

Date: September 20, 2022

To: Facilities & Operations Committee

From: Joe Crelier, Director of Risk Management

Subject: Air Quality in PPS Schools

On Thursday, 9/22, at the F&O committee meeting, staff will present information about air quality in PPS schools. PPS partners with [PBS Engineering and Environmental](#), one of the Northwest's top environmental engineering firms. Representatives of PBS will be available to provide information and answer questions you might have about PPS' air quality practices.

PPS Partners with Top Air Quality Experts.

PBS Engineering and Environmental Inc., founded in 1982, provides professional consulting and project delivery services out of multiple offices throughout the Pacific Northwest, including our primary location in Portland, Oregon. We offer a broad range of services with a staff of more than 290 professionals. Our services include geotechnical, environmental, civil, structural, traffic, and transportation engineering, as well as environmental, industrial hygiene, natural resources, planning, and land surveying services. We pride ourselves in offering quality local staff and responsive services to public and private clients. Our commitment to excellent service at every level of the firm has resulted in the high number of repeat clients, whom we have served for many years.

Doug Hancock, Senior Project Manager: Doug is one of PBS' most technically diverse professionals and has an excellent grasp of occupational health and safety issues. He holds the Certified Industrial Hygienist® and Certified Safety Professional® designations. Doug is highly experienced in air quality investigations; water quality studies; environmental soil and groundwater investigations and remediation; and asbestos and lead management. Doug has more than 33 years of experience dealing with the workplace environment, including assessment and control of hazardous waste sites and working around radiological hazards. His knowledge of chemistry and toxicology is critical in supporting PBS' Indoor Air Quality (IAQ) team in their studies of building systems, workplace environments, and manufacturing processes. His ability to assess the client's needs, to develop a sound and cost-effective project approach, and to solicit technical support from engineering and architectural staff when appropriate, has established him as the primary contact for many of our clients.

Clark Nelson, Senior Project Manager: Clark holds the Certified Industrial Hygienist® professional designation, He has 19 years of experience as a highly effective operations and project manager for PBS' Portland, Oregon environmental health and safety and industrial hygiene teams. Clark's experience, attention to detail and skillful communication skills grant him the ability to efficiently manage any project and teams. His experience includes federal, state, and local government projects as well as private clients, including infrastructure, industrial, educational, public facilities, and private commercial projects throughout Oregon.

Our classrooms are safe.

- PPS follows the consensus advice of public health experts and meets all standard regulations
- We're regularly reviewing our protocols and systems, with the help of PBS and public health experts, to ensure alignment with industry best practice
- Our **air quality experts** will share considerations they make to determine safe indoor air quality, which includes:
 - The equipment in our buildings, and how we maintain it for optimum performance
 - The portable equipment that can improve air filtration, and how we maintain it for optimum performance
 - The quantity of outside air we can pull in
 - The airflow patterns in our buildings
 - The temperature and humidity we can expect, and how variations and changes might affect airflow
- We continue to seek guidance from public health experts like the Oregon Health Authority.
 - They've informed PPS that they do not advise a set number of air changes per hour and instead advise an array of [best practices](#), many of which we are implementing in our schools and classrooms.

We are confident in our air quality practices.

- PPS follows the consensus advice of public health experts and meets all standard regulations
- PPS increased all building mechanical system filter standards from MERV-8 to MERV-13.
 - The higher the MERV rating the better the filter is at trapping air particles, including airborne bacteria and viruses.

- NOTE: MERV 13 filters help prevent the spread of COVID-19 by limiting the size of virus particles transmitted. However, they negatively impact the air changes per hour in a system due to being a more restrictive filter, slowing air flow. (Learn More: [Air Filter Pressure Drop FAQ](#))
- Every PPS learning space has a portable air purifier.
 - These additional filters help purify the existing air in classrooms while helping increase overall air changes per hour.
 - PPS used more than \$4.6 million ESSER dollars to purchase more than 6,500 purifiers.
- PPS aims to replace every school's HVAC system with new and upgraded systems.
 - While we expect to modernize all schools over several decades, we've made the **first installment** of \$75 million from the 2020 general obligation bond to improve air quality in four schools: **Lent, Bridger, Kelly, Harrison Park**
 - These improvements include a mix of full system replacements and smaller upgrades like mechanical control retrofits. Without exception, these upgrades will improve air quality in classrooms.
- Heat, ventilation, and A/C systems are independently inspected for quality by an outside expert organization on a quarterly basis.
 - Deficiencies are quickly corrected by one of our mechanical engineers.
 - i. EXAMPLE: "Unit ending in 6400 needs belt (1)4L650 and bearings greased. Located in the room next to the cafeteria" or "Unit tag ending in 4318 needs belt (1)AP30 and bearings greased."
- PPS completed and published a sampling study of indoor air quality in schools throughout 2021.
 - Part of this testing includes spot-checking representative classrooms to verify habitability after the buildings had been shuttered for an extended period.
 - These inspections included visually checking HVAC functionality and measuring CO, CO₂, temperature, humidity, and airborne particulate levels.
 - These testing efforts closely followed the protocol embraced by Chicago Public Schools and Seattle Public Schools.
- PPS completed and published a year-long sampling of airflow in schools throughout 2021-2022.
 - This study provided a baseline to inform and prioritize upcoming ventilation system improvements like at Lent, Bridger, Kelly, Harrison Park.
 - Airflow testing is expensive and time-consuming, and we used one-time ESSER dollars to accomplish work.

Air Change Rate

- We agree: how often air changes in a room does matter. But so do all the other elements of ventilation:
 - Maintenance of equipment
 - Amount of outside air supply
 - Airflow patterns between students
 - Spaces between students
 - Temperature
 - Humidity
 - Impact of improved filtration systems like MERV13 and portable air filters
- There are no standards – local, state, or federal – for how often air should change to ensure air quality.
- Interested in learning more about air quality and air change rate?
 - [Oregon Health Authority COVID-19 Public Health Recommendations: Indoor air considerations for smaller spaces](#)
 - [CDC Ventilation in Buildings](#)

Attachments

- PPS Building Ventilation Infographic