Air Quality in the Duwamish Valley
2016 Overview

pscleanair.org
Puget Sound Clean Air Agency

Fine particles and your health

Dust, soot, and smoke – all contain tiny specks of pollution called fine particles. The most hazardous particles are less than 2.5 micrometers in diameter and travel deep inside the lungs producing a pro-inflammatory response locally and systemically.

These tiny particles cause heart attacks, strokes, asthma attacks, cancers, and even premature death.[1] Fine particles are particularly harmful to sensitive populations, including children, expectant mothers, older adults, and others living with long-term heart and lung conditions (like asthma).

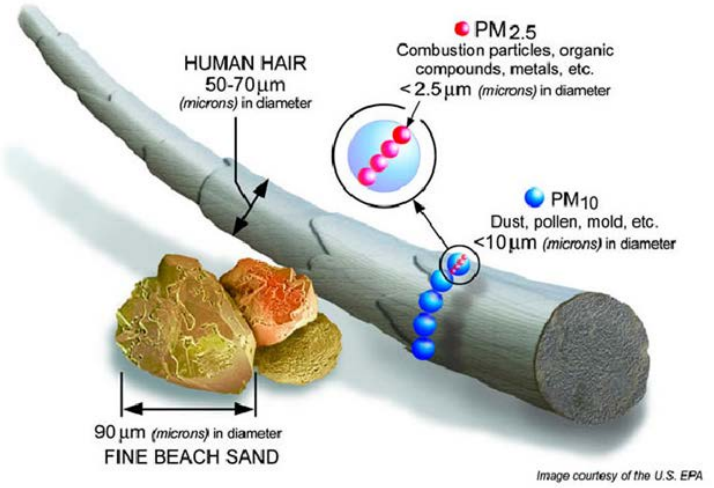

Figure 1. A human hair and a grain of sand compared to the size of fine particles (in pink)

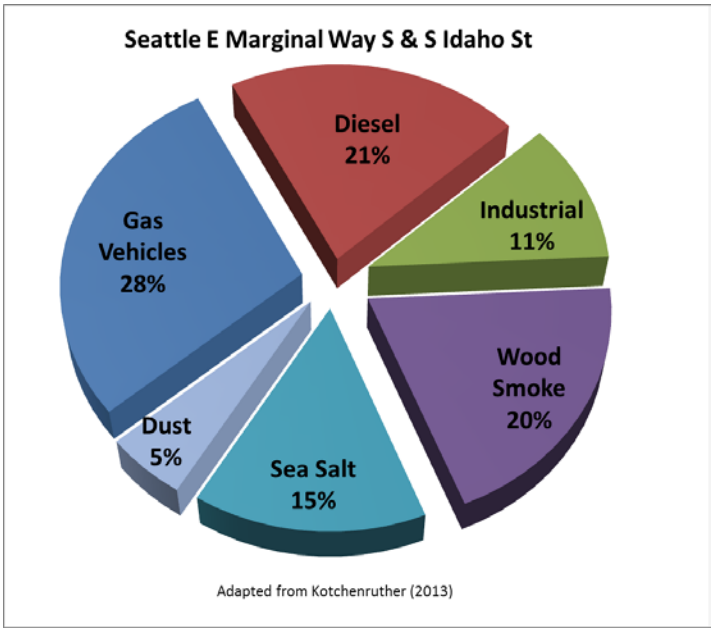

Figure 2. Sources of air pollution in the Duwamish Valley.

Sources of fine particles

In the Duwamish Valley, most fine particles come from burning fossil fuels. For example, the largest sources are from gas vehicles, trucks, trains, ships, and other diesel-powered equipment. Other sources of fine particles come from industrial activity in the area and wood smoke from residential home heating. There are also natural sources of fine particles in the air including dust and sea salt. Figure 2 shows the breakdown of fine particles in the Duwamish Valley, and Figure 3 shows a map of many sources.

[1] US EPA, "Integrated Science Assessment for Particulate Matter", https://www.epa.gov/isa/integrated-science-assessment-isa-particulate-matter

Fine particles from diesel exhaust are worse

Not all types of particles have the same risks. Of all the types of fine particles, particles from diesel exhaust are the most harmful. Of the all the cancer risk due to air pollution, diesel exhaust is the largest contributor in the Puget Sound area. In the Duwamish Valley, we estimate that diesel exhaust contributes over 70% of the total potential cancer risk from air pollution[2], estimated in a 2010 study to be 450 per million.

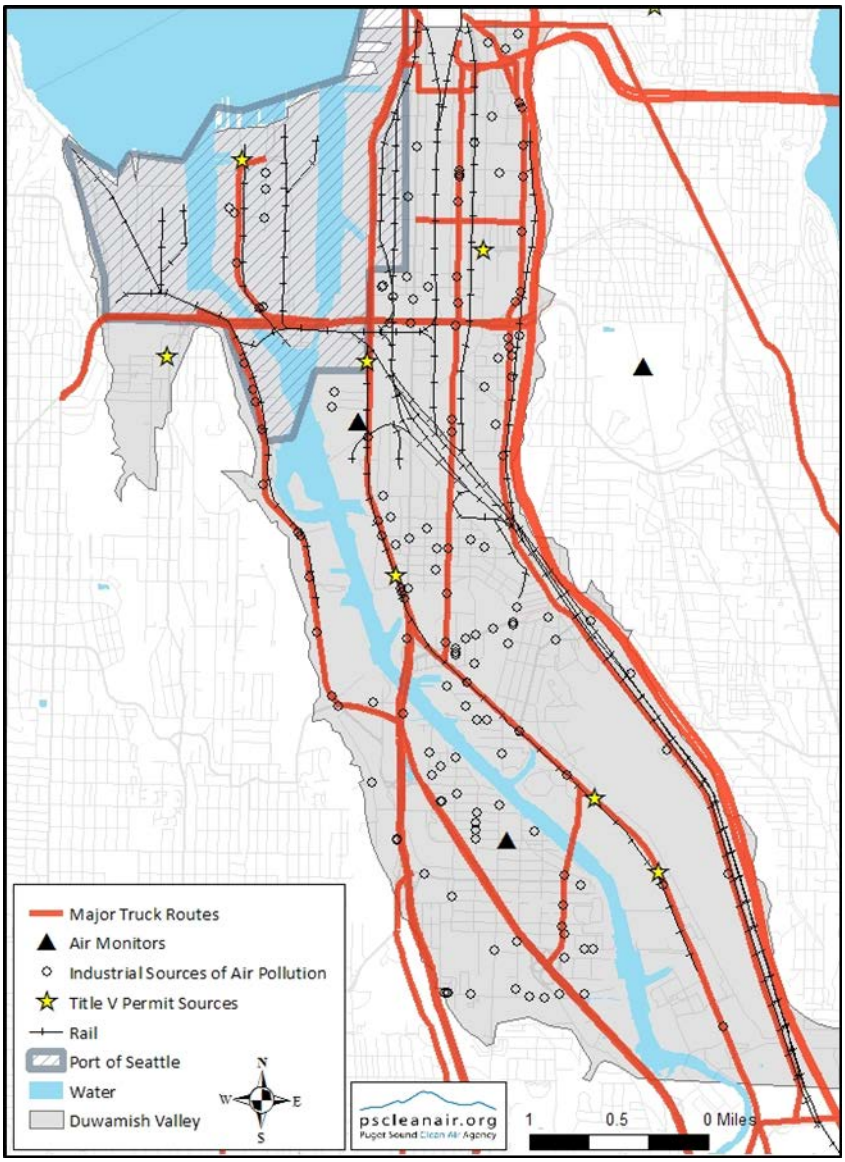

Figure 3. Map of different sources of air pollution in the Duwamish

Air Quality Improvements

Nationally, large reductions in diesel exhaust are expected to continue thanks to the newer diesel fuel and truck engine standards that took effect in 2007. The newer trucks are 50 to 60 times cleaner than the older, dirtier trucks. An international agreement requiring incoming ships to use the cleanest shipping fuels along US coastlines (called an Emission Control Area) also reduces diesel exhaust in our area.

Locally, our area benefits from actions taken as part of the Northwest Ports Clean Air Strategy, which aims to reduce diesel exhaust by 80% by 2020 (from 2005 levels). The Strategy includes a number of measures that the Ports of Seattle, Tacoma, and Vancouver are taking to reduce diesel pollution across many sources: trucks servicing the ports, ocean-going and harbor vessels (ships), cargo-handling equipment, and rail. Figure 4 shows the trend in diesel as measured by black carbon (an indicator of diesel) in the Duwamish Valley.

[2] Puget Sound Clean Air Agency, "2010 Air Toxics Study in Tacoma and Seattle", 2010, http://www.pscleanair.org/airq/basics/ExSummary2010air_toxics_study.pdf

Over the last several years, the ports, EPA, and clean air agencies have invested millions of dollars to reduce diesel emissions in the area:

- **The Seaport Truck Scrappage and Replacements for Air in Puget Sound (ScRAPS) Program** assists owners of old diesel trucks to buy newer ones that meet clean air standards. Over 480 trucks replaced or retrofitted with over $8M in grants from the EPA, Port of Seattle, Washington State DOT, and Ecology from "ScRAPS" and "ScRAPS2".
- **The "At-Berth Clean Fuels" (ABC Fuels, 2009-2014) program** gave incentives to ships at the Port of Seattle to use cleaner fuels. With $3.2M of Port of Seattle funding, this eliminated about 850 metric tons of sulfur dioxide in the Puget Sound region.

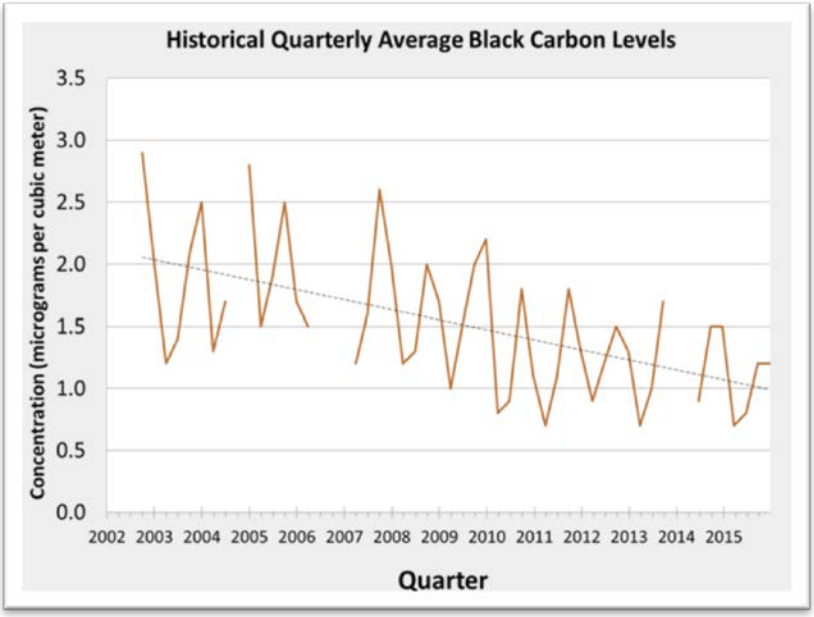

Figure 4. Trend in diesel exhaust since 2002.

- **Cargo Handling Equipment retrofits reducing diesel pollution** from over 100 pieces of equipment were completed through an EPA grant and Ports of Seattle and Tacoma funding (over $1M combined).
- **207 SeaTac Airport taxis** were converted to ones that use compressed natural gas, positively impacting air quality in the Duwamish Valley with a $2M ARRA grant.
- **650 school buses** from private and public fleets were retrofitted with $1.3M in funds from the Puget Sound Clean Air Agency and EPA.
- **Three tugboats**, two serving Elliot Bay and one serving the Duwamish River, were retrofitted and repowered with $1.2M in EPA grants.
- **Upgraded two Sound Transit locomotives** that spend 80% of the time between Tacoma and Seattle with a $1.2M EPA DERA grant.

Beyond activities specifically targeted at diesel emissions, the Puget Sound Clean Air Agency has ongoing programs that reduce air pollution in the region. For example, burn bans in the winter months help to prevent harmful levels of fine particle pollution from wood smoke. We actively work with industry to comply with regulations through our inspection, permitting, and complaint response programs.

We are also working with local community based organizations to improve the air in the Duwamish Valley through the Duwamish Community Action for Clean Air Project. We are currently testing the effectiveness of indoor air filters to help improve air in households from outdoor air pollution. The project partners include the American Lung Association, the City of Seattle, EPA, the Georgetown Community Council, Hey Duwamish, Just Health Action, Public Health – Seattle and King County, the South Park Neighborhood Association, and Western Washington University.

Helpful resources

How to reduce air pollution risk
• Limit time spent near idling cars and trucks • Review air quality forecasts before outdoor strenuous activities • Continue to exercise outdoors, especially around midday when pollutant levels are typically lower • Limit outdoor strenuous activities when air pollution is high • Recycle the air in your car when on busy roads • Consider purchasing a portable HEPA filtration unit for your home and replace your filters every three months
Disclaimer: Based upon interpretation of the current literature, the Puget Sound Clean Air Agency is providing this guidance for those who wish to take a precautionary approach to personal decisions. This is not meant to substitute for personal medical consultation with your health care provider.

Questions?

www.pscleanair.org or call 1-800-552-3565

To find your current air quality: http://www.pscleanair.org/airquality/ourairquality/Pages/currentaq.aspx

Send air quality complaints online: http://www.pscleanair.org/contact/Pages/complaint.aspx or call our air quality complaint line: 1-800-552-3565, ext. 6. Translation services are available.