RESIDENTIAL PAH EXPOSURES NEAR A WOOD PRESERVATION FACILTY IN WEST EUGENE, OR Diana Rohlman¹, Arjorie Arberry-Baribeault², Lisa Arkin², Lane Tidwell¹, Kim A. Anderson¹

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INTRODUCTION

In response to community concerns regarding industrial air pollution, Beyond Toxics and Oregon State University (OSU) initiated a community-engaged research study characterizing residential exposure to polycyclic aromatic hydrocarbons (PAHs) in West Eugene, OR. This neighborhood is next to a wood preservative facility known to emit PAHs via use of creosote (Figure 1).

BEYOND Justice organization that has been **TOXICS** tracking odor complaints in West Eugene for over a decade, stemming from a local wood preservative facility. They have worked with the Community Engagement Core of the Pacific Northwest Center for Translational Environmental Health Research on prior projects.



Figure 1. (*Left*) Map of stationary (teal GPS points) and wristband (person icon) passive samplers deployed around the facility. Locations are approximated in this figure. (*Right*) Beyond Toxics staff deploying stationary air samplers.

METHODS

- Recruitment conducted by Beyond Toxics via social media, community outreach and word of mouth.
- Recruited individuals living within 1 mile of the facility to participate for seven days
- Environmental passive samplers deployed by Beyond Toxics and OSU staff in three rings around the facility at 17 locations (Figure 1). Thirteen residents in the area wore and returned personal passive wristband samplers (Figure 1).
- Samplers analyzed by the Chemical Exposure Core of the Pacific Northwest Center for Translational Environmental Health Research for 63 PAHs.
- All activities conducted under Oregon State University Institutional Review Board approval (IRB-2021-1087)





in the inner ring (0.0-0.25 miles) relatives to the outer rings. (A) The three most abundant PAHs by average concentration in the stationary samplers. (B) The eight PAHs found in all wristband samplers and naphthalene, found in 12/13 wristband samples. *Kruskal-Wallis (one-way ANOVA, nonparametric). $p \le 0.05$

Figure 4. Levels of naphthalene across cardinal directions, by distance from the facility. Average concentration of in (A) stationary air samplers and (B) wristband samplers. (C) Average naphthalene levels across the three rings (black bars), the study (blue bar) and in different U.S. cities (gray bars).





RESULTS & DISCUSSION

Environmental samplers

• 40 PAHs detected across all samplers (Figure 2)

- Most abundant by concentration were naphthalene, acenaphthene and 2-methylnaphthalene. Concentrations of these PAHs were significantly higher in the inner ring, closest to the facility (Figure 3A).
- Wristband samplers
- 22 PAHs detected across all samplers (Figure 2)
- All chemicals detected in the wristband also detected in environmental samplers (Figure 2).
- Nine PAHs detected in majority of wristbands (Figure 3B). • Concentrations of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene were significantly higher in the inner ring closest to the facility (Figure 3B).
- Impact of geographic direction from the facility
- Levels of PAHs appeared highest in the northeast (Figure
- *Comparison to other studies*
- Levels in the environmental samplers were comparable to those in densely populated industrialized cities, albeit lower than levels of concern to health.

DISCUSSION

- In both the environmental and wristband samplers, PAHs associated with creosote were significantly higher in the inner ring.
- Levels of naphthalene in the environmental samplers were below levels of health concern yet indicate that those living or working near the facility had higher exposures to certain PAHs.
- The distribution of naphthalene, with levels highest in the NE, correlates with community reports of chemical odors.

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- **CONFLICT OF INTEREST STATEMENT** Kim Anderson and Diana Rohlman have a conflict of interest related to this study. These researchers own or are related to someone who owns a company that provides services related to the silicone wristbands."

