessee in connection with the Premises.

ARTICLE TWELVE
Assignment, Subletting, Mortgaging, Inc.

Section 12.01 Prior Written Consent. Lessee may assign or sublet all or any part of the Premises to an entity controlled by, controlling, or under common control with Lessee, or to a purchaser of substantially all of Lessee's assets. Lessee may not otherwise assign this Lease or sublet all or any part of the Premises without the prior written consent of Lessor, which shall not unreasonably be withheld.

Section 12.02 Assignee and Lessee Liable. Any assignment or transfer shall be made only if, and shall not be effective until, the assignee executes, acknowledges and delivers to Lessor an agreement in form and substance satisfactory to Lessor whereby the assignee assumes the obligations of this Lease on the part of Lessee to be performed or observed and whereby the assignee agrees that the provisions in Section 12.01 shall, notwithstanding such assignment or transfer, continue to be binding upon the assignee in respect of all future assignments or transfers.

ARTICLE THIRTEEN
Lessee's and Lessor's Property

Section 13.01 Lessee's Property.

13.01.01 All business and trade fixtures, machinery and equipment that are installed in or located within the Premises by or for the account of Lessee, without expense to Lessor, and which can be removed without structural damage to the Premises, and all articles of movable personal property owned by Lessee and located in the Premises (all of which are sometimes called "Lessee's Property" shall be and shall remain the property of Lessee and may be removed by it at any time during the Term of this Lease; provided that if any of Lessee's Property is removed, Lessee shall repair or pay the cost of repairing any damage to the Premises resulting from such removal.

13.01.02 On or before the Expiration Date, or as promptly as practicable thereafter, Lessee's Property (except such items thereof as Lessee shall have expressly agreed in writing with Lessor shall remain and become the property of Lessor) shall be removed by Lessee, and Lessee shall repair any damage to the Premises resulting from such removal. Any items of Lessee's Property that shall remain in the Premises after the Expiration Date may, at the option of Lessor, be deemed to have been abandoned or may be disposed of, without accountability, in such manner as Lessor may see fit, at Lessee's expense.

Section 13.02 Lessor's Property. Except as provided in Section 13.01, above, all Lessee's Improvements shall be deemed the property of Lessor and shall not be removed by Lessee without Lessor's consent.

ARTICLE FOURTEEN
Surrender

On the Expiration Date of this Lease, or upon any earlier termination of this Lease, or upon any re-entry by Lessor upon the Premises, Lessee shall quit and surrender the Premises, including Lessee's Improvements, to Lessor in good order, condition and repair, except for ordinary wear and tear, and Lessee shall remove all of Lessee's Property therefrom except as otherwise expressly provided in this Lease.

ARTICLE FIFTEEN
Events of Default

Section 15.01 Events of Default. Each of the following events shall be an "Event of Default" hereunder:

- (a) Failure by Lessee to make any payment required to be paid by Lessee hereunder for a period of ten (10) days after Lessee receives written notice thereof from Lessor.
- (b) Failure by either party to observe or perform one or more of the other terms, covenants and conditions contained in this Lease, and such failure shall continue for a period of fifteen (15) days after the defaulting party receives written notice thereof from the other party specifying such failure (unless such failure requires work to be performed, acts to be done, or conditions to be removed, that cannot by their nature reasonably be performed, done or removed, as the case may be, within such fifteen (15) day period, in which case no default shall be deemed to exist as long as the defaulting party shall have commenced curing the same within such fifteen (15) day period and shall diligently and continuously prosecute the same to completion, provided such delay in effecting cure shall not expose the other party or its employees or officials to prosecution for a crime).
- (c) If the Lessee is in default under the terms of the Bus Service Contract between the Town of Mansfield and M & J Bus, Inc.

ARTICLE SIXTEEN
Covenant of Quiet Enjoyment

Lessor covenants that upon Lessee paying any charges payable by Lessee hereunder and the performance of all the other terms, covenants, and conditions contained in this Lease on Lessee's part to be performed, Lessee shall peaceably and quietly enjoy the Premises, without hindrance, ejection or molestation by any persons lawfully claiming under Lessor.

ARTICLE SEVENTEEN
No Waiver

Section 17.01 No Waiver. The failure of either party to seek redress for the violation of, or to insist upon the strict performance of, any of the terms, covenants, or conditions contained in this Lease shall not constitute a waiver thereof by that party, and such party shall have all remedies provided herein and by applicable law with respect to any subsequent act that would have originally constitute a default pursuant to the terms of this Lease.

Section 17.02 No Surrender Implied. No act or failure to act by Lessor or Lessor's agents, employees, servants, contractors or subcontractors shall constitute an actual or constructive eviction by Lessor, nor shall such act or failure to act be deemed an acceptance of a surrender of the Premises.

ARTICLE EIGHTEEN
Notices

Any notice, statement, demand or other communication required or permitted to be given or made by either party to the other pursuant to this Lease or to any applicable law or requirement shall be in writing and shall be deemed to have been properly given or made if sent by registered or certified mail, postage prepaid, return receipt requested, or by an overnight mail service with acknowledgement of delivery requested, addressed to the respective party at the address set forth at the beginning of this Lease. Such notice shall be deemed to have been given or made on the day so mailed, unless mailed outside of the State of Connecticut, in which case it shall be deemed to have been given, rendered, or made three (3) days following the day on which it was deposited in a United States post office or mailbox. Either party may, by written notice hereunder, designate a different address or addresses.

ARTICLE NINETEEN
Notice of Lease

At the request of either party, Lessor and Lessee shall promptly execute, acknowledge and deliver a notice of lease sufficient for recording in accordance with the statutes of the State of Connecticut.

ARTICLE TWENTY
Lessee's Remedy Limited

Section 20.01 Nature of Lessee's Remedies.

- 20.01.01 If Lessee believes that Lessor has acted in an arbitrary and capricious manner in denying permission or refusing to approve any act that Lessee may desire to perform, Lessee may either bring an action to enjoin or reverse such decision, in which event Lessor shall not be liable for any monetary damages suffered by Lessee as a result of Lessor's actions, or Lessee may pursue mediation of the dispute by giving Lessor written notice specifying the basis of Lessee's complaint. During the thirty (30) days following Lessor's receipt of such notice (the "Dispute Resolution Period"), the parties shall each use their reasonable best efforts to resolve the dispute. If the parties are unable to resolve the dispute during the Dispute Resolution Period, the parties will attempt in good faith to resolve such dispute by mediation in Hartford, Connecticut, or such other location as may be acceptable to both parties, in accordance with the Center for Public Resources Model Procedure for Mediation of Business Disputes. The remedies herein are not exclusive; however, the parties agree not to initiate litigation with respect to any matter that they are trying to resolve pursuant to the procedures set forth in this paragraph during the Dispute Resolution Period.
- 20.01.02 Neither Lessor nor any agent, servant or employee of Lessor shall be liable to Lessee for any injury or damage to Lessee or to any other person or for any damage to (by vandalism, illegal entry, steam, gases, water, rain, snow, electricity or any other causes), or loss (by theft or otherwise) of, any property of Lessee or of any other person, irrespective of the cause of such injury, damage or loss, unless caused by or due to the sole negligent act of Lessor, its agents, servants or employees. Further, neither Lessor nor its agents, servants or employees shall be liable for consequential damages arising out of any loss of use of the Premises or any person claiming through or under Lessee.

Section 20.02 Survival of Covenants. The parties' covenants contained in this Article Twenty shall survive the Expiration Date.

ARTICLE TWENTY-ONE
Indemnity

To the fullest extent permitted by law, Lessee shall defend, indemnify and save the Town of Mansfield, the Mansfield Board of Education and their boards, employees and agents from and against all claims, of whatever nature, that arise or may arise from (1) any act, omission, or negligence of the Lessee; and the Lessee's employees, contractors, licensees, agents, servants and invitees; and (2) any breach, violation or nonperformance of obligations under this Lease. This covenant shall survive the expiration date of this Lease.

ARTICLE TWENTY-TWO
Miscellaneous

Section 22.01 Integration Clause. This Lease, together with all Exhibits and Schedules attached hereto, which by this reference are hereby fully incorporated into this Lease, contains the entire agreement between Lessor and Lessee with respect to the Premises and all prior agreements between the parties hereto are merged into this Lease. Any amendments to this Lease must be in writing and executed by both parties.

Section 22.02 Effect of Partial Invalidity. If any of the provisions of this Lease, or the application thereof to any person or circumstances, shall, to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such provision or provisions to persons or circumstances other than those as to who or which it is held invalid or unenforceable, shall not be affected thereby, and every provision of this Lease shall be valid and enforceable to the fullest extent permitted by law.

Section 22.03 Choice of Law. This Lease shall be governed in all respects by the laws of the State of Connecticut.

IN WITNESS WHEREOF, the parties have hereunto set their hands as of this day of June, 2016.

Signed, Sealed and Delivered in

Lessor: TOWN OF MANSFIELD

The Presence of:

By: _____
Its: Town Manager
Duly Authorized

STATE OF CONNECTICUT)

)

ss. Mansfield, CT 06268

COUNTY OF TOLLAND)

On this _____ day of June, 2016, personally appeared Matthew W. Hart, Town Manager of the Town of Mansfield, and signer of the foregoing instrument who acknowledged the same to be his free act and deed as Town Manager, and the free act and deed of the Town of Mansfield, before.

Notary Public

Lessee: M & J BUS, INC.

By: _____
Its
Duly Authorized

STATE OF CONNECTICUT)

)

ss. Mansfield, CT 06268

COUNTY OF TOLLAND)

On this _____ day of June, 2016 personally appeared _____ of M & J Bus, Inc. and signer and sealer of the foregoing instrument, who acknowledged the same to be his free act and deed as such _____, and the free act and deed of M & J Bus, Inc., before me.

Notary Public

SCHEDULE A

A certain piece or parcel of land, with the buildings and improvements thereon, located in the Towns of Mansfield and Willington at the intersection of Route 195 and Route 32 and more particularly bounded and described as follows:

Beginning at a C.H.D. marker located on the North side of Route 195, which point marks the Southeast corner of the parcel herein described and which point is located at the intersection of said Route 195 and Route 32; thence N 62° 35' 11" W, 162.46 feet along the Northerly line of Route 195 to a C.H.D. marker; thence N 69° 45' 18" W, 114.92 feet along Route 195 to a point; thence N 7° 02' 02" E, 335.00 feet along land now or formerly of Central Vermont Railroad; thence S 88° 10' 01" E, 130.94 feet to Connecticut Route 32; thence along Route 32 in a Southerly direction along a curve to the left having a radius of 1492.40', a distance of 100.00 feet to a point; thence S 10° 40' 58" E along the Westerly line of Route 32, 350.11 feet to the point and place of beginning.

Said premises are shown on a map entitled, "MAP SHOWING SOME LAND OF JOSEPH E. MIHALIAK MANSFIELD & WILLINGTON, CONN. SCALE 1" = 20' PREPARED FOR EDWIN SMYTH ZONE: BUS. PARCEL CONTAINS 1.636 ACRES CERTIFIED TO BE SUBSTANTIALLY CORRECT DEGREE OF ACCURACY CLASS A-2 STANLEY W SZESTOWICKI R.L.S. 7772 MAY 17, 1979 VERNON, CONNECTICUT REVISED MAY 18, 1979 REVISED SEPT. 14, 1979 REVISED OCT. 2, 1979."

Being the same premises described in a certain deed from Rhoda G. Smyth and Richard E. Smith to the Town of Mansfield, dated October 15, 1997, and recorded in the Land Records of the Town of Mansfield.

June 20, 2016

To: Mansfield Town Council

Subject: Town Line Survey

Reference: Information meeting on 6/14/2016

Our names are Lisa M. and John C. Petrus and we live at 125 So. Bedlam Road in the Town of Mansfield. On Tuesday 6/14/2016 we attended an informational meeting at the Town Hall with the objective of showing the results of a Town Line Survey that was commissioned by the towns of Mansfield and Chaplin to determine if the current town lines are accurate and if not, what could be done as we go forward. All residents of both towns who own property that the current town lines pass thru were invited to see the results. We were one of these residents.

We'd like to personally thank Mayor Paul Shapiro, Council Members Ben Shaiken, Toni Moran, Town Attorney Kevin Deneen and Director of Planning Linda Painter for not only attending this meeting but for their candid and open opinions on several of the areas under discussion. Prior to the meeting we were called by Ms. Painter and asked to attend a preliminary meeting with her to discuss how our property was affected by the new survey. She told us that there were 4 or 5 parcels that had the largest impact and of these, we were the only affected residence with children in the Mansfield School District. Since I was away on business, my wife and her father attended the meeting.

We will separate the rest of this letter into two areas. The 1st will be what we all found out at the meeting either thru charts, questions or discussions and the 2nd will be additional info that we believe you should be aware of when working with the Chaplin Selectmen to resolve the major town line boundary changes that may affect us.

What We Found Out

- Ms. Painter showed a map of the affected residences and did point out that ours was the only one that had school age children.
- Of the parcels that were most affected by the new Town Line Survey, ours was certainly one of the largest changes, since a 2006 subdivision survey showed that our entire house is in Mansfield and the new survey shows the town line going thru our residence.
- For the past 10 years it appears that the Town of Mansfield has used the 2006 subdivision survey for things like taxes, zoning, building permits, school system, town line boundary, etc. for our parcel and a different town line survey for the rest of the town which doesn't make sense. Why would anyone do this?

- The Council Members that were there and the Mayor and Town Attorney all addressed the group and every one of them stated that the intent of this was not to cause children to change school districts and that children should be considered #1 as this process continues. The Selectman from Chaplin that attended stated the exact same position. Since the meeting was recorded, this can be easily verified.

- Just prior to signing the contract for this parcel, we asked the sellers Real Estate Agent, Art Kostapapa to show us proof that it was in the Town of Mansfield. Within a couple of days he gave us a letter signed by Curt Hirsch, Mansfield Zoning Agent that stated in part, *"I have been asked to provide a certification with respect to the zoning regulation of the Town of Mansfield, that your property, known as 125 South Bedlam Road, is located within the jurisdiction of the Town of Mansfield. In fact, the physical land is located both in the Town of Mansfield and the Town of Chaplin. The single family residence located on the property is located in Mansfield."* At this point this was true however the real estate agent, town zoning agent and the sellers all new the latest town line survey was imminent and things could change. No one said anything to us about this. We will discuss this with our Real Estate Attorney to find out if not disclosing this was legal.

- Towards the end of the meeting Lisa Petrus went to the microphone and read a Connecticut State Law (Residency – Section 10-186) that she had found thru extensive research. This law states in part, *"Regarding boundary line disputes, the law defines residency for dwellings bordering on two or more town boundaries. By law, the child shall be a resident of each town in which the dwelling is located and may attend school in any one town. If the town boundary line crosses a property line but does not cross through the dwelling, then the residence does not border on the town line for purposes of dual residency."* By the end of the meeting, Attorney Kevin Deneen had also researched this law and told us that this law was current and as a result, there will be no issue. Our children will be able to continue to attend the schools in Mansfield.

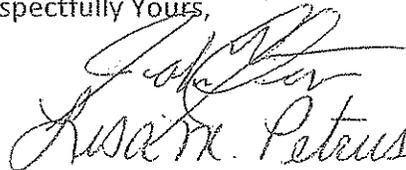
Additional Items That Should Be Considered

- Prior to moving to Connecticut we lived in New York. Of course this 100 mile move was traumatic for our two children, who were 10 and 12 years old. They had to give up their friends, sports teams, classmates and many other things that are established in a home. Since the move 10 months ago, they have adjusted well. Our children use the Community Center, have made many new friends in their school and our son is on the school soccer team. Does anyone really want to make them go thru this again? We really hope not.

- After learning that we would be moving to Connecticut and researching several school districts, Mansfield was clearly the town and school district we decided to move to. As a result, I commuted for almost 5 hrs. / day for 3 months until the right property could be found.
- Ms. Painter was asked about the 2006 Subdivision Survey and why the town line is so different from the new survey for the 125 Bedlam Rd. parcel. She told us that the original surveyor was contacted and asked that same question. She told us that he stands by the survey he did and as part of the informational presentation that was done, the new surveyor stands by his work. He stated that he was able to find several piles of rocks that were on the survey from the early 1800's. We have no piles of rocks on our parcel.

In summary, we have spoken to a surveyor that we know in New York who has done several surveys in Connecticut. He told us that town line surveys are very difficult; often result in lawsuits and that ideally, town monuments are used as markers to establish boundaries. Based on everything that we have now been told and based on the Connecticut law that was discovered, we hope and pray that our children will continue to attend the wonderful schools in Mansfield.

Respectfully Yours,

A handwritten signature in cursive script, appearing to read "Rosalyn Petrus". The signature is written in black ink and is positioned below the typed name.

cc: Mayor Paul Shapiro, Town Attorney Kevin Deneen, Planning Director Linda Painter

PAGE
BREAK

Town of Mansfield Agriculture Committee



Stacey Stearns
Chair

Item #6

June 22, 2016

Mansfield Board of Education
4 South Eagleville Road
Storrs-Mansfield, CT 06268

Dear Board Members,

It has come to our attention that you are in the process of conducting a search for a new food services director. We would like to take this opportunity to encourage you to support the Farm to School Initiative, and create a culture that embraces local food and agriculture in our Mansfield School System.

The Agriculture Committee serves in an advisory role to the Town Council and other town officials to foster agricultural viability in Mansfield. One of our charges is to promote opportunities for residents and local businesses to support agriculture, and promote the value of agriculture to the town. These charges coincide with the goals established in the Mansfield Tomorrow: Plan of Conservation and Development (POCD).

For instance, Goal 6.4 of the POCD states that we will measure effectiveness of agriculture's value in the community by the number of Mansfield farms supplying products to local schools, businesses, and institutions. Another action item is to encourage schools to promote agriculture. Further in the plan, under strategy G - we also support new market channels for local agricultural products.

These charges and duties are not just limited to agriculture, but encompass economic development for Mansfield as well, as agriculture is an important part of our economic landscape. The Agriculture Committee is working with the Economic Development Commission, and strategies and actions can also be found in the POCD section on economic development relating to agriculture.

Increasing the amount of local food purchased by the Mansfield School System is a simple step that can be taken to increase agriculture awareness in school children, provide fresh, local food on school menus, and strengthen the economic viability of the agriculture industry in Mansfield.

Members of the agriculture committee would be happy to meet with you and answer any questions that you may have. We appreciate your time and consideration of this topic, and hope that during this transition to a new food service director, that a stronger connection can also be forged with the Farm to School Initiative.

Best Regards,

Stacey Stearns
Chair

Cc: Matthew W. Hart, Town Manager
Mansfield Town Council

From: Kelly M. Lyman
Sent: Wednesday, June 22, 2016 9:08 PM
To: Jennifer S. Kaufman <KaufmanJS@MANSFIELDCT.ORG>
Cc: MBOE_BOE <MBOE_BOE@mansfieldct.org>
Subject: Re: A letter from the Mansfield Agriculture Committee to the Mansfield Board of Education

Hi Jennifer,

We are nearly finished with the search process for our new director and I am happy to share that not only did we include interview questions about the farm to school movement, we found candidates who asked us what we do to engage local producers. Clearly, this is an interest of not just the agricultural community but the general community as well.

We are close to appointing a new director and I believe you will be as excited as we are with the selection. I will make an introduction once our process is complete.

Kelly

Sent from my iPad

On Jun 22, 2016, at 5:03 PM, Jennifer S. Kaufman <KaufmanJS@MANSFIELDCT.ORG> wrote:

Hello Kelly,

I have attached a letter to the Board of Education from the Mansfield Agriculture Committee, which I staff.

I would greatly appreciate it if you could pass it along.

Best,

June 21, 2016

Governor Dannel Malloy
State Capitol
210 Capitol Avenue
Hartford, CT 06106

RE: CRUMBLING FOUNDATIONS

Dear Governor Malloy:

Residents of eastern Connecticut cities and towns impacted by crumbling residential foundations are facing many challenges going forward. The undersigned municipalities appreciate and are grateful for the leadership of Lieutenant Governor Wyman and Commissioner Jonathan Harris of the Office of Consumer Protection to investigate the cause of this problem, explore possible means of assisting homeowners and to review possible legal remedies.

The complexity of the issue requires time to thoroughly investigate all details involved, and review is necessary should there be any legal remedies available. We would request that the State immediately convene a working group or authority made up of qualified State and Municipal Officials, key Legislative Representatives, Staff and other qualified individuals charged with carrying out the recommendations set forth below and ensuring where necessary that legislative proposals are drafted in preparation for the 2017 legislative session. It is imperative that the Task Force or Authority receive appropriate Staff assistance from the State, including Legal Counsel, with a set schedule for issuing periodic progress reports. One of the first tasks of this group should be to contact Officials in Quebec, Canada as to steps they have taken over the last five years to address similar problems in their province.

While the State works through its deliberate process, some homeowners have taken action to protect their legal rights and/or have made costly repairs to their failing foundations. We have seen firsthand that impacted homeowners need relief soon and encourage the State of Connecticut to take steps in that direction.

We stand ready and willing to work together with the State to help our residents by ensuring that appropriate consideration be given to the interim relief measures identified in this letter. Some possibilities we encourage the State to consider:

- The State should establish an emergency repair fund to provide a means of interim financial relief for residents currently impacted by crumbling foundations. Many homeowners have had to expend funds for legal assistance related to the problem and/or make repairs to their foundations. Potential sources of funding might include the Small Town Economic Assistance Program, an adjustment to existing fees or surcharges, the Small Cities Grant Fund or Federal resources.

- The State should engage qualified analysts to conduct a financial impact study to assess the impacts of the issue of crumbling foundations on communities in eastern Connecticut. This study should include information regarding the effect on the overall economy, the housing market and municipal grand lists, as well as other relevant data and information.
- The State can support the Capitol Region Council of Governments in convening the Connecticut Assessors Association, local Assessors, Chief Elected Officials and Town Managers to develop a uniform method for determining any future reductions in the value of impacted homes, based on recently adopted legislation which applies to this matter.
- The State should support the Capitol Region Council of Governments in their efforts to identify a list of qualified contractors to conduct inspection services and foundation repairs, including a less expensive testing means; and develop a pricing index including a maximum per square foot cost that qualified contractors can charge homeowners for services.
- The State should provide training which focuses on crumbling foundations for home inspectors, real estate agents and municipal building officials. The State should also continue to develop guides with updated information to provide homeowners with information regarding deteriorating foundations and what to do if they believe they have been affected.
- The State should request information from its consultants on lower cost interim steps which homeowners could take to ameliorate the concrete deterioration which, if proven valid, could include items such as grading slopes away from foundations, cracksealing, waterproofing, curtain drain repair and enhancements and gutter revision. This advice should include a step-by-step guide for monitoring.
- The State should continue to work with the Commissioners of Insurance and Banking to seek protections from insurance companies that may be raising rates in eastern Connecticut and banks that may be calling line of credit and equity loans for homeowners affected by deteriorating foundations.
- We encourage the State to continue to make representatives from the Department of Banking and the Insurance Department available to talk to affected residents about how to address concerns with their banks and insurance companies.
- The State should explore a means for providing emotional support systems to assist impacted residents with family complications associated with this problem.

Governor Dannel Malloy
Page Three
June 21, 2016

Once again, we wish to thank the State of Connecticut for the work it has done so far and look forward to a stronger partnership and a closer working relationship to bring relief to our residents in need.

Sincerely,



A handwritten signature in cursive script, appearing to read "Steven Werbner".

Steven Werbner
Town Manager



A handwritten signature in cursive script, appearing to read "Christina Mailhos".

Christina Mailhos
First Selectman



A handwritten signature in cursive script, appearing to read "John Elsesser".

John Elsesser
Town Manager



A handwritten signature in cursive script, appearing to read "Paul M. Shapiro".

Paul Shapiro
Mayor

SW/CM/JE/PS/lrb

cc: Lt. Governor Nancy Wyman
Jonathan Harris, Commissioner, Consumer Protection
Matthew Hart, Mansfield Town Manager
Lyle Wray, CRCOG

PAGE
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TOWN OF MANSFIELD
OFFICE OF THE TOWN MANAGER



Matthew W. Hart, Town Manager

AUDREY P. BECK BUILDING
FOUR SOUTH EAGLEVILLE ROAD
MANSFIELD, CT 06268-2599
(860) 429-3336
Fax: (860) 429-6863

June 15, 2016

Ms. Mary G. Harper
129 East Road
Mansfield, CT 06268

Re: Appointment to Mansfield Conservation Commission

Dear Ms. Harper:

This letter is to confirm your appointment to the Conservation Commission as an alternate for an initial term through August 31, 2019.

I trust that you will find the work of the Commission to be rewarding, and I greatly appreciate your willingness to serve our community.

Please do not hesitate to contact me with any questions regarding your appointment.

Sincerely,

Matthew W. Hart
Town Manager

Cc: Town Council
Mary Stanton, Town Clerk
Quentin Kessel, Conservation Commission

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TOWN OF MANSFIELD
OFFICE OF THE TOWN MANAGER



Matthew W. Hart, Town Manager

AUDREY P. BECK BUILDING
 FOUR SOUTH EAGLEVILLE ROAD
 MANSFIELD, CT 06268-2599
 (860) 429-3336
 Fax: (860) 429-6863

June 13, 2016

Mr. Peter Adomeit, Chairman
 c/o Ms. Amanda Alfonso, Executive Assistant
 Connecticut State Employees Retirement Commission
 Office of the State Comptroller, Retirement Division
 55 Elm Street
 Hartford, Connecticut 06106
Amanda.Alfonso@ct.gov

Re: Connecticut State Employees Retirement Commission, Municipal Liaison Position

Dear Mr. Adomeit:

I am writing to express my interest in serving as the municipal liaison on the Connecticut State Employees Retirement Commission. My interest stems from the fact that the Town of Mansfield is a member of the Municipal Employee Retirement System (MERS), and it is very important to the Town to ensure that MERS remains sustainable over time. Over the years, I have testified at the General Assembly regarding various issues related to MERS and have participated in the Municipal Opportunities for Regional Efficiencies (MORE) Commission's deliberations concerning the topic. I have been briefed regarding the duties of this position by Mr. Thomas Landry, my colleague in Weston, who previously served in this role.

I have attached my resume for your consideration and am happy to respond to any questions that you might have. I greatly appreciate your consideration of my application.

Sincerely,

Matthew W. Hart
 Town Manager

CC: Mansfield Town Council
 Thomas Landry, Town of Weston
 Ronald Thomas, CCM
 Kathryn Dube, COST

STATE EMPLOYEES
RETIREMENT COMMISSION

MEDICAL EXAMINING BOARD
for DISABILITY RETIREMENT



STATE OF CONNECTICUT
RETIREMENT SERVICES DIVISION
OFFICE of the STATE COMPTROLLER
55 Elm Street
Hartford, CT 06106
PHONE: (860) 702-3480 | FAX: (860) 702-3489

May 26, 2016

Elizabeth Gara, Executive Director
Connecticut Council of Small Towns
1245 Farmington Ave. Suite 101
West Hartford, CT 06107

Re: Announcement of Opening for Volunteer, Non-Voting Position of Municipal Liaison
to the Connecticut State Employees Retirement Commission

Dear Ms. Gara,

Please notify your members that the Connecticut State Employees Retirement Commission is requesting applications for the Position of Municipal Liaison to serve in a non-voting, volunteer capacity on the Commission.

By Law (Connecticut General Statutes, Section 5-155a), the Connecticut State Employees Retirement Commission is an administrative agency that administers the provisions of the State Employees Retirement System (SERS), the Municipal Employees Retirement System (MERS) for participating municipalities, and all other state retirement and pension plans except the Teachers' Retirement System.

Additional information on the make-up and duties of the Commission can be accessed on the Web Site of Office of the State Comptroller and by reading G.C.S. Section 5-155a.

The Municipal Liaison can bring to the monthly meetings the perspectives of the Municipalities which participate in MERS. The Commission meets on the third Thursday of each month at 55 Elm Street, 7th Floor, Hartford, Connecticut at 9:00 a.m.

Interested persons should communicate their interest, along with a resume, on or before June 16, 2016, to the Chairman of the Connecticut State Employees Retirement Commission, c/o Amanda Alfonso, Executive Assistant, Office of the State Comptroller, Retirement Division, 55 Elm Street, Hartford, CT 06106, email Amanda.Alfonso@ct.gov.

Connecticut State Employees Retirement Commission by

Peter Adomeit, Chair and Neutral Trustee

EASTBROOK HEIGHTS CONDOMINIUM ASSOCIATION, INC
EASTBROOK HEIGHTS ROAD
MANSFIELD CENTER, CT 06250

May 12, 2016

Ms. Linda Painter, Director of Planning and Development
Audrey P. Beck Municipal Building
4 S. Eagleville Rd
Mansfield Center, CT 06268

RE: Special Permit Application, Meadowbrook Gardens, 91 & 93 Meadowbrook Lane, PZC File #1284-3

Dear Ms. Painter:

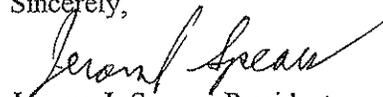
I would like to take a moment to thank you for your help with the Meadowbrook Gardens application. As you know, from the very onset our association believed that a fence between our two properties was a necessary component in order to limit access to our property and facilities by Meadowbrook Gardens' residents.

I appreciate that you shared our concerns with the developer and encouraged them to seriously consider building a fence along our shared property line. Now that they have committed to building this fence we are much more comfortable having Meadow Gardens as a neighbor than we would otherwise have been.

In closing I want to also thank you for the time you personally spent explaining to me the different aspects of the Special Permit review and approval process and in helping me understand the various criteria the PZC would rely on when reviewing this application. I found you easy to work with, forthcoming when responding to my many questions, highly professional and, of course, possessing a wealth of knowledge about planning and zoning matters.

As a long time resident of Mansfield and a former town employee, I feel fortunate to have you as member of our professional community.

Sincerely,



Jerome J. Spears, President
Executive Board, Eastbrook Heights Condominium Association, Inc.

Cc: Matthew Hart, Town Manager ✓
Audrey P. Beck Municipal
4 S. Eagleville Rd
Mansfield, CT 06268

PAGE
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Government Finance Officers Association
203 N. LaSalle Street - Suite 2700
Chicago, IL 60601

Phone (312) 977-9700 Fax (312) 977-4806

Item # 11

June 3, 2016

Matthew W. Hart
Town Manager
Town of Mansfield
4 So. Eagleville Road
Storrs Mansfield CT 06268-2574

Dear Mr. Hart:

We are pleased to notify you that your comprehensive annual financial report for the fiscal year ended **June 30, 2015** qualifies for a Certificate of Achievement for Excellence in Financial Reporting. The Certificate of Achievement is the highest form of recognition in governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government and its management

An award for the Certificate of Achievement has been mailed to:

Cheryl A. Trahan
Director of Finance

We hope that you will arrange for a formal presentation of the Certificate and Award of Financial Reporting Achievement, and that appropriate publicity will be given to this notable achievement. A sample news release is enclosed to assist with this effort. In addition, details of recent recipients of the Certificate of Achievement and other information about Certificate Program results are available in the "Awards Program" area of our website, www.gfoa.org.

We hope that your example will encourage other government officials in their efforts to achieve and maintain an appropriate standard of excellence in financial reporting.

Sincerely,
Government Finance Officers Association

Stephen J. Gauthier, Director

Technical Services Center

SJG/ds



Government Finance Officers Association
203 N. LaSalle Street - Suite 2700
Chicago, IL 60601

Phone (312) 977-9700 Fax (312) 977-4806

06/03/2016

NEWS RELEASE

For Information contact:
Stephen Gauthier (312) 977-9700

(Chicago)--The Certificate of Achievement for Excellence in Financial Reporting has been awarded to **Town of Mansfield** by the Government Finance Officers Association of the United States and Canada (GFOA) for its comprehensive annual financial report (CAFR). The Certificate of Achievement is the highest form of recognition in the area of governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government and its management.

An Award of Financial Reporting Achievement has been awarded to the individual(s), department or agency designated by the government as primarily responsible for preparing the award-winning CAFR. This has been presented to:

Cheryl A. Trahan, Director of Finance

The CAFR has been judged by an impartial panel to meet the high standards of the program including demonstrating a constructive "spirit of full disclosure" to clearly communicate its financial story and motivate potential users and user groups to read the CAFR.

The GFOA is a nonprofit professional association serving approximately 17,500 government finance professionals with offices in Chicago, IL, and Washington, D.C.