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State Implementation Plan Revision

Tacoma-Pierce County Nonattainment Area

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For more information contact:

Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Phone: (360) 407-6800

Washington State Department of Ecology - www.ecy.wa.gov

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State Implementation Plan Revision

Tacoma-Pierce County Nonattainment Area

by

Washington State Department of Ecology
Air Quality Program
Olympia, Washington

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List of Abbreviations and Other Terms

µg/m^3: Micrograms per cubic meter

98th percentile: The calculation for the 24-hour standard design value uses the 98th percentile from the daily measurements. A percentile is a measure used to rank information. For air pollution, the 98th percentile measurement is the measurement for the day that has pollution levels higher than 98% of the other days in the year. To determine the 98th percentile for a full year of sampling where 365 measurements are taken, we ignore the highest 2% of measurements – which means the highest 7 measurements are ignored (2% of 365 is 7). The 8th highest daily measurement is the 98th percentile.

CAPC: Clean Air Performance Commitment. An agreement signed by Ecology, EPA, PSCAA, and the Puyallup Tribe to use an innovative approach to achieving air quality goals in the nonattainment area.

CDD: Clean Data Determination. A CDD means the Nonattainment Area met the standard for fine particle pollution during the most recent three-year period (2009-2011)

Design Value: A calculation done on the monitoring data from a FRM monitor. EPA uses the design value to determine an area's compliance with federal health based air quality standards known as NAAQS.

Ecology: Washington State Department of Ecology

Emissions Inventory: Calculation of the amount of pollutants released into the air during a specific time span

EPA: United State Environmental Protection Agency

FRM: Federal Reference Method

Interagency State Implementation Plan Environmental Justice Work Group: An interagency work group organized by Ecology to integrate additional environmental justice concerns into the planning work related to the Nonattainment Area.

LEP: Limited English Proficient

NAAQS: National Ambient Air Quality Standard

Nonattainment Area: The Tacoma-Pierce County Nonattainment Area. A nonattainment area is an area that does not meet one or more of the federal health based air quality standards known as the NAAQS.

NO_X: Nitrogen oxide

$PM_{2.5}$: Another term for fine particles. Particles that are less than 2.5 micrograms in diameter

Priority Communities: Communities identified by the Interagency State Implementation Plan Environmental Justice Work Group as potentially having disproportionate effects from fine particle pollution or the strategies to reduce fine particle pollution

PSCAA: Puget Sound Clean Air Agency

RCW: Revised Code of Washington

SIP: State Implementation Plan

SIP revision for the Tacoma-Pierce County Nonattainment Area: Washington's plan to improve air quality in the Tacoma-Pierce County Nonattainment Area

SO_2: Sulfur dioxide

Tacoma-Pierce County Nonattainment Area: Most of the greater Tacoma area and the surrounding communities within Pierce County's urban growth area west of State Route 167. EPA designated this area nonattainment for the 2006 24-hour fine particle national ambient air quality standard in 2009

Tacoma–South L Street: The monitoring site in the Nonattainment Area with a monitor that uses the FRM. EPA uses data from the FRM monitor at Tacoma – South L Street to determine compliance with the federal health based fine particle standards

Task Force: The Tacoma-Pierce County Clean Air Task Force

UGA: Urban growth area

WAC: Washington Administrative Code

Wapato Hills-Puyallup River Valley Nonattainment Area: Tacoma-Pierce County Nonattainment Area. Ecology used this name when proposing the boundary for the Nonattainment Area in 2008

VOC: Volatile Organic Compounds

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- Sarah Clouse, Environmental Specialist
- Tami Dahlgren, Public Education & Technical Assistance Unit Manager
- Ranil Dhammapala, Natural Resource Scientist
- Miriam Duerr, Public Involvement Coordinator
- Tina Ebio, Administrative Assistant
- Jeff Johnston, Science and Engineering Section Manager
- Julie Oliver, Program Development Section Manager
- Sally Otterson, Environmental Specialist
- Melanie Pearson, Administrative Assistant
- Richelle Perez, Environmental Planner
- Millie Piazza, Environmental Specialist
- Nancy Pritchett, Rules and Planning Unit Manager
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- Margo Thompson, Environmental Planner

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Executive Summary

Introduction

In 2009, the United States Environmental Protection Agency (EPA) designated part of Pierce County as a nonattainment area. This designation is due to unhealthy levels of fine particle pollution from 2006-2008 (74 FR 58688, Nov. 13, 2009). The Tacoma-Pierce County Nonattainment Area (Nonattainment Area) (also known as the Wapato Hills-Puyallup River Valley Nonattainment Area) covers most of the greater Tacoma area and the surrounding communities within Pierce County's urban growth area (UGA) west of State Route 167.

This State Implementation Plan (SIP) revision details Washington's plan to improve air quality in the Nonattainment Area. The revision includes:

- A description of how the area will meet federal planning requirements for a nonattainment area.
- Local rules to help improve air quality.
- Information on activities and projects carried out as part of the planning process for the SIP revision.

Why fine particle pollution is a problem

The tiny size of fine particle pollution (i.e., dust, soot, smoke) allows us to inhale it easily. The tiny particles travel deep into our lung and circulatory system. As a result, fine particles have both short- and long-term health effects including respiratory disease, decreased heart and lung function, asthma attacks, heart attacks, strokes, and premature death. Fine particle pollution affects everyone, but has the most harmful effect on children, older adults, and people with respiratory and cardiac diseases.

Fine particle pollution in the Nonattainment Area is worse during the winter months when low temperatures and still winds trap fine particles close to the ground. This causes air pollution to build up rapidly.

Tracking fine particle pollution

The Washington State Department of Ecology (Ecology) and the Puget Sound Clean Air Agency (PSCAA) use data from three monitoring sites in the nonattainment area to track the levels and sources of fine particles. An emissions inventory, a calculation of the amount of pollutants released into the air during a specific time period, provided additional support about what the pollution is and where it comes from.

Air quality in the Nonattainment Area

Federal air quality standards

EPA has set two National Ambient Air Quality Standards (NAAQS) for fine particle pollution. These standards are:

- 24-hour standard–focuses on short-term health effects
- Annual standard–focuses on long-term health effects

Clean Data Determination

When EPA designated the Nonattainment Area, the area did not meet the 2006 24-hour standard for fine particles. Recent monitoring data (2009–2011) shows that the Tacoma-Pierce County Area now meets the 2006 24-hour standard for fine particles. Based on that data, Ecology requested a CDD. On September 4, 2012, EPA acted on Ecology's request with a final CDD for the Tacoma-Pierce County Nonattainment Area (77 FR 53772).

A CDD remains in effect only as long as the area continues to meet the standard. The reduction strategies for fine particle pollution, outreach and community involvement, and environmental justice efforts described in this SIP revision will be critical for continuing to meet the standard in the future.

What is in the SIP revision

CDD requirements

This SIP revision contains planning requirements that are still required under a CDD. In the future, Ecology will make separate submissions to EPA for:

- Nonattainment permitting requirements.
- Air quality criteria for transportation conformity.
- A maintenance plan and redesignation request.

Clean Air Performance Commitment

In April 2010, Ecology signed an agreement with EPA, PSCAA, and the Puyallup tribe to use an innovative approach to achieving air quality goals in the nonattainment area. This agreement, referred to as the Clean Air Performance Commitment (CAPC), should:

- Achieve the same or greater environmental improvements more quickly than the traditional process.
- Create a more flexible/adaptable process for implementing controls, while incorporating measures to ensure accountability.
- Implement targeted local control measures that complement national measures.
- Provide early and meaningful opportunities for public involvement.

- Focus on environmental justice concerns in the nonattainment area.

Public involvement

This SIP revision includes a description of public involvement activities and the efforts to identify environmental justice concerns in the Nonattainment Area.

Tacoma-Pierce County Clean Air Task Force

PSCAA established the Tacoma-Pierce County Clean Air Task Force (Task Force) to involve the public in developing community-based solutions to reduce fine particle pollution in the nonattainment area. The Task Force recommended:

- Increased enforcement during burn bans.
- Requiring removal of uncertified wood stoves and inserts.
- Work to reduce other sources of fine particle pollution.

Interagency work group

Ecology organized an interagency work group to integrate additional environmental justice concerns into the planning work for the Nonattainment Area. The work group developed the following goals:

- Reduce health risks from fine particle pollution in priority communities (communities identified as potentially having disproportionate effects from fine particle pollution or the strategies to reduce fine particle pollution)
- Consider social and environmental effects on priority communities when determining how to reduce fine particle air pollution
- Build meaningful public participation in the SIP development and decision making processes. Design a communication strategy that informs and engages priority communities
- Direct resources and incentives to priority communities
- Track progress and lessons learned in the Tacoma-Pierce County Nonattainment Area for future planning work throughout Washington

Public comment period

Ecology accepted public comments on the proposed SIP revision during a public comment period from September 10 to October 19, 2012, and at a public hearing on October 17, 2012. Ecology reviewed, responded to, and incorporated comments before finalizing the SIP revision (See Appendix G). After submitting the final SIP revision to EPA, Ecology will begin developing the maintenance plan and redesignation request.

Ecology welcomed all comments on the proposed SIP revision. However, we were particularly interested in comments on:

- 2008 Emissions Inventory for the Nonattainment Area.
- Ecology's decision to include the entire PSCAA Regulation 1-13 Solid Fuel Burning Devices in the State Implementation Plan.[1]
- Environmental justice elements of this SIP revision.

[1] Ecology responded to comments about including the PSCAA's proposed rule in the SIP revision. We did NOT respond to comments on the content of the PSCAA proposed rule. The PSCAA comment period for their rule ended September 26, 2012. PSCAA adopted the rule without significant change on October 25, 2012. So, Ecology included the final Regulation 1-13 in the final SIP revision sent to EPA.

Area Description

The Tacoma-Pierce County Nonattainment Area (Nonattainment Area) lies approximately 20 miles south of Seattle, Washington. It covers most of the greater Tacoma area and the surrounding communities within Pierce County's UGA west of SR 167. Figure 1 shows an outline of the Nonattainment Area and the approximate location of the monitoring sites in the area.

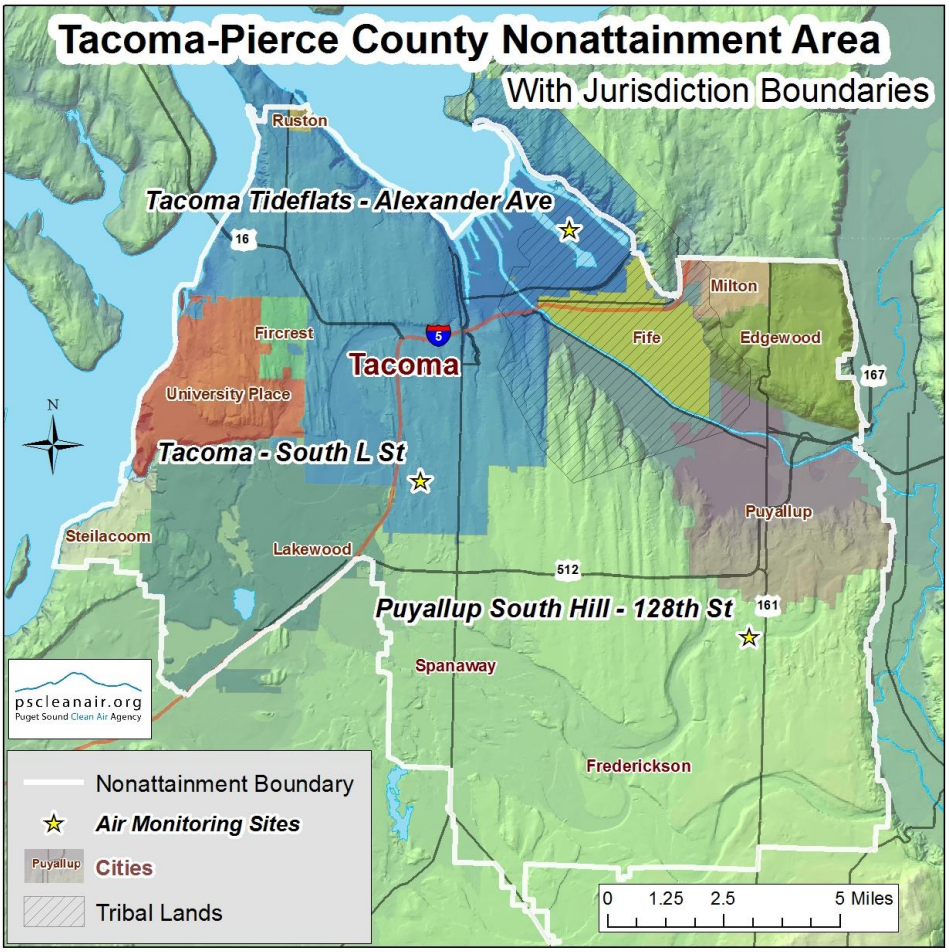

Figure 1: Map of Tacoma-Pierce County Nonattainment Area.

The topography surrounding the Nonattainment Area influences its meteorology. Important topographical features include:

- Puget Sound to the north and west
- Cascade Mountains to the east and southeast
- Puyallup River Valley running through the area

Meteorology

In the Nonattainment Area, summers are cool and comparatively dry while winters are mild, wet, and cloudy. In November and December, the wettest months, precipitation is frequently recorded on over 20 days each month. Usual wind flow is from west-southwest. However, high levels of fine particle pollution are associated with very light east-southeast surface winds, as well as calm conditions.

Elevated fine particle levels (greater than 20 micrograms per cubic meter ($\mu g/m^3$)) typically occur between October and March when temperatures are low (less than 50 degree Fahrenheit) and winds are light (less than 1.5 miles per hour). Figure 2 shows that the highest levels of fine particle pollution occur during the winter months, October–February 2000–2010.[2]

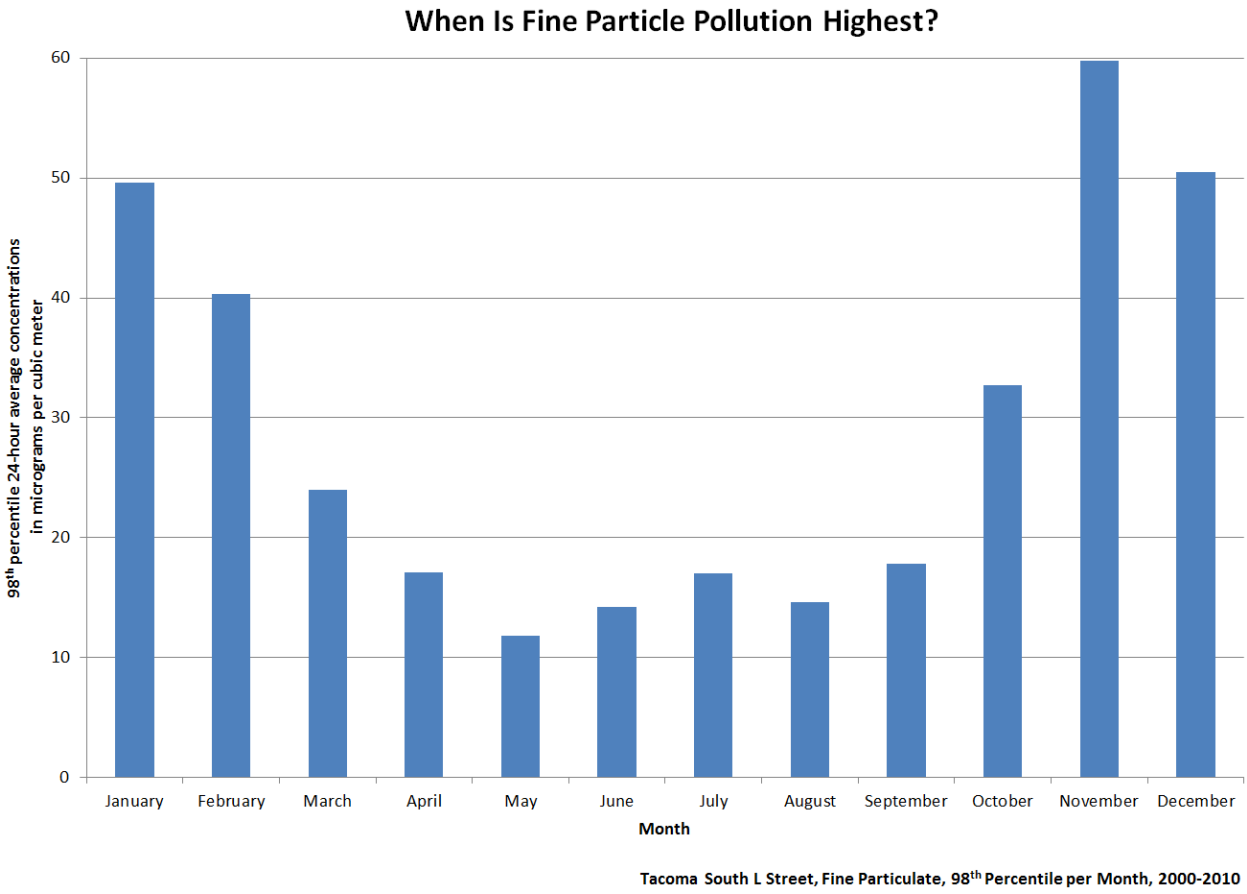

Figure 2: 98th Percentile 24-hour Fine Particle Pollution Levels by Month, Tacoma–South L Street Monitor from 2000–2010

[2] Figure 2 shows the 98th percentile concentration for each month using 10 years of data. The figure illustrates when fine particle levels are highest. This is not the form of the federal air quality standard, but is used here for demonstration purposes only. The Monitoring Section, p. 4, of this document describes the method for calculating the design value.

On days with high levels of fine particle pollution, levels rose rapidly beginning about 3 to 4 pm and peak between 12 midnight and 1 a.m. A smaller increase is often observed between 6 a.m. and 8 a.m. Outside of the home heating season (non-winter months of April–September), there is little variation of the fine particle concentration throughout the day with the exception of July days with firework celebrations. Figure 3 shows the winter day pattern of fine particle levels.

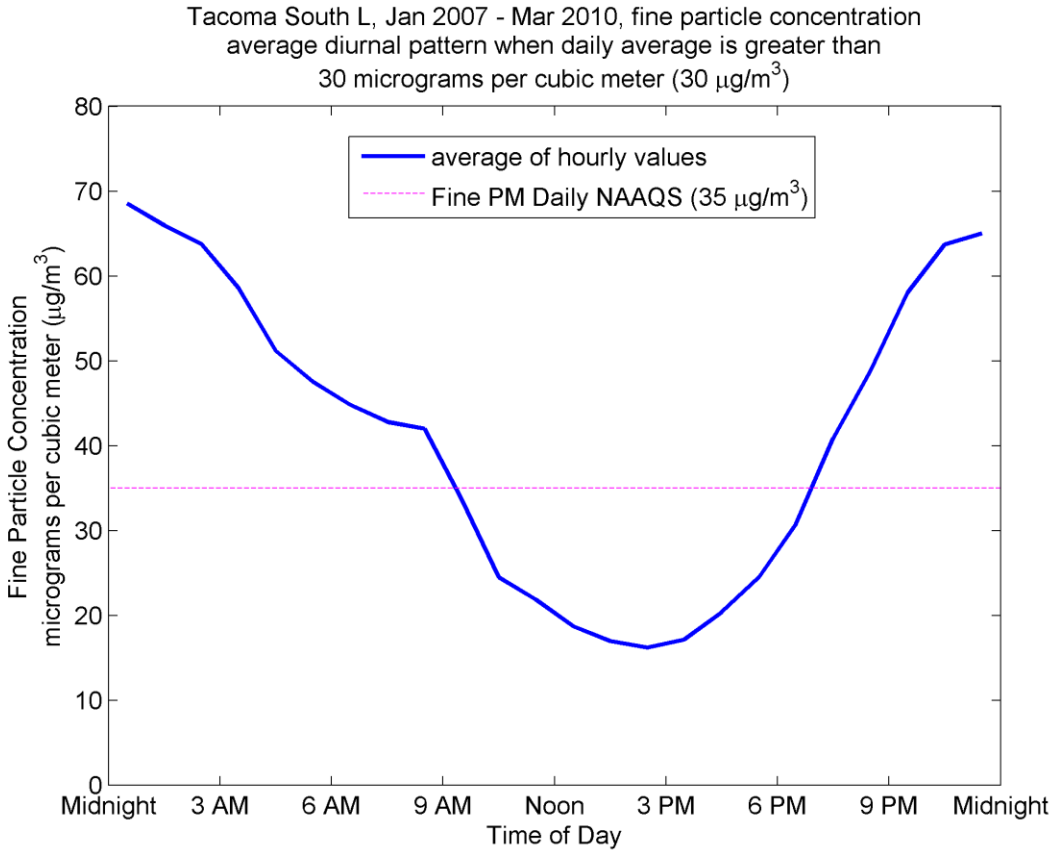

Figure 3: Winter 24-hour Pattern of Fine Particle Levels, Tacoma–South L Street

Monitoring

PSCAA currently operates three monitoring sites in the Nonattainment Area at the following locations:

- Tacoma–South L Street
- Puyallup–128th Street
- Tacoma Tideflats–Alexander Avenue

Figure 1, in the Area Description section, shows a map of the monitoring locations.

EPA uses the data from the Tacoma–South L Street monitor to determine compliance with federal health-based fine particle standards. Tacoma–South L Street is the only site of the three with a monitor that uses the Federal Reference Method (FRM). The FRM specifies the various federal requirements a compliance monitor and its site must meet before EPA can compare its data to the fine particle standard. The other two sites provide additional information that help PSCAA characterize fine particle levels throughout the Nonattainment Area. PSCAA uses information from all three sites to determine when levels of fine particle pollution are elevated. They then determine whether actions, such as calling a burn ban, are necessary to reduce levels.

The FRM monitor at Tacoma – South L Street site is at an elevation of 341 feet above sea level. It collects information about fine particle levels in 24 hour increments. EPA uses this 24-hour data to calculate "design values". Before January 2010, the monitor collected a sample once every three days, the minimum required by the FRM. Currently, the monitor collects a sample every day of the year. The design value calculated from the information is compared to either the annual or the 24-hour federal standard.

Calculating the design value

For the daily standard, EPA uses the yearly 98th percentile from three years in a row to calculate an average. This average is called the design value. EPA compares the design value to the 24-hour NAAQS for fine particles, which is 35 $\mu g/m^3$. If the design value is above 35 $\mu g/m^3$, the area does not meet the standard. When calculating the average, EPA rounds the final number before comparing it to the standard (35.4 = 35, 35.6 = 36). For the annual standard, EPA calculates the design value for the annual standard by averaging all available FRM data from three years in a row.

The calculation for the 24-hour standard design value uses the 98th percentile from the daily measurements. A percentile is a measure used to rank information. For example, if we lined up 100 people from shortest to tallest, the person in the 98th percentile would be the person taller than 98 percent of the people (second tallest).

For air pollution, the 98th percentile measurement is the measurement for the day that has pollution levels higher than 98 percent of the other days in the year. To determine the 98th percentile for a full year of sampling where 365 measurements are taken, we ignore the highest

two percent of measurements—which means the highest seven measurements are ignored (two percent of 365 is seven). The eighth highest daily measurement is the 98th percentile.

Fine particle measurements throughout the Nonattainment Area suggest the highest levels of fine particle pollution occur in the core of the Nonattainment Area, within about three kilometers of the Tacoma–South L Street monitor. While not as high as the Tacoma–South L Street monitor, monitors at other sites in the Nonattainment Area show elevated levels of fine particles.[3]

EPA designated the Tacoma-Pierce County Area as nonattainment because the 24-hour design value from 2006–2008 was 44 µg/m^3. This is higher than the 2006 24-hour fine particle standard of 35 µg/m^3. Figure 4 shows the 98th percentile values used to calculate the 24-hour design value. The 24-hour design value is rounded to a whole number (44.0666 = 44).

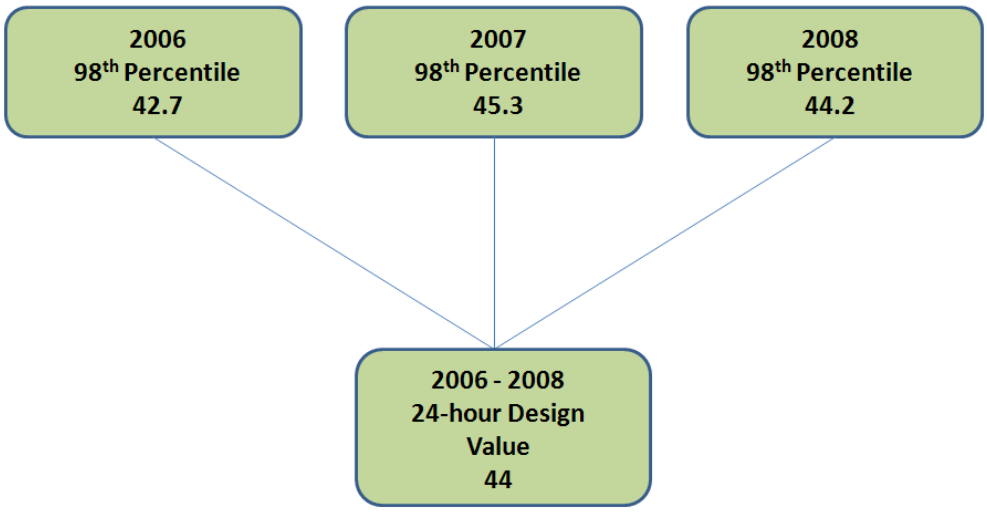

Figure 4: Calculation of the 2006–2008 24-hour Design Value for Tacoma–South L Street

[3] Please find additional information in *Tacoma-Pierce County Clean Air Task Force–Report and Recommendations to Puget Sound Clean Air Agency and Summary Technical Report in Support of $PM_{2.5}$ CAPC process for Tacoma*. Links are included in the "Additional Resources" section at the end of this document.

Clean Data

Monitoring data from 2009–2011 shows the Tacoma-Pierce County Area met the 2006 24-hour federal standard for fine particles. Based on that data, Ecology requested a CDD. A CDD means the Nonattainment Area met the standard for fine particle pollution during the most recent three-year period (2009–2011). On September 4, 2012, EPA acted on Ecology's request with a final CDD for the Tacoma-Pierce County Nonattainment Area (77 FR 53772).

As shown below in Table 1, fine particle levels were very low in 2010 largely because of unusually favorable meteorological conditions. Since the CDD remains in effect only as long as the area continues to meet the standard, the reduction strategies for fine particle pollution, outreach and community involvement, and environmental justice efforts described in the subsequent chapters will be critical for continuing to meet the standard in the future. Lastly, the SIP strengthening rules contained in Appendix B will be a key foundation for any future maintenance plan or redesignation request as described below.

Table 1 shows the monitoring data from 2007–2011. It includes 98th percentile and design values. The design value for 2009–2011 meets the 2006 24-hour standard for fine particles of 35 $\mu g/m^3$.

Table 1: Tacoma-South L Street 98th Percentiles and 24-hour Design Values for 2007–2011

		Design Value		
Year	**98th Percentile**	**2007-2009**	**2008-2010**	**2009-2011**
2007	45.3	46		
2008	44.2		38	
2009	47.6			35
2010	21.4			
2011	35.7			

The focus of this SIP revision is on planning requirements that are still required under a CDD. Ecology will make separate submissions to EPA for the nonattainment permitting requirements and air quality criteria for transportation conformity.

Emissions Inventory

An emissions inventory calculates the amount of pollutants released into the air. It looks at a specific geographic area over a specific time span. The inventory also calculates how much of each pollutant comes from each type of pollution causing activity. We refer to each type of activity as a source category.

For the Nonattainment Area, the federal Clean Air Act requires Ecology to prepare a comprehensive, accurate, current inventory of actual emissions for fine particles ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NO_X), volatile organic compounds (VOCs), and ammonia. Appendix A contains the entire 2008 emissions inventory for the Tacoma-Pierce County Nonattainment Area and a description of the methodology Ecology used for the calculations.

The 2008 Nonattainment Area inventory estimates fine particle levels for the whole year and also for a single winter day. We used data from 2008 because it is the latest year of the National Emissions Inventory.[4] The 24-hour standard focuses on emissions on a single day. Additionally, elevated concentrations of fine particles have typically occurred between October and March. Therefore, we developed a winter day inventory as well.

Figure 5 shows the percentage of fine particles from each source category in the winter day inventory. Seventy-four percent of emissions in the Nonattainment Area come from residential wood combustion (wood smoke) emitted from wood stoves and fireplaces.

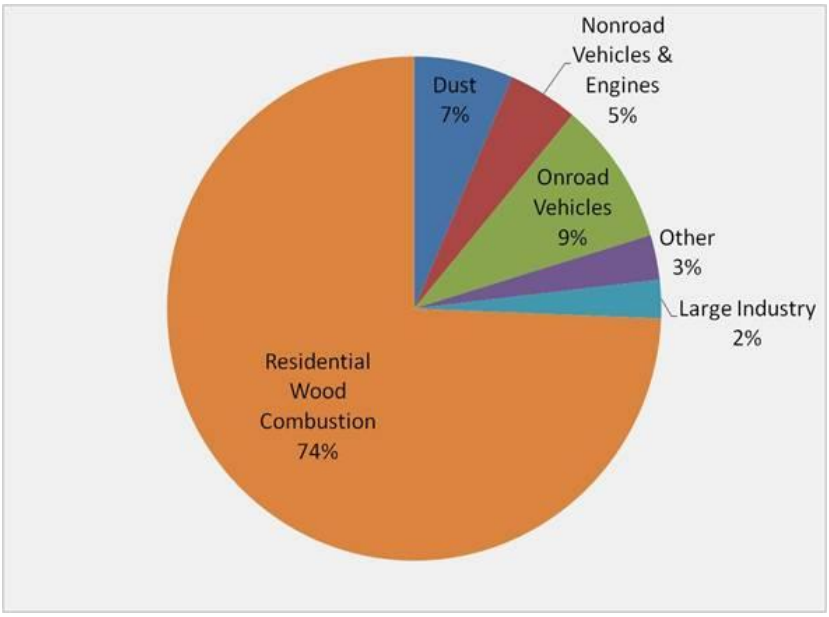

Figure 5: Tacoma-Pierce County Nonattainment Area Winter Day Fine Particle Emissions by Source Category, 2008

[4] <http://www.epa.gov/ttnchie1/net/2008inventory.html>

Table 2 shows the Nonattainment Area emissions in pounds by source category.

Table 2: Tacoma-Pierce County Nonattainment Area 2008 Fine Particle Emissions (Pounds)		
Source Category	**Yearly Emissions**	**Winter Day Emissions**
Residential wood combustion	2,398,078	24,492
Onroad vehicles	822,879	3,041
Dust	971,337	2,135
Nonroad vehicles & engines	594,863	1,503
Other	297,770	949
Large industry	296,358	812

Outreach and Community Involvement

The CAPC included an agreement to conduct education and outreach efforts to engage communities in the Nonattainment Area in planning and emission reduction efforts. As the lead agency, PSCAA sought extensive public input about strategies to reduce fine particle pollution in the Nonattainment Area. They gathered input in two main ways:

- Representative community participation in the Tacoma-Pierce County Clean Air Task Force
- Response from outreach to the public

Tacoma-Pierce County Clean Air Task Force

The CAPC included an agreement to organize a comprehensive stakeholder process. As the lead agency for this task, PSCAA established the Tacoma- Pierce County Clean Air Task Force (Task Force). The Task Force helped ensure that strategies to reduce fine particle pollution in the Nonattainment Area included community-designed solutions and reflected community values. They met 11 times from May to December 2011 to identify, evaluate, and recommend pollution-reducing strategies. Task Force membership represented the Tacoma and Pierce County communities. Task Force members participated on behalf of:

- Health care organizations.
- Utilities.
- Economic interests.
- Neighborhood councils and community groups.
- Joint Base Lewis McChord.
- Wood-burning and non-wood-burning residents.
- State and local agencies.

The input provided by the Task Force ensures that the pollution-reducing strategies will have support and durability from a range of stakeholders within the community. In addition, PSCAA will continue to use the Task Force as a sounding board for strategy implementation.

Public outreach

PSCAA began outreach in July 2010 to raise general awareness about the nonattainment problem and gather public input on draft strategies for pollution reduction. PSCAA did the following:

- Direct mailing–sent postcards to all 222,000 households in the Nonattainment Area.
- Targeted mailing–sent letters to 3,000 prior applicants and participants in previous wood stove replacement programs.

- Open houses–held two public meetings in the Nonattainment Area: Tacoma (October 20, 2011) and Puyallup (October 24, 2011). Attendance totaled more than 200 people.
- Online and print advertising–placed ads in major print media outlets within the Nonattainment Area, including one Spanish-language publication, a publication on Joint Base Lewis-McChord, and on *The News Tribune* website.
- Online comment–invited public input via an online survey tool, generating more than 400 responses. The public submitted approximately 60 additional comments by phone and U.S. mail.
- Outreach to community groups–gave presentations to more than 30 community and neighborhood groups, as well as elected officials. Newsletter articles were placed in community publications.
- Social media–posted information on the PSCAA monthly electronic newsletter, Facebook, and Twitter to reach out to approximately 9,000 total subscribers and friends.

PSCAA has ongoing public outreach activities. These include a major public awareness and social marketing campaign planned for fall 2012 and beyond. The campaign will promote participation in the wood stove removal and replacement programs and raise awareness about increased enforcement during burn bans.

Strategies to Reduce Fine Particle Pollution

The Task Force began to identify possible solutions to reduce fine particle pollution in the area after gaining an understanding of air quality issues and federal requirements. The Task Force considered more than 60 strategies related to all three major categories of sources: residential wood combustion, cars and trucks, and industrial sources. The Task Force concluded that the Nonattainment Area should implement a range of strategies for non-wood smoke sources. This includes supporting, continuing, and expanding when possible, programs that reduce particle pollution from gasoline vehicles, diesel vehicles, industrial sources, and ships. The Task Force report included in Appendix E has additional details about these programs.

The Task Force also agreed that the focus for reductions should be residential wood combustion. They considered fireplaces, freestanding wood stoves, and fireplace inserts. The Task Force reached consensus on two main strategies:

- **Increased enforcement during burn bans -** This includes significantly increasing the number of inspectors in the field during a burn ban and, if possible, enforcing the burn bans at dusk and night
- **Required removal of uncertified wood stoves and inserts -** This includes setting a date by which all households must remove uncertified devices and providing financial assistance to low income households

Regarding fireplaces, the Task Force recommended that PSCAA require cleaner technologies on fireplaces as a contingency measure. Contingency measures are a required component of an attainment plan or maintenance plan. They would not become effective unless the Nonattainment Area does not meet air quality goals outlined in those plans. The technologies include catalysts, starters, or filters (although we are not aware of a successful demonstration of filters as effective).

Appendix E contains PSCAA's board endorsement of the Task Force recommendations with a few modifications. The appendix also includes the full Task Force report as an attachment. The Additional Resources section at the end of this document contains links to additional technical information that supports a focus on reducing emissions from residential wood combustion.

In 2012, the Washington legislature considered and passed a bill that was developed based on the Task Force's recommendations. Substitute House Bill 2326 Chapter 219, Laws of 2012[5] authorized the following as potential strategies for reducing fine particle pollution in the Nonattainment Area:

- Call stage-one burn bans sooner and at lower levels of particle pollution. A stage-one burn ban restricts all types of outdoor fires and the use of fireplaces and uncertified woodstoves, unless they are the only adequate source of heat

[5] See <http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/2326-S.SL.pdf>.

- Prohibit the use of uncertified wood stoves in the Nonattainment Area including requiring disclosure, removal, or decommissioning of uncertified stoves after January 1, 2015
- Prohibit the use of fireplaces (as a contingency measure only)
- Provide city, county, and jurisdictional health departments the option to assist with enforcement activities

PSCAA's rules are needed to implement the two main strategies. PSCAA's rules do the following:

- Clarifies the definition of "adequate source of heat" to ensure only those who qualify obtain a PSCAA approved exemption
- Sets the date by which all households in the Nonattainment Area must remove uncertified wood stoves and inserts: September 30, 2015

Ecology submitted PSCAA's regulation 1-13–Solid Fuel Burning Device Standards for inclusion in Washington's SIP. The inclusion of PSCAA's rule strengthens Washington's SIP. Since PSCAA was revising its rule while we had the proposed SIP revision available for public comment, we included proposed language in Appendix B of the public review draft. For additional information on PSCAA's rulemaking process, please see <www.pscleanair.org>. PSCAA adopted the rule without significant change on October 25, 2012. Ecology included the final Regulation 1-13 in its final SIP revision and submittal.

Environmental Justice

EPA defines Environmental Justice as *the fair treatment and meaningful involvement of all people . . . with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.*[6]

The CAPC included an agreement to focus on environmental justice concerns in the Nonattainment Area. Additionally, in response to the ongoing environmental injustice challenges nationally, EPA recently released Plan EJ 2014. Plan EJ 2014 guides EPA's integration of environmental justice into its programs and policies including rulemaking, permitting, compliance, and enforcement. In May 2011, Ecology began looking at more ways to integrate environmental justice into the planning work related to the Nonattainment Area.

To complement the Tacoma-Pierce County Clean Air Task Force's efforts, Ecology organized an interagency work group to integrate additional environmental justice concerns. The work group developed the following goals:

- Reduce health risks from fine particle pollution in priority communities. Priority communities are those the interagency work group identified as potentially having disproportionate effects from fine particle pollution or the strategies to reduce fine particle pollution
- Consider social and environmental effects on priority communities when determining how to reduce fine particle air pollution
- Build meaningful public participation in the SIP development and decision making processes. Design a communication strategy that informs and engages priority communities
- Direct resources and incentives to priority communities.
- Track our progress and lessons learned in the Nonattainment Area for future planning work throughout Washington

To provide additional guidance on how to fulfill the above priorities, the interagency work group developed Appendix C, *Best Practices for Environmental Justice in the Tacoma-Pierce County Nonattainment Area.* This document identifies priority communities, Ecology resources, partners and stakeholders, and other resources in the Nonattainment Area. It also includes an Action Plan, which lists possible options for addressing environmental justice concerns in the area.

Ecology developed the questionnaire in Appendix D to help Ecology and PSCAA track the actions taken in the Nonattainment Area to integrate environmental justice. Ecology will work collaboratively with PSCAA to complete the questionnaire. The questionnaire will:

- Track challenges faced in addressing environmental justice.
- Recommend actions the agencies would like to incorporate into their efforts, if given additional resources.

[6] EPA's Environmental Justice Website at <http://www.epa.gov/environmentaljustice/>.

Next Steps

This SIP revision does not remove the nonattainment designation from the Tacoma-Pierce County Nonattainment Area. The following steps must occur before EPA removes the nonattainment designation:

- Ecology will fulfill the planning requirements that are still required under a CDD
- Ecology will do this when they submit the finalized version of this SIP revision to EPA.
- Ecology will make separate submissions focusing on nonattainment permitting requirements and air quality criteria for transportation conformity
- EPA must approve Ecology's submissions
- Ecology will develop a maintenance plan that ensures the area will continue to meet the 2006 24-hour fine particle standard. Ecology will submit the maintenance plan and a letter requesting redesignation of the area to "attainment"
- EPA must approve of Ecology's maintenance plan and request for redesignation to remove the "nonattainment" designation. This would begin a 20-year planning cycle designed to make sure that the area remains below the federal standards

DEPARTMENT OF
ECOLOGY
State of Washington

APPENDIX A: TACOMA-PIERCE COUNTY NONATTAINMENT AREA EMISSION INVENTORY DOCUMENTATION

Prepared by

Washington State Department of Ecology
Air Quality Program
Olympia, Washington

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1 INTRODUCTION

As part of developing a state implementation plan (SIP) revision the Washington State Department of Ecology (Ecology) submitted an emission inventory (EI) preparation plan (IPP) and prepared an inventory of direct fine particles and its precursors (per 40 CFR 51 Section 1008(a)). Ecology prepared winter day and annual inventories for a 2008 base year. Periodic statewide 3-year cycle inventories based on actual emissions are also required. This requirement is met by the National Emissions Inventory (NEI).[1]

The responsibility of the EI was a joint effort by Ecology and Puget Sound Clean Air Agency (PSCAA). Ecology performed most of the calculations, ran the models, and wrote the documents while much of the Nonattainment Area-specific information (i.e., sources of pollutants, survey data, etc.) needed for that task was provided by PSCAA. Puget Sound Regional Council (PSRC) provided traffic and economic forecasting data.

This document is the documentation for the 2008 base year EI, per United States Environmental Protection Agency (EPA) inventory guidance.[2] The following sections describe the approach to the EI's and the basis for selecting that approach.

1.1 Temporal Resolution

Past exceedances of the 24-hour fine particle standard have occurred primarily during cold days in the months of October through March. Analysis of the fine particle Federal Reference Method (FRM) data showed 16 monitored exceedances of the 24-hr fine particle standard during 2007–2009. All the exceedances occurred during the winter months of November–February. The exceedances generally occurred on days when temperatures, particularly the daily low, were colder than average. Therefore, the design day that the inventory was based on is representative of a cold, winter-like day. Average November-February minimum and maximum temperatures during 2006-2010 were 35°F and 49°F, respectively.

Table 1 below shows:

- Exceedances that occurred at the Tacoma - South L Street monitor.
- The minimum and maximum temperatures recorded on each exceedance date.

Table 1: Tacoma – South L-Street Fine Particle Exceedances, 2006–2010

Date	FRM $PM_{2.5}$ µg/m3	Min. Temp (°F)	Max. Temp (°F)
12/16/2006	68	26	39
12/28/2006	42.7	27	40
12/31/2006	50.2	30	48
1/12/2007	44.7	12	30
1/15/2007	58.6	16	36
1/30/2007	38.2	24	48
2/2/2007	46.7	23	45
11/23/2007	45.3	22	50
1/24/2008	44.2	20	50
1/25/2008	49.7	18	49
12/5/2008	39.2	31	55
12/23/2008	49.2	27	35
1/19/2009	39.3	25	52
2/3/2009	36.8	25	64
12/3/2009	49.9	24	45
12/9/2009	47.6	11	36
12/12/2009	50.7	18	39
12/24/2009	43.3	27	47
12/27/2009	44.4	23	47

Several source categories use hourly or daily minimum and maximum temperatures in the emissions calculations. To meet this need, a daily temperature profile was developed based on monitored temperatures and fine particle concentrations.

Seventy-four (74) days were identified between Jan. 1, 2006, and December 31, 2010, on which the daily fine particle concentration exceeded 25 µg/m^3. Each hour's temperatures for the 74 days were pooled. The 25^{th}, 50^{th} (median), and 75^{th} percentile for each hour was calculated to produce three design day temperature profiles. Emissions were calculated for each profile to ensure they are representative of temperatures observed when concentrations exceed 25 µg/m^3. The three profiles were developed for air quality rollback modeling. In the end, modeling was not required for the SIP Revision. A single profile is used for the 2008 base year inventory, and it is the 50^{th} (median) percentile. References to all three profiles are retained in this document for informational purposes.

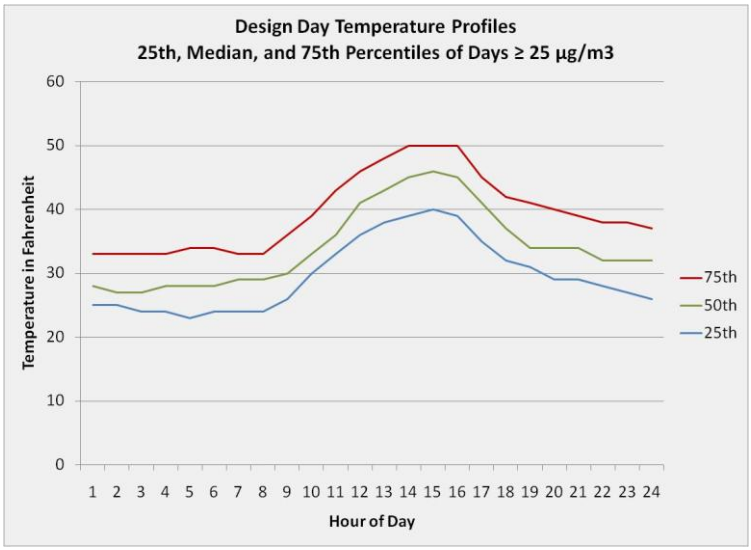

Figure 1: Design Day Temperature Profiles

Table 2: Design Day Temperature Profiles in Fahrenheit			
Hour	75th Percentile	50th Percentile	25th Percentile
0	33	28	25
1	33	27	25
2	33	27	24
3	33	28	24
4	34	28	23
5	34	28	24
6	33	29	24
7	33	29	24
8	36	30	26
9	39	33	30
10	43	36	33
11	46	41	36
12	48	43	38
13	50	45	39
14	50	46	40
15	50	45	39
16	45	41	35
17	42	37	32
18	41	34	31
19	40	34	29
20	39	34	29
21	38	32	28
22	38	32	27
23	37	32	26

2 EMISSIONS SUMMARIES

Annual emissions and winter weekday emissions for the 50th percentile temperature profile are presented here. Tables, charts, and maps are included. Tables show source types by major sector group. Sectors are abbreviated as PT – Point Sources, NP – Nonpoint Sources, NR – Nonroad Sources, OR – Onroad Sources. Nonattainment Area is abbreviated as NAA. Abbreviations for each source are shown in the table below.

Table 3: Abbreviations Used in Emissions Summaries

Sector	Source Type	Abbreviation
PT1	Point Sources – Major	MAJOR
PT2	Point Sources – Minor	MINOR
NP	Architectural Coatings	ARCH
NP	Commercial Cooking	COOK
NP	Consumer & Commercial Solvents	SOLV
NP	Dust – Construction	DUST
NP	Dust – Paved Roads	PAV
NP	Fertilizer Application	FERT
NP	Gas Stations and Gas Cans	GAS
NP	Livestock Waste	LIVE
NP	Residential Fuel, except Wood	FUEL
NP	Residential Fuel, Wood – Certified Stoves & Inserts	RWC-C
NP	Residential Fuel, Wood – Firelogs	RWC-LG
NP	Residential Fuel, Wood – Fireplaces	RWC-FP
NP	Residential Fuel, Wood – Pellet Stoves	RWC-PL
NP	Residential Fuel, Wood – Uncertified Stoves & Inserts	RWC-U
OR	Onroad	ONRD
NR	Locomotives	RR
NR	Marine – Harbor Craft	HARB
NR	Marine – Ocean-going Vessels	OCEAN
NR	Marine – Pleasure Craft	BOAT
NR	Nonroad – Commercial	COMM
NR	Nonroad – Construction	CNSTR
NR	Nonroad – Industrial	IND
NR	Nonroad – Lawn and Garden	LAWN
NR	Nonroad – Railroad Equipment	RAIL
NR	Port of Tacoma, non-Marine	PORT

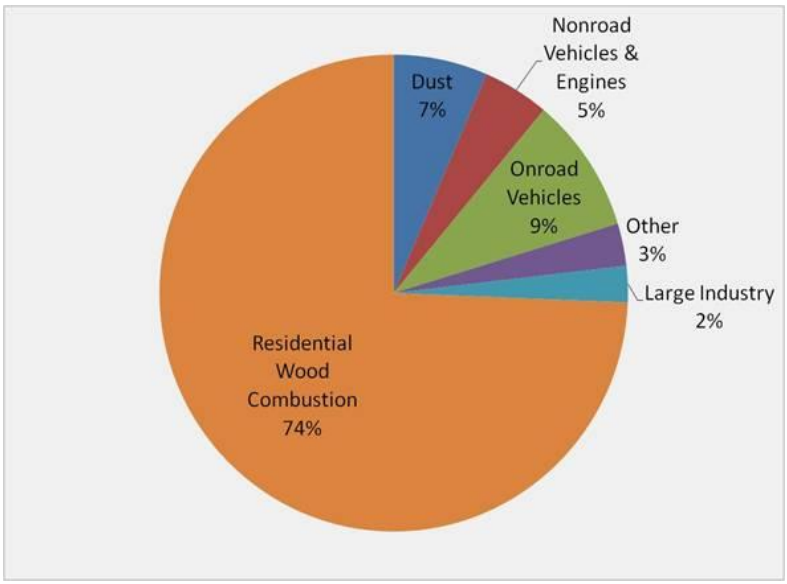

Figure 2: Fine particle Winter Day Emissions, 2008

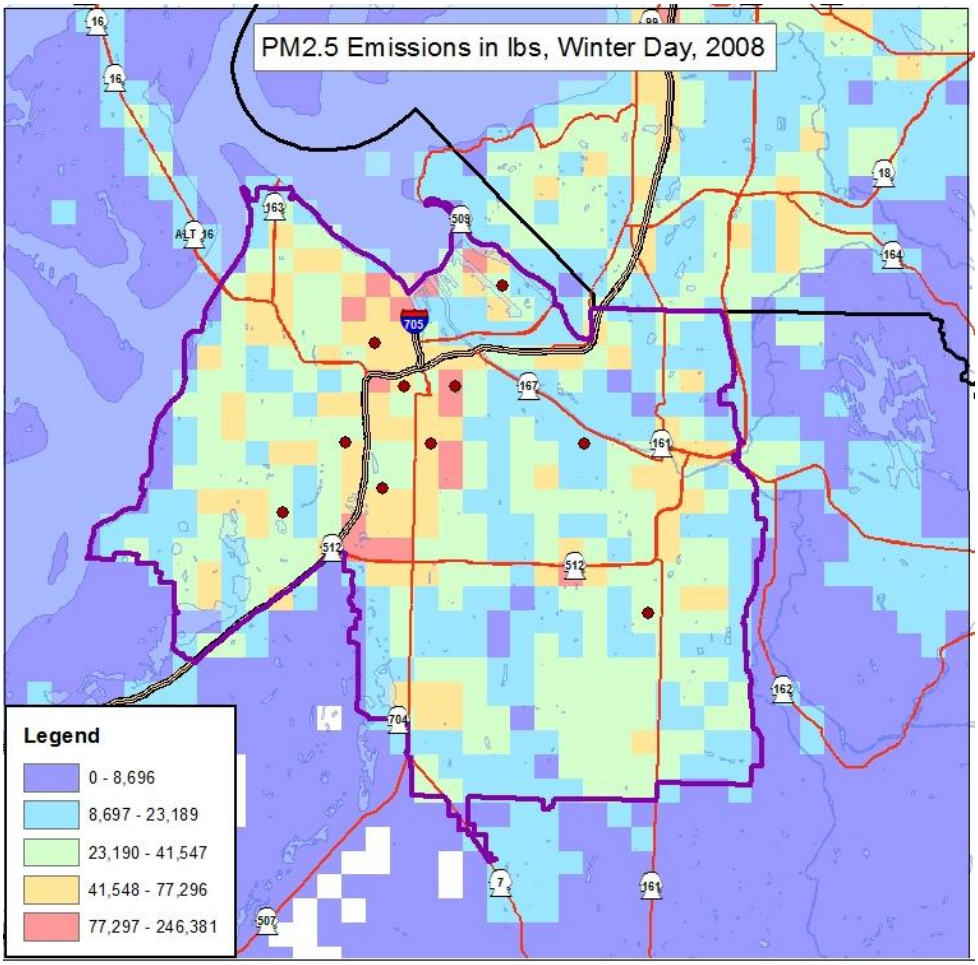

Figure 3: Fine Particle Winter Day Emissions in Pounds, 2008

Table 4: 2008 Fine Particle Emissions (Pounds)					
		Winter Weekday		Annual	
Sector	Source	NAA	Pierce County	NAA	Pierce County
PT1	MAJOR	812	812	296,358	296,358
PT2	MINOR	167	312	61,073	113,987
NP	RWC-FP	4,982	7,286	487,791	713,403
NP	RWC-U	12,630	14,596	1,236,646	1,429,087
NP	RWC-C	6,541	11,033	640,405	1,080,296
NP	RWC-PL	48	74	4,717	7,239
NP	RWC-LG	291	419	28,519	41,038
NP	FUEL	54	79	9,163	13,435
NP	COOK	727	1,190	227,533	372,428
NP	DUST	852	1,446	534,195	907,070
NP	PAV	1,284	1,835	437,143	624,896
OR	ONRD	3,041	4,071	822,879	1,176,306
NR	COMM	71	116	22,689	37,137
NR	CNSTR	787	1,185	301,734	454,555
NR	IND	52	84	21,868	35,794
NR	LAWN	169	254	91,090	137,225
NR	RAIL	1	2	201	513
NR	RR	55	113	20,020	41,277
NR	PORT	190	190	69,257	69,257
NR	OCEAN	171	268	62,305	97,642
NR	HARB	9	120	3,263	43,660
NR	BOAT	1	13	2,436	61,442
	TOTAL	32,933	45,500	5,381,285	7,754,046

Table 5: 2008 SO_2 Emissions (Pounds)					
		Winter Weekday		Annual	
Sector	Source	NAA	Pierce County	NAA	Pierce County
PT1	MAJOR	3,597	3,597	1,312,887	1,312,887
PT2	MINOR	0	44	25	16,173
NP	RWC-FP	84	123	8,268	12,092
NP	RWC-U	165	191	16,165	18,681
NP	RWC-C	132	223	12,937	21,824
NP	RWC-PL	5	8	493	757
NP	FUEL	796	1,167	134,649	197,426
OR	ONRD	422	560	154,184	220,406
NR	COMM	13	22	4,227	6,919
NR	CNSTR	216	325	82,719	124,615
NR	IND	16	26	6,684	10,941
NR	LAWN	5	8	5,253	7,913
NR	RAIL	0	0	31	79
NR	RR	140	292	51,092	106,635
NR	PORT	115	115	41,850	41,850
NR	OCEAN	3,061	4,814	1,117,148	1,757,009
NR	HARB	5	76	1,951	27,804
NR	BOAT	0	2	280	7,059
	TOTAL	8,772	11,591	2,950,844	3,891,069

Table 6: 2008 NO_X Emissions (Pounds)					
		Winter Weekday		Annual	
Sector	Source	NAA	Pierce County	NAA	Pierce County
PT1	MAJOR	4,995	4,995	1,823,163	1,823,163
PT2	MINOR	375	1,022	136,961	372,975
NP	RWC-FP	549	803	53,740	78,595
NP	RWC-U	1,156	1,336	113,157	130,766
NP	RWC-C	730	1,232	71,480	120,578
NP	RWC-PL	60	92	5,858	8,989
NP	RWC-LG	79	113	7,716	11,103
NP	FUEL	3,703	5,429	626,640	918,798
OR	ONRD	69,074	93,032	24,077,212	34,418,392
NR	COMM	975	1,596	297,098	486,291
NR	CNSTR	9,363	14,105	3,586,390	5,402,815
NR	IND	1,268	2,076	518,105	848,036
NR	LAWN	471	710	458,656	690,955
NR	RAIL	6	15	1,683	4,293
NR	RR	1,834	3,735	669,427	1,363,322
NR	PORT	4,428	4,428	1,616,157	1,616,157
NR	OCEAN	2,611	3,915	953,084	1,429,135
NR	HARB	397	5,183	144,824	1,891,834
NR	BOAT	6	153	26,026	656,454
	TOTAL	102,079	143,969	35,187,376	52,272,654

Table 7: 2008 VOC Emissions (Pounds)			
		Pierce County	
Sector	Source	Winter Weekday	Annual
PT1	MAJOR	1,998	729,389
PT2	MINOR	1,634	596,584
NP	RWC-FP	5,835	571,327
NP	RWC-U	25,280	2,475,217
NP	RWC-C	7,105	695,645
NP	RWC-PL	1	97
NP	RWC-LG	584	57,165
NP	FUEL	308	52,167
NP	COOK	182	56,817
NP	GAS	6,412	2,359,138
NP	ARCH	5,492	2,372,630
NP	SOLV	18,146	6,622,936
OR	ONRD	60,845	19,055,602
NR	COMM	1,794	583,223
NR	CNSTR	2,014	771,915
NR	IND	426	171,048
NR	LAWN	6,000	3,115,743
NR	RAIL	3	947
NR	RR	204	74,546
NR	PORT	280	102,280
NR	OCEAN	134	49,001
NR	HARB	*	*
NR	BOAT	1,316	3,728,310
	TOTAL	145,996	44,241,726
* Harbor craft county-level emissions are not readily available for VOC. May approximate as 13x Nonattainment Area values of 11 lb.			

Table 8: 2008 Ammonia Emissions (Pounds)			
		Pierce County	
Sector	Source	Winter Weekday	Annual
PT1	MAJOR	197	72,000
PT2	MINOR	0	28
NP	RWC-FP	556	54,412
NP	RWC-U	811	79,394
NP	RWC-C	502	49,104
NP	RWC-PL	7	710
NP	FUEL	1,080	182,730
NP	FERT	60	121,320
NP	LIVE	3,937	2,031,355
OR	ONRD	1,432	614,596
	TOTAL	8,582	3,205,649

3 INVENTORY DEVELOPMENT

3.1 General Information

Ecology developed inventories of emissions for base year 2008. The inventory made annual and typical fine particle ($PM_{2.5}$), Nitrogen Oxides (NO_X), Sulfur Dioxide (SO_2), Volatile Organic Compounds (VOC), and Ammonia (NH_3) winter season emissions estimates. It also defined typical emissions as average weekday and weekend emissions for the winter season. Section 1.1 provides justification for the season.

Table 9: Inventories Developed		
Geographic Area	Temporal Scale	Purpose
Pierce County	Annual and design day (wkday), median temperature profile	Starting point for allocating emissions to finer spatial resolutions, SIP requirements.
Nonattainment Area	Annual and design day (wkday), median temperature profile	SIP requirements.
State	Annual	SIP requirement. It is fulfilled by the 2008 NEI.

We developed a list of sources using the 2008 NEI,[1] local knowledge, and categories as defined in the 2005 Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations.[2] The list of sources is in Appendix A. We used the guidance to select estimation methods and gathered information necessary to develop the base year.

Temporal Allocation

Unless noted, winter daily emissions were calculated from annual emissions using temporal allocation profiles. Winter weekday and weekend emissions for the three design day temperature profiles were prepared (see Section 1.1). For most of the source types, typical winter daily emissions were used for all three temperature profiles. For residential wood combustion, emissions were calculated for each profile based on the specific temperatures. For onroad

mobile sources, the emissions were calculated for each hour of each profile based on temperature. Methods for each category are described beginning in Section 3.2.

Spatial Allocation

$PM_{2.5}$, NO_X, and SO_2 emissions were spatially allocated to the Nonattainment Area. Because of their small role in fine particle concentrations in the Nonattainment Area, VOC and NH_3 emissions were not allocated to the Nonattainment Area. For sources without specific coordinates, spatial surrogates were used to approximate both the location and magnitude of the emissions. Many of the surrogates are the same as or similar to the surrogates used in the Pacific Northwest's air quality prediction model, AIRPACT. Surrogates were allocated to the Nonattainment Area using Geographic Information Systems (GIS) tools and scripts. Each emissions source was assigned to an appropriate surrogate. The Nonattainment Area and grid emissions are estimated as:

$$E_{NAA} = E_{County} * Surrogate_{NAA}/Surrogate_{County}$$

Where E_{NAA} = emissions in the Nonattaiment Area, E_{County} = emissions in county, $Surrogate_{NAA}$ = surrogate activity in the Nonattainment Area, and $Surrogate_{County}$ = surrogate activity in county.

Fine Particle Speciation

Fine Particles were speciated into five categories (nitrate, sulfate, elemental carbon, organic aerosol, and PM fines (i.e., unspeciated fine particles) using speciation profiles by SCC code available through the AIRPACT[3] modeling system and as direct output from EPA's Motor Vehicle Emission Simulator (MOVES) model.

Demographics and Employment and Vehicle Miles Traveled

Demographic, employment, and Vehicle Miles Traveled (VMT) data are used in emissions calculations for several source categories. PSRC provided estimated population, households, and employment for Pierce County, and an area approximating the Nonattainment Area using their forecast analysis zones (FAZs).[4] The Nonattainment Area VMT were derived from roadway link statistics.

Table 10: 2008 Demographics, Employment, and VMT

Parameter	Pierce County	Pierce FAZs (NAA)
Population	805,408	542,978
Households	300,225	209,609
Total Employment	332,804	234,676
Construction Employment	29,189	18,472
Vehicle Miles Traveled	15,690,815	11,799,857

Inventory Tasks

To estimate emissions, four basic tasks were completed for each source category. The four tasks were: (1) estimate the activity level, (2) adjust/allocate the activity level (or emissions) temporally and spatially, (3) determine emission factors (rates) per the activity, and (4) estimate emissions. The tasks are described below for each source category. The summary of emissions estimates may be found in Section **Error! Reference source not found.**.

3.2 Point Sources

Industrial, commercial, or institutional stationary sources which emit criteria and/or hazardous air pollutants (HAPs) are called point sources. Major point sources are those with the potential to emit 100 tons per year or more of any one criteria pollutant or a combination of criteria pollutants, and/or point sources with the potential to emit 10 tons per year or more of any single HAP, or 25 tons per year or more of a combination of HAPs (Section 112, CAA). Facilities with a major source potential-to-emit are included in Title V Air Operating Permit (AOP) programs unless a facility voluntarily adopts federally enforceable permit limits that reduce their potential-to-emit below the criteria and HAPs thresholds. Facilities that adopt these limits are called Synthetic Minor sources.

For nonattainment areas, the federal Clean Air Act defines point sources as any stationary source having the potential to emit 100 tons per year of a criteria pollutant. These sources require Air Operating (Title V) Permits. There are 9 Title V sources in Pierce County.

Simpson Tacoma Kraft (STK) is the only major point source in Ecology's jurisdiction. The eight other Title V sources in the county fall within the PSCAA's jurisdiction

To have a more thorough inventory, all sources registered with PSCAA were included. There are 33 registered sources in the county that are not Title V sources. These sources may also include emissions reported that are less than the required reporting limits.

PSCAA registers sources that emit at least:

1) 2.5 tons of any single HAP.
2) 6.25 tons of total HAPs.
3) 25 tons of carbon monoxide, nitrogen oxides, particulate matter, sulfur dioxides, or volatile organic compounds.

Activity Level

Individual facility throughputs and production rates determine the activity level for each facility.

Spatial and Temporal Allocation

Point sources are located by county, address, and coordinates. Throughput and emissions were assumed uniform throughout the year, and 25 percent of the annual total was assigned to each season.

Emission Rates and Estimates

Emissions estimates for each facility are calculated using a variety of emissions estimation methods: continuous emissions monitors, stack test data, mass balance, best professional judgment, manufacturer's specifications, speciation profiles, EPA emission factors (e.g., AP-42), and/or other state, manufacturer, or research group emission factors. Methods are selected considering permit conditions, data availability, and resource constraints.

For the 2008 base year inventory, Ecology used the 2008 annual emissions report to develop the point source inventory (Table 11). The fields that are null mean that the pollutant has not been emitted at the source. The fields that have a zero mean that the pollutant was emitted either in the past or presently, but in too small of a quantity to make it into the emissions inventory.

Emissions Calculations

For STK, Ecology used source tests from the facility to calculate the condensable PM for each unit.[5] The following calculation was used to estimate the condensable PM:

$$(CPM/FPM)* Ftpy = Ctpy$$

Where CPM (condensable PM) and FPM (Filterable PM) = known values given in the source test
Ctpy = Condensable tons per year
Ftpy = Filterable tons per year. Known value given in the annual EI

Ctpy + PM (each TSP, $PM_{2.5}$, PM_{10}) = total Condensable + Filterable PM in tpy.

STK did not submit a stack test for the Boiler #6 Stack, so Ecology used AP-42[6] to calculate the condensables for that unit.

Table 11: 2008 Point Source EI (Pierce County Point Sources)							
Plant Name	**$PM_{2.5}$**	**SO_2**	**NO_X**	**VOC**	**NH_3**	**Within NAA**	**Title V (X)**
American Reinforced Plastics Inc				3.6	0	No	
Arclin Surfaces, LLC				31.4		Yes	X
Benchmark Custom Cabinets Inc						Yes	
Boeing Commercial Airplane, Frederickson	0	0	0	35.6	0	Yes	X
Caraustar Mill Group Inc Tacoma Paperboard	0	0	0			Yes	
ConocoPhillips Company				31.6		Yes	
Delta Prefinishing Corp				20.5		Yes	
Feed Commodities LLC	0	0	0	0		Yes	
Frederickson Power LP	5.1	2.3	43	17.7		Yes	X
General Plastics Manufacturing Co				1.2		Yes	
Georgia-Pacific Gypsum LLC	27	0	62	0		Yes	
Graymont Western US Inc	36.1	9.6	57.2			Yes	X
IDX - Seattle				0		Yes	
James Hardie Building Products Inc				0		Yes	
Jet Door LLC				0		Yes	
Lianga Pacific Inc				52.6	0	Yes	
Milgard Manufacturing Inc				0		Yes	
Northwest Pipeline GP Sumner	0	0	0	0		No	
Numatic Finishing				0		No	
Pacific Crest Industries Inc				73.3		No	
Pacific Northwest Baking Co				28.2		No	
Parker Paint Manufacturing Co Inc Professional Paint				2.3		Yes	
Ply Trim West Inc				0	0	Yes	
Professional Coatings Inc				76.7		Yes	X
Puget Sound Energy, Frederickson	1.1	3.7	18	0.2		Yes	X
Rainier Richlite Co				3.2		Yes	
Rainier Veneer Inc	21.3	2.8	24.8	20.8		No	
Rainier Woodworking				0		Yes	
Shore Terminals LLC				0		Yes	
Simpson Lumber Company, LLC	2.1	0	1.1	23.5		Yes	
Simpson Tacoma Kraft	*96.7	635	684	48	0	Yes	X
Sonoco Products Co Paper Div	0	0	0	0	0	No	
Specialty Wood Manufacturing TRSW				0		Yes	
Sunnfjord Boat Inc				0		Yes	
Tacoma Export Marketing Co LLC TEMCO LLC	0					Yes	
Tacoma Fixture Co Inc				0		Yes	
Toray Composites America Inc				23.8		Yes	X
Tucci & Sons Inc McChord	1.2	0	4.5	0		Yes	
Tucci & Sons Inc Taylor Way	0.2	0	0.9	0		Yes	
US Air Force McChord Air Force Base	0	0	37.2	0	0	No	
US Army Fort Lewis DA Public Works	5.1	5.3	56.1	37.6	0	No	
US Oil & Refining Co	9.2	5.9	109.3	131.3	36	Yes	X
Westmark Products Inc				0		Yes	
* Figure includes condensable + filterable $PM_{2.5}$ - for calculation, see *Emission Calculations*							

3.3 Nonpoint Sources

Nonpoint sources include a variety of sources such as residential wood combustion, minor stationary sources, and road dust. We typically estimate emissions by multiplying an activity level by an emission factor in mass per activity.

Emissions = Activity level x Emission Factor

Base year emissions estimation methods and data sources for each nonpoint source category are described in the sub-sections below.

3.3.1 Residential Wood Combustion

Residential wood combustion emissions were estimated using local survey data, EPA emission factors, local wood-burning device sales data, and local change-out program statistics.

Activity Level –Base Year 2008

Residential wood combustion activity was estimated using data from a residential wood combustion survey of 1,015 households conducted in the central Puget Sound area in 2007 (NRC2007).[7, 8] This survey is the most recent and comprehensive survey conducted in the area, and it solicited complete information to conduct an inventory. There have been other surveys about residential wood combustion, but they included fewer respondents, are older, or did not ask all the questions necessary to estimate the quantity of wood burned. PSCAA, Ecology, and the Hearth, Patio, and Barbeque Association reviewed the survey data and believed it to be reasonable.

The survey was used to determine the percentage of households using wood burning devices and the annual amount of wood burned per device for fireplaces, wood stoves, inserts, and pellet stoves. Wood stoves and inserts were further broken out into three categories: certified catalytic, certified non-catalytic, and non-certified.

The survey included seven geographic groups. Three of the groups were used in this inventory: Pierce County Urban Growth Area (UGA), Pierce County Non-Urban Growth Area (NUGA), and King County (KING). The Pierce County UGA survey responses were used to derive most of activity parameters for the Nonattainment Area. Parameters with low numbers of data points (e.g., fire logs burned in a certified insert) were estimated by combining geographic areas to get more data points. A few parameters were estimated using information available in EPA's residential wood combustion tool.[9]

The survey gathered information on the amount of pellets, manufactured fire logs, and cord wood burned. To calculate emissions using emission factors in pounds per ton (lb/ton) burned, the weight of the wood burned was estimated. The weight of a cord of wood varies with moisture content and species type. The most common species reported in the survey were fir, alder, and maple. PSCAA estimated the bone dry (zero percent moisture) weight of a cord to be 2189 pounds (lb). Pellets are sold in 40-lb sacks, and fire logs were estimated at 8 lb per log.

Annual emissions for each wood burning device were calculated according to the following equation:

T/yr = (HH) x (usage fraction) x (T burned/device-yr) x (pollutant lb/T) x (T/2000 lb)
Where HH = number of households in the geographic area

The numbers of households in each of the three geographic areas were estimated by the PSRC. The EPA data source is reference 9. All of the other parameter sources and values are described in the following tables.

Table 12: Residential Wood Combustion Parameter Data Sources, Base Year 2008

Parameter	Fireplaces	Inserts	Woodstoves	Pellet Stoves
Pierce Nonattainment Area				
Own device (%)	UGA	UGA	UGA	UGA
Use device (%)	UGA	UGA+NUGA	UGA	UGA+NUGA+KING
Certified (% of devices used)	n/a	UGA+NUGA	UGA	n/a
Certified non-catalytic/catalytic split (%)	n/a	EPA	EPA	n/a
Cord wood burned	UGA	UGA+NUGA	UGA	n/a
Pellets burned	n/a	n/a	n/a	Entire survey
Fire logs burned	UGA	UGA+NUGA	UGA	n/a
Pierce Attainment Area				
Own device (%)	NUGA	NUGA	NUGA	NUGA
Use device (%)	NUGA	NUGA	NUGA	UGA+NUGA+KING
Certified (% of devices used)	n/a	NUGA	NUGA	n/a
Certified non-catalytic/catalytic split (%)	n/a	EPA	EPA	n/a
Cord wood burned	NUGA	NUGA	NUGA	n/a
Pellets burned	n/a	n/a	n/a	Entire Survey
Fire logs burned	NUGA	NUGA	NUGA	n/a

Table 13: Residential Wood Combustion Parameter Values, Base Year 2008				
Parameter	**Fireplaces**	**Inserts**	**Woodstoves**	**Pellet Stoves**
Pierce Nonattainment Area				
Own device (%)	16	7	16	2
Use device (%)	10.8	4.8	14.7	1.1
Certified (% of devices used)	n/a	70	36	n/a
Certified non-catalytic/catalytic split (%)	n/a	75 / 25	75 / 25	n/a
Cord wood burned (tons)	1.0	1.8	1.9	n/a
Pellets burned (tons)	n/a	n/a	n/a	0.7
Fire logs burned (tons)	0.01	0.03	0.01	n/a
Pierce Attainment Area				
Own device (%)	19	11	11	2
Use device (%)	10.0	9.3	8.0	1.1
Certified (% of devices used)	n/a	91	50	n/a
Certified non-catalytic/catalytic split (%)	n/a	75 / 25	75 / 25	n/a
Cord wood burned (tons)	0.9	2.0	1.1	n/a
Pellets burned (tons)	n/a	n/a	n/a	0.7
Fire logs burned (tons)	0.01	0.01	0.03	n/a
King County				
Own device (%)	32	9	7	2
Use device (%)	17.3	5.9	5.9	1.2
Certified (% of devices used)	n/a	58	25	n/a
Certified non-catalytic/catalytic split (%)	n/a	75 / 25	75 / 25	n/a
Cord wood burned (tons)	1.2	1.4	1.2	n/a
Pellets burned (tons)	n/a	n/a	n/a	0.7
Fire logs burned (tons)	0.02	0.01	0.01	n/a

Activity Level–Base Year Summary

Table 14: Number of Devices Used and Tons Burned				
Parameter	**Pierce NAA**		**Pierce AA**	
	Devices	**Tons**	**Devices**	**Tons**
Fireplace	21,245	20,669	10,323	9,560
Fireplace inserts; non-EPA certified	2,786	5,102	876	1,770
Fireplace inserts; EPA certified; non-catalytic	4,983	9,124	6,569	13,273
Fireplace inserts; EPA certified; catalytic	1,661	3,041	2,190	4,424
Wood stove; non-EPA certified	18,436	35,312	4,129	4,519
Wood stove; EPA certified, non-catalytic	7,901	15,134	3,097	3,389
Wood stove; EPA certified, catalytic	2,634	5,045	1,032	1,130
Pellet Stove	2,103	1,542	1,124	824
Residential Firelog Total: All Combustor Types	---	1,004	---	441

Emission Factors

Emission factors were taken from version 7.1 of EPA's 2008 NEI Residential Wood Combustion Tool[9] (available for download at http://www.epa.gov/ttn/chief/net/2008inventory.html). Most of the factors in the tool are from AP-42, MARAMA, and Environment Canada.

Table 15: Residential Wood Combustion Emission Factors in Lb/T						
SCC	Device	$PM_{2.5}$	NO_X	SO_2	VOC	NH_3
2104008100	Fireplace	23.6	2.6	0.4	18.9	1.8
2104008210	Fireplace inserts; non-EPA certified	30.6	2.8	0.4	53	1.7
2104008220	Fireplace inserts; EPA certified; non-catalytic	19.6	2.28	0.4	12	0.9
2104008230	Fireplace inserts; EPA certified; catalytic	20.4	2	0.4	15	0.9
2104008310	Wood stove; non-EPA certified	30.6	2.8	0.4	53	1.7
2104008320	Wood stove; EPA certified, non-catalytic	19.6	2.28	0.4	12	0.9
2104008330	Wood stove; EPA certified, catalytic	20.4	2	0.4	15	0.9
2104008400	Pellet Stove	3.06	3.8	0.32	0.041	0.3
2104009000	Residential Firelog Total: All Combustor Types	28.4	7.684	0	39.56	0

Temporal Allocation

Residential wood combustion emissions were calculated for the three design day temperature profiles using a temperature adjustment equation based on heating degree days with a base of 50 degrees (see Appendix A2). The temperature adjustment eliminates the need for a monthly activity adjustment since the temperature adjustment assumes activity is directly related to temperature. The calculated daily emissions were adjusted to weekday and weekend hourly activity using AIRPACT temporal allocation profile 407, which was calculated from the 2001 Washington State University woodstove survey.[10] The profile allocates 13.5 percent of activity to each weekday, and 16.1 percent to each weekend day.

Spatial Allocation

Activity and emissions were allocated to the Nonattainment Area as described above. Emissions were allocated to the modeling grids using a combination of the three survey area results and two surrogates: the number of total occupied housing units (by 2010 Census block), and the number of households where wood is the primary heat source (by 2000 Census block group). Had we allocated by the single surrogate of all occupied housing units, we may have overestimated emissions in densely populated areas. If we had allocated only by households with wood as the primary heat source, we would have missed entire areas since many Census block groups have no households with wood as their primary heat source.

For each of the three survey areas, emissions from devices identified as the primary heat source was allocated to households where wood is the primary heat source. Emissions from devices identified as a secondary or recreational heat source were allocated to total occupied housing units.

To use this method, first the fractions of emissions by device usage type (primary, secondary/recreational) were calculated. This was done at the whole survey level, since the sample sizes were too small for each survey area to produce reliable results for each device type (e.g., the amount of cord wood burned in certified catalytic inserts used for secondary heating).

Emissions Fractions Calculation

Each survey response was weighted according to its survey group. The group weighting factors were calculated as the number of households in the group divided by the sum of all the households in the survey area.

The weighted survey responses were summarized by major device (fireplace, insert, wood stove, pellet stove) and type of usage (primary, secondary, recreational). The device type summarization included whether the device was certified/not certified, and catalytic/non-catalytic for stoves and inserts.

Tons burned and emissions from wood stoves, inserts, and pellet stove results were combined into one category; fireplaces were a separate category. The percentage of tons burned and emissions were calculated for the three usage types: primary, secondary, recreational. For the wood stoves, inserts, and pellet stove category, 51 percent of the emissions were from primary usage, and the remaining 49 percent from secondary and recreational usage. For fireplaces, 17 percent of the emissions were from primary usage, and the remaining 83 percent from secondary and recreational usage. The results were nearly identical if using tons burned instead of emissions.

Final Spatial Allocation

The fractions calculated were multiplied by the emissions in each of the three survey areas to estimate the amount of emissions produced by primary, and secondary/recreational devices in each area. The emissions were allocated to the two spatial surrogates as described above.

3.3.2 Paved Road Dust

Paved road dust was estimated using vehicle miles traveled (VMT) activity from the Washington State Department of Transportation (WSDOT) and the emission factor equation in AP-42.

Activity Level

Average daily VMT (ADVMT) based on the national WSDOT's Highway Performance Monitoring System (HPMS) was obtained from the WSDOT. WSDOT makes estimates of county ADVMT by functional (roadway) classification from HPMS.[11] The HPMS classifications available in the WSDOT data were helpful in applying the AP-42 emission factor equation. Total Pierce County ADVMT was somewhat higher than the PSRC's travel demand model estimate. The travel demand model data was used to estimate onroad emissions. This is a small inconsistency in the inventory.

Table 16: WSDOT 2008 ADVMT, Pierce County	
Road Class	**ADVMT**
Rural Interstate	328,822
Rural PA Other	0
Rural Minor Art	548,709
Rural Major Col	148,346
Rural Minor Col	33,014
Rural Local	103,912
Urban Interstate	3,218,994
Urban PA F/E	2,764,830
Urban PA Other	3,652,849
Urban Minor Art	3,306,077
Urban Collector	764,625
Urban Local	1,969,445
TOTAL	**16,839,623**

Emission Factors and Temporal Allocation

Monthly fine particle emission rates in grams per mile were calculated using equation 2 in EPA's AP42.[12, 13] Equation 2 estimates an emission rate for annual average conditions by incorporating a precipitation correction factor. Daily winter emissions were calculated assuming no rainfall, and therefore no precipitation adjustment.

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02}\,]\,(1 - P/4N) \qquad \text{equation (2)}$$

where E_{ext} is the emission factor in g/VMT
k = g/VMT particle size multiplier (0.25 for $PM_{2.5}$)
sL = silt loading in g/m^2
W = mean vehicle weight (tons)
P = number of days with at least 0.01 inches of precipitation in the given month
N = number of days in the given month

AP42 recommended values for average silt loading by average daily traffic (ADT) class were used. The HPMS facility types were classified into the ADT classes by dividing the number of statewide ADVMT by the roadway mileage. The classifications are shown in Table 17. Individual urban sampling areas are not shown in the table. However, with only minor exceptions, they each showed the same ADT classification as the urban average.

Table 17: WSDOT Statewide Estimated Average Daily Traffic, 2008						
Rural	**Interstate**	**Prin Art**	**Min Art**	**Maj Coll**	**Min Coll**	**Local**
Miles	467	1,980	1,860	8,194	6,189	42,093
ADVMT (in 1,000s)	12,000	10,747	5,066	10,230	2,830	3,076
Estimated ADT	25,696	5,428	2,724	1,248	457	73
ADT Class	> 10,000 limited access	5,000 - 10,000	500 - 5,000	500 - 5,000	< 500	< 500
Silt loading (g/m^2)	0.015	0.06	0.2	0.2	0.6	0.6
Urban	**Interstate**	**Free/Expr**	**Prin Art**	**Min Art**	**Collector**	**Local**
Miles	297	375	1,319	2,599	2,379	15,774
ADVMT (in 1,000s)	29,184	14,029	23,712	20,361	8,801	11,874
Estimated ADT	98,263	37,411	17,977	7,834	3,699	753
ADT Class	> 10,000 limited access	> 10,000 limited access	> 10,000	5,000 - 10,000	500 - 5,000	500 - 5,000
Silt loading (g/m^2)	0.015	0.015	0.03	0.06	0.2	0.2

Mean vehicle weight by road class was calculated from a Federal Highway Administration report of in-use operating weights and VMT by vehicle type and road class.[14]

Table 18: Mean Vehicle Weight in Tons			
Road Class	**Vehicle Weight (Tons)**	**Road Class**	**Vehicle Weight (Tons)**
Urban Interstate	3.27	Rural Interstate	5.71
Urban PA F/E	2.56	Rural Minor Art	3.16
Urban PA Other	2.51	Rural Major Col	2.74
Urban Minor Art	2.26	Rural Minor Col	2.62
Urban Collector	2.18	Rural Local	2.49
Urban Local	2.14		

Days per month of precipitation greater than 0.01 inches in 2008 were obtained for SeaTac.

Table 19: Days with Greater Than 0.01 Inches of Precipitation					
Month	**Days**	**Month**	**Days**	**Month**	**Days**
01	20	05	12	09	6
02	13	06	7	10	15
03	20	07	3	11	23
04	19	08	11	12	21

Monthly and day-of-week ADVMT adjustments were provided by WSDOT.[15] Weekday adjustments are the average of Monday-Friday adjustments. Weekend adjustments are average Saturday/Sunday adjustments.

Table 20: WSDOT Monthly Adjustment Factors, 2008												
Road Type	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Rural Interstate	0.77	0.85	0.93	1.00	1.03	1.12	1.22	1.24	1.10	1.03	0.89	0.83
Other Rural Arterial	0.77	0.86	0.90	0.95	1.04	1.12	1.25	1.26	1.11	1.03	0.84	0.79
Other Rural	0.72	0.77	0.82	0.87	1.05	1.23	1.42	1.36	1.20	1.01	0.84	0.71
Urban Interstate	0.92	0.97	0.99	1.01	1.06	0.99	0.98	0.98	0.99	0.95	0.91	0.91
Other Urban Arterial	0.92	0.95	0.98	1.01	1.06	1.07	1.06	1.07	1.03	1.00	0.93	0.93

Table 21: WSDOT Day-of-Week Adjustment Factors, 2008		
Road Type	**Weekday**	**Weekend**
Rural Interstate	98.578	103.52
Other Rural Arterial	100.584	98.225
Other Rural	97.956	105.565
Urban Interstate	105.658	85.855
Other Urban Interstate	107.052	82.29

Monthly emissions were calculated using the equation below. Annual emissions were calculated by summing all months. Daily emissions were calculated using the equation below with the daily emission factor E (no precipitation), the January monthly adjustment, and with D = 1.

V x T x D x E x (lb/454 g) x (T/2000 lbs) - monthly emissions
where V = ADVMT
T = monthly VMT adjustment factor
D = number of days in month, and
E = emission factor in g/VMT

Spatial Allocation

Emissions were allocated to the Nonattainment Area and modeling grid using a surrogate as described in Section 3.1. Each inventory year's PSRC's link-level VMT were the surrogates. The VMT was allocated to the Nonattainment Area and modeling grid using GIS methods. PSRC's VMT is described more fully in Section 3.5.

3.3.3 Minor Stationary Sources

PSCAA inventoried minor stationary sources. Sources are required to report emissions from any criteria pollutant that equals or exceeds 25 tons per year.[16] All reported emissions of $PM_{2.5}$, NO_X, SO_2, NH_3, and VOCs are included in this inventory (see Table 11).

3.3.4 Other Nonpoint Sources

Many nonpoint categories were estimated by EPA for the 2008 NEI. Neither PSCAA nor Ecology had local data on these sources. For the categories listed below, the EPA estimates[17] were used in the inventory without changes.

- Residential Distillate Oil Combustion

- Residential Natural Gas Combustion
- Construction Dust
- Commercial Charbroiling
- Gas Cans
- Gas Stations, Stage 1 and Underground Tank Breathing
- Non-Industrial Commercial and Consumer Solvents
- Architectural Surface Coating
- Livestock
- Fertilizer

Temporal Allocation

Annual emissions were adjusted to winter (January) weekday and weekend hourly activity using AIRPACT temporal allocation profiles for month and day of week. Several of the profiles came from EPA emissions modeling files.[18] The descriptions and category assignments are shown in the tables below.

Table 22: Temporal Profiles, Month and Day Type

Profile	Description	Source
Month		
262	Win=25.0%, Spr=25.0%, Sum=25.0%, Fal=25.0% (uniform)	EPA
485	Win=57.0%, Spr=22.5%, Sum=1.5%, Fal=19.2%	EPA
996	Win=3.7%, Spr=31.4%, Sum=28.1%, Fal=36.7%	EPA
1500	Win=17.7%, Spr=25.5%, Sum=34.3%, Fal=22.6%	EPA from Gilliland NH3 profile
4002	Win=21.1%, Spr=25.1%, Sum=30.6%, Fal=23.1%	Architectural Coating 1996 Quarterly Business review revenue
4015	Win=20.7%, Spr=24.3%, Sum=30.6%, Fal=24.0%	EPA NONROAD2008 model for Construction Equipment (SEASON.DAT)
4016	Win=23.3%, Spr=25.6%, Sum=26.5%, Fal=24.6%	2008 WSDOT[15]
Day		
6	Weekdays=16.7%, Weekends=8.3%	EPA
7	Weekdays=14.3%, Weekends=14.3% (uniform)	EPA
407	Weekdays=13.5%, Weekends=16.1%	2001 WSU Survey[10]
409	Weekdays = 14.1%, Weekends = 14.7%	2008 WSDOT[15]

Table 23: Temporal Allocation, Month and Day Type

Category	Month	Day Type
Residential Distillate Oil and Natural Gas	485	407
Construction Dust – Commercial/Industrial	4015	6
Construction Dust – Roads	4015	6
Commercial Charbroiling	262	6
Gas Cans – Spillage, Refilling	4016	409
Gas Cans – Permeation, Evaporation	262	7
Gas Stations	262	7
Non-Ind. Comm/Cons Solvents	262	7
Architectural Surface Coating	4002	7
Livestock	1500	7
Fertilizer	996	7

Temporal Allocation – Additional Adjustments for Construction Dust

A further adjustment was made to construction dust to account for higher soil moisture values in the winter. The NEI dust equations contains a multiplier of 24/PE where PE is the 30-year average precipitation-evaporation value from Thornthwaite's PE Index. Fine particle concentrations in the Nonattainment Area greater than or equal to 25 $\mu g/m^3$ from 2001–2010 occurred during October–February with few exceptions. A variation of Thornwaite's precipitation-evaporation equation (below) was used to calculate PE by month using 10 years of temperature and precipitation data[19] from the Tacoma Narrows meteorological station. The calculated monthly PE values for October–February were normalized to produce a 12-month PE value representative of the winter (i.e., the high fine particle values). The normal annual PE was divided by the winter PE to produce a moisture adjustment factor (60 percent).

Precipitation-Evaporation Equation

$$PE = \sum^{12} 115\,[P/T\text{-}10]^{10/9}$$

where P is average monthly precipitation (inches) with 0.5 being the minimum value
T is average monthly temperature (degrees F) with 28.4 ° F being the minimum value used in the calculation.

Table 24: Tacoma Narrows Temperature (°F) and Precipitation (Inches), 1999–2008

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature	41.8	43	45.7	49.7	55.1	60.3	64.8	64.8	59.9	52.7	45.5	41.5	52.1
Precipitation	7.16	3.64	4.11	2.48	1.84	1.49	0.54	1.02	1.09	3.5	6.92	5.98	39.76

The calculated 60 percent adjustment was reasonable when compared to other information:

- PSCAA regulations specify no visible emissions.
- Emissions Inventory Improvement Program estimation method applies 50 percent control to PM nonattainment areas.
- Western Regional Air Partnership and AP42 attribute 10 to 74 percent control efficiency for watering depending on schedule and operation.

Spatial Allocation

Sources emitting $PM_{2.5}$, SO_2, or NO_X were spatially allocated to the Nonattainment Area. Sources emitting only VOC or NH_3 were not allocated. Emissions were allocated to the Nonattainment Area using surrogates as described in Section 3.1. Each inventory year's PSRC's link-level VMT were the surrogates. The VMT was allocated to the Nonattainment Area using GIS methods. PSRC's VMT is described more fully in Section 3.5.

Table 25: Spatial Allocations for Other Nonpoint Sources		
Category	**Surrogate**	**Source**
Residential Distillate Oil and Natural Gas	Occupied Housing Units	2010 Census block
Construction Dust – Commercial/Industrial	Land Use: commercial/industrial/transportation	Tax Parcels, 2008
Construction Dust – Roads	Road miles	PSRC, 2008
Commercial Charbroiling	Land Use: commercial/industrial/transportation	Tax Parcels, 2008

3.4 Nonroad Mobile Sources

Nonroad mobile sources include all off-road vehicles and equipment. Locomotives and marine vessels are included in the nonroad category.

3.4.1 Nonroad Mobile Sources, Except Locomotives, Marine, and Port of Tacoma Sources

The Nonroad Mobile category includes emissions estimates from gasoline, diesel, compressed natural gas (CNG), and liquefied petroleum gas (LPG) fueled equipment. Emissions were estimated using EPA's NONROAD2005 model.[20] Equipment types are compiled into six categories:

1) Lawn and Garden Equipment
2) Railroad Maintenance Equipment
3) Recreational Marine Vessels
4) Construction and Mining Equipment
5) Commercial Equipment
6) Industrial Equipment

Temporal Allocation and Emission Rates

Emissions were generated for the four seasons using the seasonal temporal option in the NONROAD2005 model for 2008 base year and 2014 projection year. The month of January, both weekday and weekend, was also chosen to represent a typical winter day scenario for each year as well (see Table 26). NONROAD2005 requires user input of seasonal meteorological and fuel parameters. The required fuel parameters are gasoline RVP and oxygen content; sulfur contents of gasoline; diesel (land and marine); CNG; LPG; and presence of stage II vapor recovery requirements.

Table 26: 2008 Nonroad Model Parameters																
Fuel RVP	O_2 Wt. %	Gas Sulfur %	Diesel Sulfur %	Marine Diesel Sulfur %	CNG/ LPG Sulfur %	Min Temp (°F)	Max Temp (°F)	Avg. Temp (°F)	EtOH blend mkt %	EtOH Vol %	Yr.	Period	Mo.	Season	Type	Week Day/End
14	3.5	0.0045	0.0351	0.0435	0.003	26	47	36	100	10	08	Monthly	Jan		Typical Day	Day
14	0	0.0045	0.0351	0.0435	0.003	26	47	36	0	0	08	Monthly	Jan		Typical Day	Day
14	3.5	0.0045	0.0351	0.0435	0.003	26	47	36	100	10	08	Monthly	Jan		Typical Day	End
14	0	0.0045	0.0351	0.0435	0.003	26	47	36	0	0	08	Monthly	Jan		Typical Day	End
14	3.5	0.0045	0.0351	0.0435	0.003	34	46	42	100	10	08	Seasonal		Win	Period Total	Day
14	0	0.0045	0.0351	0.0435	0.003	34	46	42	0	0	08	Seasonal		Win	Period Total	Day
12	3.5	0.0045	0.0351	0.0435	0.003	41	58	52	100	10	08	Seasonal		Spg	Period Total	Day
12	0	0.0045	0.0351	0.0435	0.003	41	58	52	0	0	08	Seasonal		Spg	Period Total	Day
10	3.5	0.0045	0.0351	0.0435	0.003	53	74	67	100	10	08	Seasonal		Sum	Period Total	Day
9	0	0.0045	0.0351	0.0435	0.003	53	74	67	0	0	08	Seasonal		Sum	Period Total	Day
10	3.5	0.0045	0.0351	0.0435	0.003	46	62	57	100	10	08	Seasonal		Fall	Period Total	Day
9	0	0.0045	0.0351	0.0435	0.003	46	62	57	0	0	08	Seasonal		Fall	Period Total	Day

Activity Level and Spatial Allocation

The NONROAD model contains data on statewide equipment types and usage. The model utilizes spatial surrogates appropriate for each equipment type to disaggregate state activity levels to individual counties. The default surrogates were used for all equipment types except recreational marine vessels. The default spatial surrogate for recreational marine is water surface area. This method can overestimate recreational boat usage in certain counties due to the large areas of open water in a county's jurisdiction. A new allocation based on Pierce County boat registrations was substituted for the default. Registrations for 2008 were provided by the Washington Department of Licensing (Table 28).[21]

Emissions were allocated to the Nonattainment Area and modeling grids based on spatial surrogates.

Table 27: Spatial Allocations for Nonroad Sources		
Category	**Surrogate**	**Source**
Recreational Marine Vessels	Land Use: open water	MRLC*
Railroad Maintenance Equipment	Active Railroad Track	WSDOT GIS files
Commercial Equipment	Land Use: commercial/industrial/transportation	Tax Parcels, 2008
Construction and Mining Equipment	Land Use: residential/commercial/industrial/transportation	MRLC*
Industrial Equipment	Land Use: commercial/industrial/transportation	Tax Parcels, 2008
Lawn and Garden Equipment	Land Use: residential/commercial/industrial/transportation	MRLC*
* Multi-resolution Land Characteristics[22]		

Table 28: County Boat Registrations, 2008	
County	**Registrations**
Pierce	27896

Locomotives

Emissions from Class I line haul and switch yard locomotives were estimated using EPA guidance and other information.[23] Two Class I railroads operate in Washington: Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad (UPRR). Amtrak was also included in this inventory. Class 2 and 3 railroad locomotive emissions were not inventoried. A special AIRQUEST (formerly Northwest Regional Technical Center) project conducted by the Oregon Department of Environmental Quality (ODEQ) found that emissions from Class 2 and 3 railroad locomotives were a small percentage of total locomotive emissions.[24,25]

Activity Level

Activity level is measured in gallons of diesel consumed by locomotives. BNSF, UPRR, and Amtrak provided county fuel use for line haul and switch yard locomotives for 2008.[26,27,28]

Temporal and Spatial Adjustments

The activity information was obtained by county; therefore, no spatial adjustments were necessary at the county level. Emissions were allocated to the Nonattainment Area using active railroad track GIS data from WSDOT as the spatial surrogate.

Locomotives were assumed to operate uniformly year-round per EPA guidance.[29]

Emission Rates

BNSF, UPRR, and AMTRAK provided emissions estimates for 2008.

Table 29: 2008 Locomotive Emissions Estimates in Tons per Year			
County	**Type**	**Pollutant**	**Emissions 2008**
PIERCE	Line Haul	NO_X	514.5
PIERCE	Line Haul	$PM_{2.5}$	17.1
PIERCE	Line Haul	SO_2	44.9
PIERCE	Line Haul	VOC	30.0
PIERCE	Passenger	NO_X	56.1
PIERCE	Passenger	$PM_{2.5}$	1.3
PIERCE	Passenger	SO_2	0.8
PIERCE	Passenger	VOC	2.6
PIERCE	Yard	NO_X	111.0
PIERCE	Yard	$PM_{2.5}$	3.3
PIERCE	Yard	SO_2	7.6
PIERCE	Yard	VOC	6.7

3.4.2 Marine and Port of Tacoma Sources

Five types of marine and port sources were inventoried: ocean-going vessels, harbor vessels, cargo handling equipment, on-road heavy-duty vehicles, and port rail operations. Pleasure craft were also inventoried, but in Section 3.4.1. The 2005 inventory prepared for the Puget Sound Maritime Air Quality Forum by Starcrest Consulting Group, LLC (2005 PSEI) was the starting point for the inventories.[30] The inventory is a bottom-up, activity-based emissions inventory. It is unprecedented in scope and detail for the Puget Sound area.

Emissions Calculations

For all sources except ferries, emissions were calculated by projecting the 2005 PSEI to each of the evaluation years. Emissions for pollutant "P" were calculated:

$E_{year} = E_{2005} \times A \times F$ Where E = Emissions,
A = Activity adjustment factor
F = Fuel/engine adjustment factor for pollutant

The activity and fuel/engine adjustment factors are described in the *Activity Level* and *Emission Factors* sections below. There were some errors in the 2005 PSEI for ferry boat emissions. Fuel estimates and emission factors were available for ferries, so emissions were calculated directly.

Activity Level

Activity level and emission rates are described in the 2005 PSEI report. The report addressed PM_{10}, $PM_{2.5}$, NO_X, SO_2, Carbon Monoxide (CO), and VOC. The emissions were projected to 2008 using local information and federal regulatory programs. Activity was projected using one of four activity surrogates for each type of ship or port equipment: Port of Tacoma Twenty-ft Equivalent Units (TEUs),[31, 32] Alaska Fishing Permits,[33, 34] or Ferry Boat Fuel Use for the Pt. Defiance-Tahlequah run.[35] Most of the surrogate assignments were recommended by Ron Stuart of the Port of Tacoma.

Table 30: Ship and Port Activity Data, Growth Factors	
Activity Measure	**2005 to 2008**
Twenty-ft Equivalent Units (TEUs)	0.90
Alaska Fishing Permits	0.94
Ferry Fuel Use–Pt. Defiance-Tahlequah	1.20

Table 31: Ship and Port Activity Data		
Activity Measure	**2005**	**2008**
Twenty-ft Equivalent Units (TEUs)	2,066,446	1,861,358
Alaska Fishing Permits	31,000	29,000
Ferry Fuel Use–Pt. Defiance-Tahlequah	172,156	205,957

Table 32: Ship and Port Activity Projection Surrogates	
Marine or Port Source	**Surrogate, 2005 to 2008**
Ocean-going Vessels	TEUs
Harbor Craft–Ferry	n/a
Harbor Craft–Tugs and Workboats	TEUs
Harbor Craft–Fishing Boats	Fishing Permits
Harbor Craft–Excursion	Assume same as 2005
Harbor Craft–Government	Assume same as 2005
Cargo Handling Equipment	TEUs
Port Heavy Duty Vehicles	TEUs
Port Rail	TEUs

Emission Factors

Ocean-going Vessels–Transit & Maneuvering

Emission rates for 2008 were assumed to be the same as emission rates in 2005; therefore, no adjustments for emission factors were made.

Ocean-going Vessels–Hotelling

Some ships switch to a low sulfur fuel (less than or equal to 500 parts per million (ppm)) or use shore power at the Port of Tacoma. Based on NW Ports Clean Air Strategy 2010 Implementation Report and information from PSCAA and the Port of Tacoma, it was assumed that 50 percent of hotelling uses the same fuel as maneuvering and transit; 35 percent low sulfur (less than or equal to500 ppm), 15 percent shore power.[36]

Harbor Craft–Except Ferry Boats

Adjustment factors were calculated to adjust the 2005 emission rates to 2008. The adjustments were calculated as 2008/2005 emission rate ratios and multiplied by the 2005 emissions to

estimate 2008 emissions. EPA's NONROAD model was used to generate the emission rates for diesel-powered boats for 2005 and 2008. The rates were calculated and expressed as grams per hour using the NONROAD model output. The fuel sulfur content for 2005 was the PSEI value of 3100 ppm (p. 89, Section 1.12.1). For 2008, the NONROAD value of 435 ppm was used.

Table 33: Harbor Craft Emission Rate Adjustment Factors

Pollutant	2008
$PM_{2.5}$	0.64
SO_2	0.140
NO_X	1.00
VOC	1.00

Cargo Handling Equipment

In the 2005 PSEI (Section 5.6.1, p. 316), several factors were applied to equipment at the Port of Tacoma:

- All diesel-powered equipment used either ultra-low sulfur diesel (15 ppm) or highway diesel.
- Sixty diesel oxidation catalysts were retrofit on 30 straddle carriers.
- Sixty-four yard tractors used fuel-efficient onroad engines.

The 2005 PSEI assumed onroad diesel sulfur content was 310 ppm.

Port Heavy Duty Vehicles

The 2005 PSEI used the MOBILE model to estimate emission factors for heavy duty vehicles. MOBILE has been replaced with MOVES. Because all the specific activity data used in the 2005 PSEI inventory was not readily available, recalculation would have been a major exercise. The emissions from heavy duty vehicles were a small part of the Port inventory; therefore, no adjustments were made.

Port Rail

Emission rates for 2008 were assumed to be the same as emission rates in 2005; therefore, no adjustments for emission factors were made.

Activity Level and Emission Factors for Ferry Boats

There are two ferry routes in the modeling domain: Pt. Defiance–Tahlequah Vashon (operated by the state) and Steilacoom-Ketron-Anderson Island (locally operated). Fuel use and sulfur content for the Pt. Defiance–Tahlequah Vashon route were obtained from Washington State Ferries.[35] The Steilacoom-Ketron-Anderson Island (Anderson Island) route is about the same length as the Pt. Defiance route. In 2011, there were 20 round trips per day for Pt. Defiance and

approximately 14 for Anderson Island. Therefore, Anderson Island fuel use was estimated at 14/20 (0.7) of the Pt. Defiance amount (likely overestimation because of smaller boat size).

Ferry emissions were calculated using NONROAD emission factors expressed in grams per gallon using 15 ppm sulfur (S) fuel. The Pt. Defiance ferry used 15 ppm fuel beginning in 2007; biodiesel (B5) began in 2009. Factors for B5 were not available, so factors for 15 ppm S fuel were used. The same factors were used for the Anderson Island ferry.

Table 34: Ferry Boat Fuel Use

Year	Ship Data Source	HP	Gallons		
			Pt. Defiance	Anderson	Total
2005	Rhododendron	2170	172,156	120,509	292,665
2008	Rhododendron	2170	205,957	144,170	350,127

Table 35: Ferry Boat Emission Factors

Pollutant	2008
$PM_{2.5}$	2.18
SO_2	0.09
NO_X	130.73
VOC	4.45

Temporal and Spatial Allocation

Emissions were assumed to occur uniformly throughout the year.

County-level estimates were available in the 2005 PSEI for all source types except individual harbor craft types. Port of Tacoma, PSCAA, and Ecology staff assigned emissions to the Nonattainment Area based on the geographic area of operation for each source type. The Pierce County estimates for individual harbor craft types include a small portion of King County, which results in a small overestimation. The estimates were made early in the inventory process when modeling was contemplated. The modeling domain had included a small portion of King County. Harbor craft county-level emissions are not readily available for VOC. Pierce County, VOC was estimated at approximately 13 times the Nonattainment Area values (this is the approximate ratio for other pollutants).

Double-Counting

There is potential for double-counting in this category since it overlaps with other nonroad sources. The three sources are briefly discussed below.

Cargo handling equipment: This equipment is counted as industrial equipment in the NONROAD model, but the county allocations are based on manufacturing employment, which is not counted as port activity (Section 3.4.1). Therefore, emissions were not subtracted from the NONROAD model totals.

Port of Tacoma Rail: Three companies have rail operations in or near the Port of Tacoma:

BNSF, UPRR, and Tacoma Rail. Emissions from BNSF and UPRR were counted under the locomotive category (Section 0). The 2005 PSEI did not contain sufficient detail to determine whether any emissions from BNSF or UPRR may have been double counted in this section. If there was double-counting within the Port of Tacoma, it was likely small.

Light and Heavy-Duty Vehicles: Heavy-duty vehicle activity within port boundaries is a very small fraction of overall vehicle activity; therefore, the small amount of double-counting that will occur was considered acceptable.

3.5 Onroad Mobile Sources

Onroad mobile source emissions come from exhaust, evaporation, and brake and tire wear. Vehicle refueling was also calculated in the onroad category. EPA's MOVES model was used with local and default data to calculate emissions. MOVES may be run to produce emissions (Inventory model) or emission factors (Rates mode). MOVES was run in both the Rates and Inventory modes to calculate winter day emissions, and in the simpler Inventory mode to calculate annual emissions. The MOVES Technical Guidance for SIP inventories and the MOVES User's Guide were used in developing the local parameters.[37, 38]

Because activity level, temporal allocation, and spatial allocation are integral parts of the MOVES modeling process, they will be discussed below in the context of the MOVES model.

MOVES Modeling

MOVES input parameters were similar (though not identical) for both the annual Inventory mode run and the winter day Inventory and Rates mode runs. All of the parameters are used directly in Inventory mode; however, in Rates mode, several are treated as placeholders and essentially ignored. The actual values of these parameters are input during post-processing of the MOVES output. This allows the ability to use more specific input data. Tables outlining the inputs and data sources are shown below and are followed by a discussion of the MOVES panel options and parameters for the annual and winter day runs.

Panel Options

Scale	Pollutants and Processes
Time Spans	Datasets - Low Emission Vehicle Program
Geographic Bounds	Strategies - Bus Fuel
Vehicles	Output
Road Types	

Parameters

Vehicle Populations	Temperatures and Humidity
Vehicle Miles Traveled (VMT)	Road Type Distribution
Temporal Allocation	Vehicle Age Distribution
I/M Program	Speeds
Low Emission Vehicle Program (LEV)	Stage II Vapor Recovery
Fuel Parameters	

Table 36: Base Year 2008 MOVES Inputs and Data Sources	
Parameter	**Data Source**
Vehicle Populations	Local (DOL, OSPI, FTA)
Vehicle Miles Traveled (VMT)	Local (PSRC) with EPA default tailoring
Temporal Allocation	Local (WSDOT, PSRC) with EPA default tailoring
I/M Program	Local (Ecology)
Fuel Parameters	Local (Fuel Survey, Regulations) and Default
Temperatures	Local (Design Day Profiles)
Road Type Distribution	Local (PSRC) with EPA default tailoring
Vehicle Age Distribution	Local (DOL, OSPI, FTA)
Speeds	Local (PSRC)
Stage II Vapor Recovery	Local (Ecology) and Default

Annual Emissions

Panel Options

Annual emissions were run for Pierce County. MOVES was run in Inventory mode at the county scale by hour for one weekday and one weekend day for each of January, April, July, and October. All vehicle types, road types, and emissions processes producing the target pollutants were included. Pierce County Transit's buses run almost exclusively on CNG. This was defined in the Strategies panel item. Emissions were output by day type, fuel type, vehicle type, and emissions process.

Parameters

The model parameters used in the annual inventory are available in Appendix A3

Post-Processing

Annual emissions were calculated according to the equations below.

$$E_{Annual} = (365/4) \times \sum \{[E_{Weekday} \times (5/7)] + [E_{Weekend} \times (2/7)]\}$$

Where E = emissions and the summation $\sum$ is over the four months run, each representing a season: Jan = winter, Apr = spring, Jul = summer, Oct = fall.

Emissions were estimated for the Nonattainment Area by multiplying Pierce County emissions by the fraction of Pierce County PSRC link VMT that was in the Nonattainment Area. The link VMT is discussed under the winter day inventory below.

Winter Day Emissions

Panel Options

Winter day emission rates were run for Pierce County. MOVES was run in Rates mode at the county scale by hour for one weekday and one weekend day in January for each of the three

design day temperature profiles. Weekday and weekend Inventory runs were made for Pierce County using the median design day temperature profile in order to obtain output vehicle counts and VMT, and data supporting calculation of winter weekend emissions. All vehicle types, road types, and emissions processes producing the target pollutants were included. Pierce County Transit's buses run almost exclusively on CNG. This was defined in the Strategies panel item. Emissions were output by hour, fuel type, road type, and emissions process. Optional outputs of VMT and vehicle populations were chosen.

Parameters

With the exception of hourly temperatures, all of the parameters for the winter day runs were the same as the annual runs. The Inventory mode runs for Pierce County were run with the median design day temperature profile. One Pierce County Rates mode run was made for each of the three design day temperature profiles. As noted above, several of the parameters are treated as placeholders in MOVES, and were essentially ignored. These parameters were: VMT, month and day VMT adjustments, vehicle counts, and speeds.

Road type distribution and hourly VMT adjustments are used both actual input data and as placeholders. As actual data, the road type distribution allots vehicle types to road types by hour. The road type distribution is a placeholder with respect to the fraction of VMT assigned to each road type. For hourly adjustments, they are used as actual data to distribute vehicle operation throughout the day. This affects the some output emissions rates due to the relationship with hourly temperature. The hourly adjustments are used as placeholders with respect to the amount of VMT allocated to each hour.

The placeholder parameters were replaced by link-specific data during post-processing of the MOVES output. All of these parameters are briefly discussed below, with more detail provided in the post-processing section.

Vehicle Miles Traveled, and Month, Day, and Hour VMT Adjustments

PSRC provided average weekday daily VMT (ADVMT) for the year. The VMT was provided by link, road type, and speed for five different time periods throughout the day. Each link was identified by a "To" and "From" node, and coordinates were provided for each node. This allowed for accurate spatial allocation to the Nonattainment Area. While this introduced some inconsistency in the VMT between the annual and daily emissions calculations, it was not great.

PSRC's VMT represents an average annual weekday. It was adjusted to winter weekday by multiplying by a January adjustment factor (0.919) calculated:

$Jan_{Adjustment} = Jan_{Fraction}/AvgMonth_{Fraction}$

Where $Jan_{Fraction}$ = WSDOT January fraction = 0.077, and

$AvgMonth_{Fraction}$ = Average monthly fraction = 1/12 = 0.083

Winter VMT was assigned to each hour of the day by dividing the five time period VMT totals by the number of hours in each period and assigning the amount to each of the hours in the period. The periods were AM (6am-9am), MD (9am-3pm), PM (3pm-6pm), EV (6pm-10pm), and NT (10pm-6am).

Weekend VMT follows a different hourly pattern than weekday VMT. Weekday VMT has morning and afternoon commute peaks, while weekend VMT has a single extended peak during the mid-day. PSRC does not model weekend VMT patterns. Weekend adjustment factors were calculated by dividing the emissions from the weekend Pierce County Inventory run by the weekday emissions. Calculation of weekend emissions is described more fully in the post-processing section.

Vehicle Counts

Vehicle counts were the same as used in the annual inventory, and were obtained from the design day Inventory mode run.

Road Type Distribution and Speeds

The PSRC roadway links were classified by road type and speed for each time period. Each link's period VMT was matched to emission rates for the appropriate road type and speed.

Post-Processing

The Rates mode produces emission factors in gram per mile and grams per vehicle. The output required extensive post-processing with the PSRC VMT data to calculate emissions for each geographic area. The post-process is detailed in Appendix A3.

4 QUALITY ASSURANCE AND QUALITY CONTROL

In order to provide data of sufficient quality for maintenance planning needs, the inventory process included quality assurance (QA) and quality control (QC) procedures. The procedures addressed data quality objectives of accuracy, completeness, comparability, and representativeness. Ecology used the following target goals for each objective:

- *Accuracy:* The inventory calculated and documented all estimates using acceptable methods. Individual source requirements and availability of data and resources affected estimation method selection.
- *Completeness:* Ecology addressed completeness by ensuring that the inventory included all applicable source categories, and verified that the inventory contained all the information required to estimate emissions.
- *Representativeness:* We calculated actual annual and peak fine particle season daily emissions for the 2008 evaluation year. The inventory calculations used local data wherever possible.
- *Comparability:* Ecology compared data by source category to both the prior 2005 base year inventory done by Ecology and PSCAA's 2005 Inventory. We corrected or justified any discrepancies greater than 20 percent, involving sources that made up greater than five percent of either the 2005 or the 2008 annual inventories.

For the comparability comparison, sources that were inventoried in all three inventories were compared. The sources shaded in the table below had discrepancies greater than 20 percent

involving sources that made up greater than five percent of either the 2005 or the 2008 annual inventories.

For onroad, the SIP Revision Emissions Inventory used the MOVES model with local data. The 2005 inventories used the older MOBILE model. Fleet turnover and the change in models affected the estimates. For wood stoves, the SIP Revision Emission Inventory used a 2007 survey focused on the Nonattainment Area and greater Puget Sound area. 2005 inventories relied on older surveys with fewer respondents.

Table 37: Base Year 2008 Emissions in Tons per Year

Category	2005 EIs				2008		Discrepancy	
	PSCAA	%	ECY	%	SIP EI	%	SIP/PSCAA	SIP/ECY
Onroad Mobile	501	25.4	294	10.0	588	19.9	1.174	0.781
Nonroad Model Sources	414	21.0	434	14.7	398	13.4	0.961	0.640
Marine, except Recreational	89	4.5	89	3.0	105	3.6	1.183	0.787
Locomotives	27	1.4	26	0.9	21	0.7	0.764	0.509
Residential Wood Combustion	679	34.5	1,884	64.1	1,636	55.3	2.409	1.603
Point Sources	181	9.2	177	6.0	205	6.9	1.134	0.754
Residential Fuel Use	78	4.0	36	1.2	7	0.2	0.086	0.057
Total All sources	**1,969**	**100.0**	**2,941**	**100.0**	**2,959**	**100.0**		

4.1 Quality Control Procedures

Ecology performed calculations as appropriate for the given estimation method. QC checks were an integral part of calculations. We performed calculations electronically wherever possible to minimize errors. We made hand calculations to verify electronic calculation equations. This final inventory report fully documents those calculations. During the development of the report we made comparisons to the 2005 inventory to catch any potential errors.

4.2 Quality Assurance Procedures

Several EI staff were involved in calculating the inventories. EI staff performed the reality/peer review and sample calculation checks on one another's work. We used several quality assurance checks to address the data quality objectives:

- Reality/peer review checks
- Sample calculations
- Sensitivity analysis (emissions ranking)
- Range checks (see Comparability objective)

Appendix A1: $PM_{2.5}$, NO_X, and SO_2 Source Categories

Ecology developed a list of fine particle emissions source categories as described in Section 3. The table below lists each category and Pierce County emissions from the 2008 National Emissions Inventory, version 1 general purpose release.

Table 38: 2008 National Emissions Inventory (version 1.5 General Purpose Release)*

Sector	Category	Tons/Yr					Percent Total					Use NEI Estimations for EI
		$PM_{2.5}$	SO_2	NO_X	VOC	NH_3	$PM_{2.5}$	SO_2	NO_X	VOC	NH_3	
NP	CommercialCooking	186			28		5%	0%	0%	0%	0%	X
NP	Cnstr_IndComInst	292					7%	0%	0%	0%	0%	X
NP	Cnstr_Res	15					0%	0%	0%	0%	0%	
NP	Cnstr_Road	161					4%	0%	0%	0%	0%	X
NP	PavedRoads	120					3%	0%	0%	0%	0%	
NP	UnpavedRoads	37					1%	0%	0%	0%	0%	
NP	Fertilizer	0				61	0%	0%	0%	0%	3%	X
NP	ResFuel_Coal	0	0	0	0	0	0%	0%	0%	0%	0%	
NP	ResFuel_DO	5	96	41	2	2	0%	4%	0%	0%	0%	X
NP	ResFuel_Kerosene	0	2	1	0	0	0%	0%	0%	0%	0%	
NP	ResFuel_LPG	0	0	31	1	0	0%	0%	0%	0%	0%	
NP	ResFuel_NatGas	2	3	419	25	89	0%	0%	2%	0%	5%	X
NP	ResFuel_Wood	1,839	30	197	2,395	104	47%	1%	1%	10%	5%	
NP	Livestock	0				1,016	0%	0%	0%	0%	53%	X
NP	CMV	359	1,458	7,970	235	3	9%	60%	29%	1%	0%	
NP	Locomotives	24	8	784	38	0	1%	0%	3%	0%	0%	
NP	Managed_Burns	1		0	1		0%	0%	0%	0%	0%	
NP	OpenBurning	0	0	0	0		0%	0%	0%	0%	0%	
NP	GasCans	0			501		0%	0%	0%	2%	0%	X
NP	GasStations	0			679		0%	0%	0%	3%	0%	X
NP	GasStations_Stg2	0			152		0%	0%	0%	1%	0%	
NP	PetrolStoreTransp	0			109		0%	0%	0%	0%	0%	
NP	Asphalt	0			235		0%	0%	0%	1%	0%	
NP	DryClean	0			208		0%	0%	0%	1%	0%	
NP	SolvConsCom	0			3,311		0%	0%	0%	13%	0%	X
NP	Surf_Arch	0			1,186		0%	0%	0%	5%	0%	X
NP	Surf_Traffic	0			56		0%	0%	0%	0%	0%	
NP	Wastewater	0			15	3	0%	0%	0%	0%	0%	
NR	NRModel	377	82	4,142	4,643	5	10%	3%	15%	19%	0%	
ON	Onroad	225	100	12,791	10,818	611	6%	4%	47%	43%	32%	
P	Airports	2	2	9	14		0%	0%	0%	0%	0%	
P	Point	266	657	912	365	36	7%	27%	3%	1%	2%	
		3,911	**2,437**	**27,296**	**25,016**	**1,929**	**100%**	**100%**	**100%**	**100%**	**100%**	

Full EI

County, Design Day only

*The highlighted categories are the ones Ecology included in the EI. The peach colored rows are included in all the various inventories: county/Nonattainment Area/modeling domain for annual and design day. The green colored rows are the categories we are only doing design day county-level inventories.

Several categories were identified in the guidance as potentially having medium or high significance, but were not inventoried in the 2008 NEI. Some of the categories are captured in-part in the Minor Point Source category. Others are only small contributors to the total winter Nonattainment Area emissions. They will not be included in the inventory.

Table 39: Sources in the Nonattainment Area That will not be Inventoried Because Their Wintertime Emissions are Expected to be Insignificant	
Fuel Combustion—Industrial, Commercial, Institutional	Partly captured in Minor Point Sources
Agricultural Tiling	Expected to be Insignificant
Grain Elevators	Expected to be Insignificant
Mining and Quarrying	Expected to be Insignificant, partly captured in Minor Point Sources
Other Combustion	
Wildfires	Expected to be Insignificant
Cigarette Smoke	Expected to be Insignificant
Charcoal Grilling–Residential	Expected to be Insignificant
Firefighting Training	Expected to be Insignificant
Aircraft/Rocket Engine Firing and Testing	Expected to be Insignificant
Structure Fires	Expected to be Insignificant
Motor Vehicle Fires	Expected to be Insignificant
Open Fire	Expected to be Insignificant
Cremation, Human and Animal	Expected to be Insignificant

Appendix A2: Residential Wood Combustion Temperature Adjustment

We calculated residential wood combustion emissions for the three temperature profiles calculated for the design day (see IPP). The calculation is similar to the residential wood combustion temperature adjustment system used in the AIRPACT air quality forecasting model. Briefly, analysis of several fine particle and meteorological monitoring sites throughout the region showed a strong linear relationship between ambient temperature and ambient fine particulate concentrations at temperatures below 50 degrees Fahrenheit.[39] This relationship was used to develop the temperature adjustment system. The adjustment system involves normalizing emissions to heating degree days (based on 50 degrees = HDD_{50}), and then multiplying the normalized value by the heating degree days for the design day. A more detailed description follows.

1) Calculate baseline-heating degree-days (HDD_{50})

Calculate annual heating degree days (HDD_{50}) for wood stove survey period Sept. 2006–Aug. 2007. This is the sum of the heating degree days for each day of the year. Daily min-max temperatures from the Tacoma - South L-Street meteorological site were used.

Annual $HDD_{50} = \sum_{I=1}^{365} 50 - Tavg_i$, *where Tavg = the daily average temperature (sum over all 365 days).*

If Tavg > 50, set the value of Tavg = 50.

= 1299

2) Calculate emissions as tons per HDD_{50}

Calculate annual county emissions (tons/yr). Divide the annual emissions by the annual HDD_{50} calculated in step (1). The result is emissions expressed as tons per HDD_{50}. This can be viewed as emissions normalized to heating degree days.

Tons/HDD_{50} *= (Tons/yr) /* HDD_{50}*/yr)*

3) Calculate the design day HDD_{50}

The design day heating degree days are calculated as (50 – average temperature for the day). The average temperatures used in the calculation is the average of the maximum and minimum temperatures for the three design day temperature profiles.

Design Day HDD_{50} *= 50 –average temperature for the design day*

HDD_{50} for 25th percentile profile = 50 – (43 + 32)/2 = 9

HDD_{50} for 50th percentile profile = 50 – (46 + 27)/2 = 14

HDD_{50} for 75th percentile profile = 50 – (40 + 23)/2 = 18

4) Calculate the design day emissions

Multiply the emissions in Tons/HDD_{50} by the design day HDD_{50} calculated in step (3). These are the final daily emissions.

Tons/day = Tons/HDD_{50} *x* HDD_{50}

Appendix A3: MOVES Parameters and Post-Processing

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List of Tables

1 MOVES INPUT PARAMETERS

Motor Vehicle Emission Simulator (MOVES) input parameters suitable for modeling average daily emissions for nonattainment/maintenance plan areas are presented here. Input parameters were developed that are characteristic of local conditions for each county and month. Some of the parameters presented here require local data. For others, EPA recommends that local data be used, especially when constructing mobile source inventories for State Implementation Plan (SIP) or conformity purposes. Inputs have been developed for modeling base year 2008.

1.1 VMT Average Speed

MOVES Table: avgSpeedDistribution

Used the MOVES default.

1.2 Vehicle Miles Traveled Statistics

MOVES Tables: HPMSVtypeYear, roadTypeDistribution, roadType

The number of vehicle miles traveled (VMT) are used in MOVES. The MOVES input files require summations of VMT statistics by several different road and vehicle classifications. VMT data and crosswalks between Highway Performance Monitoring System (HPMS) and MOVES classifications are shown in tables below.

1.2.1 County Vehicle Miles Traveled

MOVES Table: HPMSVtypeYear

The national Department of Transportation's Highway Performance Monitoring System (HPMS) VMT data as obtained from the Washington State Department of Transportation (WSDOT) was used for the annual inventory.[1] HPMS is a system of traffic counts collected over several urban and rural sampling areas. WSDOT makes estimates of county VMT by roadway (functional) classification.

In MOVES, VMT must be allocated by MOVES road type and HPMS vehicle type. To allocate the VMT by HPMS vehicle type, WSDOT's travel activity by vehicle type and road class was examined. The data were not suitable for allocating VMT by vehicle type. This was due to uncertainty in assigning similar vehicle types (e.g., cars vs. light trucks, light trucks vs. smaller single-unit trucks). In lieu of the WSDOT data, a default 2008 MOVES run for the nation was conducted to determine the national distribution of VMT by vehicle and road type. This distribution was used to allocate the fraction of county VMT for each road type to the HPMS vehicle types (Table 1-1). It is noted that EPA developed the national travel fractions assuming that vehicles in the same HPMS class have the same road type distribution. County VMT estimates by HPMS vehicle class (b) were calculated:

(1) a = VMT x TF, for each combination of county, HPMS road type (Table 1-2) and HPMS vehicle class (Table 1-5). VMT is from Table 1-2. TF is the travel fraction from Table 1-1.
(2) b = ∑(a), by county and HPMS vehicle class.

1.2.2 Road and Vehicle Type Travel Distribution

MOVES Table: roadTypeDistribution

The MOVES roadTypeDistribution file contains VMT fractions by MOVES vehicle and road type. Though the vehicle breakout uses the MOVES vehicle classes, it is achieved by assuming all MOVES vehicle types included in a single HPMS class have the same road distribution (inherent assumption in the national travel fractions). The distribution fractions (d) were calculated for each MOVES vehicle type and MOVES road type as follows:

(1) a = VMT x TF, for each combination of HPMS road type (Table 1-2), MOVES road type (Table 1-4), and MOVES vehicle class (Table 1-5). VMT is from Table 1-2. TF is the travel fraction from Table 1-1.
(2) b = ∑(a), by MOVES road type and vehicle class.
(3) c = ∑(a), by vehicle class.
(3) d = b/c

1.2.3 Restricted Road Ramp Fraction

MOVES Table: roadType

To model restricted- access roads (e.g., freeways), vehicle hours traveled are split between the ramps and the roadway. The MOVES ramp fraction default is eight percent. It is recommended to use the default unless local data exists to replace the default. Since local data was not available, the default was used.

1.2.4 WSDOT VMT Information and MOVES-HPMS Classifications

Table 1-1: National Travel Activity by MOVES Vehicle and Road Class					
HPMS Veh Class	MOVES Veh Class	Rural		Urban	
		Restricted	Unrestricted	Restricted	Unrestricted
Motorcycles	Motorcycle	0.0054	0.0054	0.0054	0.0046
Passenger Cars	Passenger Car	0.4642	0.5259	0.5536	0.5718
Other 2 axle-4 tire	Passenger Trk	0.2389	0.2820	0.2722	0.2825
Other 2 axle-4 tire	Light Commercial Trk	0.0798	0.0942	0.0909	0.0944
Buses	Intercity Bus	0.0012	0.0015	0.0006	0.0006
Buses	Transit Bus	0.0004	0.0005	0.0002	0.0002
Buses	School Bus	0.0013	0.0017	0.0007	0.0007
Single Unit Trucks	Refuse Truck	0.0008	0.0009	0.0006	0.0006
Single Unit Trucks	Single Unit Short-haul Trk	0.0266	0.0300	0.0188	0.0180
Single Unit Trucks	Single Unit Long-haul Trk	0.0034	0.0039	0.0024	0.0023
Single Unit Trucks	Motor Home	0.0016	0.0018	0.0011	0.0011
Combination Trucks	Cmb Short-haul Trk	0.0746	0.0221	0.0226	0.0098
Combination Trucks	Cmb Long-haul Trk	0.1018	0.0302	0.0309	0.0134

Table 1-2: Pierce County WSDOT ADVMT in Thousands by HPMS Road Type, 2008					
Rural					
Interst	Prin Art	Min Art	Maj Col	Min Col	Local
329	0	549	148	33	104
Urban					
Interst	Free/Expr	Prin Art	Min Art	Col	Local
3,219	2,765	3,653	3,306	765	1,969

Table 1-3: HPMS and MOVES Road Classifications		
HPMS Road Type	WSDOT Road Type (temporal)	MOVES Road Type
Rural Interstate	Rural Interstate	Rural Restricted Access
Rural Principal Arterial Other	Rural Arterial	Rural Unrestricted Access
Rural Minor Arterial	Rural Arterial	Rural Unrestricted Access
Rural Major Collector	Rural Other	Rural Unrestricted Access
Rural Minor Collector	Rural Other	Rural Unrestricted Access
Rural Local	Rural Other	Rural Unrestricted Access
Urban Interstate	Urban Interstate	Urban Restricted Access
Urban Principal Arterial Freeway/Expressway	Urban Arterial	Urban Restricted Access
Urban Principal Arterial Other	Urban Arterial	Urban Unrestricted Access
Urban Minor Arterial	Urban Arterial	Urban Unrestricted Access
Urban Collector	Urban Arterial	Urban Unrestricted Access
Urban Local	Urban Arterial	Urban Unrestricted Access

Table 1-4: HPMS and MOVES Vehicle Classifications	
MOVES Vehicle Type	**HPMS & MOVES Vehicle Class**
Motorcycle	Motorcycles
Passenger Car	Passenger Cars
Passenger Truck	Other 2 axle-4 tire vehicles
Light Commercial Truck	Other 2 axle-4 tire vehicles
Intercity Bus	Buses
Transit Bus	Buses
School Bus	Buses
Refuse Truck	Single Unit Trucks
Single Unit Short-haul Truck	Single Unit Trucks
Single Unit Long-haul Truck	Single Unit Trucks
Motor Home	Single Unit Trucks
Combination Short-haul Truck	Combination Trucks
Combination Long-haul Truck	Combination Trucks

1.3 VMT Temporal Adjustments

MOVES Tables: monthVMTFraction, dayVMTFraction, hourVMTFraction

VMT is not temporally uniform. WSDOT provided adjustment factors for month, day-of-week, and hour (weekday and weekend).[2] The adjustment factors were based on traffic counter data, and were calculated for five road classes. MOVES temporal files were developed using the WSDOT temporal adjustments with WSDOT VMT and road and vehicle travel estimates described in Section 1.2.

It is again noted that EPA developed the national travel fractions assuming that vehicles in the same HPMS class have the same road type distribution. Therefore, all MOVES vehicle types included in a single HPMS vehicle class have the same temporal adjustments. In the MOVES default database, all vehicle types are assumed to have the same temporal distributions. The same assumption will be made for Washington, since the state has no information to develop temporal distributions by vehicle type.

The MOVES day-of-week and hourly adjustment files contain adjustment factors by MOVES vehicle and road type. One set of adjustments were developed for the state. Because the adjustments are specific to road type, the factors can be applied to Pierce County based on the individual mix of road types within the county. The MOVES monthly adjustment file contains estimates by MOVES vehicle type, but not by road type. Without road type, county variation could not be obtained through linkage with the county mix of road types. Therefore, the monthly adjustments were constructed for Pierce County specifically.

1.3.1 Monthly Adjustments

MOVES Table: monthVMTFraction

The monthly adjustments (d) were calculated for leap years and non-leap years for each month. The same distribution is used for all vehicle types; this is consistent with the MOVES default. The *Other Rural Arterial* category is used to represent MOVES class *Rural Unrestricted*. *Off-network* fractions were calculated as the average of the fractions for *Urban Restricted* and *Urban Unrestricted*.

Non-Leap Year

(1) a = ∑VMT, for Pierce County and MOVES road type (Table 1-4). VMT is from Table 1-2.
(2) b = ∑(a), for Pierce County
(3) c = a/b, which are VMT fractions by county and MOVES vehicle class.
(4) m = WSDOT VMT fractions by month and MOVES road type. The fractions were calculated from the data in Table 1-6 such that the fractions sum to 1 for the year.
(5) d = ∑(c x m), by month

Leap Year

Leap year factors were calculated by multiplying the WSDOT February monthly adjustments by 29 days/28 days, (2) summing all monthly adjustments by vehicle type (using the new adjustment for Feb.), and (3) normalizing all the monthly factors by dividing them by the summed monthly adjustments.

Table 1-5: WSDOT VMT Monthly Adjustment Factors

WSDOT Road Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rural Interstate	0.77	0.85	0.93	1	1.03	1.12	1.22	1.24	1.1	1.03	0.89	0.83
Other Rural Arterial	0.77	0.86	0.9	0.95	1.04	1.12	1.25	1.26	1.11	1.03	0.84	0.79
Other Rural	0.72	0.77	0.82	0.87	1.05	1.23	1.42	1.36	1.2	1.01	0.84	0.71
Urban Interstate	0.92	0.97	0.99	1.01	1.06	0.99	0.98	0.98	0.99	0.95	0.91	0.91
Other Urban Arterial	0.92	0.95	0.98	1.01	1.06	1.07	1.06	1.07	1.03	1	0.93	0.93

1.3.2 Day of Week Adjustments

MOVES Table: dayVMTFraction

The day-of-week adjustments (d) were calculated for each day type (weekday, weekend) and MOVES road type. The same distribution is used for all months and vehicle types; this is consistent with the MOVES default. The *Other Rural Arterial* category is used to represent MOVES class *Rural Unrestricted*. *Off-network* fractions were calculated as the average of the fractions for *Urban Restricted* and *Urban Unrestricted*.

(1) a = ∑ Mon to Fri adjust. factors (Table 1-7) for each MOVES road type (Table 1-4).

(2) b = ∑ Sat and Sun adjust. factors (Table 1-7) for each MOVES road type (Table 1-4).

(3) c = a+b, by MOVES road type.

(4) $d_{weekday}$ = a/c, $d_{weekend}$ = b/c

Table 1-6: WSDOT VMT Day of Week Adjustment Factors (x 100)

Road Type	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Rural Interstate	107.38	93.76	88.1	89.95	98.22	122.86	99.66
Other Rural Arterial	96.32	95.22	94.32	95.17	100.48	117.73	100.13
Other Rural	100.33	93.64	92.97	94.06	98.66	110.45	110.8
Urban Interstate	79.69	101.01	103.03	104.91	106.65	112.69	92.02
Other Urban Interstate	75.33	102.5	104.86	106.51	107.92	113.47	89.25

1.3.3 Hourly Adjustments

MOVES Table: hourVMTFraction

The hourly adjustments (b) were calculated for each day type (weekday, weekend), hour, and MOVES road type. The same distribution is used for all vehicle types; this is consistent with the MOVES default. The *Other Rural Arterial* category is used to represent MOVES class *Rural Unrestricted*. *Off-network* fractions were calculated as the average of the fractions for *Urban Restricted* and *Urban Unrestricted*.

(1) a = ∑ Hourly factors (Table 1-8) for each MOVES road type (Table 1-4) and day type (weekday/weekend)

(2) $b_{weekday}$ = Hour j/a, where j = 1 through 24, and daytype = weekday

(3) $b_{weekend}$ = Hour j/a, where j = 1 through 24, and daytype = weekend

Table 1-7: WSDOT VMT Hourly Fractions (x 100)										
Hour	Rural						Urban			
	Interstate		Arterial		Other		Interstate		Other	
	Wkday	Wkend	Wkday	Wkend	Wkday	Wkend	Wkday	Wkend	Wkday	Wkend
1	1	1.2	0.6	1	0.6	1	0.8	1.6	0.6	1.6
2	0.8	0.8	0.4	0.6	0.4	0.8	0.6	1	0.4	1
3	0.6	0.6	0.4	0.4	0.4	0.6	0.4	0.8	0.4	0.8
4	0.8	0.6	0.6	0.4	0.6	0.4	0.6	0.6	0.4	0.6
5	1.2	0.6	1	0.6	1.4	0.6	1.2	0.6	1.2	0.6
6	2.4	1	2.2	1	2.6	1	3.2	1	2.8	1.2
7	3.6	1.6	3.8	1.6	4.2	1.4	5.2	1.8	5.2	1.8
8	4.6	2.6	5.2	2.6	5.6	2.4	6.6	2.6	6.6	2.6
9	4.8	3.8	5.2	4	5.2	3.8	6	3.8	5.8	3.8
10	5.4	5.2	5.8	5.6	5	5.2	5.2	5	5.4	5
11	6	6.4	6.2	7	5.4	6.6	5.2	6	5.2	6.2
12	6.4	7.2	6.6	7.8	5.8	7.6	5.2	6.8	5.4	7
13	6.6	7.6	7	8.4	6.2	8.4	5.6	7.2	5.8	7.6
14	6.8	7.8	7	8.4	6.6	8.6	5.8	7.4	6	7.6
15	7.2	8	7.6	8.4	7	8.6	6.4	7.4	6.6	7.6
16	7.6	8	8.2	8.4	8	8.6	7	7.4	7.4	7.4
17	7.6	7.8	8.2	8	8.4	8.2	7.4	7.4	7.8	7.4
18	7.2	7.2	7.4	7	8.2	7.2	7.4	7	7.4	7
19	5.6	6.2	5.4	5.8	6.2	5.8	5.8	6.2	5.8	6.2
20	4.4	5	3.8	4.6	4.4	4.6	4.2	5.2	4.2	5
21	3.6	4	3	3.4	3.4	3.4	3.4	4.4	3.4	4.2
22	2.8	3	2.2	2.6	2.6	2.6	3	3.8	2.8	3.6
23	2	2.2	1.6	1.8	1.6	1.8	2.2	3	2	2.8
24	1.4	1.4	1	1.2	1	1.2	1.4	2	1.4	1.8

1.4 Fleet Characteristics

MOVES Tables: sourceTypeAgeDistribution, sourceTypeYear, SCCVtypeDistribution

Washington has a substantially older fleet than the national average. This has a significant effect on emissions. Local data sources were supplemented with some national default information to calculate the number of vehicles by type and age, and the age distribution as of December 31. The data sources and calculations are described below.

The Washington State Department of Licensing (DOL) registers non-governmental vehicles annually. Registrations for calendar year 2008 were obtained from DOL.[3] Because DOL does not register public transit and school buses each year, alternate sources of information were obtained.

Transit and Intercity bus data came from Federal Transit Administration (FTA) Annual Report data for 2008.[4] EPA classified all FTA buses as Transit when they developed the default database. They used Federal Highway Administration (FHWA) bus information to develop the Intercity estimates. EPA believed this estimate should be improved. The overall split was 62 percent/38 percent Intercity/Transit. For Washington, the FTA data appears to include both

Intercity and Transit (though could not find definition of these terms). For the Washington fleet, the FTA counts were supplemented with private bus counts from DOL (identified as Stages). Though the end use (school or other transit) of the DOL buses cannot be determined by any easy means, they are only a small portion of the buses (~300). The default 62 percent/38 percent Intercity/Transit split was applied to the total.

For public school buses, the Washington State Office of the Superintendent of Public Instruction (OSPI) supplied data for 2008.[5] Private school buses were counted in the DOL data. Total school buses were the sum of the DOL and OSPI data.

1.4.1 Age Distribution

MOVES Table: sourceTypeAgeDistribution

The DOL, FTA, and OSPI registration data was used to calculate the number of vehicles in the state by model year for several vehicle classes. The registration classes matched to the MOVES vehicle types as shown in Table 1-9.

Four of the registration classes had to be split in order to match the MOVES vehicle types: light duty trucks, non-refuse single unit trucks, combination trucks, and transit/intercity buses. To make the splits, the fractions in Table A.1 of the MOVES Technical Guidance were used.[6] The fractions were multiplied by the number of Washington registrations in the registration class to estimate the number of Washington registrations in the MOVES vehicle type.

Table 1-8: DOL and MOVES Vehicle Classifications

MOVES Vehicle Type	WA Registration Vehicle Class
Motorcycle	Motorcycle
Passenger Car	Passenger Car
Passenger Truck	Trucks up to 19,500 lbs gvwt
Light Commercial Truck	Trucks up to 19,500 lbs gvwt
Intercity Bus	Transit/Intercity Bus
Transit Bus	Transit/Intercity Bus
School Bus	School Bus
Refuse Truck	Refuse Truck
Single Unit Short-haul Truck	Single Unit Trucks > 19,500 lbs gvwt
Single Unit Long-haul Truck	Single Unit Trucks > 19,500 lbs gvwt
Motor Home	Motor Home
Combination Short-haul Truck	Combination Trucks
Combination Long-haul Truck	Combination Trucks

1.4.2 Vehicle Counts

MOVES Table: sourceTypeYear

Vehicle counts and MOVES vehicle type for 2008 were calculated according to the MOVES Technical Guidance.[6] Vehicle counts were calculated as described in Section 1.4.

An adjustment was made for short and long haul single and combination trucks. County registrations may not be a good indicator of trucking activity in an individual county. For these trucks, the state total registrations were apportioned to Pierce County based on county-to-state truck VMT calculated in Section 1.2.1.

Table 1-9: Vehicle Counts

MOVES Vehicle Type	Pierce
Motorcycle	22,835
Passenger Car	279,200
Passenger Truck	246,062
Light Commercial Truck	80,118
Intercity Bus	289
Transit Bus	177
School Bus	1,202
Refuse Truck	236
Single Unit Short-haul Truck	3,768
Single Unit Long-haul Truck	262
Motor Home	7,307
Combination Short-haul Truck	1,776
Combination Long-haul Truck	1,530
TOTAL VEHICLES	644,762

1.5 Vehicle Inspection and Maintenance Program

MOVES Table: IMCoverage

A Vehicle Inspection and Maintenance (I/M) program is operated in the Puget Sound region.[7] Both gasoline and diesel vehicles are tested, but MOVES only models I/M benefits for gasoline vehicles. The remainder of this section addresses the I/M program for gasoline vehicles.

In MOVES, the I/M program is defined for each county and evaluation year. The required parameters are test frequency, pollutant, test type, first and last model year tested, fuel type, vehicle type, emissions process, and compliance factor. They are described in more detail below.

The test frequency is biennial. The pollutant and emissions processes tested are exhaust hydrocarbons and carbon monoxide, and evaporative hydrocarbons.

The program includes multiple test types. From 2008 to June 30, 2012, vehicles required to test are given a gas cap check, and either a 2500/idle test, acceleration simulation mode (ASM) test, or on-board diagnostic (OBD) test. The vehicle type and model year determine the test type given. Beginning July 1, 2012, Ecology is proposing to simplify the I/M tests by eliminating the gas cap check and ASM tests. The I/M program will be ended no later than December 31, 2019, and may be ended in 2017.

A summary of the test types, model years tested, and vehicle (duty) types are shown in the table below.

Table 1-10: I/M Program Test Types and Applicable Model Years and Vehicle Duty Class

ID	Test Type	Veh Duty	First MY	Last MY
1	ASM 2525 Phase-in Cutpoints	Light	First MY	1995
2	Two-mode, 2500 RPM/Idle Test	Light		
3	Exhaust OBD Check	Light	1996	Last MY
4	Two-mode, 2500 RPM/Idle Test	Heavy	First MY	Last MY
5	Evaporative Gas Cap Check	Heavy	First MY	1999
6	Evaporative System OBD Check	Light	1996	Last MY
7	Evaporative Gas Cap Check	Light	First MY	1995

Note: First and last model year (MY) for each year of evaluation are defined in WACs 173-422 and 173-422A.

The final parameter is the compliance factor. The compliance factor is the product of the compliance rate and (100 - waiver rate)/100. The compliance rate is the percentage of vehicles required to test that either pass the test or receive a waiver. A compliance factor was calculated for each geographic area based on 2007 testing and licensing data.[8] The waiver rate is the percentage of vehicles that fail an initial test and do not pass a retest, but do receive waiver. Waiver rates were calculated for each test type and geographic area based on 2007–2008 testing data.[9]

Table 1-11: Compliance Rate, Waiver Rate, and Compliance Factor

ID	Test Type	Veh Duty	Waiver Rate	Compliance Rate	Compliance Factor
1	ASM 2525 Phase-in Cutpoints	Light	20.5	94.5	75.1
2	Two-mode, 2500 RPM/Idle Test	Light	19.7	94.5	75.9
3	Exhaust OBD Check	Light	27.9	94.5	68.1
4	Two-mode, 2500 RPM/Idle Test	Heavy	13.6	94.5	81.6
5	Evaporative Gas Cap Check	Heavy	0	94.5	94.5
6	Evaporative System OBD Check	Light	27.9	94.5	68.1
7	Evaporative Gas Cap Check	Light	0	94.5	94.5

1.6 Meteorological Parameters

MOVES Table: zoneMonthHour

Emissions are affected by temperature and humidity. These parameters are required by month and hour to estimate emission rates. EPA contracted with Air Improvement Resources, Inc. (AIR) to develop MOVES default average temperature and humidity data for each month and hour. AIR developed the parameters using data from the National Climatic Data Center, National Weather Service and its Cooperative Observation branch, and the Federal Aviation Administration.[10]

The defaults were examined. They appeared reasonable and were used for calculating the annual inventory. Daily emissions were calculated using the median temperature profile described in the main inventory documentation.

1.7 Fuel Parameters

MOVES Tables: fuelFormulation, fuelSupply, AVFT Strategy file

The gasoline fuel parameters are Reid vapor pressure (RVP); sulfur content; oxygenate types, volume, and market share; aromatic, olefin, and benzene content; and the volume percentage of gasoline evaporated at 200 and 300 degrees Fahrenheit. For diesel, only sulfur content is required. Gasoline fuel parameters were determined using a combination of legal specifications, MOVES defaults, and fuel survey information.

Fuel survey information came from Northrop-Grumman. They sample summer and winter gasoline in several major urban areas. The surveys provide information for all the parameters except the market share of oxygenates. Sampling data were obtained for the summer of 2007, and the winter of 2006–2007 for three urban areas: Portland, Seattle, and Spokane.[11] The samples were grouped by area and oxygenate level (zero percent or 10 percent). The survey did not include volumetric data necessary to calculate weighted averages of the parameters; therefore, the survey data could not be used directly to develop MOVES fuel properties.

The MOVES defaults came from the National Mobile Inventory Model (NMIM) County Database (NCD), which has actual data for years up to 2005; and the Energy Information Administration's Annual Energy Outlook 2007, which projected fuel usage for 2012. Counties were allocated to one of four groups: (1) King, Pierce, and Snohomish, (2) Spokane, (3) Other Western Washington, (4) Other Eastern Washington.

The default data county groupings separating King/Pierce/Snohomish from the rest of western Washington were likely based on past conditions. Pierce/King/Snohomish Counties were once part of a voluntary low Reid Vapor Pressure (RVP) agreement, but this condition no longer existed in 2008. A comparison of the MOVES defaults with the Northrup-Grumman data showed the Seattle survey data (representing King/Pierce/Snohomish) agreed better with the Other Western Washington group (excluding RVP). Without volumetric survey data, selecting the best default was partly subjective.

The MOVES Technical Guidance[6] recommended using model defaults for all fuel properties except RVP and oxygenated fuel market share, unless survey data was available and included volumetric data to weigh the sample results. Since the Northrup-Grumman data did not include volumes, the guidance recommendation was followed, though Pierce County was regrouped according to the best-fit with survey data ranges as described in the paragraph above (see Section 1.7.4).

Additional information is provided for some of the parameters below.

1.7.1 Reid Vapor Pressure (RVP)

RVP varies by year, geographic area, and time of year. The most recent RVP requirements were set in 1992.[12] The summertime (May–Sept.) RVP limit for Washington is 9.0 pounds per square inch (psi). When using a 10 percent ethanol blend, the RVP limit is allowed to increase by 1 psi, so ethanol fuels' RVP was increased 1 psi. (The MOVES model defaults did not increase RVP by the waiver amount).

The default MOVES winter RVPs were unchanged. Instructions for the NMIM County Database specify how to calculate RVP for each month based on the summer and winter RVPs.[13] December, January, and February are all given the winter value. May through October are given the summer value. March, April, and November are set according to the equation:

SummerRVP + [(WinterRVP – SummerRVP) * 0.57]

1.7.2 Oxygenated Fuels

Federal regulations require increasing amounts of ethanol be used nationally. Most commonly, ethanol fuels are a blend of 10 percent ethanol and 90 percent gasoline (abbreviated as E10). The actual Northrup-Grumman survey values ranged from 8.2 to 10.9 percent ethanol. All fuels in this range were modeled as E10.

In 2008 Washington saw a rise in E10 use from approximately 46.5 percent in the early part of the year to near 100 percent by the year's end.[14] E10 fuel is expected to stay at 100 percent for 2009 and future years.

1.7.3 Fuel Sulfur Content

1.7.3.1 Gasoline

Federal Tier 2 regulations require refiners to meet an average gasoline sulfur content of 30 parts per million (ppm). The Northrup-Grumman fuel survey data showed sulfur contents ranging from 11 ppm to 55 ppm. In MOVES, sulfur values below 30 ppm are treated as 30 ppm.[15, 16] The MOVES default of 45 ppm was used.

1.7.3.2 Diesel

Sulfur content is the only parameter for diesel fuel. Under the federal 2007 Heavy-Duty Highway Rule, most diesel fuel was required to meet a 15 ppm sulfur limit on September 1, 2006. There are credits, phase-ins, and hardship provisions that result in a full phase-in on December 1, 2010.[17] The MOVES model sulfur content default of 43 ppm was used.

1.7.4 Final Gasoline Parameters

The default MOVES fuel parameters for Western and Eastern Washington were used as templates to create fuel profiles. The RVPs were changed as necessary to reflect the summertime legal limits and interpolated spring/fall values, and the oxygenated fuel waiver. Oxygenated fuels were modeled as E10. The market shares were changed to reflect actual ethanol usage.

Table 1-12: Western Washington Gasoline Parameters, 2008

Month	Market Share	Ethanol	RVP	Sulfur	Aromatic	Olefin	Benzene	E200	E300
	%	%	psi	ppm	%	%	%	%	%
Jan-Feb	53.5	0	14.2	45.1	28.6	8.2	1.45	49	87
Mar	53.5	0	12.0	45.1	28.6	8.2	1.61	50	87
Apr	33.7	0	12.0	45.1	28.6	8.2	1.61	50	87
May-Oct	33.7	0	9.0	45.1	28.6	8.2	1.83	50	87
Nov	3.0	0	12.0	45.1	28.6	8.2	1.61	50	87
Dec	3.0	0	14.2	45.1	28.6	8.2	1.45	49	87
Jan-Feb	46.5	10	14.2	45.1	28.6	8.2	1.45	49	87
Mar	46.5	10	12.4	45.1	28.6	8.2	1.61	50	87
Apr	66.3	10	12.4	45.1	28.6	8.2	1.61	50	87
May-Oct	66.3	10	10.0	45.1	28.6	8.2	1.83	50	87
Nov	97.0	10	12.4	45.1	28.6	8.2	1.61	50	87
Dec	97.0	10	14.2	45.1	28.6	8.2	1.45	49	87

1.7.5 Transit and Intercity Bus Fuel

MOVES Alternate Fuels and Vehicle Technology file

Pierce County Transit's buses run almost exclusively on Compressed Natural Gas (CNG). The fuel was defined as 100 percent CNG via the MOVES Strategy panel for Alternate Fuels and Vehicle Technologies (AFVT).

1.8 Stage II Vapor Recovery

MOVES Table: countyYear

A stage II vapor recovery program began in 1992 in Pierce County.[18] Gasoline stations dispensing more than 600,000 gallons per year were required to install stage II controls.

MOVES models stage II programs by county using the percent efficiency of the controls on vapor displacement and spills. Recent program data has not been collected to calculate the efficiencies. AP42 and MOBILE documents gave some guidance on a total efficiency as follows: When information on the amount of gasoline dispensed is available by control category, i.e., with stage II control and without stage II control, the efficiencies may be set to 90 percent, which is the expected efficiency of the stage II system.[19] This is the preferred method. When information on the amount of gasoline dispensed with and without stage II control is not known, the efficiencies may both be set to 86 percent,[20] which is a combined estimate of the efficiency of the stage II system, the amount of gasoline dispensed through stage II controls, and the effect of enforcement programs.[21]

MOVES used Washington's old calculation of 86 percent as the MOVES default vapor displacement efficiency for Washington counties using stage II. MOVES default spillage efficiency is 50 percent for all counties in the nation using stage II. The MOVES defaults were used.

2 WINTER DAY INVENTORY POST-PROCESSING

Post-processing MOVES and VMT data to calculate winter day emissions for each geographic area consisted of nine steps. Each step is described below.

1) Assign each link to the MOVES Road Type.
2) Apportion each link's VMT to one or two MOVES speed bins.
3) Split VMT into the individual 24 hours.
4) Split VMT by fuel type (gas, diesel, CNG).
5) Calculate link population.
6) Generate emission factors using the MOVES model for the three design day temperature profiles.

7) Calculate weekday link emissions.
8) Estimate weekend link emissions.
9) Allocate the link emissions to Pierce County and the Nonattainment Area.

PSRC provided VMT by link for five time periods (AM, MD, PM, EV, NT).[22]

- Node coordinates
- Length
- Facility type
- Functional class (for most links)
- Nonattainment area flag
- Congested speed
- VMT

2.1 Step 1 – Assign each link to the MOVES Road Type

Table 2-1: PSRC and MOVES Road Types

PSRC Facility Type	MOVES Road Type
Urban Arterial	Urban Unrestricted
Rural Arterial	Rural Unrestricted
Freeways or Expressways with any Urban Functional Class	Urban Restricted
Freeways or Expressways with any Rural Functional Class	Rural Restricted
Freeways or Expressways with no Functional Class	Urban Restricted
Centroid Connectors *see assignment logic below*	Rural Unrestricted
Centroid Connectors *see assignment logic below*	Urban Unrestricted

Centroid Connectors represent travel from one zone to another and were predominantly assigned a functional class of *5*. Class 5 is not identified as either rural or urban. Centroid connector links were classified by querying all links with the same i-node coordinate as the given centroid connector. If any i-node coordinate was classified as an urban arterial, then the centroid connector was classified as urban unrestricted. If no i-node coordinate was classified as urban, but one or more was classified as a rural arterial, then the centroid connector was classified as rural unrestricted. If there were no other links with the same i-node, or the i-nodes could not be classified, then the centroid connector was classified as urban unrestricted.

2.2 Step 2 – Apportion each link's VMT to one or two MOVES speed bins

The calculation is described in the MOVES Technical Guidance for SIPs.[6] The calculation assigns a portion of the link VMT to the speed bins with midpoints that lie below and above the link speed as shown in the example below. (Note in the guidance, the midpoint of speed bin 1 is 2.5 mph, and the midpoint of speed bin 16 is 75 mph for the purposes of the calculations.)

EXAMPLE
Given: Link speed = 17 mph with 50 VMT.
This speed falls between the midpoints of bins 4 and 5:
Bin 4 midpoint = 15, Bin 5 midpoint = 20

Calculation:
Fraction of VMT in bin 4: 1-[(17-15)/(20-15)] = 0.6; VMT in bin 4 = 50 x 0.6 = 30
Fraction of VMT in bin 5: 1-[(20-17)/(20-15)] = 0.4; VMT in bin 5 = 50 x 0.4 = 20

NOTE: This process creates records for each speed bin, resulting in two records for each link that fell in between two speed bins. As an alternate, additional fields could have been added to each link: binA, binA VMT, binB, binB VMT.

2.3 Step 3 – Split VMT into the individual 24 hours

MOVES emission rates are specific to each hour. To match emission rates to VMT, VMT was assigned to each hour. Each PSRC time period was split into its individual hours by dividing the VMT by the number of hours in each period. For example, the AM peak runs from 6 to 9, so the VMT in this period was divided by 3 and assigned to each hour 6, 7, and 8.

NOTE: An alternate way of handling the hourly variation would be to adjust the emission factors to match the PSRC time periods: *Average* the MOVES rateperdistance emission factors, and *add* the rateperprofile and ratepervehicle emission factors for each time period.

2.4 Step 4 – Split VMT by fuel type (gas, diesel, CNG)

MOVES was used to make the fuel split. It was run in Inventory mode, with Distance Traveled and Population output checked in the Activity box of the General Output panel (population will be used in the next step). Fuel Type and Road Type were checked in the Output Emissions panel. The other MOVES settings and inputs were the same as for the actual emission factor runs. These will be described later in this document. The activity output from the MOVES run was used to calculate the fraction of VMT for each fuel type by county, day type (weekday, weekend), hour, and road type. These fractions were multiplied by the link VMT to assign to each fuel type.

NOTE: This step is not necessary if emissions by fuel type are not necessary.

2.5 Step 5 – Calculate link population

Vehicle populations are needed since part of the emission factors are output in grams pervehicle (e.g., start emissions, some evaporative emissions). We are lacking a good spatial data for these processes, so they are allocated to links based on the amount of VMT. Vehicle populations are constant for each hour, meaning the entire vehicle population is used in each hour's emissions calculation.

Link VMT from the previous step was disaggregated by hour, speed bin, and fuel type. This resulted in multiple records for each link. Other link characteristics were nonattainment area flag, day type, and road type. The population output from the MOVES Inventory mode run used in the previous step gave population by fuel type. VMT was summed by day type, hour, and fuel type. Each link record's VMT was divided by this sum to calculate the fraction of population to assign to each link record. The fraction was multiplied by the population by fuel type.

NOTE: This step was the most confusing of the steps. Care must be taken to check results and make sure the sum of all link population by hour is the total vehicle population.

2.6 Step 6 – Generate emission factors using the MOVES model for the three design day temperature profiles

MOVES was run at the County Scale in Emission Rate (factor) mode according to the MOVES Technical Guidance for SIPs. The panel and County Data Manager settings and input files are described in a separate document. Emissions factors are output in three files: rateperdistance (grams per mile), rateperprofile (grams per vehicle), and ratepervehicle (grams per vehicle).

Emission factors in the rateperdistance file can be output by year, month, day type, hour, pollutant, process, vehicle type or source classification code (SCC), fuel type, model type, road type, and speed bin. Panel settings determine how aggregated they can be. For this project, they were output by year, month, day type, hour, pollutant, process, fuel type, road type, and speed bin. They were summed to eliminate process type since it was not needed for this project.

Emission factors in the rateperprofile file can be output by temperature profile, year, day type, hour, pollutant, process, vehicle type or SCC, and fuel type. Panel settings determine how aggregated they can be. For this project, they were output by year, day type, hour, pollutant, process, and fuel type. They were summed to eliminate process type since it was not needed for this project.

Emission factors in the ratepervehicle file can be output by year, month, day type, hour, pollutant, process, vehicle type or SCC, and fuel type. Panel settings determine how aggregated they can be. For this project, they were output by year, day type, hour, pollutant, process, and fuel type. They were summed to eliminate process type since it was not needed for this project.

Emission factors from the rateperprofile and rateperdistance files were summed since both are multiplied by vehicle population.

NOTE: Process will be needed if speciated HC is needed, e.g., in an ozone modeling inventory.
NOTE: The MOVES manual has tips for running emission factors to lessen run time and output. The methods normally result in having to design a somewhat more complex post-process. For this project, none of the time-saving tips were used. Run time was about eight hours per each of the three design day temperature profiles.

2.7 Step 7 – Calculate weekday link emissions

The link record VMT in Step 4 and population in Step 5 were multiplied by the emission factors in Step 6. Rateperdistance factors were matched to VMT by year, month, day type, hour, pollutant, process, fuel type, road type, and speed bin. The sum of the rateperprocess and ratepervehicle factors were matched to population by year, day type, hour, pollutant, process, and fuel type. The link record emissions were summed by link, day, hour, and fuel.

2.8 Step 8 – Estimate weekend link emissions

Weekend emissions were calculated using the Pierce County Inventory run (Step 4) to get the ratio of weekend to weekday emissions. The ratios were multiplied by the weekday link emissions to estimate weekend emissions.

2.9 Step 9 – Allocate the link emissions to the County and Nonattainment Area

The link emissions were summed by county and Nonattainment Area using the link county and Nonattainment Area flags.

2.10 Step 10 – Quality Assurance

County emissions in pounds per day (ppd) calculated in Step 9 were compared to the January weekday county emissions output from the MOVES Inventory mode run done in Step 4. Results were similar as shown in the tables below. Possible sources of the differences are: (1) average January temperature profile vs. the design day temperature profile, and (2) average speed distribution vs. link speeds.

Table 2-2: Comparison of Inventory and Rates Mode Emissions

Pollutant	Rates ppd	Inventory ppd	Rates/ Inventory Ratio
NH_3	1,636	1,432	0.88
NO_X	97,154	93,032	0.96
$PM_{2.5}$	3,875	4,071	1.05
SO2	594	560	0.94
VOC	59,521	60,845	1.02

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ACRONYMS AND ABBREVIATIONS FOR APPENDIX A

%	percent
µg/m^3	micrograms per cubic meter
ADT	average daily traffic
ADVMT	average daily vehicle miles traveled
AFVT	alternate fuels and vehicle technologies
AIR	Air Improvement Resources, Inc
AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
AIRPACT	Air Information Report for Public Access and Community Tracking
Anderson Island	Steilacoom-Ketron-Anderson Island ferry route
AOP	air operating permit
AP-42	EPA document ID for *Compilation of Air Pollutant Emission* Factors publication
ARCH	architectural coatings
Art	arterial
ASM	acceleration simulation mode
Avg	average
B5	fuel blend of five percent biodiesel and 95 percent petroleum diesel
BNSF	Burlington Northern Santa Fe Railway
BOAT	marine–pleasure craft
CAA	Clean Air Act
CARB	California Air Resources Board
CNG	compressed natural gas
CNSTR	nonroad–construction
CO	carbon monoxide
Col	collector
Comm	commercial
COMM	nonroad–commercial
Cons	consumer
COOK	commercial cooking
CPM	condensable PM
Ctpy	condensable tons per year
Device-yr	device year
DOL	Washington State Department of Licensing

DUST	dust–construction
E10	ethanol fuel blend of 10 percent ethanol and 90 percent gasoline
E200	The percent of fuel evaporated at 200 degrees Fahrenheit
E300	The percent of fuel evaporated at 300 degree Fahrenheit
Ecology	Washington State Department of Ecology
Ecy	Washington State Department of Ecology
EI	emissions inventory
EPA	United State Environmental Protection Agency
EtOH	ethanol
EV	evening hours 6pm–10pm
Fal	fall
FAZs	forecast analysis zones
F/E	freeways and expressways
FERT	fertilizer application
FHWA	Federal Highway Administration
FPM	filterable PM
FRM	Federal Reference Method
Ft	foot/feet
FTA	Federal Transit Administration
Ftpy	filterable tons per year
FUEL	residential fuel, except wood
GAS	gas stations and gas cans
GIS	geographic information systems
g/m^2	grams per meter squared
g/VMT	grams per vehicle mile traveled
HAPs	hazardous air pollutants
HARB	marine–harbor craft
HC	hydrocarbon
HDD_{50}	annual heating degree days
HH	number of households in the geographic area
HPMS	Highway Performance Monitoring System
I/M	Vehicle Inspection and Maintenance Program
IND	nonroad–industrial
IPP	Inventory preparation plan
KING	King County

LAWN	nonroad–lawn and garden
Lb	pound(s)
Lb/ton	pounds per ton
LEV	low emission vehicle program
LEV II	California low-emission vehicle program
LIVE	livestock waste
Lpg	liquefied petroleum gas
Major	major point sources
Max	maximum
MD	midday hours 9am to 3pm
Min	minimum
Minor	minor point sources
Mkt	market
MLRC	multi resolution land characteristics
Mo	month
MOBILE	vehicle emission factor model
MOVES	Motor Vehicle Emission Simulator model
MY	model year
n/a	not applicable
NAA	Tacoma-Pierce County Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NCD	National Mobile Inventory Model County database
NEI	National Emissions Inventory
NH_3	ammonia
NMIM	National Mobile Inventory Model
Nonattainment Area	Tacoma-Pierce County Nonattainment Area
Non-ind	non-industrial
NO_X	nitrogen oxides
NP	nonpoint sources
NR	nonroad sources
NRC	National Research Council
NT	night hours 10pm-6am
NUGA	Pierce County non-urban growth area
O_2	oxygen
OBD	on-board diagnostic test

OCEAN	marine–ocean-going vessels
ODEQ	Oregon Department of Environmental Quality
ONRD	onroad
OR	onroad sources
OSPI	Washington State Office of the Superintendent of Public Instruction
PA	principal arterial
PAV	dust-paved roads
PE	precipitation-evaporation
PM	particulate matter
PM fines	unspeciated fine particles
PM_{10}	particles that are less than 10 micrograms in diameter
$PM_{2.5}$	particles that are less than 2.5 micrograms in diameter
PORT	Port of Tacoma, non-marine
Ppd	pounds per day
PPM	parts per million
PSCAA	Puget Sound Clean Air Agency
PSEI	Puget Sound Maritime Emissions Inventory
PSI	pounds per square inch
PSRC	Puget Sound Regional Council
PT	point sources
PT1	major point sources
PT2	minor point sources
Pt. Defiance	Point Defiance–Tahlequah ferry route
QA	quality assurance
QC	quality control
RAIL	nonroad–railroad equipment
RR	locomotives
RVP	reid vapor pressure
RWC-C	residential fuel, wood—certified stoves & inserts
RWC-FP	residential fuel, wood—fireplaces
RWC-LG	residential fuel, wood—firelogs
RWC-PL	residential fuel, wood—pellet stoves
RWC-U	residential fuel, wood—uncertified stoves & inserts
S	sulfur
SCC	source classification code

SIP	State Implementation Plan
SO_2	sulfur dioxide
SOLV	consumer & commercial solvents
Spr	spring
STK	Simpson Tacoma Kraft
SUV	sports utility vehicles

Tacoma-Pierce County Nonattainment Area – Most of the greater Tacoma and the surrounding communities within Pierce County's urban growth area west of State Route 167. EPA designated this area nonattainment for the 2006 24-hour fine particle national ambient air quality standard in 2009

Tacoma–South L Street – The monitoring site in the Nonattainment Area with a monitor that uses the FRM. EPA uses data from the FRM monitor at Tacoma – South L Street to determine compliance with the federal health based fine particle standards.

TEUs	twenty foot equivalent units
Title V	Title V (five) air operating permits
tpy	tons per year
TSP	total suspended particles
Week Day/End	weekday or weekend
Win	winter
Wkdy	weekday
WSDOT	Washington State Department of Transportation
UGA	Pierce County urban growth area
UPRR	Union Pacific Railroad
VMT	vehicle miles traveled
VOC	volatile organic compounds
Vol	volume
VSP	vehicle specific power
Yr	year(s)
ZEV	zero-emission vehicle

APPENDIX A ENDNOTES

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Appendix B. SIP Strengthening Rules

Puget Sound Clean Air Agency's Regulation 1-13–Solid Fuel Burning Device Standards

Effective Date: December 1, 2012

AMENDATORY SECTION

REGULATION I, SECTION 13.01 POLICY AND PURPOSE

The Board of Directors of the Puget Sound Clean Air Agency (Board) declares it to be the public policy of the Agency to control and reduce air pollution caused by ((~~woodstove emissions~~)) solid fuel burning devices such as wood stoves, pellet stoves, and fireplaces. It is the Agency's policy to ((~~reduce woodstove emissions by encouraging the continued efforts to~~)) educate the public about the health effects of ((~~woodstove~~)) wood stove emissions ((~~, other~~)) and cleaner heating alternatives ((~~, and~~)). It is the ((~~desirability~~)) intent of ((~~achieving better emission performance and heating efficiency from woodstoves pursuant to the emissions performance standards as adopted by the Department of Ecology~~)) this regulation to secure and maintain levels of air quality that protect human health and to comply with the requirements of the state and federal Clean Air Acts. ((~~It is further the policy of the Board to encourage the replacement of uncertified woodstoves with cleaner sources of heat.~~))

The Board encourages cities, towns and counties within its jurisdiction to ((~~adopt woodsmoke control programs including~~)) enhance((~~d~~)) public education ((~~and abatement ordinances~~)) and assist in the enforcement of this Regulation during declared air quality episodes and periods of impaired air quality. ((~~Nothing in this Regulation shall be construed to impair the right of any city, town or county to adopt and enforce woodsmoke abatement ordinances.~~))

REPEALER

REGULATION I, SECTION 13.02 GENERAL CONDITIONS FOR SOLID FUEL BURNING DEVICES

NEW SECTION

REGULATION I, SECTION 13.02 DEFINITIONS

When used herein:

(a) ADEQUATE SOURCE OF HEAT means a heating system designed to maintain seventy degrees Fahrenheit at a point three feet above the floor in each normally inhabited room. If any part of the heating system has been disconnected, damaged, or is otherwise nonfunctional, the Agency shall base the assessment of the adequacy of the design on the

system's capability prior to the disconnection, damage, improper maintenance ((~~failure to maintain~~)), malfunction, or occurrence that rendered the system nonfunctional.

(b) AGENCY means the Puget Sound Clean Air Agency.

(c) CERTIFIED WOOD STOVE means a wood stove that:

(1) has been determined by Ecology to meet Washington emission performance standards, pursuant to RCW 70.94.457 and WAC 173-433-100; or

(2) has been certified and labeled in accordance with procedures and criteria specified in "40 C.F.R. 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990; or

(3) meets the "Oregon Department of Environmental Quality Phase 2" emissions standards contained in Subsections (2) and (3) of Section 340-21-115, and is certified in accordance with "Oregon Administrative Rules, Chapter 340, Division 21 - Woodstove Certification" dated November 1984.

(d) COAL-ONLY HEATER means an enclosed, coal burning appliance capable of and intended for residential space heating, domestic water heating, or indoor cooking and has all of the following characteristics:

(1) An opening for emptying ash which is located near the bottom or the side of the appliance;

(2) A system which admits air primarily up and through the fuel bed;

(3) A grate or other similar device for shaking or disturbing the fuel bed or power driven mechanical stoker; and

(4) The model is listed by a nationally recognized safety testing laboratory for use of coal only, except for coal ignition purposes.

(e) ECOLOGY means the Washington State Department of Ecology.

(f) EPA means the United States Environmental Protection Agency.

(g) FINE PARTICULATE or PM2.5 means particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

(h) FIREPLACE means any permanently installed masonry fireplace or any factory-built metal solid fuel burning device designed to be used with an open combustion chamber and without features to control the air to fuel ratio.

(i) NONAFFECTED PELLET STOVE means a pellet stove that has an air-to-fuel ratio equal to or greater than 35.0 to 1.0 when tested by an accredited laboratory in accordance with methods and procedures specified by the EPA in "40 CFR 60 Appendix A, Test Method 28A - Measurement of Air to Fuel Ratio and Minimum Achievable Burn Rates for Wood-Fired Appliances" as amended through July 1, 1990.

(j) NONATTAINMENT AREA means a geographical area designated by EPA at 40 C.F.R. Part 81 as exceeding a National Ambient Air Quality Standard for a given criteria pollutant. An area is nonattainment only for the pollutants for which the area has been designated nonattainment.

(k) PM10 means particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

(l) PROPERLY SEASONED FUEL WOOD means untreated wood or untreated lumber with moisture content of 20% or less, wet basis, or 25% or less, dry basis.

(m) SOLID FUEL BURNING DEVICE or SOLID FUEL HEATING DEVICE means a device that burns wood, coal, or any other nongaseous or nonliquid fuels, and includes any device burning any solid fuel which has a heat input less than one million British thermal units per hour. This includes, but is not limited to, devices used for aesthetic or space-heating purposes in a private residence or commercial establishment.

(n) SUBSTANTIALLY REMODELED means any alteration or restoration of a building exceeding sixty percent of the appraised value of such building within a twelve-month period.

(o) TACOMA, WASHINGTON FINE PARTICULATE NONATTAINMENT AREA means the area of Pierce County that is designated by EPA as not meeting the 2006 federal 24-hr fine particulate National Ambient Air Quality Standard and described in 40 CFR 81.348. This area is also known as the Tacoma, Pierce County Nonattainment Area.

(p) TREATED WOOD means wood or lumber of any species that has been chemically impregnated, painted, or similarly modified to prevent weathering and deterioration.

(q) WOOD STOVE or WOOD HEATER means an enclosed solid fuel burning device capable of and intended for residential space heating and domestic water heating that meets the following criteria contained in "40 CFR 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990:

(1) An air-to-fuel ratio in the combustion chamber averaging less than 35.0, as determined by EPA Reference Method 28A;

(2) A useable firebox volume of less than twenty cubic feet;

(3) A minimum burn rate less than 5 kg/hr as determined by EPA Reference Method 28; and

(4) A maximum weight of 800 kg, excluding fixtures and devices that are normally sold separately, such as flue pipe, chimney, and masonry components not integral to the appliance.

Any combination of parts, typically consisting of but not limited to: doors, legs, flue pipe collars, brackets, bolts and other hardware, when manufactured for the purpose of being assembled, with or without additional owner supplied parts, into a woodstove, is considered a woodstove.

REPEALER

REGULATION I, SECTION 13.03 CONTINGENCY PLAN

NEW SECTION

REGULATION I, SECTION 13.03 OPACITY STANDARDS

(a) A person shall not cause or allow emission of a smoke plume from any solid fuel burning device to exceed an average of twenty percent opacity for six consecutive minutes in any one-hour period.

(b) Test method and procedures. Methods and procedures specified by the EPA in "40 CFR 60 Appendix A reference method 9 –Visual Determinations of the Opacity of Emissions from Stationary Sources" as amended through July 1, 1990, shall be used to determine compliance with subsection (a) of this section.

(c) Enforcement. Smoke visible from a chimney, flue or exhaust duct in excess of the opacity standard shall constitute prima facie evidence of unlawful operation of a solid fuel burning device. This presumption may be refuted by demonstration that the smoke was not caused by a solid fuel burning device. The provisions of this section shall not apply during the starting of a new fire for a period not to exceed twenty minutes in any four-hour period.

NEW SECTION

REGULATION I, SECTION 13.04 ALLOWED AND PROHIBITED FUEL TYPES

(a) A person shall cause or allow only the following materials to be burned in a solid fuel burning device:

(1) Properly seasoned fuel wood; or

(2) An amount of paper necessary for starting a fire; or

(3) Wood pellets; or

(4) Biomass fire logs intended for burning in a wood stove or fireplace; or

(5) Coal with sulfur content less than 1.0% by weight burned in a coal-only heater.

(b) All other materials are prohibited from being burned in a solid fuel burning device, including, but not limited to: garbage; pallets; treated lumber; fencing; treated wood; plastic and plastic products; rubber products; animal carcasses; asphaltic products; waste petroleum products; paints and chemicals; paper (other than an amount necessary to start a fire); or any substance that emits dense smoke or obnoxious odors.

NEW SECTION

REGULATION I, SECTION 13.05 RESTRICTIONS ON OPERATION OF SOLID FUEL BURNING DEVICES

(a) No person in a residence or commercial establishment shall operate a solid fuel burning device under any of the following conditions:

(1) Whenever the Agency has declared the first stage of impaired air quality for a geographical area in accordance with RCW 70.94.473(1)(b)(i) or (ii) unless an exemption for the residence or commercial building has been obtained from the Agency pursuant to subsection (d) of this section or the solid fuel burning device is one of the following:

(A) A nonaffected pellet stove; or

(B) A wood stove certified and labeled by the EPA under "40 CFR 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990; or

(C) A wood stove meeting the "Oregon Department of Environmental Quality Phase 2" emission standards contained in Subsections (2) and (3) of Section 340-21-115, and certified in accordance with "Oregon Administrative Rules, Chapter 340, Division 21 – Woodstove Certification" dated November 1984; or

(D) A solid fuel burning device approved by Ecology as meeting the standards in RCW 70.94.457(1)(a)-(b).

(2) Whenever the Agency has declared the second stage of impaired air quality for a geographical area in accordance with RCW 70.94.473(1)(c)(i), (ii), or (iii) unless an exemption for the residence or commercial building has been obtained from the Agency pursuant to subsection (d) of this section.

(b) Whenever a first stage of impaired air quality is declared under subsection (a)(1):

(1) New solid fuel shall be withheld from any solid fuel burning device already in operation for the duration of the first stage of impaired air quality if that device is restricted from operating under subsection (a)(1) of this section during the first stage of impaired air quality;

(2) Smoke visible from a chimney, flue, or exhaust duct after three hours has elapsed from the declaration of a first stage of impaired air quality shall constitute prima facie evidence of unlawful operation of a solid fuel burning device if that solid fuel burning device is restricted from operating during a first stage of impaired air quality. This presumption may be refuted by demonstration that the smoke was not caused by a solid fuel burning device.

(c) Whenever a second stage of impaired air quality is declared under subsection (a)(2):

(1) New solid fuel shall be withheld from any solid fuel burning device already in operation for the duration of the second stage of impaired air quality if that device is restricted from operating under subsection (a)(2) of this section during the second stage of impaired air quality.

(2) Smoke visible from a chimney, flue, or exhaust duct after three hours has elapsed from the declaration of a second stage of impaired air quality shall constitute prima facie evidence of unlawful operation of a solid fuel burning device if that solid fuel burning device is restricted from operating during a second stage of impaired air quality. This presumption may be refuted by demonstration that the smoke was not caused by a solid fuel burning device.

(d) Any person desiring an exemption from the Agency for the purposes of subsections (a)(1) or (2) of this section shall apply to the Agency using procedures specified by the Agency.

(1) The following are eligible for exemption:

(A) A residence or commercial building that has no adequate source of heat other than a solid fuel burning device and the building was neither constructed nor substantially remodeled after July 1, 1992.

(B) A residence or commercial building that has no adequate source of heat other than a solid fuel heating device and the building:

i. was constructed or substantially remodeled after July 1, 1992; and

ii. is outside an urban growth area, as defined in RCW 36.70A; and

iii. is outside an area designated by EPA as a PM2.5 or PM10 particulate nonattainment area.

(2) Exemptions shall be valid for a period determined by the Agency. Exemptions may be renewed using procedures specified by the Agency, provided the applicant meets the applicable requirements at the time of exemption renewal. Exemptions may be revoked if the Agency determines the residence or commercial building for which the exemption was approved no longer qualifies for an exemption.

NEW SECTION

REGULATION I, SECTION 13.06 EMISSION PERFORMANCE STANDARDS

(a) Solid fuel burning devices. A person shall not advertise to sell, offer to sell, sell, bargain, exchange, give away, or install a solid fuel burning device unless it meets both subsections (1) and (2):

(1) It has been certified and labeled in accordance with procedures and criteria specified in "40 CFR 60 Subpart AAA - Standards of Performance for Residential Wood Heaters" as amended through July 1, 1990; and

(2) It meets the following particulate air contaminant emission standards and the test methodology of EPA in effect on January 1, 1991, or an equivalent standard under any test methodology adopted by EPA subsequent to such date:

(A) Two and one-half grams per hour for catalytic woodstoves; and

(B) Four and one-half grams per hour for all other solid fuel burning devices.

(3) For purposes of subsection (a)(2) of this section, "equivalent" shall mean the emissions limits specified in subsection (a)(2) multiplied by a statistically reliable conversion factor determined by Ecology that relates the emission test results from the methodology established by the EPA prior to May 15, 1991, to the test results from the methodology subsequently adopted by EPA.

(b) Fireplaces. A person shall not advertise to sell, offer to sell, sell, bargain, exchange, give away, or install a factory-built fireplace unless it meets the 1990 EPA standards for wood stoves or an equivalent standard that may be established by the state building code council by rule.

(c) Subsection (a) of this section shall not apply to fireplaces, including factory- built fireplaces and masonry fireplaces.

NEW SECTION

REGULATION I, SECTION 13.07 PROHIBITIONS ON WOOD STOVES THAT ARE NOT CERTIFIED WOOD STOVES

(a) Subsections (a)(1) – (a)(4) of this section shall be effective January 1, 2015 and apply only to PM2.5 nonattainment areas or areas where required by EPA.

(1) Any person who owns or is responsible for a wood stove that is both (a) not a certified wood stove and (b) is located in the Tacoma, Washington fine particulate nonattainment area must remove and dispose of it or render it permanently inoperable by September 30, 2015.

(2) Any person who owns or is responsible for a coal-only heater located in the Tacoma, Washington fine particulate nonattainment area must remove and dispose of it or render it permanently inoperable by September 30, 2015.

(3) Subsection (a)(1) of section does not apply to:

(A) A person in a residence or commercial establishment that does not have an adequate source of heat without burning wood; or

(B) A person with a shop or garage that is detached from the main residence or commercial establishment that does not have an adequate source of heat in the detached shop or garage without burning wood.

(4) The owner or person responsible for removing or rendering permanently inoperable a wood stove under subsection (a)(1) of this section or a coal-only heater under subsection (a)(2) of this section must provide documentation of the removal and disposal or rendering permanently inoperable to the Agency using the Agency's procedures within 30 days of the removal or rendering permanently inoperable.

(b) PM10. Subsection (b) of this section is established for the sole purpose of a contingency measure for PM10 nonattainment and maintenance areas. If the EPA makes written findings that: (1) an area has failed to attain or maintain the National Ambient Air Quality Standard for PM10, and (2) in consultation with Ecology and the Agency, finds that the emissions from solid fuel burning devices are a contributing factor to such failure to attain or maintain the standard, the use of wood stoves not meeting the standards set forth in RCW 70.94.457 shall be prohibited within the area determined by the Agency to have contributed to the violation. This provision shall take effect one year after such a determination.

Appendix C. Best Practices for Environmental Justice in the Tacoma-Pierce County Nonattainment Area

1. Introduction and Background

"Best Practices for Environmental Justice" provides an outline of Ecology's plan to integrate environmental justice into the Tacoma-Pierce County Nonattainment Area. EPA defines Environmental justice as *the fair treatment and meaningful involvement of all people . . . with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.*

Priority communities include:

- Low-income households–(an example of a possible definition of low income includes 150% of the federal poverty line)
- Vulnerable populations
  - Communities of Color
  - Children
  - Elderly
  - People with low levels of mobility
  - Those with underlying health conditions
- Limited English Proficient (LEP) based on 2010 census data
  - LEP communities with a high level of illiteracy in their native language
- Puyallup Tribe of Indians
- People whose primary source of heat is wood

2. Environmental Justice Goals for the SIP

- Reduce health risks from fine particle pollution in priority communities
- Consider social and environmental effects on priority communities when determining how to reduce fine particle pollution
- Build meaningful public participation in the SIP development and decision making processes. Design a communication strategy that informs and engages priority communities
- Direct resources and incentives to priority communities

3. Ecology Resources

Project Lead: Richelle Perez

Air Quality Program Leadership Team Sponsor: Julie Oliver

Senior Environmental Planner: Doug Schneider

Outreach Environmental Planner: Margo Thompson

As needed:

Ecology Environmental Justice Committee: Millie Piazza, Frank Van Haren, technical experts, i.e., GIS, toxicologists, demographers

In-house Translation: Spanish, Chinese, Vietnamese, & Korean

4. Partners and Stakeholders

A. Partners

- Washington State Department of Ecology
- Puget Sound Clean Air Agency
- U.S. Environmental Protection Agency (EPA)

  Region 10: Jeff Hunt

  EPA Environmental Justice Program: Rochelle Labiosa
- City/County governments
- Environmental Justice and Public Health Advocacy Organizations
- Public Health Organizations (hospitals, other)
- Puyallup Tribe of Indians

B. Stakeholders

- Business
  - Hearth, Patio, and Barbeque Association
  - Chambers of Commerce/Tacoma-Pierce County Economic Development Board
  - Other business associations and local businesses
- Community and Non-Profit Organizations
- Religious and Faith based Organizations
- Rental Associations/Landlords
- Realtor Associations
- Housing and Neighborhood Associations

- Neighborhood councils
- Homeowners associations
- Other community and neighborhood associations

- Local Utilities

C. Resources

- Other states with fine particle nonattainment areas
- Office of Financial Management

5. Action Plan

A. Demographic Analysis

- Assess socio-economic data to determine priority areas
- Determine if we need to consider any communities outside of the Nonattainment Area. Are there populations that work or recreate in the Nonattainment Area but do not live there?

B. **Evaluate Social and Environmental Effects of Control Strategies**

Collaboratively work with agencies, interest groups, and affected communities to evaluate the effects of control strategies and mitigation options. Work with community groups and member to do the following:

- Identify disproportionately high and adverse effects (environmental, economic, health, social effects) of control strategies on priority communities
  - What are the current social, environmental, health and economics effects on communities–Baseline or "Do Nothing" Scenario?
  - Do SIP control measures impose undue hardships on priority communities?
  - Is it justified to develop control measures that go significantly beyond what is required, so that the priority community receives an added margin of health benefits?
- Identify mitigation options
  - Identify and distribute incentive funding with a focus on priority communities
  - If assistance levels are not adequate, consider possible exemptions and associated effects
- Work with others to consider changes to control strategies that prevent or mitigate adverse environmental, social, health or economic effects

C. Identify and Prioritize Resources

- Identify resources and any limitations/restrictions on particular resources
  - Identify what resources already exist in the community
  - Seek out additional resources
  - Explore opportunities to leverage additional resources or package resources of different types and from different sources
    - Funding related to improvements in health
    - Weatherization
    - Incentives at local, state, and federal levels
- Decide if legislation is necessary
- Determine how to distribute, prioritize, and direct funds and assistance in line with community values

D. Plan for Public Outreach & Education

- Consider type and level of community involvement
  - Will the SIP development involve a formal stakeholder process? If not, what level of community involvement do you need to plan for?
- Develop a Communication Plan
- Build meaningful involvement
  - Use and update Ecology's Environmental Justice checklist when planning outreach activities
  - Ensure that the priority communities understand the problems, solutions, and are part of the discussion
  - Hold "fact-gathering" public meetings in the priority communities
  - Plan meetings in areas/at time accessible to the community
  - Build partnerships with community groups on air quality issues to address community concerns and issues
- Plan for Limited English Proficiency (LEP) Audiences
  - Decide on languages for translation/interpretation
  - Translate crucial public documents, notices, etc
  - Identify when interpretation needs to be provided (i.e., public meetings, community educational talks) and in what media (i.e., radio, print, public meeting or presentation)
  - When possibly, field test documents

- Evaluate existing resources to disseminate messages/materials
  - School programs
  - Faith-based communities
  - Neighborhood organizations

6. Next Steps

- Track lessons learned and develop tools for ensuring environmental justice best practices in the development of future SIPs

Developed by the Interagency State Implementation Plan Environmental Justice Work Group

Anya Caudill – SIP Planner, Air Quality Program (AQP), Washington State Dept. Ecology (Ecology)
Laurie Hulse-Moyer –SIP Planner, AQP, Ecology
Julie Oliver –Program Development Section Manager, AQP, Ecology
Tania Park – Puget Sound Clean Air Agency
Richelle Perez- Project Manager for Tacoma-Pierce County Nonattainment Area, AQP Ecology
Nancy Pritchett – Rules and Planning Unit Manager, AQP, Ecology
Millie Piazza – Environmental Justice Coordinator, Ecology
Kathy Ross - Tacoma-Pierce County Health Department
Gail Sandlin – AQP, Ecology
Doug Schneider – Senior SIP Planner, AQP, Ecology
Alexandria Teague – Pierce County
Margo Thompson –SIP Outreach Planner, AQP, Ecology
Frank Van Haren – Environmental Justice Committee Member, AQP, Ecology

Appendix D. Environmental Justice Questionnaire

Ecology developed Appendix D to help Ecology and PSCAA track the actions taken in the Nonattainment Area to address environmental justice. It will:

- Track challenges the agencies and their partners faced in addressing environmental justice.
- Recommend actions the agencies would like to incorporate into their efforts, if given additional resources.

Ecology will work collaboratively with PSCAA to complete the questionnaire.

1. How did the agencies address environmental justice concerns for the priority communities identified in the sections below?

A. Low-income households

Examples include the following:

- The eligibility level for low income used in assistance programs
- Incentive levels for uncertified wood stove removal and replacement programs
- Heating options available to households replacing an uncertified wood stove
- Partnerships with other organizations that provide related assistance such as for weatherization or covering heating expenses
- Options for responding to a notice of violation during a burn ban

B. People whose primary source of heat is wood

Examples include the following:

- Heating options available to households replacing an uncertified wood stove
- Options for responding to a notice of violation during a burn ban
- Outreach and program recruitment strategies targeted at this community
- Partnerships developed to provide assistance for alternative heat sources during burn bans

C. Limited English Proficient (LEP) communities

Examples include the following:

- Demographic analysis at the neighborhood level
- Translation and interpretation services available in various languages
- Outreach and program recruitment strategies focused on this community.

D. Households that Rent

Examples include the following:

- Outreach and program recruitment strategies focused on landlords
- Outreach and program recruitment strategies focused on tenants
- Options for responding to a notice of violation during a burn ban

E. Vulnerable populations including the following:

- Communities of Color
- Children
- Elderly
- People with low levels of mobility
- Those with underlying health conditions

Examples include outreach and program recruitment strategies targeted at these communities.

F. Puyallup Tribe of Indians

2. Are there other ways the agencies focused on environmental justice concerns that the comments above do not cover?

3. Is there anything else the agencies would like to share?

Appendix E. PSCAA's Board Resolution No. 1238

Approval of Tacoma-Pierce County Fine Particle Nonattainment Recommendations for Emission Reduction Strategies

http://www.pscleanair.org/announce/hearings/documents/0212_RES1238.pdf

Appendix F. Substitute House Bill 2326 Chapter 219, Laws of 2012

An Act relating to protecting air quality that is impacted by high emitting solid fuel burning devices; amending RCW 70.94.473 and 70.94.477; adding a new section to chapter 70.94 RCW; and providing an expiration date.

http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/2326-S.SL.pdf

Appendix G. Response to Comments

Part 1 – Overview

Appendix G has the following five major sections:

1. This overview
2. Ecology's response to comments
3. Copies of written comments
4. Transcript of the October 16, 2012, hearing
5. Public involvement notices for the public comment period and public hearing

Two of the major requirements of any SIP revision are a public comment period and public hearing on the proposed SIP revision. The second section of this appendix contains a summary of the comments received during the public comment period and public hearing on the proposed SIP revision along with Ecology's response. Ecology accepted comments from September 10 through October 19, 2012.

The third section of this appendix contains copies of the written comments received including e-mails.

The fourth section of this appendix contains the transcript from the public hearing on the proposed Tacoma-Pierce County Nonattainment Area SIP revision. Ecology will hold the hearing in Tacoma, Washington, on October 17, 2012.

The fifth section of this appendix contains copies of materials related to public involvement notices for the public comment period and public hearing. This includes:

- Certification of Hearing
- Affidavits of publication of the Notice for Opportunity for Public Comment in newspapers
- Ecology News Release on the public comment period and public hearing

Part 2 – Ecology's Response to Comments

This is a summary of the comments received during the public comment period and public hearing on the Proposed State Implementation Plan Revision for the Tacoma-Pierce County Nonattainment Area along with Ecology's responses. Ecology accepted comments between September 10, 2012 and October 19, 2012. A public hearing was held on October 17, 2012 at the University of Washington Tacoma campus. The following are the comments received during the public comment period and Ecology's responses. Ecology paraphrased or provided an excerpt from lengthy comments. The full, original comment is available in part 3 of this appendix.

Marjorie Sebesta, DuPont Resident, letter

Comment #1
I live in the older section DuPont, WA which is located at the south end of Pierce County. I checked the web site and saw there are no air quality monitors located here. Please consider an air monitor here.

Response
Thank you for your comment and expressing your concerns. Puget Sound Clean Air Agency regulates air quality in your area. Ecology has forwarded your comment regarding additional monitors to them.

Ecology did not change the SIP revision based on your comment.

Comment#2
The quality of air in this community is very bad in the winter time as there are a lot of wood stoves in use. I am not sure that they meet the standards of air quality that I expected when I purchased my home.

Response
Thank you for your comment and expressing your concerns. The Puget Sound Clean Air Agency (PSCAA) and other local jurisdictions are working on the issues talked about in your comment. The strategies in the SIP revision will improve air quality throughout the nonattainment area. The strategies include reducing fine particle pollution from gasoline vehicles, diesel vehicles, industrial sources, and ships, increased enforcement during burn bans, and required removal of uncertified wood stoves and inserts.

The strategies in the SIP revision are based on recommendations developed by a community Task Force. These strategies have shown reductions in fine particle pollution in other communities. Ecology believes these strategies will help the Tacoma-Pierce County areas continue to meet federal standards for fine particle pollution.

Ecology has forwarded your comment regarding wood stove use and air quality in your community to PSCAA.

Ecology did not change the SIP revision based on your comment.

Comment #3
In the summer time there are many fire pits going even during dry seasons and sometimes there is very little air movement so that smoke will enter my house even through I have replaced the former windows with high quality replacements and insulated all the walls. At 309 Louviers in DuPont there is a group home and the people often start a fire late at night that is only surrounded by rocks and has no cover. I think that this could be a risk to the residents of that home as well as the neighboring property.

Response
Thank you for your comment and expressing your concerns. Your comment about backyard fire pits falls outside the scope of the SIP revision. However, Ecology forwarded your comment on to the Puget Sound Clean Air Agency which regulates air quality in the Tacoma-Pierce County Nonattainment Area.

Ecology did not change the SIP revision based on your comment.

Jason Jordan, Port of Tacoma, Letter

Comment #4
The Port of Tacoma (Port) supports the Washington State's Department of Ecology's (Ecology) proposed State Implementation Plan (SIP) which represents a collaboration between Ecology and the Puget Sound Clean Air Agency to advance an innovative and balanced approach to achieving air quality goals in the nonattainment area.
As you may already know, the Port of Tacoma, Port of Seattle, and Port Metro Vancouver, B.C. formed an alliance to implement the Northwest Ports Clean Air Strategy, with direct involvement of federal, state, provincial and regional clean air agencies. In order to minimize emissions from marine-related sources, the Port has collaborated with Ecology to develop and implement many voluntary emission reduction programs, which are designed to reduce fine particulates for vehicles and equipment operating on Port properties.
While we consider the Port's fine particulate contribution to be minor during those periods of wintertime exceedances, we remain committed to support the State's efforts to bring down fine particulate pollution. As system-wide transportation is critical to the Port's operations, we are concerned about the potential impact from Ecology's nonattainment permitting requirements and air quality criteria for transportation conformity. Therefore, we ask to be included in any on- going discussions.
The Port of Tacoma has committed to continue working with agencies and stakeholders in a united effort to bring the region into attainment. We stand ready to assist Ecology in drafting new permit requirements and developing a maintenance plan.

Response
Thank you for your support and for the Port of Tacoma’s hard work as a Clean Air Task Force member.

Ecology did not change the SIP revision based on your comment.

Walt Parker, Private Citizen

Comment #5
Your map is not very clear. Can you post or send one that shows streets so I can see where the south end of area is? Thank you.

Response
Thank you for comment about the map of the Nonattainment Area. Puget Sound Clean Air Agency is developing a web tool for this purpose. We expect this tool will be available to the public soon.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Tuesday, October 23, 2012 10:38 AM
Subject: FW: tacoma - public comment

Comment #6
Below please find a copy of my letter, submitted in person, to the Board of Directors, Puget Sound Clean Air Agency.

I feel it represents a more concise summary of the various issues i have brought up, informally, via emails.

Please ensure that this letter is included with public comment and also I would appreciate if you could forward it to parties that may be willing to contemplate it's content.

Response
Thank you for your comment and expressing your concerns. Ecology has included a copy of your letter in part 3 of this appendix. The Puget Sound Clean Air Agency and other local jurisdictions are working on the issues talked about in your comment. Ecology will continue to support and work with the governing jurisdictions of the area.
Please see the response to comment #7 regarding your request to change Ecology's "Wood Smoke and your Health" brochure.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Tuesday, October 23, 2012 10:44 AM
Subject: nuisance laws

Comment #7
I do not see where ANY reference (to the public) is made specifically stating
a) Wood smoke is 12 TIMES more toxic than a cigarette (EPA, 1991)
b) Reference to nuisance laws (which has now, oddly, been deleted from the previous ECY Wood Smoke and your Health pdf/handout)

Response

Thank you for your comment and expressing your concerns. Ecology agrees that wood smoke has harmful effects on health. The executive summary of the SIP revision discussed the short and long term health effects of final particle pollution on p. ix.

Some local governments have enacted "nuisance laws" to deal with smoke problems. These laws vary greatly. Ecology made changes to their publication "How Wood Smoke Harms Your Health" to guide the public to contact their local clean air agency and ask about nuisance laws in their area.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Tuesday, October 23, 2012 11:55 AM
Subject: NEW construction/fireplaces + restaurants

Comment #8

Require (via changes in building CODES) that all fireplaces built in new construction MUST meet pollution standards. The 'old' type of masonry or manufactured fireplace should no longer be allowed to be installed in ANY construction or ANY zoning
Phase out existing fireplaces (masonry and manufactured)
STOP permitting **wood burning in restaurants or any commerical application**
Get PREVENTATIVE now on **wood burning BOILERS**

Response

Thank you for your comment and sharing ideas about how to reduce fine particle pollution in the Nonattainment Area. The Puget Sound Clean Air Agency (PSCAA) and other local jurisdictions are working on the issues talked about in your comment. Ecology will continue to support and work with the governing jurisdictions of the area.

The strategies in the SIP revision are based on recommendations developed by a community Task Force. These strategies have shown reductions in fine particle pollution in other communities. Ecology believes these strategies will help the Tacoma-Pierce County areas continue to meet federal standards for fine particle pollution.

Ecology only has the legislative authority to prohibit the use of fireplaces as a contingency measure. Contingency measures are a required component of an attainment plan or maintenance plan. They would not become effective unless the Nonattainment Area does not meet air quality goals outlined in those plans.

Ecology forwarded your comment to PSCAA.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 10:01 AM
Subject: Nuisance Laws/Zero visible smoke/PSCA "complaint response" content - public comment

Comment #9
The previous Dept of Ecology document on Wood Smoke and Your Health included a specific reference to Nuisance Laws that was not included in the revision
It is CRITICAL that both the wood burning source and the person(s) suffering under wood smoke air pollution be advised about Nuisance Laws. As I recall it read something like: "it is illegal to produce an odor or smoke which interfers with the health or enjoyment of property of your neighbor"
Additionally: The PSCA website states if a person suffering under the impact of wood smoke air pollution requests a neighbor put out their smoke producing fire, that the person(s) burning wood need to put the fire out.
1) I request, specifically, that Dept of Ecology reinstate the previous nuisance law reference (above paragraph) asap and that the PSCA website link to that pdf be changed soon to reflect said change
2) Additionally, I think it would be a good idea for PSCA to include the following information on the response to wood smoke complaints (it addresses "how to burn" but not Nuisance Laws and some protection for the complainant). To be specific: It would be helpful to those suffering under excessive smoke - who have the courage to make a formal complaint (which can cause retaliation and sometimes having even more smoke generated in a 'don't tell me what to do' attitude) So: when a complaint is made, I think it would be important for the response from PSCA to specifically include the item on the website within the response packet: That it is always illegal to smoke out your neighbor. That if a person burning wood produces either smoke or odor, and the neighbor advises the burning wood party that it bothers them, and makes a request to put the fire out - that it must be put out. The PSCA "response" letter/packet - to me - seems to be about how to burn cleaner, but does not advise the wood burning party of nuisance laws that it is illegal to smoke out your neighbor. The complaining party needs some support on this.
3) Also the complaint "response packet" should include the allowed start up length, opacity allowances and criteria for smoke opacity over ____ number of hours. Zero visible smoke should be the goal - and that would be beneficial to be included in the "response packet" as well, and it would make alot of difference to have ZERO SMOKE VISIBILITY after start up time. That would help with air quality, and also clarify in enforcment.
4) Emphasis on ZERO SMOKE VISIBILITY GOALS should be in literally all website, paperwork and outreach components.

Response
Thank you for your comment and expressing your concerns. Ecology modified the "How Wood Smoke Harms Your Health" brochure in July 2012 to simplify our messages to the public. We removed the reference to the nuisance laws because these laws and their enforcement vary in different areas, and are difficult to summarize.

Ecology agrees the public should be aware there may be nuisance laws in their area. Staff has made changes to reinstate a reference to nuisance laws into the document. The new

version is available on Ecology's web site. The newest version is also now available on PSCAA web site.

Ecology will continue to work with and support PSCAA's work in the Tacoma-Pierce County Nonattainment Area. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 10:23 AM
Subject: FW: wood smoke/speak to Legislature?

Comment #10
I would like to offer the following suggestions with regard to wood smoke air pollution and potential ideas for addresssing it:
1) REQUIRE all multiple unit dwellings who now have wood burning devices (many of which are not certified) to switch over to either CERTIFIED wood burning devices or GAS fireplaces within 2 years (more or less) …
2) Start citing EPA, 1991 research when educating the public and enforcement authorities. It states that wood smoke is 12 TIMES more toxic than a cigarette (actually second hand smoke) …
3) please do NOT ask for "clean burning". Instead take a stance that is based on research: STOP BURNING WOOD ! Even certified stoves have smoky start up and end of the night smoldering.
4) Get a back bone with the wood stove industry that is actively working to break down our clean air efforts. Please contact marie.wood@kingcounty.gov to figure out why King County would be retracting laws in place on wood burning devices.
5) Get effective enforcement. There is not enough staff to adequately respond to and deal with fireplace chimney smoke (totally unfiltered and nasty - see 1. above) …
6) Join with the amazing people at CDC and Public Health who put that fabulous ad (now running) on tv about cigarette smoke and get one for wood smoke. I find it amazing that literally no one sees wood smoke as the poison it is.
7) LEGALLY MANDATE CHANGES from a State and Federal level…

Response
Thank you for your comment and sharing your ideas about how to reduce fine particle pollution in the Nonattainment Area. The strategies in the SIP revision include the increased enforcement during burn bans and required removal of uncertified wood stoves and inserts. Increased enforcement includes significantly increasing the number of inspectors in the field during a burn ban and, if possible, enforcing the burn bans at dusk and night. Required removal includes setting a date by which all households must remove uncertified devices, and providing financial assistance to low income households.

The strategies in the SIP revision are based on recommendations developed by a community Task Force. These strategies have shown reductions in fine particle pollution in other communities. Ecology believes these strategies will help the Tacoma-Pierce County areas continue to meet federal standards for fine particle pollution.

Revised Code of Washington (RCW) 70.94.453(2) clarifies that the term "wood stove" does not include wood cook stoves. The regulation of wood burning restaurants falls outside the scope this SIP revision.

Thank you for sharing your ideas related to outreach regarding the health effects of wood smoke. Ecology continues to work with and support the Puget Sound Clean Air Agency and other local partners with their public outreach efforts related to the Tacoma-Pierce County Nonattainment Area.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 10:29 AM
Subject: FW: wood smoke public comment 9/2012

Comment #11

As ask you to contemplate this: **If I smoked a cigarette in your office, no amount of smoke would be tolerated**. Given cigarette smoke is not nearly so toxic as wood smoke, it is an interesting irony.

The public voted to not have smoking of cigarettes in public. Yet, few realize that wood smoke is 12 TIMES more toxic than a cigarette (EPA, 1991). American Lung Assoc. site states that wood smoke (due to small particulate size) gets into homes even with all the windows and doors closed. Neighbors of wood burning (fireplaces often being the worst: no filtering at all of smoke) ...the neighbors get more smoke, often, than the people burning the wood.

I think you would not want someone to smoke in your office/home/car. Why? Smoke is deadly. Why allow wood smoke - at all? It is MYTH there is clean burning. 6 minutes of smoke is plenty to smoke up the inside of neighboring homes. 20 minutes in 4 hours: same. Would you allow someone to smoke a cigarette in your office/home for 6 minutes? How about 20 min. in four hours? Why? Because it is a deadly toxin….

… There should be NO EXEMPTION for garages or shops in urban areas, whatsoever. And in homes any exception should be careful given, and protect against abuse/manipulation. Using the Landlord LICENSING in Tacoma (like Seattle has) should help alot. Landlords in Seattle MUST supply adequate heat, or they can loose their license. Perhaps a cooperation with Puget Sound Energy can get people over to gas fireplaces? Maybe grants for low income? Any federal $ available? Maybe even give the installer of GAS fireplaces write offs on labor? material?

… I would like to see permits for wood burning restaurants stopped. Montana and some other States have made forward ground in that regard: denied permits for wood burning restaurants.

Also would suggest that there be date set for multi-units to switch over to either gas, or remove "fireplaces" inside…

Response

Thank you for sharing your ideas about how to reduce fine particle pollution in the nonattainment areas. Ecology agrees that wood smoke has harmful effects on health. The strategies in the SIP revision are based on recommendations developed by a community Task Force. These strategies have shown reductions in fine particle pollution in other communities. Ecology believes these strategies will help the Tacoma-Pierce County areas continue to meet federal standards for fine particle pollution.

The legislature included an exemption for detached shops or garages without an adequate source of heat from the prohibition on uncertified wood stoves and inserts. Ecology does not have the authority to change this exemption. However, Puget Sound Clean Air Agency has assistance programs to help people in the nonattainment area remove or replace their uncertified wood stove.

Ecology only has the legislative authority to prohibit the use of fireplaces as a contingency measure. Contingency measures are a required component of an attainment plan or maintenance plan. They would not become effective unless the Nonattainment Area does not meet air quality goals outlined in those plans.

Revised Code of Washington (RCW) 70.94.453(2) clarifies that the term "wood stove" does not include wood cook stoves. The regulation of wood burning restaurants falls outside the scope this SIP revision.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 10:48 AM
Subject: public comment EXEMPTIONS

Comment #12

EXEMPTIONS should be **'hard won'** and should not only **be time limited**, but **require an in person inspection** - including upon any subsequent renewal. I think the 'burden of proof' should be upon the person requesting an exemption. Exemption status is very likely to be abused and manipulated. Making it easy, or having no burden of proof would be a mistake.

Response

Thank you for your comment and expressing your concerns. Ecology included Puget Sound Clean Air Agency (PSCAA)'s regulation 1-13 in the SIP revision. This regulation includes a definition of "adequate source of heat". The implementation of exemptions under this definition falls in PSCAA's jurisdiction.

Ecology will continue to support and work with PSCAA. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 11:08 AM
Subject: FW: wood smoke

Comment #13
ms. Thompson and Mr. Kenworthy - I am trying to get the CDC/Dept Health tv ad for your review. thanks, pat davis

Response
Thank you for sharing your ideas related to outreach and the health effects of wood smoke. Ecology continues to work with and support the Puget Sound Clean Air Agency and other local partners with their public outreach efforts related to the Tacoma-Pierce County Nonattainment Area.

Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 11:15 AM
Subject: FW: FIREPLACES

Comment #14
Please seriously consider interventions on fireplace smoke….
(a) NO wood burning masonry fireplaces, or manufactured fireplaces, allowed in ANY new construction or remodels in URBAN areas. Any and all fireplaces must meet current pollution criteria…
(b) Make it a priority to acquire equipment to monitor smoke after dark (a great deal of smoke is produced then) and be inventive on getting SIGNIFICANT increases in enforcement staff that may also include volunteers in order to adequately intervene on night time smoke…
(c) Enforcement with MONETARY FINES. Have the money received from fines go back into enforcement equipment (night monitoring and additional staff)…
(e) REQUIRE an in person inspection with photos of premises that request exemptions. Not 'stated' , but confirmed status…

Response
Thank you for your comment and sharing your ideas to reduce fine particle pollution in the Nonattainment Area. Ecology only has the legislative authority to prohibit the use of fireplaces as a contingency measure. Contingency measures are a required component of an attainment plan or maintenance plan. They would not become effective unless the Nonattainment Area does not meet air quality goals outlined in those plans.

Ecology included Puget Sound Clean Air Agency (PSCAA)'s regulation 1-13 in the SIP revision. This regulation includes a definition of "adequate source of heat". The implementation of exemptions under this definition falls in PSCAA's jurisdiction.

The strategies in the SIP revision include the increased enforcement during burn bans. This includes significantly increasing the number of inspectors in the field during a burn ban and, if possible, enforcing the burn bans at dusk and night.

Ecology will continue to support and work with PSCAA and the governing jurisdictions of the area. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 11:27 AM
Subject: public comment NIGHT TIME AND WEEKEND ENFORCEMENT

Comment #15
Ms Thompson - again: summaring previously submitted public comment sent via emails:
NIGHT TIME AND WEEKEND ENFORCEMENT is critical and essential. It should be a top priority to acquire equipment and staff/staff hours staggered/volunteers/student interns to handle the time when people come home from work and burning at night time.
Evening and weekend wood burning is more likely to include 'aesthetic' wood burning
Evening and weekend wood burning is very known to be unlikley to illicit ANY inspector - unless it is a burn ban
It is ESSENTIAL AND CRITICAL that night time and weekend viewing equipment and staff be acquired asap. This can make a huge different on enforcement being taken seriously, as well as a better air quality.

Response
Thank you for your comment and sharing your ideas about how to reduce fine particle pollution in the Nonattainment Area. The strategies in the SIP revision include the increased enforcement during burn bans. This includes significantly increasing the number of inspectors in the field during a burn ban and, if possible, enforcing the burn bans at dusk and night.

Ecology will continue to work with and support the Puget Sound Clean Air Agency. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Wednesday, October 24, 2012 11:38 AM
Subject: FW: public comment EXEMPTIONS

Comment #16
EXEMPTIONS should be '**hard won**' and should not only **be time limited**, but **require an in person inspection** - including upon any subsequent renewal. I think the 'burden of proof' should be upon the person requesting an exemption. Exemption status is very likely to be abused and manipulated. Making it easy, or having no burden of proof would be a mistake.
REQUIREMENTS for an exemption:
* **proof of income** (perhaps an income tax return?) so as to determine the capacity of the person to pay for cleaner heating methods

* **inspection** of ORIGNAL/ALTERNATE heating source as well as inspecting the wood burning device, chimney, etc. by an heating and air conditioning professional (funded by intervention money available?) is very important to verify Exemption viability.
*** require** that they contact electric and/or gas (depending on their original heating source) to **see if they qualify for assistance** with a furnace or other cleaner heat source
* co-partner with gas/electric providers for low income heat assistance with CLEANER heat source
* REQUIRE they **are meticulous** with regard to air pollution . **Strict compliance with allowed opacity and duration is required - at all times - or the exemption will be WITHDRAWN. An exemption cannot be an excuse to pollute or defy our needs for cleaner air to breathe and resulting deaths/health hazards that go with wood smoke air pollution (it is a known carcinogenic)**
* Exemption must be renewed (NOT a 'rubber stamp' procedure) annually. This evaluation of criteria for exemption, hooking up needs for heat with utility low income programs, etc could potentially be done by volunteer staff (it is not highly technical) For example: a gradute student in Environment Sciences could get credit and you get competent free staff. Any complaints about smoke with regard to the exempted party should cause obstacles or denial to another exemption being granted.
These requirements (* above) should be clearly stated in the Exemption, and it should be a legally binding document where the person(s) receiving the exemption have certain REQUIREMENTS of them in order to have an exemption. Breaking their end of the deal withdraws the exemption.

Response

Thank you for your comment and expressing your concerns. Ecology included Puget Sound Clean Air Agency (PSCAA)'s regulation 1-13 in the SIP revision. This regulation includes a definition of "adequate source of heat". The implementation of exemptions under this definition falls in PSCAA's jurisdiction.

Ecology will continue to support and work with PSCAA. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen
Email Sent: Thursday, October 25, 2012 10:02 PM
Subject: RE: more detail please

Comment #17
Dear Ms. Davis,
I have been working this afternoon on getting answers to your questions. Your questions as I understand them are:

- Why was the reference to nuisance laws removed from the How Wood Smoke Harms Your Health brochure?
- How quickly can we make a change to the document? If not very quickly, why not?
- When will the revised document show up on PSCAA web page?

Response

Thank you for your comment and expressing your concerns. Ecology modified the "How Wood Smoke Harms Your Health" brochure in July 2012 to simplify our messages to the public. We removed the reference to the nuisance laws because these laws and their enforcement vary in different areas, and are difficult to summarize.

Ecology agrees the public should be aware there may be nuisance laws in their area. Staff has made changes to reinstate a reference to nuisance laws into the document. The new version is available on Ecology and PSCAA web sites.

Ecology did not change the SIP revision based on your comment.

Tom Gillilan, Private Citizen

Comment #18

Your proposal to :

- Increased enforcement during burn bans.
- Required removal of uncertified woodstoves and inserts.

is a sugar coated approach that will not eliminate human exposure to toxic wood smoke vapors and will do little to nothing to improve human health in the Tacoma area, but will allow you to play the game that makes it look like you are doing something when you are not.

Burning wood no matter what form it is in is inappropriate in urban settings unless of course the smoke itself is somehow filtered and prevented from entering the air. The technology is available now, but the will to implement it is not. Pollution pigs always plead poverty.

Living near people who use wood to heat their home and charcoal to cook their food is like living next to a pig. Stinky, slimy, filthy pigs whose cave man habits destroy their neighbors health and well being.

I live in Los Angeles and am leaving the area because of unhealthy air quality. I can see right now that I will not be relocating to the Tacoma area.

ALL OF THE FOLLOWING CHEMICALS ARE IN CHARCOAL AND WOOD SMOKE:

CARBON MONOXIDE, METHANE, VOLATILE ORGANIC COMPOUNDS, FORMALDEHYDE, ACROLEIN, PROPIONALDEHYDE, BUTRYALDEHYDE, ACETALDEHYDE, FURFURAL, SUBSTITUTED FURANS, BENZENE, ALKYL BENZENES, TOLUENE,ACETIC ACID, FORMIC ACID, NITROGEN OXIDES,SULFER DIOXIDE, METHYL CHLORIDE, NAPTHALENE, SUBSTITUTED NAPTHALENES, OXYGENATED MONOAROMATICS, GUAIACOL, PHENOL, SYRINGOL, CATECHOL, PARTICULATE ORGANIC CARBON,OXYGENATED POLYCYCLIC AROMATIC HYDROCARBONS (PAH), FLORENE, PHENANTHRENE, ANTHRACENE, METHYL ANTHRACENES, FLUORANTHENE, PYRENE, BENZO(A)ANTHRACENE, CHRYSENE, BENZOFLUORANTHENES, BENZO(E)PYRENE, BENZO(A)PYRENE, PERYLENE, IDENO(1,2,3-cd)PYRENE, BENZ(ghi)PERYLENE, CORONENE.

WE INHALE THESE AS TOXIC VAPORS WHEN OUR NEIGHBORS COOK WITH CHARCOAL AND WOOD OR USE THEIR FIREPLACE

AT LEAST TEN OF THESE CHEMICALS CAUSE CANCER

THESE CHEMICALS ALSO CAUSE ASTHMA , COPD, CARDIOVASCULAR DISEASE AND MORE, MUCH MORE

Freedom does not apply to injuring others or putting others at risk needlessly.

Thanks, but no thanks

Response

Thank you for your comment and expressing your concerns. Ecology agrees that wood smoke has harmful effects on health. The strategies in the SIP revision are based on recommendations developed by a community Task Force. These strategies have shown reductions in fine particle pollution in other communities. Ecology believes these strategies will help the Tacoma-Pierce County areas continue to meet federal standards for fine particle pollution.

Ecology did not change the SIP revision based on your comment.

Michel Bellamy, Private Citizen

Comment #19

I just read your publication "How Wood Smoke Harms Your Health." It has a lot of good information and I hope it gets widely distributed.

I have a lot of problems during the summer months with neighbors' backyard fire pits. These are sold for ridiculously low prices at Home Depot / Lowes / etc., and they seem to be popular. Is there any movement towards banning these awful things? They are totally unnecessary.

Response

Thank you for your feedback on our publication.

Your comment about backyard fire pits falls outside the scope of the SIP revision. However, Ecology forwarded your comment on to the Puget Sound Clean Air Agency which regulates outdoor burning in the Tacoma-Pierce County Nonattainment Area.

Ecology did not change the SIP revision based on your comment.

jcaction@comcast.net , Private Citizen

Comment #20

Sounds good but we are losing our freedoms little by little. How to keep warm is the question especially when you can't afford the expensive equipment on the market.

Response

Thank you for your comment and expressing your concerns. Puget Sound Clean Air Agency (PSCAA) is currently implementing programs to assist low-income households. The programs will allow replacement and cover costs to change to an electric heat pump, gas furnace or gas stove/insert, pellet stove/insert, or wood stove/insert.

Ecology will continue to support and work with PSCAA. Ecology did not change the SIP revision based on your comment.

Janet Primomo, Associate Professor at University of Washington Tacoma

Comment #21
I strongly support the proposed state implementation plan (SIP) revision for the Tacoma, Pierce County Nonattainment Area. Elements of the revised plan were developed through a public process that involved a wide range of stakeholders, including health professionals like myself.

For over 25 years, I have been engaged in community health activities and research, including those that address the rising rates of asthma, as a university faculty member and community health nurse. It is imperative that steps are taken to improve air quality in the region in order to protect the public's health. Increased enforcement of burn bans, required removal of uncertified wood stoves and inserts, and reducing sources of fine particle pollution will not only help the region meet Federal Clean Air Act requirements, but it will help improve air quality and minimize the health risks from wood smoke and particulate matter exposure. Ecology's efforts to address environmental justice concerns are particularly noteworthy, as often disadvantaged populations experience the highest levels of exposures and illness.

Response
Thank you for your support and your hard work as a Clean Air Task Force member.

Ecology did not change the SIP revision based on your comment.

Gary Brackett, Tacoma-Pierce County Chamber

Comment #22
You might inform DOE that is not the proper name for the nonattainment area.

Thank you for your comment and expressing your concerns. EPA used the name Tacoma, WA – Pierce County (part) in the federal register notice designating the Tacoma-Pierce County area as nonattainment. During the designation process, Ecology referred to the areas as the Wapato Hills-Puyallup River Valley $PM_{2.5}$ Nonattainment Area in some documents. However, before beginning the public process used to develop the SIP revision, Ecology and its partners (including EPA and Puget Sound Clean Air Agency) decided to use the name Tacoma-Pierce County Nonattainment Area. Ecology and its partners felt that this name would accurately communicate the location of the nonattainment area to the public.

Ecology did not change the SIP revision based on your comment.

Steve Webber, Tacoma-Pierce County Clean Air Task Force

Comment #23

Thanks for the great conversation and insight to my concern. I am glad that I was present to explain my perspective as a wood burner.

As I was watching the slide show presentation, it occurred to me that the "Tracking fine particle pollution" pie chart included in the presentation described a different scenario than the pie chart that was presented in our Puget Sound Clean Air Task Force meetings. In the Ecology presentation, the pie chart described a residential wood combustion percentage of 74% compared to the 53% wood smoke that was presented to us in the PSCATF meetings. It was explained to me after the presentation that the 74% residential wood combustion represented a snapshot (or a 24 hour time frame sometime in 2008). My concern is that the general public will perceive this to be the case at all times during burning season. One suggestion may be to place a caption somewhere near the pie chart that explains in detail the snapshot readings that were taken from the monitor. Also, you may want to add the pie chart (53% wood smoke) that was presented in the PSCATF meetings and also place a caption near that pie chart explaining the time frame and data that was used to create it.

Looking back, my involvement and ideas/solutions would have been much different had the PSCATF used a pie chart that described the residential wood combustion to be 74% on average (December, January, February from 2006 -2009). I believe that I would have been in favor of more aggressive solutions as it relates to burning wood, because there would have been more room to reduce the wood smoke emissions based on a 74% contribution to the problem.

Response

Thank you for your comment on the emissions inventory pie chart used during the public hearing presentation. Figure 5 of the SIP revision identifies the pie chart with 74% residential wood combustion as emissions for a winter day. Figure 4 of Appendix E identifies the pie chart with 53% residential wood combustion as emissions for fall and wintertime source. We will ensure that we accurately label these pie charts in future presentations and other publications.

Ecology did not change the SIP revision based on your comment.

mcdo80796@juno.com , Private Citizen

Comment #24

As usual, you have totally ignored my concerns. I beieve your agency should be abolished because it provides no interest in public input and is a waste of tax payers resources.

Response

Thank you for your comment and expressing your concerns. Ecology developed the SIP revision to meet federal requirements in the Clean Air Act. The strategies in the SIP revision are based on recommendations from a community Task Force.

Ecology did not change the SIP revision based on your comment.

Kim Rader, Private Citizen

Comment #25

Please government, get out of my life, and quit telling me how to run my existence in Peirce County! We live in a Republic remember? Pierce County government seems to ambitiously pride itself with these kind of Socialistic policies
It really isn't your role to tell me what kind of wood heater to use. I am so tired of hearing about ways YOU seem think I should improve the air. Why doesn't our gluttonous, bloated "EPA" do something about the trains and ships, not to mention the semi trucks that continually belch smoke into the atmosphere and do a lot more polluting than my wood heating system.
By the way, don't send me any more of these annoying messages as they raise my blood pressure to the boiling point!
I guess evidently you people don't realize that this is another layer of a wasteful government bureaucracy that is universally hated by the voting public.

Response

Thank you for your comment and expressing your concerns. Ecology developed the SIP revision to meet federal requirements in the Clean Air Act. The strategies in the SIP revision are based on recommendations from a community Task Force. The strategies include reducing fine particle pollution from gasoline vehicles, diesel vehicles, industrial sources, and ships.

Ecology did not change the SIP revision based on your comment.

Lisa, Private Citizen

Comment #26

You goverment run a mucks should disban and save our tax dollar for industries development and jobs. And quit robbing the working class, If there needs to be an adjustment in yhere air quality that should come from an independent study not a goverment backed idiot.

Response

Thank you for your comment and expressing your concerns. This SIP revision is the first step in removing the nonattainment designation for the Tacoma-Pierce County Nonattainment Area. In the future Ecology will develop and submit to EPA a maintenance plan and redesignation request. Upon EPA approval, redesignation to

attainment will help the area avoid negative economic effects on industry development and jobs in the area.

Ecology did not change the SIP revision based on your comment.

Craig Kenworthy, Puget Sound Clean Air Agency

Comment #27

Thank you Melanie. Good evening, I'm Craig Kenworthy and I'm the executive director of the Puget Sound Clean Air Agency. We've worked with a group of citizens to come up with a plan to solve this problem in the Tacoma-Pierce County area. I want to recognize Steve Weber, one the members of the Task Force, is here this evening. And, this was a broad group in terms of their perspectives and what they do. We had Steve and other individuals who burn wood in their home for heat. We had representatives from the chamber of commerce, other businesses, transportation sector, the realtors. So, we had a really broad ranging conversation about how do you solve this problem. And, what the group came up with was to acknowledge a couple of things. First and foremost, the goal that we really had to have was to strike the balance where we have clean air and warm homes. That we had to find a way to make sure that in cleaning the air, we were still providing a way for people to be warm in their homes. The second thing was acknowledging that while we working to clean up other sources to clean up the air, as alluded to earlier, in terms of transportation, ships in the harbor, there are new rules, for example, coming in on ship fuel. That, while we wouldn't solve this problem just by addressing wood smoke, we couldn't solve this problem if we didn't address wood smoke. We simply could not get there, and get the pollution levels down enough without strategies related to wood smoke. So, with that underway, the Task Force focused in on a couple of things as it worked through those several months of meetings and those were, as mentioned earlier, the two strategies. One, getting better burn ban compliance, getting people to follow burn bans, that includes an education and outreach component to make sure people are aware of what's going on, working with the local communities to make sure people know there are burn bans, and urging everyone who can follow a burn ban, who has alternatives, to follow the burn ban. So, that was the first strategy while acknowledging and recognizing, as the legislature has directed us that if someone has wood as their only adequate source of heat, that they are exempt from the burn ban. Part of the Task Force recommendations and the rules that are in this package to go into the SIP from our agency, acknowledge wanting to make sure that the claim of being exempt for adequate source of heat is taken by those who are legitimately are entitled to it. So there are steps in our rules to make sure that those exemptions are granted to the people who really need it and are not claimed by someone who isn't really entitled to do it.

Second strategy was, recognizing that the uncertified stoves produce 50-60% more air pollution than a well-run, well-maintained, well-operated certified stove, that we needed to move people towards getting rid of those uncertified wood stoves. Um, as a note on this, I keep an article on my desk, that is from the newspaper, that talks about the need to get rid of uncertified stoves because they are much more polluting and talks about how many of them we have in the Puget Sound, central Puget Sound region and references that the legislature has granted the Clean Air Agency the authority to ban those

uncertified stoves. The date of that article is August of 1991. So, we've been talking about how to solve this problem for a long time. Those uncertified, older stoves are at least 20 years old and in most cases some of them are 30, 40 years old. So, we are asking people to acknowledge that those are an older generation of polluting devices, just like we would say to someone if you have a 1972 Buick you probably don't have the right set of pollution controls on the road. So, at the same time, while doing that, encouraging people to change that out, we have created an incentive program. I just want to note for the record, while it's not part of the rule making, to enable people who need help to change out to the cleaner device, to do so.

Quickly, noting a couple of other things, we do support obviously including our rules, rule 1-13 in the SIP revision, in its entirety, to make sure that we can demonstrate to EPA that we have the right set of strategies in place to get the area back into attainment and actually request that we be designated in attainment. I'll also note that the Task Force did a lot of work in discussing both social and environmental justice for people in the community, in reference to that element in Ecology's plan, and considered very carefully how to make sure, that people who needed assistance, in terms of being able to reduce the air pollution they were polluting from their heat source or to moving to a cleaner heat source were aided, and also in making sure that we didn't ignore areas where a number of people, who are low-income might all be burning wood. While we solved the overall problem, we didn't ignore those packets of air pollution and make sure that people, in those areas weren't left with impaired air quality. So, I want to note that for the record as part of the Task Force work and the work that was done to identify and address environmental justice concerns in the area. Referenced earlier, a substantial public task force process, in addition to the Task Force work that was done, the 8 months of work, all the meetings that happened with the Task Force, we did a mailer to all households in the nonattainment area, 220,000 households, telling them what the Task Force was up to, last October before the Task Force reached its final conclusions, those mailings produced people coming out and offering comments. We received several hundred comments, 600 comments, from individuals. We also had 200 people come to open houses in South Tacoma where the violating monitor is, and also to Puyallup, to talk to us about what they saw in the strategies and the concerns they had, to express their support or their opposition to the strategies, to tell us things they wanted us to consider. So, I want to note in addition to the process that Ecology's had and in addition to the direct Task Force meetings, our Board has also come down and held public hearings on the rules. We had a public hearing in September in Tacoma, on those rules. We had a hearing, where our board considered the recommendations from the Task Force in Tacoma, as well. We've had multiple meetings in Tacoma to provide opportunities for the public to weigh in on this as well. So, we've created a number of different opportunities to make sure that the public could comment and see not just what the Task Force was thinking about when they were done but to make sure that they could actually weigh in. And the Task Force received all of that public comment as well before they came to their final conclusions. So, in summary, this was a long and effective public task force process. I'm sure that the Task Force members occasionally felt like it was taking even longer because we extended it to make sure that we got all that public comment in. Uh, they did a lot of work as volunteers in the community to solve this problem and define that balance of clean air and warm homes. I want to thank them one more time for all of that work and urge that

the work that they created, which resulted in these rules by our agency and the elements in this plan be submitted by Ecology to EPA as part of the SIP revision. Thank you.

Response

Thank you for your support and your collaboration as a partner during the development of the SIP revision.

Ecology will continue to support and work with the Puget Sound Clean Air Agency. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen

Comment #28

Sure, that's fine. First off, can you hear me ok? Ok. I'd like to thank all of you who've worked so hard on this. And as a person who suffers from breathing in a lot of wood smoke, I, uh personally am glad Tacoma reached nonattainment so that we can address this huge problem that we have with wood smoke. I did um, address the Board of Directors meeting in October..uh was that, yeah anyway recently. And I'd like to just, because of the public record aspects of this cover a couple of those that we all know already. Um, so first off, sincerely thank you for all of the work that you do and as I stated and you know from your own statistics, 1,100 people in Washington state will die prematurely from breathing in particulate matter. So, this is really important what you're doing…and, um, I like what I see, as well. Both the work on, all the agencies.

So, I think the things that are, I've submitted written comment and I think that all I really need to add today is an affirmation of some the main points of that. In particular, I would like to see the legislature involved more. I think that we have tremendous difficulty with getting nuisance laws enforced. And I think that that's a legal issue, meaning a legal issue. It's well defined, but it's challenging to prosecute from a private party stand point, and I think that that needs to be addressed legislatively. Also, it's my understanding, that some of the mmm..tighter elements that were submitted, some were not passed in the legislature. So I suggested that we differentiate between urban and rural areas, with this matter. And I think that can be really really effective. One, urban areas have a much more dense population, and therefore much more health impact. And in addition, I think that we see a lot more reasonable burning criteria in a rural area. I think that people out there have less gas lines, less power options. And I think that some of things that we look at as exceptions might really be worthy there. My experience has been that this is abused, that I don't have adequate heat, almost everyone seems to know. And that they don't know the 1991 EPA research that wood smoke is twelve times more toxic than a cigarette. I don't personally want to be breathing in a carcinogenic so that somebody else can enjoy a fire. If they need it, that's one thing. So, I would like to see the exceptions stringently, stringently enforced, not just stated, but an inspection and proof and a re-inspection, and it only allowed for a short period of time. Word gets around, uh, in life, of how you can get away with what you want to get away with. And it got away with murder, as far as I'm concerned. We're understaffed as agencies to try to truly address this problem. And when you let people have an exception that they don't truly, truly need, you are harming someone like me, who is trying to be healthy. I'm a cancer survivor. I do not want to

breathe a known carcinogenic. I'm here today, and really turning my life upside down to do what I'm doing, because I don't want to breathe it. So, I want to support you in what you're doing. So, I think that urban versus rural really really makes sense both for enforcement and population impact as well.

Let's see, um, it's a tough thing when you start looking at start up and opacity. When you have a lot of places combined, like multi-family units, all with their fireplaces, what I experience is that people can come home, all light up their fires, not at the same time, so you have a start up here, start up there, start up here, so it's challenging when you really look at the full impact of how much smoke you may be breathing when you got such high density units that are putting out wood smoke. Same problem with, is this too much? Is that ok? Same problem when they die out at night, which is hellish, and we need some enforcement for that. So, I strongly support buying equipment to do nighttime observation and to get adequate staff for nighttime because we see this statistically as well. Nighttime is a bad time for wood smoke.

Um, I'm glad to see fireplaces finally getting included. I think that they are very challenging to deal with as an entity. We are beloved to our fireplaces and I understand that. Uh, oddly enough many years ago I heated with wood, and I burned my fireplace too, and I'm a cancer survivor now. So, who knows if that played a role in it, it's certainly possible. But I understand the aesthetics, but the sad part is when you build the fire you are probably breathing much less smoke than your neighbors. And as we know with the American Lung Association, wood smoke gets in a building, and your neighbors, with all the windows and doors closed.

Um, we need to really step up enforcement. That's a tough thing to do given the budget constraints. Personally, I would like to see fines and, first the gentleman, who no doubt will be speaking after me asked, I think for a waiver for uh, amazingly getting caught. I'm just surprised he even got a ticket. But, and I do support you paying it, just for the record. Um, no one should have to breathe your smoke, and I'm glad you got a fine, just personally. I would like to see those fines go back, I'd like to see them increase, not just at a set amount. I think that as someone continues to disrespect the laws and people's breathing air that the fines go up. And I don't know if you can do this legally, but I would like to see that money go back into enforcement, and to add staff and to add funding, so that we have a way to generate more response to this significant air pollution problem.

Um, I think other than what I've written this pretty well sums it up. I, again, I thank you all. I am hoping that this, we can get something really effective going on. Oh, and I did have one more line on here. Love the removal of uncertified stoves and I guess another thing I should state is that I would really like to see fireplaces addressed, in maybe the same way that when a home is sold, it has to be addressed. And, I think that that's ahead of where we are at right now, and I understand that. But, I'm glad to see it included. Are there any questions to me? K. Thank you.

Response

Thank you for your support of our work to reduce fine particle pollution in the nonattainment area.

The enforcement of nuisance laws falls outside the scope of the SIP revision because it is the responsibility of local governments.
The Pierce-County Nonattainment Area includes mostly urban areas including most of the greater Tacoma area and the surrounding area within Pierce County's urban growth area west of state route 167.

Legislative authority provides an exemption for households who have wood stoves as their only adequate source of heat. Ecology included Puget Sound Clean Air Agency (PSCAA)'s regulation 1-13 in the SIP revision. This regulation includes a definition of "adequate source of heat" designed to ensure that only those who qualify obtain a PSCAA approved exemption.

The definitions of start up and opacity are in Chapter 173-433 of the Washington Administrative Code – Solid Fuel Burning Devices. Changes to this rule fall outside the scope of this SIP revision.

The strategies in the SIP revision include the increased enforcement during burn bans. This includes significantly increasing the number of inspectors in the field during a burn ban and, if possible, enforcing the burn bans at dusk and night.

Ecology only has the legislative authority to prohibit the use of fireplaces as a contingency measure. Contingency measures are a required component of an attainment plan or maintenance plan. They would not become effective unless the Nonattainment Area does not meet air quality goals outlined in those plans.

Ecology will continue to support and work with the governing jurisdictions of the area. Ecology did not change the SIP revision based on your comment.

Patricia Davis, Private Citizen

Comment #29

Ok..um..thank you for letting me remember one thing I forgot…um.. and this is Patricia Davis again. Um, talking about clean air versus warm homes, I guess really that is a bottom line issue. Thank you Mr Kenworthy for reminding me of that. Um..it's possible to be warm in a whole lot of ways that I would like to see given to the public, maybe in paper form, so to speak…and I did. So, let's look at some of those…um you can do what they use to do in the old days, which is close off a room, you can wear more clothes, you can drink hot liquids, you can wear one of those emergency blankets on you, because what we are trading off is somebody's breathing really deadly smoke. So, the balance, I think, would also be expecting people to do what they can do that's reasonable, not to ruin their evening at home, but certainly to make a sincere effort to have, to do what they can do to be warm and recognize that when they are polluting the air they are harming

other people. So, I'd like to see a little bit more ideas out to the public about how to keep warm. Thank you.

Response

Puget Sound Clean Air Agency (PSCAA) is currently implementing programs to assist low-income households keep warm by providing assistance to remove or replace their uncertified wood stoves with an alternative heat.

Additionally, Ecology and PSCAA will use the tools in Appendix C and Appendix D to integrate environmental justice concerns into the air quality planning process for the Tacoma-Pierce County Nonattainment Area. This includes goals to reduce health risks from fine particle pollution and also consider the social and environmental effects on priority communities such as those who use wood as their primary source of heat.

Ecology will continue to support and work with PSCAA to work towards clean air and warm homes in the Nonattainment Area. Ecology did not change the SIP revision based on your comment.

Table 3: Commenter Index

The table below lists the names of organizations or individuals who submitted a comment on the rule proposal and where you can find Ecology's response to the comments.

Commenter	Representing	Comment number	Location (page number)
Marjorie Sebesta	Private Citizen	1, 2,3	104, 105
Jason Jordan	Port of Tacoma	4	105
Walt Parker	Private Citizen	5	106
Patricia Davis Email Sent: Tuesday, October 23, 2012 10:38 AM Subject: FW: tacoma - public comment	Private Citizen	6	106
Patricia Davis Email Sent: Tuesday, October 23, 2012 10:44 AM Subject: nuisance laws	Private Citizen	7	107
Patricia Davis Email Sent: Tuesday, October 23, 2012 11:55 AM Subject: NEW construction/fireplaces + restaurants	Private Citizen	8	107

Patricia Davis Email Sent: Wednesday, October 24, 2012 10:01 AM Subject: Nuisance Laws/Zero visible smoke/PSCA "complaint response" content - public comment	Private Citizen	9	108, 109
Patricia Davis Email Sent: Wednesday, October 24, 2012 10:23 AM Subject: FW: wood smoke/speak to Legislature?	Private Citizen	10	109, 110
Patricia Davis Email Sent: Wednesday, October 24, 2012 10:29 AM Subject: FW: wood smoke public comment 9/2012	Private Citizen	11	111
Patricia Davis Email Sent: Wednesday, October 24, 2012 10:48 AM Subject: public comment EXEMPTIONS	Private Citizen	12	111
Patricia Davis Email Sent: Wednesday, October 24, 2012 11:08 AM Subject: FW: wood smoke	Private Citizen	13	112
Patricia Davis Email Sent: Wednesday, October 24, 2012 11:15 AM Subject: FW: FIREPLACES	Private Citizen	14	112
Patricia Davis Email Sent: Wednesday, October 24, 2012 11:27 AM Subject: public comment NIGHT TIME AND WEEKEND ENFORCEMENT	Private Citizen	15	113
Patricia Davis Email Sent: Wednesday, October 24, 2012 11:38 AM Subject: FW: public comment EXEMPTIONS	Private Citizen	16	114
Patricia Davis Email Sent: Thursday, October 25, 2012 10:02 PM Subject: RE: more detail please	Private Citizen	17	115
Tom Gillilan	Private Citizen	18	116
Michel Bellamy	Private Citizen	19	116
jcaction@comcast.net	Private Citizen	20	116
Janet Primomo	Professor at UW Tacoma	21	117
Gary Brackett	Tacoma-Pierce County Chamber	22	117
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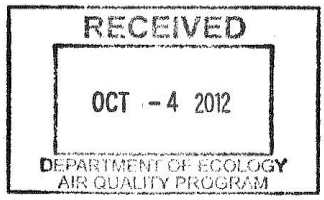
Part 3 - Copies of all written comments

Comments #1, #2, #3

September 28, 2012



Margo Thompson
Washington Department of Ecology
PO Box 476000
Olympia, WA 98504-7600

Dear Ms Thompson,

I live in the older section of DuPont, WA which is located at the south end of Pierce County. I checked the web site and saw that there are no air quality monitors located here. I wish that there were monitors.

The quality of the air in this community is very bad in the winter time as there are a lot of wood stoves in use. I am not sure that they meet the standards of air quality that I expected when I purchased my home.

In the summer time there are many fire pits going even during dry seasons and sometimes there is very little air movement so that smoke will enter my house even though I have replaced the former windows with high quality replacements and insulated all the walls. At 309 Louviers in DuPont there is a group home and the people often start a fire late at night that is only surrounded by rocks and has no cover. I think that this could be a risk to the residents of that home as well as the neighboring property.

In addition, I am concerned for our health because of the prevalence of smoke so much of the year. There have been many hot evenings that I am unable to open my windows for fresh air or work outside in my flowers due to the smoke. Please consider an air monitor here.

Sincerely,

Marjorie Sebesta

Marjorie Sebesta
502 DuPont Ave.
DuPont, WA 98327 .

Comment #4

Hello,
Attached are comments by the Port of Tacoma on the SIP revision for Tacoma-Pierce County Nonattainment Area.

Thanks,
Matoya Darby | Administrative Specialist | Port of Tacoma | 253.383.9464 | www.portoftacoma.com

September 25, 2012

Margo Thompson
Washington Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Submitted electronically to: AQComments@ecy.wa.gov

RE: Proposed State Implementation Plan (SIP) Revision for Tacoma-Pierce County Nonattainment Area

Dear Ms. Thompson:

The Port of Tacoma (Port) supports the Washington State's Department of Ecology's (Ecology) proposed State Implementation Plan (SIP) which represents a collaboration between Ecology and the Puget Sound Clean Air Agency to advance an innovative and balanced approach to achieving air quality goals in the nonattainment area.

As you may already know, the Port of Tacoma, Port of Seattle, and Port Metro Vancouver, B.C. formed an alliance to implement the Northwest Ports Clean Air Strategy, with direct involvement of federal, state, provincial and regional clean air agencies. In order to minimize emissions from marine-related sources, the Port has collaborated with Ecology to develop and implement many voluntary emission reduction programs, which are designed to reduce fine particulates for vehicles and equipment operating on Port properties.

While we consider the Port's fine particulate contribution to be minor during those periods of wintertime exceedances, we remain committed to support the State's efforts to bring down fine particulate pollution. As system-wide transportation is critical to the Port's operations, we are concerned about the potential impact from Ecology's nonattainment permitting requirements and air quality criteria for transportation conformity. Therefore, we ask to be included in any on-going discussions.

The Port of Tacoma has committed to continue working with agencies and stakeholders in a united effort to bring the region into attainment. We stand ready to assist Ecology in drafting new permit requirements and developing a maintenance plan.

If you have any questions concerning this subject, please contact me at jjordan@portoftacoma.com or (253) 830-5321.

Sincerely,

Jason Jordan
Director of Environmental Programs

Comment #5

From: Carole Cenci [mailto:CaroleC@pscleanair.org]
Sent: Thursday, September 13, 2012 11:26 AM
To: Thompson, Margo (ECY)
Subject: FW: Clean Air Pierce County Update
Another one for you.

From: Walt Parker [mailto:wjparker@live.com]
Sent: Wednesday, September 12, 2012 2:55 PM
To: Clean Air Pierce County
Subject: RE: Clean Air Pierce County Update
Your map is not very clear, cna you post or send one that shows streets so I can see where the south end of area is? Thank you.

Date: Mon, 10 Sep 2012 19:35:37 -0400
From: cleanairpierce@pscleanair.org
To: wjparker@live.com
Subject: Clean Air Pierce County Update

Message from the Puget Sound Clean Air Agency

Clean Air Pierce County Update

Thank you for your continued interest in learning more about Pierce County's air quality challenges.

We are forwarding this announcement as a courtesy to our partners at the Washington State Department of Ecology (Ecology). Ecology is proposing plans to improve air quality in the Tacoma-Pierce County nonattainment area, as follows:

_____

To Whom It May Concern:

The Washington State Department of Ecology (Ecology) is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Ecology will accept comments on the proposed revision from September 10 through October 19 by 5:00 p.m. See the public hearing notice link below for a brief overview of the proposal and instructions for submitting comments.

Here are links to:

- an overview of the nonattainment area and Ecology's proposed plans to reduce fine particle pollution
- the public hearing notice for Ecology's proposed SIP revision

For more information, contact:

Margo Thompson
WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

Thank you for taking the time to learn more about Pierce County's air pollution challenges and strategies aimed to improve air quality to help the area meet federal health standards in a timely manner. We hope you will continue to stay involved.

Sincerely,

Puget Sound Clean Air Agency

Comment #6

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Tuesday, October 23, 2012 10:38 AM
To: Thompson, Margo (ECY)
Subject: FW: tacoma - public comment

Hello Ms. Thompson:
Below please find a copy of my letter, submitted in person, to the Board of Directors, Puget Sound Clean Air Agency.
I feel it represents a more concise summary of the various issues i have brought up, informally, via emails.
Please ensure that this letter is included with public comment and also I would appreciate if you could forward it to parties that may be willing to contemplate it's content.
thank you
pat davis

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, September 26, 2012 7:00 PM
To: carolec@pscleanair.org
Subject: tacoma - public comment

Date: September 26, 2012

To: Board of Directors
Puget Sound Clean Air Agency
From: Patricia Davis
RE: PUBLIC COMMENT
Tacoma non-attainment/ SIP

Honorable Board Members:

I have reviewed the SIP, requested and read numerous documents with regard to this issue, as well as material on wood smoke in general.

I would like to take this opportunity to address what I believe are some of the main issues at hand with regard to wood smoke from the standpoint of both a layman, and a person who has found breathing wood smoke to be an overwhelmingly negative experience on multiple levels.

Clearly there has been a lot of work put into the SIP by many people. It is a complex issue, and one that will be challenging to effectively address and come into compliance with the Clean Air Act. In addition, it is a timely issue and one that may have challenges with regard to the EPA time line/extension.

I am pleased to see a multi-pronged approach to the problem

WE CHANGE WHEN WE HAVE A <u>BIG ENOUGH</u> "WHY"……..

So, the question is likely who is motivated and why.

The SIP does a nice job of addressing those that are burning.

Center for Urban Waters makes the proposal that they take 20 homes residents who burn non-certified devices and determine "the number of residents that decide to replace their uncertified stoves" as the measurement of effectiveness. Both the N in that, and also the subjects themselves may be difficult variables to create both reliability and validity, scientifically.

On another note regarding "big enough why" one might ask WHO will help, within the public, with cleaning up our air. The focus on the wood burning folks seems to carry undue weight. Myself I think that the people with the big enough "why" are the one's who DON'T burn wood and that once educated they will be even more clear on the issue. I would like to see PSCA go through their files and contact those who have complained about smoke and bring them into this process. Let them know that their help is needed to clean up the air.

You will find I make numerous references to cigarettes with regard to logic in this issue. Unlikely a cigarette smoker is going to be as motivated to get behind no smoking in public as would a person who does not smoke cigarette. Again: the big enough why.

<u>EDUCATION:</u>

Very very few people know these things (please get the word out. Simple, but powerful information that should be given to those that do NOT burn wood as well those that do)

1) Wood smoke is 12 TIMES (please capitalize it, people don't "read" it well) as toxic as a cigarette (EPA, 1991) (yes, I know it is second hand smoke, but keep it simple)
2) American Lung Assoc. states that wood smoke particulate is so small that it gets into neighbors homes even with all the doors and windows closed
3) American Heart Assoc. (2010) shows that air pollution causes heart disease
4) In Washington state 1,100 people will DIE from breathing in smoke/smog
5) Children get asthma and permanent lung damage from both cigarettes and wood smoke (CDC, Health Dept)

<u>IDEAS ON HOW TO EDUCATE</u>:

I am hopeful some of you have seen the amazing, effective CDC ad that has been on tv lately. It is brief, visually evocative, and highly educational in a very short time (15 – 30 seconds?) It starts with a large industrial truck. The driver gets out in "haz-mat" gear and "sprays" smoke (vapor) onto people in the area. Then you see the side of the truck and it read "cigarette smoke" and the ad states (I am going from memory here) "Did you know that there are over 7,000 chemicals in cigarettes? And they name 3 I am not immediately recalling, sorry. (I have my mind on wood smoke today)
I have personally asked a number of people if they have seen this ad. Many have seen it, and remember it. That is an effective ad !
Saw another ad (regarding kids smoking cigarettes) and again it was the CDC.
Question**: Does CDC have funding for health related ads**? Or maybe that can even produce one? Certainly if they care about cigarettes, they must care about something (wood smoke) 12 TIMES more toxic than a cigarette.
Can you inquire? Can you PLEASE get a copy of that ad and view it as an agency. It is awesome !
How about **public service billboards**? Simply stating: 1) (above) EPA, 1991
PCC newsletter (they published one on wood smoke already and are aware of the issue. PCC does not sell wood as a result)
Brainstorm where to find people that CARE ABOUT THEIR HEALTH:
www.washingtontoxics.org
Brainstorm, look around – who wants to be healthy. Educate them – I think that is where the "big enough why" is.

EXEMPTIONS:
A category up for abuse. That's for sure. I like that an application is required. Time limited. I think it should require an in person inspection by PSCA staff to ensure legitimacy. Not just something on paper/stated.
I find it offensive that garages, shops and commercial entities can get an exemption – and say NO! to that. Put on some more clothes. Other people should not have to die (think 1,100 people DIE) for that scenario.
In my frequent personal "polling" of people on wood smoke – many many people know the "inadequate heat" loophole. They don't know how toxic wood is, but they know that one. True story: smelled heavy smoke driving along to a store. Thought maybe a fire? Following the extreme smoke to a house. Inside through the window was man in a sleeveless tank top and shorts, even the windows were open a bit ! I went up to the door and told him that his smoke volume and opacity was illegal. He said "it's only source of heat". (Ridiculous !)
LICENSE RENTAL HOUSES (as Seattle has done**):**
The legal "footwork" is already done and in place. The advantage regarding wood smoke: rental housing is inspected (not complaint based) and must comply with building code, per se. If there is "inadequate heat" it becomes the clear responsibility of the owner to remedy the situation. No exemption – because adequate heat is a requirement of licensing.

APPLY BUILDING DEPT./HEALTH DEPT. standards
Most effective with rental housing. Can also be used elsewhere.

DISPOSING OF NON-CERTIFIED WOOD BURNING DEVICES:

In the public comments there was reference to these devices going to the landfills. I think it is important to make clear they can be recycled for metal, etc. Also might be useful to **contact salvage locations** and have them remove the material? Given them incentives? Might be some stainless steel piping that could be reused as well.
Note: I have been to multiple salvage locations that DO sell used wood burning devices. They need to be formally advised that is not allowed and there should be fines for not complying.
Craig's list should be monitored as well (one comment mentioned going underground" with buying non-certified stoves via craig's list) Also perhaps craigs list should have a "statement" that it is illegal to buy, sell, trade, or install a non-certified wood burning device and that there can be fines for doing so.

BURN BAN ENFORCEMENT:
Yes, enhanced enforcement is necessary. Great ! But when you look at the statistics on how often Tacoma has been out of compliance it is four months and almost five MONTHS out of the year. This problem is not going to be adequately addressed via burn ban windows – that's for sure. This is a chronic problem. Between 2000 and 2012 there were 17 burn bans in Pierce County with an average of 6 days in length. Compare that to 4 – 5 MONTHS of high PM
Fines, and increasing consequences must take place.

ENFORCEMENT IN GENERAL:
Understaffed. Literally no night time observations. Please DO get the equipment for night time observations of smoke (that is often when it is the worst). That should be a priority with the funding you have lined up: night time equipment. **BUY NIGHTTIME SMOKE DETECTION EQUIPMENT – this is essential !**
How about also using **ENVIRONMENTAL STUDIES STUDENTS ?** they can do "internships" or "work study" and get credit. Work study does not require any payment the student and they get credit with the school (I did that at the U.W.) That also might further the interest of environmental students with regard to air quality and the issues at hand.
Have heard many complaints about not enough enforcement. Also people have tried to submit photos, and video of excessive chimney smoke and it is not allowed. It is very difficult to get a certified inspector to a site WHILE the heavy smoke is taking place. And evening, after work, people stoke up their fires and no inspectors are around. That needs to change. Maybe alternate hours/shifts? Trained volunteers?
Inspection and enforcement are a great problem. I would like to see that addressed much more in detail and with greater velocity in the SIP.

KEEPING WARM:
Very workable ways to keep warm

1) Close off rooms and only heat a smaller space. If there is no door: use a blanket and hang it in the opening between rooms
2) Boil some hot water: humidity increases temperature
3) Drink hot fluids/hot water (in Russia they warm up from the inside out)
4) Get an "emergency blanket" that holds in most of body heat (very expensive, or use some of the funding money to make those available ONLY to those with proven inadequate heat (so the money is used wisely)
5) Wear layers of clothes.

FIREPLACES – masonry and factory built

There are 21,245 fireplaces in Pierce County. That is a lot. Of all devices listed, that is the highest category of wood burning entities. And, they are extremely air polluting due to no filtration of smoke. Fireplaces need to be very seriously addressed.

- **sale of house**: Yes, it is wise to **require** that non-certified wood burning devices be removed from houses that are sold. Could we additionally require that a fireplace be changed over to gas or a certified wood stove? That would address 21, 245 fireplaces – the highest number of wood burning devices.
- **Apartments, multi-units**: I would be great if they (now) are given a time period to to remove factory made fireplaces OR to install gas fireplaces/cert. wood. This would have a huge impact on our air. We get multiple people (can be dozens) burning wood at the same time in a neighborhood. Give them a 6 min. start up with a staggering start up time – you will choke on smoke INSIDE your home. How about 20 min. in 4 hours? (stagger that with multiple units- it can be continuous smoke) Not to speak of the smoldering that multiple fireplaces "go out" themselves when the people go to bed. Sickening nighttime smoke. Given we often have less wind at night - double trouble.

START UP TIME AND SMOLDERING AT NIGHT:

My intention as I address this is not to be disrespectful, but instead to be poignant. Please bear with me

If I smoked a cigarette in your home or office, or car for 6 minutes, how would you feel about that? How about 20 min. in four hours? I am assume that is a no . If you managed to withstand that: how about another smoke lights up? Then they hve 6 minutes, etc.

That is a reality with wood smoke. It is not one person starting up and then you are done, but is a lot of fires and smoke. A lot of smoldering at night . Many many…..

SALE OF BUNDLES OF WOOD/ MFG LOGS during burn ban should be illegal:

I talked with the manager of the store near me and asked them not to sell wood during a burn ban. Guess what? He told me that they actually sell MORE during a burn ban. Why? It is usually cold out/temperature inversion. So people that don't buy cord wood, buy these.

Can wood, mfg. logs be removed from the sale area during a burn ban? A fine if they are sold?

PCC (on it's own) stopped selling bundles of wood because it is toxic. Thank you

NUISANCE LAWS:

This needs to be part of the education of the public (prev. stated) and WHY did that get removed from ECY "Wood Smoke and your Health" new edition? It should **be reinserted** and that information (nuisance law) needs to be available to the people with the "big enough why" to help clean up the air.

It should also **be included in the "information packet**" sent to wood burners who have received a complaint so they understand about Nuisance laws and also that they cannot smoke out their neighbors. This NEEDS to be in the packet from PSCA sent to wood burning "offenders"

A profound and revealing question:

What are you letting be "most important" versus what IS "most important" ?

One side of the scale might say: being warm

The other side of the scale: breathing
Clearly: breathing is "most important"

And then we have the 1,100 people that will die prematurely. The kids with asthma. The people that go to the emergency room during filthy air because they can't breathe (statistically true).
We can get warm – we cannot find air to breathe when it is full of smoke all around our neighborhoods. We need to breathe !
In summary, I have taken a great deal of time I really do not have in order to read the SIP, make contacts, get information, read files , write this letter and come in person to the Board of Directors meeting in Tacoma 9/27/12.
I will also be attending the ECY October hearing.
Why have I done all this work? Well, because I have that "big enough why". Like many people who suffer from wood smoke. Who are literally choking on smoke INSIDE their homes with no where to get clean air. I want to be part of the solution.
Like cigarettes – which used to be smoked everywhere (as in everywhere !) now we have a law that says "no" to smoking in public. Isn't it interesting that the research has been here for DECADES on the poison toxicity of wood smoke and most people don't know it? That we don't want cigarette smoke around us, but "we" will generate massive toxic smoke (wood smoke) without a thought or care?
People like myself who are trying to be healthy are passively choking on smoke they did not generate and cannot get away from. Also there is a challenge to get timely and effective enforcement and remedy.
I hope my thoughts and ideas (which represent many many hours of reading, many hours of thought and even some loss of sleep) can facilitate change.
1,100 people do not have to die prematurely. We need the help of governmental agencies because no private party could intervene on the scale of this. I am thankful for EPA,ECY and PSCA and I commend you for the unending challenge of protecting our children, citizens and planet from harm.
Some pollutants we must endure. But wood smoke is not one of them. There is no "clean burning" per se. Smoke is smoke. And it kills.
Thank you
Pat Davis

Comment #7

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Tuesday, October 23, 2012 10:44 AM
To: Thompson, Margo (ECY)
Subject: nuisance laws
From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, September 26, 2012 8:34 AM
To: Craig Kenworthy
Cc: Laurie Halvorson
Subject: questions

Greetings

I have been reading over a great deal of material relative to Tacoma's non attainment.

Couple of questions:

Regarding contacting the public - did PSCA make contact with people who had made COMPLAINTS and advise them of the hearings/process/ask for comments?

Also I do not see where ANY reference (to the public) is made specifically stating

a) Wood smoke is 12 TIMES more toxic than a cigarette (EPA, 1991)

b) Reference to nuisance laws (which has now, oddly, been deleted from the previous ECY Wood Smoke and your Health pdf/handout)

eg: words similar to this (I do have a copy of the ECY earlier version, but I will go from memory). Something similar to: it is illegal to produce and odor or smoke which interfers with the health or enjoyment of property of your neighbor.

additionally: has PSCA included the: it is always illegal to smoke out your neighbor

and has PSCA included: you must extinguish your fire if your neighbors tells you it is bothering them

I sincerely believe where you will get the most impact in this SIP intervention is from those that do NOT burn wood. They are a majority numerically. That is why (the above) informatin about hazards and remedy are key.

I would appreciate a specific reply from you to the above questions.

Given I am going to the Board of Directors meeting tomorrow it would be useful to have a reply prior to that so I understand if I maybe just "missed" this information being given to the public. Also, if you contacted and involved wood smoke complainants. thank you :)

thank you

pat davis

Comment #8

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Tuesday, October 23, 2012 11:55 AM
To: Thompson, Margo (ECY)
Subject: NEW construction/fireplaces + restaurants

Dear Ms. Thompson

I have been reviewing the numerous emails I have sent and wish to summarize herewith (for the purpose of inclusion in the public comments) that I strongly believe that a wider spectrum of agencies need to be involved. As I presented previously: I think addressing wood smoke issues that occur in URBAN versus RURAL areas is critical.

MAIN POINT: The population density, and therefore pollution impact on health effects more people. Urban areas have almost guaranteed access to natural gas and other cleaner burning options than wood burning. Enforcement in urban areas can address more cases than is likely able to take place in a spread out, rural area. Additionally, I believe that rural areas may have more 'need', in some cases, to burn wood than in an urban area. I would strongly recommend and request that this be addressed specifically with the Legislative bodies at hand.

MAIN POINT: We need to address wood smoke air pollution through zoning/code/permit approaches. In particular:

1. **Require** (via changes in building CODES) that all fireplaces built in new construction MUST meet pollution standards. The 'old' type of masonry or manufactured fireplace should no longer be allowed to be installed in ANY construction or ANY zoning. Those 'old' fireplaces, which have zero filtration, would no longer be allowed. Not commercially, residentially, or otherwise. Just like cars: pollution devices must in place and not dismantled, per se. Although this is a slow method to address the disgusting level of smoke that comes from fireplaces (which is not likely being used for heating purposes given fireplaces are not adequate for heat, and can even suck the heat out of the area) it at least would be start to stop allowing them to be built. This can have a large impact over time, and no doubt save some children and others from harm.

2. **Phase out existing fireplaces** (masonry and manufactured). This could begin in multifamily zoning. Why? There are massive numbers of wood burning devices in a small area (relatively speaking) Start up times likely 'stagger' and therefore the total smoke load on the neighborhood can be a great deal. Same with the smoldering out of numerous fireplaces in a bulding complex smoldering out at night. Result: much greater than a single fireplace. this can be done in two ways: change the zoning laws and phase them out with a specific 'end time' and a fine for not removing them. And a fine that increases for not removing them/replacing them with devices that meet air quality standards. (again: no new ones) This can also be attained via licensing rental housing and not allowing fireplaces/burning devices that do not meet current criteria for emissions.

note: Washington Landlord Association Quarterly. www.landlord.com Tim Seth, President. Said newspaper included an article entitled: 'Protect your property, increase your product's appeal and benefit community health - go smoke free in realtion to cigarettes. I think it also can apply to the smoke that is generated from building a wood fire inside a rental unit. Fireplace smoke most certainly penetrates carpet and rental proeprty. (I can send you a copy of the article if you would like, regretfully i did not note the date)

It states that it is "within the rights of landlords" to go smoke free; addtionaly it reads: that cigarette smoke free can:

* " reduces cleaning costs - which can be as high as 1K less than a non-smoking unit"
* protects property from fire
* (I type this in bold, not the original) "MORE THAN 80% OF ALL RENTERS WHO SMOKE , PREFER SMOKE FREE HOUSING. CLEARLY SMOKE FREE POLICIES HAVE THE BENEFIT OF ATTRACTING A LARGER SHARE OF THE TOTAL DEMAND FOR RENTAL HOUSING"

Note: The above mentioned article references www.smokefreewashington.com and also Chris Hawkins at Thurston County Public Health & Social Services.
hawkinc@co.thurston.wa.us (360) 867-2513

b) STOP permitting **wood burning in restaurants or any commerical application**. It is not necessary to, for example, cook pizza on wood and the completely UNFILTERED smoke from those restaurants is highly air polluting. Other states, such as Montana, have done this. We have eaten very tasty pizza for years within pizza ovens that do not pollute neighborhood air. Stop allowing permits for wood burning devices in commercial appliations - immediately/asap. Seems like a pretty easy thing to change from a code standpoint and it would have multiple positive impacts on health and air quality

c) Get PREVENTATIVE now on **wood burning BOILERS** that are becoming 'popular' around the country. They should not be allowed or permitted (again: start with URBAN zoning on this)

In summary: wood smoke is often a misunderstood entity. It is often seen as 'renewable' and 'clean' and 'cheap' (health costs are not considered the assessment of 'cheap') In fact, it is a well researched commodity that is a known carcinogenic, a heart health hazard (American Heart Assoc), a lethal and deady air pollutant. In addition, it is problematic in that it is very difficult to avoid it inside our homes. According to the American Lung Assoc. wood smoke particulate is so small that it enters neighbors homes with the doors and windows closed. That happens to me where I live. And, I cannot open a door or window to get clean air to breathe. There isn't any. This is especially bad at night and in low wind conditions.

I am a private party who is taking a great deal of time and effort to try to contribute to a solution regarding wood smoke. I am doing this for myself, as well as the 1,100 people in Washington State who will die prematurely from wood smoke/particulate matter.
Wood smoke air pollution is a timely and urgent issue. We need multi-pronged interventions on a Legislative level, all the way down to changes in zoning laws (some suggestions/ideas above)
It feel the building codes getting changed asap is critical with regard to new construction and commerical wood burning. The outlawing of wood burning boilers should take place asap and be in place and not permitted at all in any urban area. Nuisance laws need to much easier to enforce (legislatively and locally).
thank you for your consideration of the above suggestions
cc: PSCA, EPA
patricia davis

Comment #9

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 10:01 AM
To: Thompson, Margo (ECY)
Subject: Nuisance Laws/Zero visible smoke/PSCA "complaint response" content - public comment
Dear Ms. Thompson
I am continuing to go through previously sent emails to summarize them in a more brief manner so as to ensure they are included in public comment with regard to wood smoke issues/tacoma non-attainment/SIP
The previous Dept of Ecology document on Wood Smoke and Your Health included a specific reference to Nuisance Laws that was not included in the revision
It is CRITICAL that both the wood burning source and the person(s) suffering under wood smoke air pollution be advised about Nuisance Laws. As I recall it read something like: "it is illegal to produce an odor or smoke which interfers with the health or enjoyment of property of your neighbor"
Additionally: The PSCA website states if a person suffering under the impact of wood smoke air pollution requests a neighbor put out their smoke producing fire, that the person(s) burning wood need to put the fire out.
1) I request, specifically, that Dept of Ecology reinstate the previous nuisance law reference (above paragraph) asap and that the PSCA website link to that pdf be changed soon to reflect said change
2) Additionally, I think it would be a good idea for PSCA to include the following information on the response to wood smoke complaints (it addresses "how to burn" but not Nuisance Laws and some protection for the complainant). To be specific: It would be helpful to those suffering under excessive smoke - who have the courage to make a formal complaint (which can cause retaliation and sometimes having even more smoke generated in a 'don't tell me what to do' attitude) So: when a complaint is made, I think it would be important for the response from PSCA to specifically include the item on the website within the response packet: That it is always illegal to smoke out your neighbor. That if a person burning wood produces either smoke or odor, and the neighbor advises the burning wood party that it bothers them, and makes a request to put the fire out - that it must be put out. The PSCA "response" letter/packet - to me - seems to be about how to burn cleaner, but does not advise the wood burning party of nuisance

laws that it is illegal to smoke out your neighbor. The complaining party needs some support on this.
3) Also the complaint "response packet" should include the allowed start up length, opacity allowances and criteria for smoke opacity over ____ number of hours. Zero visible smoke should be the goal - and that would be beneficial to be included in the "response packet" as well, and it would make alot of difference to have ZERO SMOKE VISIBILITY after start up time. That would help with air quality, and also clarify in enforcment.
4) Emphasis on ZERO SMOKE VISIBILITY GOALS should be in literally all website, paperwork and outreach components.
cc: PSCA, EPA
thank you
pat davis

Comment #10

Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 10:23 AM
To: Thompson, Margo (ECY)
Subject: FW: wood smoke/speak to Legislature?
From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 03, 2012 10:14 AM
To: margo.thompson@ecy.wa.gov
Subject: Fw: wood smoke/speak to Legislature?
margo - fyi
patricia

----- Original Message -----
From: Nelson, Sen. Sharon
To: Patricia Davis
Sent: Tuesday, October 02, 2012 4:18 PM
Subject: RE: wood smoke/speak to Legislature?

Hi Patricia,

I will be sure to let Senator Nelson know that you would like to testify on this issue. Thank you!

Elizabeth Hummel
Legislative Assistant
Senator Sharon Nelson
360-786-7667
Subscribe to Senator Nelson's e-newsletter:
http://apps.leg.wa.gov/subscriptions/member.aspx?member=nelson

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Friday, September 28, 2012 3:24 PM
To: Nelson, Sen. Sharon
Subject: wood smoke/speak to Legislature?
hello again.....if there is a chance for me to speak before the Legislature on the wood burning issue please let me know. And thank for helping protect our environment and actually "getting it" about how important that is.
respectfully,

pat davis
----- Original Message -----
From: Nelson, Sen. Sharon
To: 'Patricia Davis'
Cc: Nelson, Sen. Sharon
Sent: Friday, September 28, 2012 11:03 AM
Subject: RE: wood smoke

Hello Patricia,

Thank you for your email, I have forwarded it to Senator Nelson, and also to two staffers who have worked with this issue in the Environment Committee. Senator Nelson agrees that there are significant health impacts from wood smoke, both indoors as well as the ambient air. Where these emissions are determined to be a primary cause of air quality problems, such as the Pierce County nonattainment situation, these sources should be a primary focus of strategies to reduce their use and replace wood stoves with alternatives where feasible. Senator Nelson believes that a combination of education and enforcement, combined with public financial assistance will likely be the most effective pathway to addressing the problem.

I have cut and pasted staff comments below, describing the legislation that passed in 2012 addressing this problem, as well as comments or clarifications on the some of the excellent suggestions you raise. Note that the third bullet below describing legislation that passed in 2012 gives authority to local jurisdictions (such as Seattle) to assist with enforcement, so you may wish to contact them as well.

I hope the following information is helpful. Thank you again for taking the time to contact Senator Nelson about this important issue.

Sincerely,

Elizabeth Hummel
Legislative Assistant
Senator Sharon Nelson
360-786-7667

(From non-partisan Environment Committee staff:

In response to some of this constituent's concerns, this session SHB 2326 passed which in part:

- Requires the Department of Ecology and local air pollution control authorities to provide assistance to households to change out wood stoves to lower emission devices. In areas of non-attainment, they are also required to provide public education about cleaner burning practices, adhering to burn bans and opportunities to obtain a cleaner burning device.
- Authorizes the Department of Ecology or the local air pollution control authority through rules, to require disclosure of an uncertified wood stove, removal or render inoperable a wood stove in areas designated in non-attainment for fine particulates.
- Allows, within a non-attainment area, a city, county, or local health department to assist with enforcement of burn bans.
- Lowered the burn ban trigger for areas in non-attainment or at risk for non-attainment so that burn bans could be called before the federal standards are exceeded.

The changes in the bill were directed to help with Tacoma/Pierce County non-attainment issues, which are primarily due to wood smoke.

From Environment Committee caucus staff:

Emission standards for new stoves: Washington State's clean air laws require a stringent emission standard in the sale of new wood stoves, with product testing and certification done per USEPA standards. These standards do not apply to masonry fireplaces.
Requiring elimination of noncertified stoves: This is a laudable goal that Senator Nelson explored last session for a potential pilot area in the nonattainment area of Pierce County for homes going through foreclosure and sale by banks. But it ran into a number of problems and did not pass. The "tax credit" idea is one that Senator Kastama explored with a bill that would have funded the program by reduced requirements in repair of vehicles failing emission tests, but this "out of kind" type of trade ran into opposition from clean air regulatory agencies.
The idea of switching to gas heat also is a laudable goal, but much of the state does not have natural gas services, and the cost of propane or oil heat is much more than natural gas or heating with wood.
Educating about the health impacts from wood smoke: Absolutely a good idea. Ecology, local health agencies, and others are engaged in this effort, but more could be done. Ecology's website has extensive information on the health impacts:
http://www.ecy.wa.gov/programs/air/indoor_woodsmoke/wood_smoke_page.htm
Oppose wood burning entirely: Realistically in many areas with low- and moderate-income households the only adequate source of heat may be through wood stoves or fireplaces. With natural gas service not available, assisting households to acquire a certified wood stove may be the only practical alternative, and it's still a step in the right direction to reducing particulate emissions.
Wood stove industry: The wood stove industry is not monolithic. The "industry" is keenly interested in selling their new, certified products, and have been generally supportive of clean air initiatives that may also drive toward replacing noncertified older stoves with new products.

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Tuesday, August 28, 2012 10:38 AM
To: Nelson, Sen. Sharon
Subject: Fw: wood smoke
Dear Ms. Nelson - I am sending you an email where I offer input/ideas to Puget Sound Clean Air with regard to wood smoke. Would you be so kind as to read it? Also feel free to forward it anywhere/anyone. thank you, patricia davis
----- Original Message -----
From: Patricia Davis
To: cleanairpierce@pscleanair.org
Sent: Friday, August 17, 2012 11:17 AM
Subject: wood smoke
I would like to offer the following suggestions with regard to wood smoke air pollution and potential ideas for addresssing it:
1) REQUIRE all multiple unit dwellings who now have wood burning devices (many of which are not certified) to switch over to either CERTIFIED wood burning devices or GAS fireplaces within 2 years (more or less) Give a tax incentive/write off/credit for doing so. Or coordinate with GAS fireplace (not certified wood: GAS) to work out a tax incentives as well for the supplier of the devices.
Goal: get rid of non-certified wood burning devices
Goal: switch to gas (ideally) due to clean burning
Goal: mandate it legally and give tax incentives
Goal: PROMOTE gas above wood burning devices. Why? The start up time generates air pollution both inside (harmful) and outside into the neighborhood. The smoldering that takes place when it "dies out" in the evening is also extremely polluting and almost impossible to enforce.

2) Start citing EPA, 1991 research when educating the public and enforcement authorities. It states that wood smoke is 12 TIMES more toxic than a cigarette (actually second hand smoke)
We VOTED not to allow cigarette smoking in public, and have great CDC/Health Dept ads (the truck spraying people with cigarette smoke and advising that there are 7,000 chemicals in cigarettes) BUT why is no one addressing wood smoke that way? In fact: wood smoke is much much more lethal and deadly than a cigarette. The public has VOTED not to breathe cigarette smoke - we need to get them EDUCATED on wood smoke chemicals, toxicity, and the number of people that will DIE early (as well as children with asthma) due to breathing in wood smoke.

3) please do NOT ask for "clean burning". Instead take a stance that is based on research: STOP BURNING WOOD ! Even certified stoves have smoky start up and end of the night smoldering.

4) Get a back bone with the wood stove industry that is actively working to break down our clean air efforts. Please contact marie.wood@kingcounty.gov to figure out why King County would be retracting laws in place on wood burning devices.

5) Get effective enforcement. There is not enough staff to adequately respond to and deal with fireplace chimney smoke (totally unfiltered and nasty - see 1. above) Puget Sound Clean Air apparently does not allow video of smoke and requires an inspector to see it. The statistically liklihood of EFFECTIVELY dealing with any large scale wood burning in this manner is laughable. Not possible. So how about training a LARGE volunteer staff with the capacity to assess/measure opacity (not hard to train someone on that) and then let them input that opacity and violation into a system that can EFFECTIVELY address the problem and get citations and fines. That money can be used to support additional staffing and ENFORCEMENT. again: there is absolutely no way that this scale of wood burning can be solved by the inadequate staff at PSCA - **impossible !** Here in Seattle - people are quite aware that staff at PSCA is usually gone from 4/4:30 pm M - F and they burn burn burn thereafter and on the weekends - with no worry. Maybe start giving work study positions to college students who are going into Environmental Studies and get them on ENFORCEMENT.

6) Join with the amazing people at CDC and Public Health who put that fabulous ad (now running) on tv about cigarette smoke and get one for wood smoke. I find it amazing that literally no one sees wood smoke as the poison it is.

7) LEGALLY MANDATE CHANGES from a State and Federal level. Beware: the wood burning stove industry and free standing wood devices for in the yard (those need to be stopped !) will be right there lobbying hard for the "right" to pollute our air. Why should someone be able to sit in an urban area yard and for aesthetic reasons sit there and pollute the neighboring air - for their "enjoyment"? That is where **Nuisance laws** come in. Although it is "illegal to produce odor or smoke that enjoys with the health of enjoyment of property" - help get that more easily enforcment in COURT. Change the laws to make a Nuisance lawsuit more speedy and effective - with mandatory fines that go into regulating and enforcing wood smoke pollution.
We also need to stop giving permits for wood burning pizza, etc. Those stacks have zero emission control and they are increasing in our neighborhoods. Start up and refueling is smoky. End of night smoky. Why do we need to make pizza on wood when it smokes up the neighborhood. And getting enforcement for that (among other wood burning activities commercially) is very very difficult. Other States (montana and CA have curtailed permits on those polluting businesses)

8) The claim by wood burning product producers is that along the lines of the poor people who can't afford to heat their homes. Well.....let's get realistic. Those people who are killing other people by polluting their breathing air can a) put on more clothing b) cover themselves with blankets, etc - including the LOW COST emergency blankets that hold in body heat. They cost under $5 c) close off rooms with blankets between rooms (like in the old days) d) increase humidity which increases heat e) drink hot fluids (like they do in Russia: warm up from the inside out) e) use thicker window coverings. Those are all very real solutions that are no or low cost.
The public has a RIGHT to be able to breathe ! It exceeds to right to sit in a backyard and burn wood for "enjoyment". Same with a fireplace. Fireplaces suck heat out of the house and are high useless in heating. The

purpose of a fireplace fire is almost always aesthetic. **Wood smoke** is a huge health concern. **It is a killer. A killer**. Wood burning is on the increase and other states are having difficulties with wood burning boilers as well. We need to come at this from a multi-pronged approach. Education (research is replicated and abundant.....why are the laws not **stopping** this killer?) Effective enforcement - get help and lots of it. Make Nuisance Laws more readily known - PLEASE let the public know about Nuisance Laws in every single effort you make and combine that with making it easier to win a Nuisance Lawsuit (again: we need stronger laws to protect our air from this KILLER) Start requiring switching over from non-certified wood stoves - ideally to gas with a HIGH MOTIVATION to use gas. again: beware not to be bullied by wood burning devices sellers. We do NOT need to be burning wood - for any reason at all. We need to be able to breathe.

The American Lung Association reminds us that wood smoke particulate is so small that it bypasses the immune system, and also get into neigboring houses with all the windows and doors closed. There is no such thing as opening the window to get clean air. Where does a person go to be able to breathe? Again: we have a right to breathe. Stop being swayed by special interests that minimize the accumlated impact of even certified wood smokes and pay attention to the reality that massive numbers of people will die early and be unhealthy (costing money for state services directly and indirectly) due to wood smoke (including secondary and tertiary effects). Children will be suffering through a lifetime of asthma and the health and day to day impact of that (along with cost for services on health care) The planet is also at risk.

This is going to take a multi-level strong stand. The research is there. Wood smoke KILLS - period. Wood smoke kills. Let's quite "rationalizing" it and selling out to wood smoke generating manfacturers. Why not offer them tax incentive to switch all their devices to gas only?

People resisting recycling - at first. But it was required. We heard how not allowing cigarette smoking in public was going to destroy businesses - but it didn't.

Take a stand - and get the laws behind this. A "fluffy" light effort will not work. The CDC ad (although I don't know how many channels it is on - like is it on cable as well?) is fabulous and lots of people talk about that ad. It is superior and it is educating in just a few seconds. The visual is genius. Now do that for wood smoke.

Please email this to any and everyone that you can think of.

thank you

pat davis, seattle

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Tuesday, August 28, 2012 10:38 AM
To: Nelson, Sen. Sharon
Subject: Fw: wood smoke

Dear Ms. Nelson - I am sending you an email where I offer input/ideas to Puget Sound Clean Air with regard to wood smoke. Would you be so kind as to read it? Also feel free to forward it anywhere/anyone. thank you, patricia davis

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From: Patricia Davis
To: cleanairpierce@pscleanair.org
Sent: Friday, August 17, 2012 11:17 AM
Subject: wood smoke

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Goal: get rid of non-certified wood burning devices
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Goal: PROMOTE gas above wood burning devices. Why? The start up time generates air pollution both inside (harmful) and outside into the neighborhood. The smoldering that takes place when it "dies out" in the evening is also extremely polluting and almost impossible to enforce.

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3) please do NOT ask for "clean burning". Instead take a stance that is based on research: STOP BURNING WOOD ! Even certified stoves have smoky start up and end of the night smoldering.

4) Get a back bone with the wood stove industry that is actively working to break down our clean air efforts. Please contact marie.wood@kingcounty.gov to figure out why King County would be retracting laws in place on wood burning devices.

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6) Join with the amazing people at CDC and Public Health who put that fabulous ad (now running) on tv about cigarette smoke and get one for wood smoke. I find it amazing that literally no one sees wood smoke as the poison it is.
7) LEGALLY MANDATE CHANGES from a State and Federal level. Beware: the wood burning stove industry and free standing wood devices for in the yard (those need to be stopped !) will be right there lobbying hard for the "right" to pollute our air. Why should someone be able to sit in an urban area yard and for aesthetic reasons sit there and pollute the neighboring air - for their "enjoyment"? That is where **Nuisance laws** come in. Although it is "illegal to produce odor or smoke that enjoys with the health of enjoyment of property" - help get that more easily enforcment in COURT. Change the laws to make a Nuisance lawsuit more speedy and effective - with mandatory fines that go into regulating and enforcing wood smoke pollution.
We also need to stop giving permits for wood burning pizza, etc. Those stacks have zero emission control and they are increasing in our neighborhoods. Start up and refueling is smoky. End of night smoky. Why do we need to make pizza on wood when it smokes up the neighborhood. And getting enforcement for that (among other wood burning activities commercially) is very very difficult. Other States (montana and CA have curtailed permits on those polluting businesses)

8) The claim by wood burning product producers is that along the lines of the poor people who can't afford to heat their homes. Well.....let's get realistic. Those people who are killing other people by polluting their breathing air can a) put on more clothing b) cover themselves with blankets, etc - including the LOW COST emergency blankets that hold in body heat. They cost under $5 c) close off rooms with blankets between rooms (like in the old days) d) increase humidity which increases heat e) drink hot fluids (like they do in Russia: warm up from the inside out) e) use thicker window coverings. Those are all very real solutions that are no or low cost.

The public has a RIGHT to be able to breathe ! It exceeds to right to sit in a backyard and burn wood for "enjoyment". Same with a fireplace. Fireplaces suck heat out of the house and are high useless in heating. The purpose of a fireplace fire is almost always aesthetic. **Wood smoke** is a huge health concern. **It is a killer. A killer**. Wood burning is on the increase and other states are having difficulties with wood burning boilers as well. We need to come at this from a multi-pronged approach. Education (research is replicated and abundant.....why are the laws not **stopping** this killer?) Effective enforcement - get help and lots of it. Make Nuisance Laws more readily known - PLEASE let the public know about Nuisance Laws in every single effort you make and combine that with making it easier to win a Nuisance Lawsuit (again: we need stronger laws to protect our air from this KILLER) Start requiring switching over from non-certified wood stoves - ideally to gas with a HIGH MOTIVATION to use gas. again: beware not to be bullied by wood burning devices sellers. We do NOT need to be burning wood - for any reason at all. We need to be able to breathe.

The American Lung Association reminds us that wood smoke particulate is so small that it bypasses the immune system, and also get into neigboring houses with all the windows and doors closed. There is no such thing as opening the window to get clean air. Where does a person go to be able to breathe? Again: we have a right to breathe. Stop being swayed by special interests that minimize the accumlated impact of even certified wood smokes and pay attention to the reality that massive numbers of people will die early and be unhealthy (costing money for state services directly and indirectly) due to wood smoke (including secondary and tertiary effects). Children will be suffering through a lifetime of asthma and the health and day to day impact of that (along with cost for services on health care) The planet is also at risk.

This is going to take a multi-level strong stand. The research is there. Wood smoke KILLS - period. Wood smoke kills. Let's quite "rationalizing" it and selling out to wood smoke generating manfacturers. Why not offer them tax incentive to switch all their devices to gas only?

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Take a stand - and get the laws behind this. A "fluffy" light effort will not work. The CDC ad (although I don't know how many channels it is on - like is it on cable as well?) is fabulous and lots of people talk about that ad. It is superior and it is educating in just a few seconds. The visual is genius. Now do that for wood smoke.

Please email this to any and everyone that you can think of.

thank you

pat davis, seattle

Comment #11

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 10:29 AM
To: Thompson, Margo (ECY)
Subject: FW: wood smoke public comment 9/2012

reading below.....seems covered? Will write a more brief email summary on exemptions right now.

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Monday, September 24, 2012 3:59 PM
To: Thompson, Margo (ECY)
Subject: Re: wood smoke public comment 9/2012

thank you.

----- Original Message -----
From: Thompson, Margo (ECY)
To: Patricia Davis
Sent: Monday, September 24, 2012 3:28 PM
Subject: RE: wood smoke public comment 9/2012

Yes, comments emailed to the address provided will be treated the same as those recorded at the hearing.

Margo Thompson

WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Monday, September 24, 2012 3:21 PM
To: ECY RE AQComments
Cc: Thompson, Margo (ECY)
Subject: Fw: wood smoke public comment 9/2012
Hello Ms. Thompson: I assume this is the correct address (above: main email address) for comments ?

question: will that be "equal"/ suffice to attending the hearing October 17, 2012 at 6 pm?
please advise
thank you
patricia davis

----- Original Message -----
From: Patricia Davis
To: Craig Kenworthy
Cc: Laurie Halvorson
Sent: Monday, September 24, 2012 2:35 PM
Subject: wood smoke public comment 9/2012
Hello
I WILL be attending the Board of Directors meeting in Tacoma this Thurs. I had set aside some time to comprise "comments" (per email below) but realize I do not know where to submit the comments. So I will type my comments in general (below) while I have set aside time to do so. Please submit to appropriate parties. I will email this to EPA,and ECY as well.
Please advise. Also I asked Stella to email me the postcards, and public handouts/information (referenced in SIP - Non-attainment/tacoma) Can you get those to me? I assume they are the usual "burn clean" myth. Would like to see them, please
As ask you to contemplate this: **If I smoked a cigarette in your office, no amount of smoke would be tolerated**. Given cigarette smoke is not nearly so toxic as wood smoke, it is an interesting irony.
The public voted to not have smoking of cigarettes in public. Yet, few realize that wood smoke is 12 TIMES more toxic than a cigarette (EPA, 1991). American Lung Assoc. site states that wood smoke (due to small particulate size) gets into homes even with all the windows and doors closed. Neighbors of wood burning (fireplaces often being the worst: no filtering at all of smoke) ...the neighbors get more smoke, often, than the people burning the wood.
I think you would not want someone to smoke in your office/home/car. Why? Smoke is deadly. Why allow wood smoke - at all? It is MYTH there is clean burning. 6 minutes of smoke is plenty to smoke up the inside of neighboring homes. 20 minutes in 4 hours: same. Would you allow someone to smoke a cigarette in your office/home for 6 minutes? How about 20 min. in four hours? Why? Because it is a deadly toxin.
When PSCA/EPA/ECY **KNOW** that wood smoke is straight out toxic - why ask for "clean burning". I suppose a "step at a time". Meanwhile we choke on smoke and children can't breathe, and some will die prematurely, or be unhealthy from the smoke. Step at a time -with a deadly toxin.
Start up time can be very nasty. The fire "dying down"/going out at night.....super nasty as well. Then multiply that by _____. Think apartments, and multi-units with many many (unfiltered) wood burning devices. And home fireplaces: over the top smoke ! Fireplaces don't heat a house. They suck heat out. But they are the "little darling" of the self involved who do not care if they harm others from their self-indulgence.
Smoke is smoke....including manufactured log. We need to NOT SMOKE. Again: ok if I smoke in your home for 6 minutes? But, gee....I enjoy it :) Awww...I should be able to smoke....it's my right. (tongue in cheek)
I understanding addressing wood smoke is a tough issue. It has alot of aesthetic elements (however uneducated a person is on it's toxicity).

Enforcement is a problem. Nuisance laws need to be referenced in the public education. And a REMEDY that is effective needs to take place. How? We need Legislative/legal changes. I would suggest starting with urban areas in particular due to population density. And a serious response to offenders: fines, and enforcement that actually intervenes effectively.
Also, very much disagree with garages and shops being exceptions. Would suggest that they not be allowed in garages or shops in URBAN areas/zoning and wait (forever) on the rural areas (they will burn anyway, and less inspectors/resources). So start now in cities of Tacoma and Seattle - to start with. I think it is crucial for wood smoke abatement laws to differeniate (initially) between urban and rural areas - according to zoning.
There should be NO EXEMPTION for garages or shops in urban areas, whatsoever. And in homes any exception should be careful given, and protect against abuse/manipulation. Using the Landlord LICENSING in Tacoma (like Seattle has) should help alot. Landlords in Seattle MUST supply adequate heat, or they can loose their license.
Perhaps a cooperation with Puget Sound Energy can get people over to gas fireplaces? Maybe grants for low income? Any federal $ available? Maybe even give the installer of GAS fireplaces write offs on labor? material? We need to be inventive and resourceful. Wood burning is becoming even more popular in the last few years, and now we are suffering from wood burning pizza places, wood burning boilers, etc. There seems to be literally zero recourse on wood burning restaurants. One by my home as ZERO filtering on their smoke. They do not need to cook pizza with wood. I would like to see permits for wood burning restaurants stopped. Montana and some other States have made forward ground in that regard: denied permits for wood burning restaurants.
Landlord-Tenant Laws are different in Seattle than in King County and other area.
I think wood smoke laws and legislation should be zoning based. Urban areas have a much more dense population and therefore the health hazards are more deadly due to numbers of people exposed to wood smoke (unwillingly). Also would suggest that there be date set for multi-units to switch over to either gas, or remove "fireplaces" inside. Seattle requires licensing for landlords now. It can become part of that: Given it is not legal to burn in a non-certified stove: then fireplaces are illegal. For rental units - that can be enforced - now.

I think it comes down to
1) education (people that burn are not likely to "care" and have alot of denial going on, but education of the people NOT burning - with an EFFECTIVE remedy for them is more workable) Nuisance laws are the likely "education" component that will work with someone burning wood - not health, but that there is recourse.
2) enforcement: has to be effective and with some teeth in (fines, licensing for multi-units/landlords) Otherwise, this effort will be manipulated and ignored/ineffective
3) LAWS (as in legislation) have to be changed to protect the public health. Nuisance laws need to be much easier to enforce and prevail in court.
Seattle VOTED not to smoke. That speaks volumes. We have a right to breath - let alone in our own homes. When amid an inversion and/or smoke in the neighborhood there is no such thing as opening a window or door to get clean air: there isn't any. Again: if someone smoked in your office/home - you *could* get away from it - to alternate air. Not so in our neighborhoods. I don't know how many times I have laid in be with my entire inside of my house stinking like smoke (as wood burning "dies down" at night and the pizza place and charcoal burning restaurant "die down"). It is strong, stench of smoke. I cannot "go anywhere" easily for clean air. Why should someone have to be breathing in wood smoke inside their homes? again and again and again? The SIP clearly shows the harm that wood burning is doing. It needs to be STOPPED. Yes, although manufactured logs are incrementally better...it is smoke, just the same. Yes, a certified stove should have less smoke than non-certified (hopefully, depends on alot of variables). BUT the accumulative impact of smoke is a reality.Take as if one person is burning wood. That is one scenario. But many people do, and their night time smoke is choking in density and duration at times.
There is no such thing as "burning clean". We need to go with the research: wood smoke is TOXIC and a killer. Replicated, valid research loudly shows the toxicity and lethality of wood smoke. Let's "do what we know" and get very serious. People are manipulating the existing system, for sure.
There is a saying that says(personal growth saying): **What are you letting be "most important" versus "what <u>IS</u> most important**".
So...what do we trade off ? Letting our children suffer from asthma, permanent lung damage, cutting peoples lives and health short (not to speak of the environmental issues at hand as well) VERSUS someone's "right" to burn wood and pollute the air. It is going to take deep ethical clarity, day by day, as to what you/we personally choose as

"most important". The public relies on agencies like the EPA, ECY and PSCA to protect them. The mission is clear. The challenge is huge. But it must be done and it takes personal courage. The research is there to back up legal challenges. These agencies have legal staff at hand specifically to take on legal challenges. Please do so. Clearly the SIP shows the massive statistical impact of wood smoke. Please go to court. Please get those precedents set. Explore other States and how they are addressing these issues effectively. The time as come for a stand. Again: with cigarettes.....can I smoke, just a bit in your home? maybe just 6 minutes (tongue in cheek, please see the irony of the reference point :) The answer (hopefully) is NO! I don't want to breathe your smoke.

We have many ways to keep warm now days: Layers of clothing, hot water boiling to increase humidity/heat, using emergency blankets (cost under $5) on beds, watching tv, etc., section off a part of the room with a blanket, or (as do they do in Russia) drink lot liquids. Those are all cheap and easy. Readily available. So let's not get distracted on keeping warm. Recall the Mission statements and public reliance of your doing right by their health.

BREATHING is non-negotiable.

There are some air pollutants we cannot avoid. Wood smoke is one we can avoid. There is no "clean burning" ..... wood burning has to stop. Step at a time

Just like with cigarettes: we went from smoking in cars, houses, meetings, everywhere.....to people voting they don't want to breathe it. Took decades.

And, the reality is: wood smoke is 12 times more toxic than a cigarette (actually 2nd hand smoke) .....

Governmental agencies, and legal changes are the only hope we have. The public needs help on this

Reporting wood burning in your neighborhood can result in retaliatory and aggressive behavior. Not for the weak at heart. Trying to address it legally: tough, expensive and out of the "means" of many people.

We therefore rely on YOU (every one of YOU) to do the tough work at hand. To be forerunners. To be courageous and step up.

They say: If one life has breathed easier because of YOU, then your life on this planet has mattered.

Turns out: that is true - literally in case.

We need to BREATHE. People can find ways to keep warm - always. Can't find a way to breathe when smoke is in your home and neighborhood. It is a killer. A killer. That exceeds the right to be "warm" - lots of options on how to be warm. Please do the legal battle(s) that are inevitably involved in this process. We, the general public, are relying on you. Please represent us with the greatest integrity and in conjunction with your agency Mission Statements and your own personal wisdom and integrity.

thank you

pat davis

----- Original Message -----

From: Puget Sound Clean Air Agency
To: tapestry4@gmail.com
Sent: Monday, September 10, 2012 4:35 PM
Subject: Clean Air Pierce County Update

Message from the Puget Sound Clean Air Agency

Clean Air Pierce County Update

Thank you for your continued interest in learning more about Pierce County's air quality challenges.

We are forwarding this announcement as a courtesy to our partners at

the Washington State Department of Ecology (Ecology). Ecology is proposing plans to improve air quality in the Tacoma-Pierce County nonattainment area, as follows:

To Whom It May Concern:

The Washington State Department of Ecology (Ecology) is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Ecology will accept comments on the proposed revision from September 10 through October 19 by 5:00 p.m. See the public hearing notice link below for a brief overview of the proposal and instructions for submitting comments.

Here are links to:

- an overview of the nonattainment area and Ecology's proposed plans to reduce fine particle pollution
- the public hearing notice for Ecology's proposed SIP revision

For more information, contact:

Margo Thompson

WA State Department of Ecology

Air Quality Program

360-407-6827

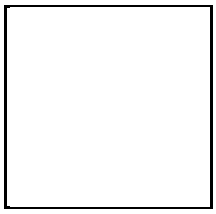
margo.thompson@ecy.wa.gov

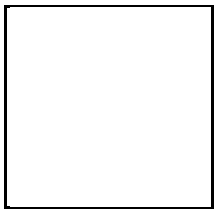
Thank you for taking the time to learn more about Pierce County's air pollution challenges and strategies aimed to improve air quality to help the area meet federal health standards in a timely manner. We hope you will continue to stay involved.

Sincerely,

Puget Sound Clean Air Agency

Forward email





Comment #12

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 10:48 AM
To: Thompson, Margo (ECY)
Subject: public comment EXEMPTIONS

Ms. Thompson, in a continued effort to go through my numerous, previous, emails that were submitted as public comment regarding Tacoma's non-attainment/SIP I will summarize my view on EXEMPTIONS herewith:

EXEMPTIONS should be **'hard won'** and should not only **be time limited**, but **require an in person inspection -** including upon any subsequent renewal. I think the 'burden of proof' should be upon the person requesting an exemption. Exemption status is very likely to be abused and manipulated. Making it easy, or having no burden of proof would be a mistake.

REQUIREMENTS for an exemption:

* **proof of income** (perhaps an income tax return?) so as to determine the capacity of the person to pay for cleaner heating methods
* **inspection** of ORIGNAL/ALTERNATE heating source as well as inspecting the wood burning device, chimney, etc. by an heating and air conditioning professional (funded by intervention money available?) is very important to verify Exemption viability.

*** require** that they contact electric and/or gas (depending on their original heating source) to **see if they qualify for assistance** with a furnace or other cleaner heat source
* co-partner with gas/electric providers for low income heat assistance with CLEANER heat source
* REQUIRE they **are meticulous** with regard to air pollution . **Strict compliance with allowed opacity and duration is required - at all times - or the exemption will be WITHDRAWN. An exemption cannot be an excuse to pollute or defy our needs for cleaner air to breathe and resulting deaths/health hazards that go with wood smoke air pollution (it is a known carcinogenic)**
* Exemption must be renewed (NOT a 'rubber stamp' procedure) annually. This evaluation of criteria for exemption, hooking up needs for heat with utility low income programs, etc could potentially be done by volunteer staff (it is not highly technical) For example: a gradute student in Environment Sciences could get credit and you get competent free staff. Any complaints about smoke with regard to the exempted party should cause obstacles or denial to another exemption being granted.

These requirements (* above) should be clearly stated in the Exemption, and it should be a legally binding document where the person(s) receiving the exemption have certain REQUIREMENTS of them in order to have an exemption. Breaking their end of the deal withdraws the exemption.
thank you
pat davis

Comment #13

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 11:08 AM
To: Thompson, Margo (ECY)
Cc: Craig Kenworthy
Subject: FW: wood smoke
ms. Thompson and Mr. Kenworthy - I am trying to get the CDC/Dept Health tv ad for your review. thanks, pat davis
From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 9:37 AM
To: 'Davis, Paul A (DOH)'
Subject: RE: wood smoke
Hello again Mr. Davis,
I fine myself mentioning the CDC and Public Health Seattle King County ad on cigarette smoke to various agency members of Puget Sound Clean Air and Dept of Ecology.
Would I be able to purchase a couple of DVD's of that ad? If so, how much? I would like to provide them as an example of very effective advertising about smoke issues (currently we are working on wood smoke)
Also do you know who devised the ad concept? It is short, informative and memorable. Is it still being shown ? (I don't watch much tv)
thanks so much
patricia
From: Davis, Paul A (DOH) [mailto:Paul.Davis@DOH.WA.GOV]
Sent: Sunday, October 14, 2012 10:15 AM

To: tapestry4@gmail.com
Cc: Scott.Neal@kingcounty.gov
Subject: Re: wood smoke

Those ads were run by Public Health Seattle King County in partnership with the Center for Disease Control and Prevention.

Paul Davis
Washington State Department of Health
Tobacco Policy Specialist

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Sunday, October 14, 2012 10:11 AM
To: Davis, Paul A (DOH)
Subject: wood smoke

Greetings Mr. Davis
I am so thankful that the Dept of Health understands the impact of cigarette smoke and second hand smoke on health.

question: was your agency part of the tv ad with the CDC that had a huge truck with the guy coming out in hazmat clothing and 'spraying' smoke on bystanders? Mentioning 7K chemicals in cigarette smoke.....that ad. ABSOLUTELY effective in a brief period of time, and I have heard comments on it as well (which means people really do pay attention to the ad)
question: i am hopeful your agency will also address wood smoke. Wood smoke is much more lethal and toxic than cigarette smoke and it is becoming increasingly 'popular' with outdoor burning of chimineas, our hardware stores now stocking many free standing wood devices to use on the patio - and now they are selling bundles of wood to burn as well. People do not understand the toxicity of wood smoke. They seem to be "getting" it on cigarettes. but when I ask people about wood smoke they think it is 'green', nostalgic, and gives a homey feel. Meanwhile others are breathing in a lethal known carcinogenic. As I am sure you know: wood smoke gets into neighbors homes even with all the doors and windows closed. in the evening when all the fireplaces (FIREPLACES need to be addressed: like these **outdoor wood burning devices, fireplaces** have ZERO filtration and are miserable to live by and try to breathe).....anyway people come home from work, or it is evening, and they light up a fireplace fire (or go into their yards and light up a fire and sit there) and that alone is overwhelming to deal with. But then the smoldering of when it goes out can make it hard to even breathe (can't open a window for clean air - there isn't any) All the research (since EPA, 1991) shows the toxicity of wood smoke. American Heart Assoc. showed direct causality between air pollution (wood smoke is what I am thinking of here) and heart disease. We know that 1,100 people in Washington State will die prematurely due to wood smoke/particulate matter. Children get asthma - even more so from wood smoke than cigarette. The CDC ad referenced permanent lung damage, as I recall. Imagine wood smoke impact.
I have contacted PSCA over the years. I am increasing my involvement and emailing with ECY and EPA. Now I contact you. I am trying and trying to get this issue effectively addressed. Turns out to be a major challenge. Can you help?
Although there are some people that burn wood for heat - around here that is simply not the case. It is for pleasure much of the time. We DESPERATELY need help to deal with this issue. Additionally, now we have wood burning pizza near us (why wood???) and have to deal with

that day after day, hour after hour at varying levels of smoke. I, and others, have contacted the 'building dept' and they have basically no effective laws to deal with the **pizza** place although they have rec'd many complaints.
We need massive public education (like was done with cigarettes) DESPERATELY ! We also need land use/permit changes that do not allow wood burning restaurants/food places. Montana has taken a good stand on that, fyi. The pizza place by here simply has a stainless steel flu and ZERO filtration. Why is that ok? We are supposed to have certified wood stoves in a home, but a NEW restaurant can be allowed to have nothing at all to contain smoke? That needs to be stopped via no permits for wood burning food restaurants. We do not need pizza cooked on wood. years have taken place without it. why should neighbors have to breathe that? people like myself who are trying to be healthy and no zero remedy.

We need changes with restaurant permits asap. **We need legislative changes that help succeed with nuisance law**. The attorneys I have spoke with say it is difficult to impossible to prevail in wood smoke nuisance cases. Why is that? And why should a private party have to spend massive $$$$ to try to get help, and still have no certainty of getting the issue handled?
People so do not 'get" wood smoke that our store nearby actually sells MORE wood in a burn ban than normal. I think stores should have to remove 'bundles' of wood and mfg. logs during a burn ban (to the back of the store) or face a fine.
would be great to get a 'black box' warning on wood (like cigarettes have) with a health warning. To some people that would impact their choices.
And perhaps where wood is sold there be a large sign about health hazards of wood burning and a reference to illegal to smoke out your neighbor. Or the harm that comes to children? something that telling the truth about this 'nostalgic' carcinogenic.
Due to non-attainment in Tacoma there are some efforts at hand. How successful those are remains to be seen. Ultimately it is about effective enforcement, education, and staff/equipment for night time smoke. Fines and nuisance laws that are effective. My experience is that fireplaces and people (in dense urban neighborhoods) burn wood in their yards for 'pleasure' while the smoke (usually going away from them onto others) impacts many others. Taking "issue" with a neighbor on wood smoke can be an intimidating and retaliatory activity at profound levels. Laws need to be changed and the people that are PAID to protect our air quality should be front line - not some 64 year old woman (like me....and I am also trying to survive a lethal breast cancer/masectomy) trying to fight to breathe.
I feel very strongly that if the laws and approach to the Legislature and governing bodies are divided between URBAN AND RURAL that we can get more effective at intervention. The greatest population density is in urban areas, and also more resources for enforcement. Rural may truly have more wood burning needs (that are legitimate - as compared to the WELL KNOWN and manipulated guise of 'gee, it is my only source of adequate heat'. Different criteria and laws for urban areas is essential, in my opinion. And it is a good starting place.
We are not impacting wood smoke/pleasure wood burning. It is increasing - as can be seen by stores stocking wood and wood burning devices that never did so before. Some areas are now suffering under wood powered boilers.
It is URGENT that wood smoke toxicity get addressed effectively. Can you help?
thank you
pat davis

Comment #14

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 11:15 AM
To: Thompson, Margo (ECY)
Subject: FW: FIREPLACES

include a) b) and C) and omit exemption section (it is covered with summary email) and omit teamsters reference. Although valid in some cases, I choose to omit it because it may offend some union people that actually work very very hard. I should not have made such a over generalization in that arena. thank you, pat davis

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Friday, October 12, 2012 11:56 AM
To: 'Thompson, Margo (ECY)'
Subject: FIREPLACES

Dear Ms. Thompson

As the SIP for Tacoma's non-attainment is approached structurally I would like to see more emphasis on the following areas:

1) FIREPLACES: Whether masonry fireplaces or manufactured fireplaces - they are source of completely unfiltered smoke. I think it is safe to assume they are literally never used for heat (as in the case of exemptions, or inadequate heat scenarios) due to the fact that fireplaces are not only inefficient but normally suck heat out of a house through the chimney. Therefore fireplaces should not be considered a heat source, and not protected in any way relative to exemptions or adequate heat criteria.

The SIP recognized 21,245 firepalces and referenced them as contributing 20,669 tons of particulate within Pierce County.

Please seriously consider interventions on fireplace smoke. Again: it is not effective for heat, and a fireplace has completely unfiltered smoke. Personally, our neighborhood has fireplace smoke has the biggest source of smoke and air pollution. And the smoldering at night is absolutely choking (as well as the start up)

Suggestions:

a) NO wood burning masonry fireplaces, or manufactured fireplaces, allowed in ANY new construction or remodels in URBAN areas. Any and all fireplaces must meet current pollution criteria. In our area we have high density of multi-family units that each have a wood burning fireplace. It is choking when they are burning in unison. Additionally, the criteria of start up and smoldering out - meant to help lessen the impact of wood burning on the neighborhood air - is staggered with some people doing their start up, and then another and another as they arrive home from work to light up an AESTHETIC fire. Meanwhile non-smokers/non burners suffer under hours and hours of smoke and after bedtime it is really bad, and often the wind is less at night as well (and that is almost a guarantee in air stagnation situations). So it is horrible air, full of heavy smoke for hours and hours around 10 pm onward until around 1 am as the last fire seems to die out after wood burners go to bed and leave a smoldering fire that lasts for hours. Again: multiple this by many units with fireplaces. Inside the homes of many non wood burning people (including some with chidlren) they are forced to breathe in the smoke of others with no window to open for fresh air: there is no air in the neighborhood that does not have smoke in it when low or no wind it is even worse.

b) Make it a priority to acquire equipment to monitor smoke after dark (a great deal of smoke is produced then) and be inventive on getting SIGNIFICANT increases in enforcement staff that may also include volunteers in order to adequately intervene on night time smoke. Fireplaces

would be a useful priority for nighttime enforcement given that people that claim they are burning due to inadequate heat would be readily available to view in daytime. The after work burning crowd/aesthetic wood burners (many of which are using fireplaces) usually are burning in the evening.
c) Enforcement with MONETARY FINES. Have the money received from fines go back into enforcement equipment (night monitoring and additional staff). I would think one "pass go" scenario and any more offenses and there is a fine, and an increasing fine each time the wood burner disregards the "rules". Wood smoke is a KILLER health hazard. This issue must be take with grave concern and effective reponse.
d) NOTE: THIS PORTION OF THE COMMENT HAS BEEN REDACTED BY REQUEST FROM THE COMMENTER.
e) REQUIRE an in person inspection with photos of premises that request exemptions. Not 'stated' , but confirmed status.
In summary, we have a huge problem with wood smoke. We have a killer on hand. Non-burning people who are trying to be healthy, or deal with children with asthma or health problems, have a RIGHT to be able to breathe. We need an aggressive approach this problem. EXPECT lies/misrepresentation regarding exemptions. any exemption needs to be given very rarely and enforced/check up on. That "word" will get around that (for once) "we mean business" about cleaning up the air. Stop the manipulation around the arena of "only adequate source of heat".
Get serious. Get tough, and stick to it.
Please include this letter in public comment and also forward as is appropriate.

Comment #15

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 11:27 AM
To: Thompson, Margo (ECY)
Subject: public comment NIGHT TIME AND WEEKEND ENFORCEMENT

Ms Thompson - again: summaring previously submitted public comment sent via emails:
NIGHT TIME AND WEEKEND ENFORCEMENT is critical and essential. It should be a top priority to acquire equipment and staff/staff hours staggered/volunteers/student interns to handle the time when people come home from work and burning at night time.
Evening and weekend wood burning is more likely to include 'aesthetic' wood burning
Evening and weekend wood burning is very known to be unlikley to illicit ANY inspector - unless it is a burn ban
It is ESSENTIAL AND CRITICAL that night time and weekend viewing equipment and staff be acquired asap. This can make a huge different on enforcement being taken seriously, as well as a better air quality.
thank you
pat davis

Comment #16

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 11:38 AM
To: Thompson, Margo (ECY)
Subject: FW: public comment EXEMPTIONS

ms.Thompson - fyi, I have included these summaries to email to Mr. Dicks (the emails today). he is the only PSCA Board Member (other than Craig Kenworthy) to receive these more concise summaries. EPA and some ECY staff also rec'd the summaries because they are easier to read and more to the point. thank you, pat davis

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 11:00 AM
To: 'rdicks@co.pierce.wa.us'
Subject: FW: public comment EXEMPTIONS

Hello again Mr. Dicks - i wrote numerous emails for pubic comment and am trying to make them more concise for inclusion in the record . I think the ideas below are very workable and effective. May i ask you to present this to the board on my behalf? i am trying very hard and putting in tremendous effort to give ideas on helping clean up the air. thank you, pat davis

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 10:48 AM
To: 'Thompson, Margo (ECY)'
Subject: public comment EXEMPTIONS

Ms. Thompson, in a continued effort to go through my numerous, previous, emails that were submitted as public comment regarding Tacoma's non-attainment/SIP I will summarize my view on EXEMPTIONS herewith:
EXEMPTIONS should be **'hard won'** and should not only **be time limited**, but **require an in person inspection** - including upon any subsequent renewal. I think the 'burden of proof' should be upon the person requesting an exemption. Exemption status is very likely to be abused and manipulated. Making it easy, or having no burden of proof would be a mistake.
REQUIREMENTS for an exemption:
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*** require** that they contact electric and/or gas (depending on their original heating source) to **see if they qualify for assistance** with a furnace or other cleaner heat source
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* REQUIRE they **are meticulous** with regard to air pollution . **Strict compliance with allowed opacity and duration is required - at all times - or the exemption will be WITHDRAWN. An exemption cannot be an excuse to pollute or defy our needs for cleaner air to breathe and resulting deaths/health hazards that go with wood smoke air pollution (it is a known carcinogenic)**
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in Environment Sciences could get credit and you get competent free staff. Any complaints about smoke with regard to the exempted party should cause obstacles or denial to another exemption being granted.
These requirements (* above) should be clearly stated in the Exemption, and it should be a legally binding document where the person(s) receiving the exemption have certain REQUIREMENTS of them in order to have an exemption. Breaking their end of the deal withdraws the exemption.
thank you
pat davis

Comment #17

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Thursday, October 25, 2012 10:02 PM
To: Thompson, Margo (ECY)
Subject: RE: more detail please

Dear Ms. Thompson
Yes those are the questions at hand. I look forward to that important element - which gives some support to those suffering from wood smoke - being restored in the document asap.
Thank you for your inquiry and follow up
patricia davis

From: Thompson, Margo (ECY) [mailto:MATH461@ECY.WA.GOV]
Sent: Thursday, October 25, 2012 4:55 PM
To: Patricia Davis
Subject: RE: more detail please

Dear Ms. Davis,
I have been working this afternoon on getting answers to your questions. Your questions as I understand them are:

- Why was the reference to nuisance laws removed from the How Wood Smoke Harms Your Health brochure?
- How quickly can we make a change to the document? If not very quickly, why not?
- When will the revised document show up on PSCAA web page?

I have been working with my supervisor this afternoon on your questions, and should be able to have a response early next week.
Thank you,
Margo Thompson
WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 9:00 PM
To: Thompson, Margo (ECY)
Subject: more detail please

Dear Ms.Thompson,

Thank you for clarifying. I want to be certain my inquiry is understood: I am not making a 'suggestion' per se, and I am specifically inquiring as to why something so helpful to those breathing smoke was removed. Given the scale of revisions I think it is certain that the portion referencing nuisance law criteria MUST have been read by staff and purposefully taken out. it would seem simple enough to change the pdf to include what was there before, and is still valid and also useful to those suffering the negative impact of wood smoke on their health and lifestyle. Personally, I see this as an ethical issue and I am looking for a 'fair playing field' for those of us trying to impact this process and have half a chance to lessen the smoke we unwillingly breathe inside our homes.
I am amazed this was removed. I am looking for a timely correction to that removal, or to understand why that cannot take place in a fairly short period of time (eg: weeks) Simple enough: it was already written, and simply insert the same terminology.
Or, are there other issues at hand that interfer with that rather simple recovery of important information. A pdf is easy to revise.
I would be interested in a specific reply to help me understand why this would be delayed.
Meanwhile, i do intend to stay involved - despite extreme frustration. Given I am trying to survive a very lethal breast cancer (masectomy, positive lymph nodes, and cancer getting out the lymph nodes) I am highly motivated NOT to breath known carcinogenics inside my home such as wood smoke. I know of no one in this neighborhood who cannot afford to heat their homes without wood.
So, perhaps i will be one of the 1,100 people who die prematurely from breathing wood smoke. But perhaps if I keep a vigilant eye on the agencies that are supposed to be protecting our air (their mission is NOT to ensure adequate heat - it is to keep the air clean) then maybe someone else,or maybe many after me, will live longer than perhaps I will. I do not unappreciate an unlevel playing field on this issue - which is why my frustration. The Mission Statement for each agency is clearly stated. The public has a right to expect those agency staff to be ethical and diligent about protecting our air.
I specifically am requesting why the pdf cannot be changed on the PSCA website easily and quickly, as well as 'reinstating' what was already written in the previous edition. Please advise me in detail what the challenges at hand are. Why not simply 'copy' the content and include it - as it was previously. Why not? Why a delay when we are entering the heaviest wood smoke pollution time of the year. How much time could this take?

cc: PSCA
EPA
sincerely,
pat davis

From: Thompson, Margo (ECY) [mailto:MATH461@ECY.WA.GOV]
Sent: Wednesday, October 24, 2012 4:56 PM
To: Patricia Davis
Subject: RE: response please
Dear Ms. Davis,
Your email on September 29, 2012 also mentioned this. Perhaps my response got lost in your inbox with all of the email traffic back and forth. As I said in my email on October 1, we have added your suggestions to the list for the next revision of the brochure. Due to very heavy

workload issues of the staff who do the revisions, I don't have an estimated date for the changes. But I will certainly mention it again to my supervisor.
Thanks for your input.
Margo Thompson
WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

From: Patricia Davis [mailto:tapestry4@gmail.com]
Sent: Wednesday, October 24, 2012 3:23 PM
To: Thompson, Margo (ECY)
Subject: response please
hello ms. thompson - just want to ensure that I receive a reply as to whether the section in the previous ECY pdf on the health effects of wood smoke will INCLUDE the reference to nuisance laws that the previous pdf had. And, when that might appear on the PSCA website. Would be curious how such an important piece of information got purposefully left off. thank you, pat davis

Comment #18

From: Tom Gillilan [mailto:tomgillilan@gmail.com]
Sent: Monday, September 10, 2012 6:53 PM
To: ECY RE AQComments
Cc: Tom Gillilan
Subject: TOXIC WOOD BURNING
Your proposal to :

- Increased enforcement during burn bans.
- Required removal of uncertified woodstoves and inserts.

is a sugar coated approach that will not eliminate human exposure to toxic wood smoke vapors and will do little to nothing to improve human health in the Tacoma area, but will allow you to play the game that makes it look like you are doing something when you are not.
Burning wood no matter what form it is in is inappropriate in urban settings unless of course the smoke itself is somehow filtered and prevented from entering the air. The technology is available now, but the will to implement it is not. Pollution pigs always plead poverty.
Living near people who use wood to heat their home and charcoal to cook their food is like living next to a pig. Stinky, slimy, filthy pigs whose cave man habits destroy their neighbors health and well being.
I live in Los Angeles and am leaving the area because of unhealthy air quality. I can see right now that I will not be relocating to the Tacoma area.
ALL OF THE FOLLOWING CHEMICALS ARE IN CHARCOAL AND WOOD SMOKE:
CARBON MONOXIDE, METHANE, VOLATILE ORGANIC COMPOUNDS, FORMALDEHYDE, ACROLEIN, PROPIONALDEHYDE, BUTRYALDEHYDE, ACETALDEHYDE, FURFURAL, SUBSTITUTED FURANS, BENZENE, ALKYL BENZENES, TOLUENE,ACETIC ACID, FORMIC ACID, NITROGEN OXIDES,SULFER DIOXIDE, METHYL CHLORIDE, NAPTHALENE, SUBSTITUTED NAPTHALENES, OXYGENATED MONOAROMATICS, GUAIACOL, PHENOL, SYRINGOL, CATECHOL, PARTICULATE ORGANIC CARBON,OXYGENATED POLYCYCLIC AROMATIC HYDROCARBONS (PAH), FLORENE, PHENANTHRENE, ANTHRACENE, METHYL ANTHRACENES, FLUORANTHENE, PYRENE, BENZO(A)ANTHRACENE, CHRYSENE, BENZOFLUORANTHENES, BENZO(E)PYRENE, BENZO(A)PYRENE, PERYLENE, IDENO(1,2,3-cd)PYRENE, BENZ(ghi)PERYLENE, CORONENE. WE INHALE THESE AS TOXIC VAPORS WHEN OUR NEIGHBORS COOK WITH CHARCOAL AND WOOD OR USE THEIR FIREPLACE
AT LEAST TEN OF THESE CHEMICALS CAUSE CANCER
THESE CHEMICALS ALSO CAUSE ASTHMA , COPD, CARDIOVASCULAR DISEASE AND MORE, MUCH MORE
Freedom does not apply to injuring others or putting others at risk needlessly.
Thanks, but no thanks.
Tom Gillilan

Comment #19

From: Michel Bellamy [mailto:mbellamy@harbornet.com]
Sent: Friday, September 14, 2012 2:48 PM
To: ECY RE AQComments
Subject: Backyard fire pits
I just read your publication "How Wood Smoke Harms Your Health." It has a lot of good information and I hope it gets widely distributed.
I have a lot of problems during the summer months with neighbors' backyard fire pits. These are sold for ridiculously low prices at Home Depot / Lowes / etc., and they seem to be popular. Is there any movement towards banning these awful things? They are totally unnecessary.
Just wondering.
Michel Bellamy

Comment #20

Cenci [mailto:CaroleC@pscleanair.org]
Sent: Tuesday, September 11, 2012 10:15 AM
To: Thompson, Margo (ECY)
Subject: FW: Clean Air Pierce County Update
This one looks like yours.
From: icaction@comcast.net [mailto:icaction@comcast.net]
Sent: Tuesday, September 11, 2012 8:10 AM
To: Clean Air Pierce County
Subject: Re: Clean Air Pierce County Update
Sounds good but we are losing our freedoms little by little. How to keep warm is the question especially when you can't afford the expensive
equipment on the market.

From: "Puget Sound Clean Air Agency" <cleanairpierce@pscleanair.org>
To: icaction@comcast.net
Sent: Monday, September 10, 2012 4:35:29 PM
Subject: Clean Air Pierce County Update

Message from the Puget Sound Clean Air Agency

pscleanair.org
Puget Sound Clean Air Agency

Clean Air Pierce County Update

Thank you for your continued interest in learning more about Pierce County's air quality challenges.

We are forwarding this announcement as a courtesy to our partners at the Washington State Department of Ecology (Ecology). Ecology is proposing plans to improve air

quality in the Tacoma-Pierce County nonattainment area, as follows:

To Whom It May Concern:

The Washington State Department of Ecology (Ecology) is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Ecology will accept comments on the proposed revision from September 10 through October 19 by 5:00 p.m. See the public hearing notice link below for a brief overview of the proposal and instructions for submitting comments.

Here are links to:

- an overview of the nonattainment area and Ecology's proposed plans to reduce fine particle pollution
- the public hearing notice for Ecology's proposed SIP revision

For more information, contact:

Margo Thompson

WA State Department of Ecology

Air Quality Program

360-407-6827

margo.thompson@ecy.wa.gov

Thank you for taking the time to learn more about Pierce County's air pollution challenges and

strategies aimed to improve air quality to help the area meet federal health standards in a timely manner. We hope you will continue to stay involved.

Sincerely,

Puget Sound Clean Air Agency

Comment #21

From: Janet Primomo [mailto:jprimomo@u.washington.edu]
Sent: Monday, September 17, 2012 11:15 AM
To: ECY RE AQComments
Subject: Support for the Proposed State Implementation Plan (SIP) Revision for Tacoma-Pierce County Nonattainment Area

I strongly support the proposed state implementation plan (SIP) revision for the Tacoma, Pierce County Nonattainment Area. Elements of the revised plan were developed through a public process that involved a wide range of stakeholders, including health professionals like myself.

For over 25 years, I have been engaged in community health activities and research, including those that address the rising rates of asthma, as a university faculty member and community health nurse. It is imperative that steps are taken to improve air quality in the region in order to protect the public's health. Increased enforcement of burn bans, required removal of uncertified wood stoves and inserts, and reducing sources of fine particle pollution will not only help the region meet Federal Clean Air Act requirements, but it will help improve air quality and minimize the health risks from wood smoke and particulate matter exposure. Ecology's efforts to address environmental justice concerns are particularly noteworthy, as often disadvantaged populations experience the highest levels of exposures and illness.

Sincerely,

Janet Primomo, PhD, RN
Associate Professor, Nursing Program
University of Washington Tacoma
Mailing Address: Campus Box 358421 1900 Commerce Street Tacoma, WA 98402
Phone: 253 692-4475 FAX: 253 692-4424 email: jprimomo@u.washington.edu

********** www.tacoma.washington.edu/nursing **********

Comment #22

From: Gary Brackett [mailto:Gary.Brackett@tacomachamber.org]
Sent: Tuesday, September 11, 2012 10:01 AM
To: Carole Cenci; Catherine Rudolph; Craig Kenworthy; Earl Brydson; Frank DiBiase; Gary Smith; Hugh Taylor; Jake Fey; Janet Primomo; Jason Jordan; Jesse Hart; Julio Quan; Kelly McGourty; Lisa Rennie; Liz Norton; Steve Webber; Clark, Stuart (ECY); Terri Patterson; Tiffany Speir; Tim Sexton; Tom Olsen
Cc: Alisa O'Hanlon; Amy Warren; Cindy DeGrosse; Schneider, Doug (ECY); Johnston, Jeff (ECY); Kathy Strange; Thompson, Margo (ECY); Matoya Darby; Melissa Paulson; Rhonda Peterson; Perez, Richelle (ECY); Weiler, Tami (ECY)
Subject: RE: Tacoma-Pierce County Task Force SIP Update

Carole,

You might inform DOE that is not the proper name for the nonattainment area.

Best, Gary

Gary D. Brackett, CCR
Manager, Business and Political
Tacoma-Pierce County Chamber
950 Pacific Ave., Ste. 300, Tacoma WA 98402
P.O. Box 1933, Tacoma WA 98401-1933
Phone: 253-682-1720
Fax: 253-597-7305
Email: garyb@tacomachamber.org
Web: www.tacomachamber.org
Business in Motion

From: Carole Cenci [mailto:CaroleC@pscleanair.org]
Sent: Tuesday, September 11, 2012 9:52 AM
To: Catherine Rudolph; Craig Kenworthy; Earl Brydson; Frank DiBiase; Gary Brackett; Gary Smith; Hugh Taylor; Jake Fey; Janet Primomo; Jason Jordan; Jesse Hart; Julio Quan; Kelly McGourty; Lisa Rennie; Liz Norton; Steve Webber; Stu Clark; Terri Patterson; Tiffany Speir; Tim Sexton; Tom Olsen
Cc: Alisa O'Hanlon; Amy Warren; Carole Cenci; Cindy DeGrosse; Doug Schneider; Jeff Johnston; Kathy Strange; Margo Thompson; Matoya Darby; Melissa Paulson; Rhonda Peterson; Richelle Perez; Tami Weiler
Subject: Tacoma-Pierce County Task Force SIP Update

Dear Task Force Members,

As we discussed during the Task Force meetings, the Washington Department of Ecology is required to submit a revision to the State Implementation Plan (SIP) for the Tacoma-Pierce County nonattainment area. They have completed the draft SIP and have published it for public comment. They have asked us to forward a copy of the notice of the public hearing and comment period to keep you updated on their progress. Their notice is below along with links to their website where you can find more information and the contact name for any comments you might have.

To Whom It May Concern:

The Washington State Department of Ecology (Ecology) is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Ecology will accept comments on the proposed revision from September 10 through October 19 by 5:00 p.m. See the public hearing notice link below for a brief overview of the proposal and instructions for submitting comments.

Here are links to:

- an overview of the nonattainment area and Ecology's proposed plans to reduce fine particle pollution
- the public hearing notice for Ecology's proposed SIP revision

For more information, contact:

Margo Thompson

WA State Department of Ecology

Air Quality Program

360-407-6827

margo.thompson@ecy.wa.gov

Thank you,

Carole

Carole Cenci
Air Resources Specialist
Puget Sound Clean Air Agency
1904 Third Ave
Seattle, WA 98101
206.689.4091
carolec@pscleanair.org

Comment #23

From: Steve Webber [mailto:steve@stevesorganizing.com]
Sent: Thursday, October 18, 2012 11:30 AM
To: Thompson, Margo (ECY)
Subject: Comments for Ecology hearing 10-17-2012

Hi Margo,

Thanks for the great conversation and insight to my concern. I am glad that I was present to explain my perspective as a wood burner.

As I was watching the slide show presentation, it occurred to me that the "Tracking fine particle pollution" pie chart included in the presentation described a different scenario than the pie chart that was presented in our Puget Sound Clean Air Task Force meetings. In the Ecology presentation, the pie chart described a residential wood combustion percentage of 74% compared to the 53% wood smoke that was presented to us in the PSCATF meetings. It was explained to me after the presentation that the 74% residential wood combustion represented a snapshot (or a 24 hour time frame sometime in 2008). My concern is that the general public will perceive this to be the case at all times during burning season. One suggestion may be to place a caption somewhere near the pie chart that explains in detail the snapshot readings that were taken from the monitor. Also, you may want to add the pie chart (53% wood smoke) that was presented in the PSCATF meetings and also place a caption near that pie chart explaining the time frame and data that was used to create it.

Looking back, my involvement and ideas/solutions would have been much different had the PSCATF used a pie chart that described the residential wood combustion to be 74% on average (December, January, February from 2006 -2009). I believe that I would have been in favor of more aggressive solutions as it relates to burning wood, because there would have been more room to reduce the wood smoke emissions based on a 74% contribution to the problem.

Warmest regards,

Steve webber

Please feel free to contact me if needed. I hope I have covered in this email, the conversation we had at the hearing. 253-229-1237

Comment #24

From: Carole Cenci [mailto:CaroleC@pscleanair.org]
Sent: Tuesday, September 11, 2012 10:15 AM
To: Thompson, Margo (ECY)
Subject: FW: Clean Air Pierce County Update

This one is yours too. He sent a similar comment to us.

-----Original Message-----
From: mcdo80796@juno.com [mailto:mcdo80796@juno.com]
Sent: Monday, September 10, 2012 6:37 PM
To: Clean Air Pierce County
Subject: Re: Clean Air Pierce County Update

As usual, you have totally ignored my concerns. I beieve your agency should be abolished because it provides no interest in public input and is a waste of tax payers resources.

Comment #25

From: Carole Cenci [mailto:CaroleC@pscleanair.org] **On Behalf Of** Clean Air Pierce County
Sent: Monday, September 17, 2012 8:43 AM
To: Thompson, Margo (ECY)
Subject: FW: Clean Air Pierce County Update

For you -

From: Kim Rader [mailto:electrician_iam@yahoo.com]
Sent: Friday, September 14, 2012 8:51 PM
To: Clean Air Pierce County
Subject: Re: Clean Air Pierce County Update

Please government, get out of my life, and quit telling me how to run my existence in Peirce County! We live in a Republic remember? Pierce County government seems to ambitiously pride itself with these kind of Socialistic policies
It really isn't your role to tell me what kind of wood heater to use. I am so tired of hearing about ways YOU seem think I should improve the air. Why doesn't our gluttonous, bloated "EPA" do something about the trains and ships, not to mention the semi trucks that continually belch smoke into the atmosphere and do a lot more polluting than my wood heating system.
By the way, don't send me any more of these annoying messages as they raise my blood pressure to the boiling point!
I guess evidently you people don't realize that this is another layer of a wasteful government bureaucracy that is universally hated by the voting public.

From: Puget Sound Clean Air Agency <cleanairpierce@pscleanair.org>
To: electrician_iam@yahoo.com
Sent: Monday, September 10, 2012 4:35 PM
Subject: Clean Air Pierce County Update

Message from the Puget Sound Clean Air Agency

pscleanair.org
Puget Sound Clean Air Agency

Clean Air Pierce County Update

Thank you for your continued interest in learning more about Pierce County's air quality challenges.

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For more information, contact:

Margo Thompson
WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

Thank you for taking the time to learn more about Pierce County's air pollution challenges and strategies aimed to improve air quality to help the area meet federal health standards in a timely manner. We hope you will continue to stay involved.

Sincerely,

Puget Sound Clean Air Agency

Comment #26

From: Lisa [mailto:lisa52@centurytel.net]
Sent: Friday, October 19, 2012 7:08 AM
To: ECY RE AQComments
Subject: Economic Disaster
You goverment run a mucks should disban and save our tax dollar for industries development and jobs. And quit robbing the working class, If there needs to be an adjustment in yhere air quality that should come from an independent study not a goverment backed idiot.

Part 4 -Hearing Transcript for Public Hearing on the Tacoma-Pierce County Nonattainment Area SIP revision on October 17, 2012.

Melanie Forster: I'm Melanie Forster, hearing's officer for this hearing. This evening we are to conduct a hearing on the proposed State Implementation Plan revision for the Tacoma-Pierce County nonattainment area. Let the record show it is 6:35 pm on October 17, 2012 and this hearing is being held at the University of Washington, Tacoma Campus, Garretson Woodruff Pratt Building, 1900 Commerce Street, Tacoma, WA 98402.

In addition, notices of the hearing sent by email to over 1,000 interested people, and a news release was issued on September 10, 2011. A notice was also published in the following newspapers on September 10, the News Tribune and the Daily Journal of Commerce.

I will be calling people up to provide oral testimony based on the order that I received your sign-in**.** Once everyone who has indicated that they would like to testify has had the opportunity, I will open it up for others. When I call your name, please step up to the front, state your name and address for the record. And please speak clearly, so that we can get a good recording of your testimony. First up we have Patricia Davis followed by Craig Kenworthy.

Patricia Davis: Hi

Melanie Forster: Would you like to hold this?

Comment #28

Patricia Davis: Sure, that's fine. First off, can you hear me ok? Ok. I'd like to thank all of you who've worked so hard on this. And as a person who suffers from breathing in a lot of wood smoke, I, uh personally am glad Tacoma reached nonattainment so that we can address this huge problem that we have with wood smoke. I did um, address the Board of Directors meeting in October..uh was that, yeah anyway recently. And I'd like to just, because of the public record aspects of this cover a couple of those that we all know already. Um, so first off, sincerely thank you for all of the work that you do and as I stated and you know from your own statistics, 1,100 people in Washington state will die prematurely from breathing in particulate matter. So, this is really important what you're doing…and, um, I like what I see, as well. Both the work on, all the agencies.

So, I think the things that are, I've submitted written comment and I think that all I really need to add today is an affirmation of some the main points of that. In particular, I would like to see the legislature involved more. I think that we have tremendous difficulty with getting nuisance laws enforced. And I think that that's a legal issue, meaning a legal issue. It's well defined, but it's challenging to prosecute from a private party stand point, and I think that that needs to be addressed legislatively. Also, it's my understanding, that some of the mmm..tighter elements that were submitted, some were not passed in the legislature. So I suggested that we differentiate between urban and rural areas, with this matter. And I think that can be really really effective. One, urban areas have a much more dense population, and therefore much more health impact. And in addition, I think that we see a lot more reasonable burning criteria in a rural area. I think that people out there have less gas lines, less power options. And I think that some of things that we look at as exceptions might really be worthy there. My experience has been that this is abused, that I don't have adequate heat, almost everyone seems to know. And that they don't know the 1991 EPA research that wood smoke is twelve times more toxic than a cigarette. I

don't personally want to be breathing in a carcinogenic so that somebody else can enjoy a fire. If they need it, that's one thing. So, I would like to see the exceptions stringently, stringently enforced, not just stated, but an inspection and proof and a re-inspection, and it only allowed for a short period of time. Word gets around, uh, in life, of how you can get away with what you want to get away with. And it got away with murder, as far as I'm concerned. We're understaffed as agencies to try to truly address this problem. And when you let people have an exception that they don't truly, truly need, you are harming someone like me, who is trying to be healthy. I'm a cancer survivor. I do not want to breathe a known carcinogenic. I'm here today, and really turning my life upside down to do what I'm doing, because I don't want to breathe it. So, I want to support you in what you're doing. So, I think that urban versus rural really really makes sense both for enforcement and population impact as well.

Let's see, um, it's a tough thing when you start looking at start up and opacity. When you have a lot of places combined, like multi-family units, all with their fireplaces, what I experience is that people can come home, all light up their fires, not at the same time, so you have a start up here, start up there, start up here, so it's challenging when you really look at the full impact of how much smoke you may be breathing when you got such high density units that are putting out wood smoke. Same problem with, is this too much? Is that ok? Same problem when they die out at night, which is hellish, and we need some enforcement for that. So, I strongly support buying equipment to do nighttime observation and to get adequate staff for nighttime because we see this statistically as well. Nighttime is a bad time for wood smoke.

Um, I'm glad to see fireplaces finally getting included. I think that they are very challenging to deal with as an entity. We are beloved to our fireplaces and I understand that. Uh, oddly enough many years ago I heated with wood, and I burned my fireplace too, and I'm a cancer survivor now. So, who knows if that played a role in it, it's certainly possible. But I understand the aesthetics, but the sad part is when you build the fire you are probably breathing much less smoke than your neighbors. And as we know with the American Lung Association, wood smoke gets in a building, and your neighbors, with all the windows and doors closed.

Um, we need to really step up enforcement. That's a tough thing to do given the budget constraints. Personally, I would like to see fines and, first the gentleman, who no doubt will be speaking after me asked, I think for a waiver for uh, amazingly getting caught. I'm just surprised he even got a ticket. But, and I do support you paying it, just for the record. Um, no one should have to breathe your smoke, and I'm glad you got a fine, just personally. I would like to see those fines go back, I'd like to see them increase, not just at a set amount. I think that as someone continues to disrespect the laws and people's breathing air that the fines go up. And I don't know if you can do this legally, but I would like to see that money go back into enforcement, and to add staff and to add funding, so that we have a way to generate more response to this significant air pollution problem.

Um, I think other than what I've written this pretty well sums it up. I, again, I thank you all. I am hoping that this, we can get something really effective going on. Oh, and I did have one more line on here. Love the removal of uncertified stoves and I guess another thing I should state is that I would really like to see fireplaces addressed, in maybe the same way that when a home is sold, it has to be addressed. And, I think that that's ahead of where we are at right now, and I understand that. But, I'm glad to see it included. Are there any questions to me? K. Thank you.

Melanie Forster: Thank you. Now we have Craig Kenworthy.

Comment #27

Craig Kenworthy: Thank you Melanie. Good evening, I'm Craig Kenworthy and I'm the executive director of the Puget Sound Clean Air Agency. We've worked with a group of citizens to come up with a plan to solve this problem in the Tacoma-Pierce County area. I want to recognize Steve Weber, one the members of the Task Force, is here this evening. And, this was a broad group in terms of their perspectives and what they do. We had Steve and other individuals who burn wood in their home for heat. We had representatives from the chamber of commerce, other businesses, transportation sector, the realtors. So, we had a really broad ranging conversation about how do you solve this problem. And, what the group came up with was to acknowledge a couple of things. First and foremost, the goal that we really had to have was to strike the balance where we have clean air and warm homes. That we had to find a way to make sure that in cleaning the air, we were still providing a way for people to be warm in their homes. The second thing was acknowledging that while we working to clean up other sources to clean up the air, as alluded to earlier, in terms of transportation, ships in the harbor, there are new rules, for example,e coming in on ship fuel. That, while we wouldn't solve this problem just by addressing wood smoke, we couldn't solve this problem if we didn't address wood smoke. We simply could not get there, and get the pollution levels down enough without strategies related to wood smoke. So, with that underway, the Task Force focused in on a couple of things as it worked through those several months of meetings and those were, as mentioned earlier, the two strategies. One, getting better burn ban compliance, getting people to follow burn bans, that includes an education and outreach component to make sure people are aware of what's going on, working with the local communities to make sure people know there are burn bans, and urging everyone who can follow a burn ban, who has alternatives, to follow the burn ban. So, that was the first strategy while acknowledging and recognizing, as the legislature has directed us that if someone has wood as their only adequate source of heat, that they are exempt from the burn ban. Part of the Task Force recommendations and the rules that are in this package to go into the SIP from our agency, acknowledge wanting to make sure that the claim of being exempt for adequate source of heat is taken by those who are legitimately are entitled to it. So there are steps in our rules to make sure that those exemptions are granted to the people who really need it and are not claimed by someone who isn't really entitled to do it.

Second strategy was, recognizing that the uncertified stoves produce 50-60% more air pollution than a well-run, well-maintained, well-operated certified stove, that we needed to move people towards getting rid of those uncertified wood stoves. Um, as a note on this, I keep an article on my desk, that is from the newspaper, that talks about the need to get rid of uncertified stoves because they are much more polluting and talks about how many of them we have in the Puget Sound, central Puget Sound region and references that the legislature has granted the Clean Air Agency the authority to ban those uncertified stoves. The date of that article is August of 1991. So, we've been talking about how to solve this problem for a long time. Those uncertified, older stoves are at least 20 years old and in most cases some of them are 30, 40 years old. So, we are asking people to acknowledge that those are an older generation of polluting devices, just like we would say to someone if you have a 1972 Buick you probably don't have the right set of pollution controls on the road. So, at the same time, while doing that, encouraging people to change that out, we have created an incentive program. I just want to note for the record, while it's not part of the rule making, to enable people who need help to change out to the cleaner device, to do so.

Quickly, noting a couple of other things, we do support obviously including our rules, rule 1-13 in the SIP revision, in its entirety, to make sure that we can demonstrate to EPA that we have the right set of strategies in place to get the area back into attainment and actually request that we be designated in attainment. I'll also note that the Task Force did a lot of work in discussing both social and environmental justice for people in the community, in reference to that element in Ecology's plan, and considered very carefully how to make sure, that people who needed assistance, in terms of being able to reduce the air pollution they were polluting from their heat source or to moving to a cleaner heat source were aided, and also in making sure that we didn't ignore areas where a number of people, who are low-income might all be burning wood. While we solved the overall problem, we didn't ignore those packets of air pollution and make sure that people, in those areas weren't left with impaired air quality. So, I want to note that for the record as part of the Task Force work and the work that was done to identify and address environmental justice concerns in the area. Referenced earlier, a substantial public task force process, in addition to the Task Force work that was done, the 8 months of work, all the meetings that happened with the Task Force, we did a mailer to all households in the nonattainment area, 220,000 households, telling them what the Task Force was up to, last October before the Task Force reached its final conclusions, those mailings produced people coming out and offering comments. We received several hundred comments, 600 comments, from individuals. We also had 200 people come to open houses in South Tacoma where the violating monitor is, and also to Puyallup, to talk to us about what they saw in the strategies and the concerns they had, to express their support or their opposition to the strategies, to tell us things they wanted us to consider. So, I want to note in addition to the process that Ecology's had and in addition to the direct Task Force meetings, our Board has also come down and held public hearings on the rules. We had a public hearing in September in Tacoma, on those rules. We had a hearing, where our board considered the recommendations from the Task Force in Tacoma, as well. We've had multiple meetings in Tacoma to provide opportunities for the public to weigh in on this as well. So, we've created a number of different opportunities to make sure that the public could comment and see not just what the Task Force was thinking about when they were done but to make sure that they could actually weigh in. And the Task Force received all of that public comment as well before they came to their final conclusions. So, in summary, this was a long and effective public task force process. I'm sure that the Task Force members occasionally felt like it was taking even longer because we extended it to make sure that we got all that public comment in. Uh, they did a lot of work as volunteers in the community to solve this problem and define that balance of clean air and warm homes. I want to thank them one more time for all of that work and urge that the work that they created, which resulted in these rules by our agency and the elements in this plan be submitted by Ecology to EPA as part of the SIP revision. Thank you.

Melanie Forster: Thank you, is there anyone else who wishes to provide testimony?….Ok.

From the crowd: Can...She has one more thing.

Patricia Davis: I have a question. Could I make one more comment as far as the warm home versus clean air by any chance.

Melanie Forster: Sure…absolutely.

Patricia Davis: Thank you so much.

Melanie Forster: Please state your name and address again for clarity. Thank you.

Comment #29

Patricia Davis: Ok..um..thank you for letting me remember one thing I forgot…um.. and this is Patricia Davis again. Um, talking about clean air versus warm homes, I guess really that is a bottom line issue. Thank you Mr Kenworthy for reminding me of that. Um..it's possible to be warm in a whole lot of ways that I would like to see given to the public, maybe in paper form, so to speak…and I did. So, let's look at some of those…um you can do what they use to do in the old days, which is close off a room, you can wear more clothes, you can drink hot liquids, you can wear one of those emergency blankets on you, because what we are trading off is somebody's breathing really deadly smoke. So, the balance, I think, would also be expecting people to do what they can do that's reasonable, not to ruin their evening at home, but certainly to make a sincere effort to have, to do what they can do to be warm and recognize that when they are polluting the air they are harming other people. So, I'd like to see a little bit more ideas out to the public about how to keep warm. Thank you.

Melanie Forster: Thank you. Anyone else?....ok

If you would like to send Ecology written comments, please remember they are due, received by October 19, 2012. You can send them to Margo Thompson at PO Box 47600 Olympia, WA 98504-7600 or you may email them to AQcomments@ecy.wa.gov.

All testimony received at this hearing along with all written comments received no later than October 19, 2012 will be part of the official hearing record for this proposal.

Ecology will send notice about the Concise Explanatory Statement or the CES publication to everyone that provided written comments or oral testimony on this proposal, everyone that signed in for today's hearing, provided an email address, other interested parties on the agencies mailing lists for this proposal.

The CES will among other things, contain the agency's response to questions and issues of concern that were raised during the public comment period. If you would like to receive a copy, Ecology will need to have your contact information. If you did not sign-in or give an email or mailing address, please talk to Ecology staff after this hearing and we'll be happy to take your information. You may also contact Margo Thompson using the information provided for submitting comments.

The next step is submittal to the EPA**.** Ecology Director Ted Sturdevant will consider the rule documentation and staff recommendations and will make a decision about sending the SIP revision to the EPA.

Submittal is currently scheduled for November 28, 2012. After submittal of the SIP revision, Ecology will develop a maintenance plan that ensures the area will continue to meet the 2006 24-hour fine particle standard. In the future, Ecology will also submit the maintenance plan and a letter requesting redesignation of the Tacoma-Pierce County area to "attainment." If we can be of further help to you, please do not hesitate to ask or you can contact Margo Thompson if you have other questions.

On behalf of the Department of Ecology, thank you for coming. I appreciate your cooperation and courtesy.

Let the record show that this hearing is adjourned at 6:55 pm.

Part 5 - Public involvement notices for the public comment period and public hearing

DEPARMENT OF ECOLOGY

HEARING SUMMARY

M E M O R A N D U M

October 17, 2012

TO: Ted Sturdevant
Director

FROM: Melanie Forster
Hearings Officer

SUBJECT: Tacoma-Pierce County Nonattainment Area State Implementation Plan (SIP) Revision Public Hearing Summary

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Topic: Proposed revisions to the SIP to address fine particle pollution in Tacoma and surrounding communities in Pierce County

Program name: Air Quality

Name(s) of Ecology employee(s) at hearing: Richelle Perez, Margo Thompson, Stuart Clark, Nancy Pritchett, Doug Schneider,

Hearing location(s): University of Washington, Tacoma Campus

Total number of people at hearing(s): 10

Total number of testimonies: 2

Summary of Comments: The two testimonies were in favor of Ecology's proposed SIP revision. One concerned citizen expressed a desire for more stringent controls on wood burning, but indicated that she considered the SIP revision a step in the right direction. Craig Kenworthy, director of Puget Sound Clean Air Agency (PSCAA), also provided testimony. He strongly supported Ecology's action to include PSCAA's Regulation 1-13 Solid Fuel Burning Devices in the SIP.
Please summarize the comments received at the public hearing. Describe if those in attendance were generally in favor of this agency action or opposed. If there were certain aspects of this agency action that satisfied or dissatisfied attendees, please explain.

cc: Deputy Director
Program Manager
Rules Unit
Rule/Permit Writer

From: Thompson, Margo (ECY)
Sent: Thursday, September 06, 2012 5:11 PM
Subject: Public Hearing Notice for Proposed SIP Revision for Tacoma-Pierce County Nonattainment Area

To Whom It May Concern:

The Washington State Department of Ecology (Ecology) is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Ecology will accept comments on the proposed revision from September 10 thru October 19 by 5:00 p.m. The attached public hearing notice gives a brief overview of the proposal and instructions for submitting comments. For more information about the nonattainment area and the proposed SIP revision, go to http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm.

Sincerely,

Margo Thompson
WA State Department of Ecology
Air Quality Program
360-407-6827
margo.thompson@ecy.wa.gov

Public Hearing Notice

DEPARTMENT OF ECOLOGY
State of Washington

Air Quality Program — **September 2012**

Proposed State Implementation Plan (SIP) Revision for Tacoma-Pierce County Nonattainment Area

In December 2012, the Department of Ecology (Ecology) will submit proposed SIP revisions to the United States Environmental Protection Agency (EPA) for the Tacoma-Pierce County Nonattainment Area. The area includes most of the greater Tacoma and surrounding communities within Pierce County. It became a "nonattainment area" due to unhealthy levels of fine particle pollution.

Why are we revising the SIP?

This SIP revision will:

- Provide to EPA strategies to reduce air pollution in the nonattainment area as recommended by the Tacoma-Pierce County Clean Air Task Force and endorsed by the PSCAA Board of Directors. These include:
  - Increased enforcement of burn bans
  - Required removal of uncertified wood stoves and inserts
  - Work to reduce other sources of fine particle pollution
- Meet Federal Clean Air Act requirements by submitting 2008 Emissions Inventory for the Tacoma-Pierce County Nonattainment Area.
- Strengthen the SIP by including the Puget Sound Clean Air Agency (PSCAA) Regulation 1-13 Solid Fuel Burning Devices
- Report on how Ecology considered environmental justice concerns in the area
- Report on the public involvement and stakeholder process

Where can you get more information?

The proposed SIP revision and related documents are available for review on Ecology's web site at http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm.

Your can also view copies of the documents at the following locations:

Tacoma Public Library - Main
1102 Tacoma Ave. S.
Tacoma, WA 98402
(253) 292-2001

Swasey Branch Library
7001 Sixth Ave.
Tacoma, WA 98406
(253) 617-7810

South Tacoma Branch Library
3411 S. 56th St.
Tacoma, WA 98409
(253) 617-7809

Puyallup Public Library
324 S. Meridian
Puyallup, WA 98371
(253) 841-5454

MORE INFORMATION

Formal comment period:

September 10, 2012 through 5:00 p.m. October 19, 2012

Public Hearing:

Wednesday, October 17, 2012
6:00 p.m.

UW Tacoma
1754 Pacific Ave
GWP Building
Tacoma, WA 98402

Contact information:

Margo Thompson
Air Quality Program
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
360-407-6827
margo.thompson@ecy.wa.gov

Special accommodations:

If you require special accommodations or need this document in a format for the visually impaired, call the Air Quality Program at 360-407-6800 by October 8, 2012.Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

What comments is Ecology seeking?

Ecology welcomes all comments on the proposed SIP Revision. However, Ecology is particularly interested in comments on the following:

- 2008 Emissions Inventory for the Tacoma-Pierce County Nonattainment Area
- Ecology's decision to include the entire Puget Sound Clean Air Agency's (PSCAA) Regulation 1-13 Solid Fuel Burning Devices in the State Implementation Plan
- Environmental justice elements of the proposed SIP revision

How can you submit comments?

You can give us your official comments until 5:00 p.m. October 18, 2012 in the following ways:

1. Testify or submit written comments at the public hearing.
2. Email your comments to: AQComments@ecy.wa.gov
3. Mail comments to:

   Department of Ecology
   ATTN: Margo Thompson
   PO Box 47600
   Olympia, WA 98504-7600

How will Ecology respond to comments?

All of the comments we receive will become part of the official record. Ecology will compile a summary of oral and written comments received during the comment period and Ecology's response to those comments.

Note: Ecology will respond to comments about including the Puget Sound Clean Air Agency (PSCAA) proposed rule in the SIP revision. We will NOT respond to comments on the content of the PSCAA proposed rule. The PSCAA comment period for their rule ends September 26, 2012. Direct your comments about the rule content directly to PSCAA at www.pscleanair.org by that date.

If the hearing is cancelled

Ecology is including the proposed PSCAA Regulation 1-13 in the revision. If PSCAA substantially changes their proposed rule due to comments they receive, Ecology may cancel our hearing. If we cancel our hearing, the information will be posted at http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm and a future public comment period and hearing will be scheduled.

El área de Tacoma y el Condado de Pierce tiene un problema con contaminación del aire. El departamento de Ecología del estado de Washington invita a público comentar sobre el propuesto plan para mejorar la calidad del aire. El periodo de comentario público está abierto desde el 10 de septiembre hasta el 19 de octubre de 2012. Para más información en español, favor de contactar a Gretchen Newman a (360) 407-6097 o por correo electrónico AQComments@ecy.wa.gov.

តំបន់ភៀសខោនធី-ក្រុងតាកូម៉ា (Tacoma-Pierce County) គឺមានបញ្ហាផ្នែកអាកាសធាតុក្រខ្ទក់។ ក្រសួងបរិស្ថានវិទ្យានៃរដ្ឋវ៉ាស៊ីនតោនសូមអញ្ជើញសាធារណៈជន ដើម្បីផ្តល់យោបល់ចំពោះផែនការនៃសំណើនេះ ដើម្បីធ្វើឱ្យគុណភាពអាកាសធាតុមានភាពប្រសើរឡើង។ រយៈពេលនៃការធ្វើអត្ថាធិប្បាយរបស់សាធារណៈជនគឺបើកពេលចំហរ ចាប់តាំងពីថ្ងៃទី 10 ខែកញ្ញារហូតដល់ថ្ងៃទី 19 ខែតុលា ឆ្នាំ 2012។ សំរាប់ពត៌មានច្រើនថែមទៀតជា**ភាសាខ្មែរ**, សូមអ៊ីមែលសំណើរទៅតាមអាសយដ្ឋាន AQComments@ecy.wa.gov។ យើងសូមស្វាគមន៍សំរាប់សរសេរជាភាសាខ្មែរ។

타코마-피어스 카운티 지역에 대기 오염 문제가 있습니다. 워싱톤 주 환경부에서는 이 지역 공기를 맑게하기 위해 주민들의 의견을 듣고자 하오니 여러분들의 의견을 2012년 9월 10일부터 10월19 일 사이에 환경부로 제출해주시기 바랍니다. 보다 자세한 사항은 주 환경부로 문의하시기 바랍니다 (맹병규: 425-649-7253, 또는 AQComments@ecy.wa.gov).

Department of Ecology News Release - September 10, 2012

12-292

Ecology seeks comments on plans for improving air quality in greater Tacoma area

OLYMPIA – The public has an opportunity to weigh in on strategies designed to improve air quality in the greater Tacoma area and surrounding communities.

In 2009, the U.S. Environmental Protection Agency (EPA) designated a nonattainment area that included those communities because local air quality did not meet the federal health-based clean air standard for fine particle pollution. People can easily inhale tiny fine particles, which penetrate deep into the lungs and the circulatory system. Exposure to fine particles is linked with respiratory disease, decreased heart and lung function, asthma attacks, heart attacks, strokes, and premature death.

The Washington Department of Ecology (Ecology) is working with the Puget Sound Clean Air Agency, and other interested organizations and individuals to improve air quality and reverse the federal designation.

A nonattainment designation could hinder economic development because large industries seeking to expand or new large businesses looking to build and bring jobs to the area face additional strict requirements. Some large existing businesses could be required to install more emission controls. That might prompt businesses to move elsewhere, taking jobs and potential revenue from the area.

Also, if the state doesn't implement a plan to improve air quality, EPA could impose a federal plan that may not provide the best solutions for the area. In addition, if the air quality doesn't improve federal transportation funding for highway projects could be cut because more traffic could add to air pollution in the area.

Ecology has drafted a plan that describes strategies to make sure air quality meets the federal standard for fine particles. The strategies are outlined in the revised State Implementation Plan (SIP) for reducing key air pollutants. Ecology plans to submit the revised SIP to EPA before the end of the year.

The public can review and comment on the revised SIP. Ecology's public comment period runs from Sept. 10 through Oct. 19, 2012.

The proposed revision:

- Describes strategies to reduce air pollution in the nonattainment area. A task force of local residents and organizations recommended the strategies, which Puget Sound Clean Air's board of directors endorsed. Strategies include:
  - Increased enforcement during burn bans.
  - Required removal of uncertified woodstoves and inserts.
  - Work to reduce other sources of fine particle pollution.
- Includes Puget Sound Clean Air's proposed regulation for solid-fuel burning devices.
- Reports on how Ecology considered environmental justice concerns in the area.
- Reports on the public involvement and stakeholder process.
- Includes the 2008 emissions inventory for the nonattainment area, which is required by the federal Clean Air Act.

You can find the proposed SIP changes and related documents at these locations:

- Ecology's SIP website.

- Tacoma Public Library (Main Branch), 1102 Tacoma Ave. S.
- Swasey Branch Library, 7001 Sixth Ave., Tacoma.
- South Tacoma Branch Library,3411 S. 56th St.
- Puyallup Public Library, 324 S. Meridian.

Here's how you can submit comments:

- Testify or submit written comments at a public hearing that begins at 6 p.m. Oct. 17 at the University of Washington's Tacoma campus. The hearing will be in the GWP Building at 1754 Pacific Ave.
- Email your comments to AQComments@ecy.wa.gov.
- Mail comments to Margo Thompson, Washington Department of Ecology, P.O. Box 47600, Olympia, WA 98504-7600.

Ecology will review and consider all comments. The comments will be summarized in a document, along with Ecology's responses. The proposed SIP changes may be modified based on public comments.

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Media Contact: Seth Preston, Ecology communications manager, 360-584-5744 cell; seth.preston@ecy.wa.gov

For more information:

Ecology's SIP website for Tacoma-Pierce County Nonattainment Area (www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm)

Ecology's social media (www.ecy.wa.gov/about/newmedia.html)

STATE OF WASHINGTON – KING COUNTY

--ss.

288276 No.
DEPT OF ECOLOGY

Affidavit of Publication

The undersigned, on oath states that he is an authorized representative of The Daily Journal of Commerce, a daily newspaper, which newspaper is a legal newspaper of general circulation and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a daily newspaper in Seattle, King County, Washington, and it is now and during all of said time was printed in an office maintained at the aforesaid place of publication of this newspaper. The Daily Journal of Commerce was on the 12th day of June, 1941, approved as a legal newspaper by the Superior Court of King County.

The notice in the exact form annexed, was published in regular issues of The Daily Journal of Commerce, which was regularly distributed to its subscribers during the below stated period. The annexed notice, a

PNPH:SIP PUBLIC HEARING

was published on

09/12/12

The amount of the fee charged for the foregoing publication is the sum of $106.60 which amount has been paid in full.

Subscribed and sworn to before me on

09/12/2012

Notary public for the State of Washington,
residing in Seattle

MELISSA M. DOWD
STATE OF WASHINGTON
NOTARY PUBLIC
MY COMMISSION EXPIRES
11-21-15

Affidavit of Publication

State of Washington, King County

State of Washington

AIR QUALITY PROGRAM NOTICE OF PUBLIC HEARING AND OPPORTUNITY FOR PUBLIC COMMENT

Ecology is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Public hearing schedule:

Date: Wednesday, October 17, 2012

Time: 6:00 p.m.

Location: UW Tacoma 1754 Pacific Ave

GWP Building

Tacoma, WA 98402

For more information and the proposed SIP revision go to: http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm

Ecology will accept comments from September 10 through 5:00 p.m. October 19, 2012. Send comments to:

Margo Thompson

Air Quality Program

Department of Ecology

PO Box 47600

Olympia, WA 98504-7600

AQcomments@ecy.wa.gov

If you require special accommodations, call the Air Quality Program at 360-407-6800 by October 8, 2012. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Date of publication in the Seattle Daily Journal of Commerce, September 12, 2012.

9/12(288276)

FORM A 19-1A (Rev. 5/91)

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IN THIS SPACE

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That said notice was published in the regular and entire issue of every number of said newspaper during said period and times of publication; that said notice was published in the newspaper proper and not in a supplement; that the changes herein made are at the regular rates charged for such advertising, and that the same or any part thereof has not been paid.

Cheri Winden

Subscribed and sworn to before me this 14th day of November, 20 12

Melissa Hakenson

Notary Public in and for the State of Washington

Residing at 1950 South State St Tacoma WA 98411

MELISSA ARLENE HAKENSON NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 03-15-14

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Payment Amt	$0.00		
Amount Due	$227.23		

Product	Start Date	Stop Date	# Inserts
The News Tribune	9/12/2012	9/12/2012	1

ECOLOGY

AIR QUALITY PROGRAM
NOTICE OF PUBLIC HEARING AND OPPORTUNITY FOR PUBLIC COMMENT

Ecology is revising the State Implementation Plan (SIP) for the Tacoma-Pierce County Nonattainment Area. The Environmental Protection Agency (EPA) designated this area as nonattainment due to unhealthy levels of fine particle pollution. The purpose of the SIP revision is to reduce levels of fine particle pollution.

Public hearing schedule:

Date: Wednesday, October 17, 2012
Time: 6:00 p.m.
Location: UW Tacoma
1754 Pacific Ave
GWP Building
Tacoma, WA 98402

For more information and the proposed SIP revision go to: http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm

Ecology will accept comments from September 10 through 5:00 p.m. October 19, 2012. Send comments to:

Margo Thompson
Air Quality Program
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
AQcomments@ecy.wa.gov

If you require special accommodations, call the Air Quality Program at 360-407-6800 by October 8, 2012. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

Appendix H. Additional Resources

Ecology's Tacoma-Pierce County Nonattainment Area Website
http://www.ecy.wa.gov/programs/air/sips/designations/pm_tacoma.htm

Clean Air Pierce County – Puget Sound Clean Air Agency's (PSCAA) Website for the Tacoma-Pierce County Nonattainment Area
http://www.cleanairpiercecounty.org/

Tacoma-Pierce County Clean Air Task Force – Report and Recommendations to Puget Sound Clean Air Agency
http://www.cleanairpiercecounty.org/taskforce/CleanAirTaskForceReport_FullReport.pdf

Clean Air Performance Commitment (CAPC) Memorandum of Understanding
http://www.pscleanair.org/announce/hearings/documents/100420MOUfinal.pdf

Rules and Statutes

Chapter 36.70A RCW (Revised Code of Washington) Growth management – planning by selected counties and cities
http://apps.leg.wa.gov/RCW/default.aspx?cite=36.70A&full=true

RCW 70.94.457 Solid fuel burning devices – Emission performance standards
http://apps.leg.wa.gov/RCW/default.aspx?cite=70.94.457

(Washington Administrative Code) WAC 173-433-100 – Solid fuel burning devices
https://fortress.wa.gov/ecy/publications/publications/wac173433.pdf

Additional Technical Information

Summary Technical Report in Support of $PM^{2.5}$ Clean Air Performance Commitment (CAPC) Process for Tacoma Washington
http://www.pscleanair.org/programs/community/nonattainment/fineparticulatematter/tacomapierce/Tacoma%20PM2.5%20CAPC%20Tech%20Report%20-%20Oct%2014%202010.pdf

Sources of Fine Particles in the Wapato Hills-Puyallup River Valley $PM_{2.5}$ Nonattainment Area
http://www.ecy.wa.gov/pubs/1002009.pdf

2008 National Emissions Inventory
http://www.epa.gov/ttnchie1/net/2008inventory.html