Air Toxics

Questions and Answers

What is going on?

Possibly unsafe levels of arsenic and cadmium were found in the air near Bullseye Glass Company in Southeast Portland. Cadmium was found in the air around Uroboros Glass in North Portland. Chromium +6 (also known as hexavalent chromium) is also used at these glass factories and can be dangerous to health.

Since this determination in January 2016, the Oregon Health Authority (OHA) and Multnomah County Health Department have worked with the Oregon Department of Environmental Quality (DEQ) to test the air and soil around the glass companies. They have reviewed cancer cases around both glass companies; and urine tests from residents for cadmium.

The agencies found that there are no short-term, or acute, health risks from being exposed to these emissions. However, the long-term effect of these emissions on residents is not known.

The agencies have been collecting additional air samples and reporting results on the www.SaferAir.oregon.gov website every Thursday. They are working to assess the long-term risk in a full environmental public health assessment expected by fall 2016.

On April 6, Gov. Kate Brown announced the state is launching a regulatory overhaul of its air quality rules that will, for the first time, consider the effect of industrial air emissions on human health. Federal and state air quality programs currently use regulations and control technologies that are targeted to specific industrial processes to reduce air toxics from industrial businesses.

On April 12, the Environmental Protection Agency (EPA) clarified that Bullseye Glass Company and Uroboros Glass Company must comply with a federal hazardous emissions control standard. In conjunction with DEQ's regulatory overhaul, these regulations will require each company to install pollution control equipment and apply for the appropriate permit. DEQ will issue an enforceable order to each company requiring that they install the pollution control equipment.

On April 21, the Oregon Environmental Quality Commission adopted temporary rules that prohibit colored glass manufacturing facilities from using arsenic, cadmium, or chromium VI until control devices are installed.

Air quality in a city like Portland is complicated because of the number of industrial and commercial sources. Agencies are committed to bringing all pollutants to healthy levels, but that will take time.

Are the companies still using these heavy metals?

In February 2016, Uroboros Glass voluntarily agreed to stop using cadmium and chromium. Uroboros does not use arsenic.

Bullseye Glass also voluntarily agreed to stop using arsenic, cadmium, and chromium.

Multnomah County Health Department

Oregon Health Authority

DEQ State of Oregon Department of Environmental Quality

On April 11, Bullseye notified the state it had resumed use of cadmium after the company installed a baghouse. The DEQ inspected the baghouse and is overseeing stack testing and air monitoring since the resumption. Those results will be shared with the public.

How did this happen?

U.S. Forest Service researchers studied moss to measure air pollution in Portland. They found two hot spots for cadmium. The Oregon DEQ then tested the air near Bullseye Glass in Southeast Portland, collecting 24-hour monitoring samples in October 2015.

The air tests showed that the glass company was the likely source of the metals. When those results became available on January 21, 2016, DEQ shared the findings with the OHA and the Multnomah County Health Department. The DEQ also identified a second area of concern near Uroboros Glass, in North Portland.

The glass companies were operating in compliance with the current law. Bullseye Glass was operating within its permit. Uroboros is not required to have a permit.

The OHA and the Multnomah County Health Department are looking into what these air toxics can do to people's health and informing the public. So far, air monitoring samples have shown that there is little short-term health risk for the public.

What can the Forest Service moss maps tell me about health risks?

Many people are concerned about hot spots they saw on maps printed in the media that were created from preliminary Forest Service moss data. With the exception of cadmium, there is no way to use those maps to predict or estimate health risks to people.

OHA, DEQ and Multnomah County are working on a fair way to begin testing other areas of the city. Agencies started with Bullseye and Uroboros glass companies, because those areas had the highest concentrations of verified levels of cadmium in the air.

What are the health risks of these metals?

So far, three heavy metals were found to be at higher-than-acceptable levels near the glass companies.

Arsenic: Arsenic is not currently thought to be a public health risk in North Portland. Arsenic was found at higher-than-acceptable levels in Southeast Portland. Arsenic can come from many sources including vehicle engines, glass and metal facilities, and local volcanic soils. Long-term arsenic exposure is linked to skin color changes, nerve damage, skin cancer, and cancers of the lung, bladder, and liver.

Cadmium: Cadmium was detected at higher-than-acceptable levels in Southeast Portland and estimated at higher levels in North Portland. Long-term cadmium exposure is linked to kidney disease, fragile bones, and lung cancer.

Chromium: Chromium comes in different forms. Chromium-3 (chromium three) is a nutrient required by our bodies. Hexavalent chromium (chromium +6) was used at both glass companies and was also likely to have been released into the air. Experts are currently researching how much of the total chromium detected could be hexavalent chromium. Hexavalent chromium exposure is linked to anemia (low iron in the blood), asthma, skin allergies, and cancers of the lung and stomach/intestinal tract.

More information on these heavy metals is available at the Oregon Health Authority. (www.healthoregon.org/metalsemissions).

Is the soil in my yard or garden safe?

Yes. Recent dose and risk calculations for arsenic and chromium-6 indicate that metals in soil are too low to harm the health of people living and working near both Bullseye Glass and Uroboros, including children attending nearby daycare centers. Gardening near the glass companies, including growing and consuming your own produce in nearby soil, can be done with no significant risk to health. Because Portland is an urban environment and all urban soils have heavy metals to some degree, public health officials recommend that people follow the guidelines in the OHA Healthy Gardening fact sheet and webpage. This includes washing hands after working in the soil, and thoroughly washing all produce before consuming it.

I have small children and live in one of the affected areas. Should I be worried?

The health effects of exposure to cadmium, arsenic, and chromium depend on how much of these metals a child is exposed to and for how long. Exposure to high levels of cadmium and arsenic over a long period of time may cause developmental delay (low IQ) in children, but it's not known for sure. Soil and air sampling from SE Portland and N Portland confirm that metals concentrations in those areas are too low to cause these kinds of health effects in children.

Young children who play in dirt and frequently put their hands in their mouths are at risk of eating metals that have settled in the soil.

Making sure that all children wash their hands before eating, and after playing outdoors, can significantly lower their risk of exposure. Follow safe gardening practices, including washing produce before eating.

To help keep kids healthy it is important that they **1)** avoid tobacco smoke - tobacco smoke contains heavy metals including cadmium and arsenic; **2)** eat a healthy diet with calcium and iron; and **3)** wash their hands before eating or drinking.

I'm pregnant and live in one of the affected areas. Should I be worried?

We do not know for sure what the health effects are of these metals in pregnant women who have been exposed. Arsenic, cadmium, and chromium are all known to cross the placenta (move from mother to baby).

Arsenic and cadmium may contribute to low birth weight in babies. There are no studies showing that chromium causes birth defects in humans.

If you are pregnant, and have been exposed, it's important to **1)** avoid tobacco smoke - tobacco smoke contains heavy metals including cadmium and arsenic; **2)** continue regular prenatal care with a health care provider; and **3)** eat a healthy diet with plenty of calcium, iron, and folic acid. Those nutrients help protect the body against some of the bad effects heavy metals can have.

I'm breastfeeding and live in one of the affected areas. Should I stop?

Arsenic, cadmium, and chromium can all be found in breast milk. We are just beginning to understand the situation in Portland neighborhoods and what it means to people's health. Breastfeeding offers many health benefits to mom and baby, so nursing mothers should continue to breastfeed. We will review this advice regularly as we get more information.

I've had a cancer diagnosis. Was my cancer caused by emissions from one of these glass companies?

Many types of cancer have many different causes. Arsenic exposure is linked to skin, bladder, lung, and liver cancers. Cadmium exposure is linked to lung cancer. Chromium exposure is linked to lung and gastrointestinal cancers. These links are generally based on studies of animals and of people with heavy, direct exposures for long periods of time. It is extremely difficult to link one individual's diagnosis to an environmental exposure like this one. OHA investigates cancer clusters (groups of cancer in the same area) and tries to find out if there are more cases than we would expect for any one group of people. But, cancer clusters rarely find a clear environmental exposure responsible for that higher-than-expected number.

Have the affected neighborhoods had an unusually high number of people diagnosed with cancer?

The OHA reviewed lung and bladder cancers in Southeast and North Portland neighborhoods near the glass manufacturers over the last five years and found no evidence of an increase in the disease.

On March 31, OHA published an analysis of cancer rates for the past 15 years in neighborhoods surrounding both glass companies. According to OHA's report, rates of lung and bladder cancer, the diseases most closely associated with exposure to arsenic and cadmium, were generally consistent with expected rates from 1999 through 2013 near Bullseye and Uroboros, where environmental levels of heavy metals were found to be elevated. The only exception was for one five-year period in North Portland, where a small, statistically significant increase in the number of observed bladder cancer cases was noted during 1999 through 2003.

OHA cautions that the small number of expected bladder cancer cases (calculated based on rates in all of Multnomah County) in the two North Portland census tracts during 1999 through 2003 meant that even a small, but increased, number of observed cases could result in a statistically significant outcome. The increase in observed cases was not sustained in subsequent years.

Should I get tested for arsenic, cadmium, or chromium?

The Oregon Health Authority is not recommending that you get tested. Talk to your doctor to make the best choice for your health. Urine testing does not always detect arsenic and chromium-6. This is because the body passes these metals fast.

Cadmium remains in the body and can be found in the urine of someone who has been exposed over time. This leads to a build-up in the kidneys, and at high levels, can cause damage and may increase the risk for some cancers.

More than 500 people have been tested so far and very few have shown any level of cadmium. Results are encouraging to public health officials.

Testing hair and nails is not recommended by the Centers for Disease Control and Prevention (CDC) because of frequent contamination with dirt and dust.

I want my family tested. Who will pay for it?

Talk to your doctor about the need for a test, and the potential benefits and limitations. Most private insurance will cover the cost of cadmium testing for people who live near the glass companies. The Oregon Health Plan (OHP) also will cover urine cadmium testing for

members who live in the highest-risk areas. For persons living, working, or going to school or daycare within one-half mile of either glass manufacturing plant, the OHA has contracted with a health care system to arrange for urine cadmium testing. In order to be tested, please follow these steps:

1. Call **971-673-3308** (9 am to 4 pm, Monday through Friday) to determine if you qualify.
2. OHA staff will collect some basic information and provide directions to a clinic where you can submit a urine specimen for testing.

Depending on the result of your test, the following actions will be taken:

- If no urine cadmium is detected, a letter will be mailed to you within three weeks.
- If urine cadmium is detected, your results will be forward to your primary care provider (PCP). If you do not have a PCP, OHA's environmental health assessment program will help identify a provider who can help explain your results and any need for follow up.

My health care provider has questions. Who should they call?

State and county public health agencies are regularly updating guidance for health care providers. Physicians who want more information on test interpretation can call the Oregon Poison Center (1-800-222-1222). If necessary, the Poison Center will refer calls related to children or pregnancy to the NW Pediatric Environmental Health Specialty Unit (1-877-KID-CHEM).

Does the emergency rule make it mandatory for laboratories to report the results of these cadmium tests?

Yes, on February 18, 2016, OHA began requiring that laboratories report cadmium tests.

Where can I learn more about the findings and effects?

You can visit www.saferairportland.oregon.gov for the latest updates.

I understand there are treatments that remove metals from the body. Should I do this?

This type of treatment is usually only for people who we know have received a high dose and have symptoms. Medicines, known as chelating agents, bind to metals and put them into the bloodstream so the body can get rid of them. Chelating agents can lower calcium and iron, both of which are important for health. Even with medical supervision, this treatment has serious risks like allergic reaction, dehydration, kidney failure, and death.

State and local public health doctors are ***not*** recommending routine chelation treatment for people tested as a result of this exposure. Health care providers needing more information on tests and results test can call the Oregon Poison Center (1-800-222-1222), NW Pediatric Environmental Health Specialty Unit (1-8777-KID-CHEM), or a Board Certified Medical Toxicologist.

When will we be able to identify the "hot spots" for residents for whom you promised to cover the cost of urine cadmium testing?

DEQ is working to identify other "hot spots" around the city and will work with OHA to determine potential health risks in those areas. OHA and Multnomah County alert community members about their risks, whether people should get tested, and how and where to do so.

Do you have any urine test results so far? What are the results? What are you doing with the results of these tests?

As of April 8, 2016, OHA has received urinary cadmium results for 530 Oregonians statewide; 457 (86%) are Multnomah County residents. Of these, 23 (5%) had detectable cadmium in their urine. Six were in children under 18 and 17 were adults. Five results, or one percent, were at levels that would indicate need for clinical follow-up. OHA is interviewing these people to better understand their risk factors for cadmium exposure. Of the 434 Multnomah County residents with no cadmium detected in their urine, 263 (60.5%) are children (younger than 18).

OHA and Multnomah County Health Department are working with health care providers to inform them about testing in a regularly updated guide for clinicians. OHA is also contacting health care providers for every person with higher cadmium results to make sure they get the right follow-up.

Is it safe to eat fruits, vegetables and herbs grown in this neighborhood?

Yes. Vegetables should be washed or peeled before eating them, and anyone working or playing in soil should wash their hands before eating or drinking. The main risks from your garden are through eating the soil.

Local and state health officers advised people living within a half mile of the glass factories not to eat backyard produce until further notice. When will these residents be able to eat produce from their gardens?

Today! Based on the soil data collected in February 2016, OHA reports that the levels of metals in soil around Bullseye Glass and Uroboros are *too low to harm the health of people in the surrounding community*. OHA analyzed 67 soil samples collected by DEQ near Bullseye Glass and 21 soil samples near Uroboros. OHA focused on samples that were collected at shallow depth (0-6 inches) because they represent what people in the area would likely be exposed to. All samples were collected from public spaces and often from under a layer of sod. Samples were not collected from garden soil and did not include food grown in garden soil.

All soils contain some levels of metals, minerals and microorganisms. Arsenic, lead, cadmium and other metals occur naturally in soils. In Oregon, some metals occur in the soil at higher levels because of volcanic activity. It is also common for soil in city neighborhoods to have contaminants from building materials, vehicles and roadways, pesticides/herbicides, and nearby industrial and commercial uses.

We recommend that people follow the guidelines in our Healthy Gardening fact sheet and webpage.

Should I have my soil tested?

OHA is not recommending soil testing at this time. If you choose to have your soil tested, a list of soil testing companies can be found at www.SaferAirOregon.oregon.gov. Laboratories that will test soil for heavy metals will tell you how to collect samples. It's important to remember soil in any city has pollutants and that a positive test does not mean the levels are high enough to harm health.

I had tests done by an independent laboratory that performed soil and air monitoring. Would state and local agencies investigating metals emissions in Southeast and North Portland be interested in my results?

Portland State University, Portland Public Schools, daycares, media outlets, and individuals are also having soil and urine tested. Several of these are analyzing the data they collect, or distributing the results widely. All this information can potentially help us understand the public health risks. But, the collecting must be done in a way that meets the state's standards so we don't compare apples to oranges.

The OHA, DEQ, and MCHD want the public to have accurate information. In response to community concern, public health officials are speeding up the usual analysis process to find answers as soon as possible. All data provided will be fully considered to determine its validity and whether it helps us understand the health risk from exposure. Protecting the health of people who have been, and may be, exposed is the most important thing.

What are you advising parents and teachers about whether children should use the playground in areas with high levels of air toxics?

Parents and teachers can allow children to play outside. Soil tests show the level of metals around both glass companies are too low to harm health short term, including children at the daycare center and lifelong residents.

OHA added the estimated cancer risks for arsenic and chromium +6 from exposure to soil for children at the daycare center near Bullseye and lifelong residents. They found the combined cancer risk to be 60 in 1 million over an 80-year lifespan for daycare children and 30 in 1 million for lifelong residents. Even combined, these cancer risks would cause no detectable increase in cancer rates over baseline.

What steps should students follow when they come inside the house or return to the school classroom after playing outside?

Children should always wash their hands when returning inside after playing, before eating, and any other time that their hands are visibly dirty.

Is the produce from school gardens safe to eat?

Yes. Gardens tend to be a mixture of soil, compost, and other things. This makes garden soil very different from soil found in parks or your lawn. Garden soils that are amended with compost have healthier plants and make it harder for contaminants to get absorbed. The only way to know what is in your garden soil is to test for the contaminants of concern. A person must come into contact with, or be exposed to, a high enough level of contamination in soil for it to cause harm to their health. To be exposed to metals in soil, a person must swallow the contaminated soil. That is why we worry about young children who play on the ground, in dirt, and frequently put their hands in their mouths. Children and adults should wash their hands before eating and after playing outdoors.

Should schools test the dust in the schools for cadmium and arsenic?

Additional indoor testing will not be necessary unless outdoor tests identify metals at abnormally high levels. Regular cleaning also helps prevent dust build-up. Wet cleaning methods, or vacuuming with HEPA-equipped equipment, would reduce the amount of dust that gets stirred up into the air during cleaning.

Are my pets at risk? How can I keep them safe?

Like people, animals can be exposed through the air and environment. Talk to your veterinarian if you have questions or concerns.

Should we be worried about our water supply?

Portland's main source of water is the Bull Run Watershed, a protected area outside the city. Portland Water Bureau regularly tests for water pollutants including arsenic and chromium, which occur naturally in the environment. Water quality test results from recent years show levels that would be unlikely to have a negative effect on health.

What can I do to stay well?

People are less likely to suffer health problems from exposure to heavy metals if they take care of themselves in other ways:

- Avoid tobacco smoke
- Eat a healthy diet with a lot of different foods
- Get plenty of exercise
- Get enough sleep
- Wash hands well before you eat or drink

I'm feeling anxious about this situation. What can I do?

Learning about an environmental exposure like this can be very stressful because of the uncertainty and worrying about loved ones and property.

Take care of yourself by **1)** talking to loved ones about concerns; **2)** staying informed; and **3)** maintaining your daily routines, especially the healthy habits listed above.

If your stress becomes too much and gets in the way of your daily activities, see your health care or mental health provider. You can call the Multnomah County Crisis Line 24/7 at 503-988-4888. A helpful fact sheet is at (http://saferair.oregon.gov/Pages/Stay-Informed.aspx).

Where can I find information in other languages?

Information is being developed in other languages and shared on the agencies' websites. You can visit (www.saferairportland.oregon.gov) for the latest updates.

What are the different agencies involved?

DEQ - Oregon Department of Environmental Quality is a state agency that makes rules to protect the quality of our air, water, and land.

OHA - Oregon Health Authority is a state agency that works to ensure the health and health care of all Oregonians.

MCHD - Multnomah County Health Department is a local county agency focused on promoting and protecting the health of everyone in Multnomah County.

USFS - The U.S. Forest Service is the agency that manages and protects national forests and grasslands. Forest Service researchers discovered that moss collected from trees around art glass companies in the Portland area had much higher concentrations of heavy metals than other areas in the city.