



# Air Toxics

## Questions and Answers

### What is going on?

Possibly unsafe levels of arsenic and cadmium have been found in the air around the Bullseye Glass Company in Southeast Portland. Cadmium has been found in the air around Uroboros Glass Studio in North Portland. Chromium VI (chromium six, also known as hexavalent chromium) is also used at these glass factories and can be dangerous to health. The week of Feb. 15, 2016, Bullseye Glass and Uroboros Glass voluntarily agreed to stop using arsenic, cadmium, and chromium VI.

### How did this happen?

In May 2015, the U.S. Forest Service did a pilot study looking at moss samples as a measure of contaminants in the air. The moss results showed areas near the two glass companies with high levels of the heavy metals cadmium and arsenic near Bullseye Glass in Southeast Portland.

This pilot study prompted the Oregon Department of Environmental Quality (DEQ) to set up air monitoring systems near the one company in Southeast Portland to collect 24-hour air samples every few days over 30 days in October 2015.

The air monitoring information confirmed that the glass company was the likely source of the metals. Those results became available to DEQ in late January 2016. DEQ then shared its analysis of the findings with the Oregon Health Authority (OHA) and the Multnomah County Health Department.

The DEQ also identified a second area of concern near a second company, Uroboros, in North Portland.

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

The Oregon Health Authority (OHA) and the Multnomah County Health Department became involved to look into what these air toxics can do to people's health. They are sharing that information with 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 the Forest Service moss data. But with the exception of cadmium, there is no way to use those maps to predict or estimate health risks to people. The moss maps for metals other than cadmium only show where in the city moss has higher concentrations of metals relative to moss in other parts of the city. Just because there is a presence of metals in moss, it does not necessarily mean that these metals when in the air are, or were, above levels that would be a risk to people's health.

In the case of cadmium only, the Forest Service was able to find a mathematical correlation



between moss concentrations and air concentrations that existed in October 2015. The Forest Service has not been able to find a correlation between moss concentrations and air concentrations for any other metals for any period of time. This means that moss maps for metals other than cadmium cannot be used to predict air or soil concentrations in those areas. Because health risk is based on exposure by breathing contaminated air and not eating moss, the moss maps cannot be used to accurately predict health risks.

OHA, DEQ and Multnomah County are working on a fair and clear system for prioritizing those areas that are identified based on current air, soil and moss data and other factors in deciding where to do additional testing. Currently, state agencies are focused on the area around 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, agencies have focused on three heavy metals that were found to be at higher-than-acceptable levels in the areas near the glass companies.

**Arsenic:** Arsenic is not currently thought to be a risk in North Portland. Arsenic was found at higher-than-acceptable levels in Southeast Portland. 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 both North Portland and Southeast Portland. Long-term cadmium exposure is linked to kidney disease, fragile bones, and cancers of the lung and prostate.

**Chromium:** Chromium comes in different forms. Chromium III (Chromium three) is a nutrient naturally found in our bodies. Hexavalent chromium (Chromium VI or Chromium six) 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](http://www.healthoregon.org/metalsemissions)).

### **Is it safe to spend time outdoors in these neighborhoods?**

Yes. Both glass makers have stopped using arsenic, cadmium, and chromium VI, so there is no ongoing risk of exposure from those pollutants through the air. Air pollution clears quickly with rain and wind. Being outdoors also encourages physical activity, which is important for improving well-being and preventing chronic diseases.

### **Is the soil in my yard or garden safe?**

Probably. The answer to this question depends on many things. It is common for soil in city neighborhoods to have contaminants. Contaminants in soils come from past and current uses of the land. For example, contaminants can come from building materials, vehicles and roadways, pesticide use, and industrial and commercial uses. These glass companies have operated in their locations for decades, so there likely are metals in the soil of yards and properties around the facilities. A person must first come into contact with, or be exposed to, a high enough level of contamination in soil in order for it to cause harm to their health. To be



exposed to contaminants in soil, a person must eat the contaminated soil. This is typically of most concern for young children who tend to play on the ground, in dirt, and frequently put their hands in their mouths. Ensuring that children wash their hands before eating and after playing outdoors can significantly lower their possible exposure to contamination in yard or garden soil.

### **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.

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. Avoiding eating from gardens in these areas until there is more information on metal levels in the soil will remove the possible risk for exposure through eating garden food.

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 Oregon Health Authority collects and studies information about cancer cases in the state. OHA reviewed cases for the neighborhoods in Southeast Portland with reported elevated levels of cadmium and arsenic. Initial results showed no evidence of an increase in cancers associated with cadmium and arsenic exposure. Those results were reported Feb. 18, 2016 in a study published on the OHA's website [healthoregon.org/metalsemissions](http://healthoregon.org/metalsemissions) (see "Oregon cancer incidence evaluation"). OHA is conducting a similar review for North Portland and will publish those results in March.

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

We don't yet know the health risks from this situation. Those who live, work, attend school, or play near these glass companies will have different levels of exposure depending on their activities and how much time they spend there.

Based on the initial information from DEQ, and our understanding of air movement from these sources, the greatest exposure is expected to have been among those who spent the greatest amount of time within approximately half of a mile of the identified glass factories.

Testing is an individual decision. Talk with your healthcare provider first.

Medical testing for arsenic, cadmium, and chromium can be done as a one-time urine test. OHA and Multnomah County Health Department issued a detailed guidance for health care providers whose patients choose to get tested.

Arsenic and chromium leave the body quickly, so a urine test for these two metals can only measure very recent exposure (hours to days). The urine test for cadmium can measure long-term cadmium exposure that occurred over the past several years. Both tests can show if the recent exposure was above average. The tests cannot determine specific health effects. Test results of children under age six can be falsely high and should be interpreted carefully with an expert.

OHA is currently looking at ways to make test results available to their agency, while still protecting the person's privacy. That way, the health effects across the city can be better understood. The agency will provide updates on this on its website.

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

People thinking about testing should talk to their 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. OHA is working on a funding plan to cover the cost of urine cadmium testing for people in the affected areas whose insurance will not pay for the tests. OHA is also working with the Oregon Health Plan to offer the same benefit to its members.



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

State and county public health agencies have sent out guidance for health care providers about testing and advice for patients. Health care providers who need more information on test interpretation can contact experts at 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 physicians to report the results of these cadmium tests?**

Yes, and OHA is working with laboratories to make it possible to have fast, electronic reporting of the results to public health officials.

### **Where can I learn more about the findings and effects?**

You can visit [www.healthoregon.org/metalsemissions](http://www.healthoregon.org/metalsemissions) for the latest updates.

### **Now that the results are reportable, what does that allow you to learn?**

The urine test for cadmium can help estimate cadmium exposure that has occurred over the past several years. Arsenic and chromium, on the other hand, leave the body quickly, so a urine test for these two metals only reflects recent exposure (days to at most a week or so). Unfortunately, these tests only show exposure, not specific health effects. Elevated levels of metals in children under age six can be hard to understand and should be interpreted carefully with an expert.

Experts at the federal Centers for Disease Control and Prevention do not recommend testing of hair or nails because of frequent contamination with dirt and dust.

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

This type of treatment is usually only for individuals with a known high-dose exposure who 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 additional information on test interpretation can contact experts at 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. Based on that information, OHA will alert community members about their risks, whether OHA recommends testing, and if so, where and how to get tested.



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

OHA does not yet have urine test results. On Feb. 18, OHA began requiring all health care providers and laboratories to report all positive urine tests for cadmium in Oregon. This will allow the state to gather information, as it does with other conditions. Local public health officials will then follow up on the positive test reports. They will collect information from patients on such things as how long the person has lived in that area, their occupation, their work place, what schools they attend, and other information that can help identify potential sources of cadmium exposure. Once OHA looks at the test results over the next few months, it will decide whether or not to recommend testing. Individual test results reported to OHA for public health purposes are confidential under Oregon law. However, OHA can report summary data to the public.

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

Until soil tests are studied over the next several weeks, it is difficult to say for sure whether vegetables grown in the affected neighborhoods are safe to eat. To be safe, we recommend avoiding produce grown within one-half mile of the highest mapped concentrations until further notice.

In general, vegetables should be washed well or peeled before eating, and anyone working in the soil should wash their hands well before eating or drinking.

For people who would like information about the soil on their property sooner, there are a number of laboratories serving Oregon that will test soil for heavy metals.

Generally, urban gardens are at a higher risk of soil contamination from heavy metals, petroleum products, and other pollutants. OHA's [Healthy Gardening Factsheet](#) provides some additional information.

## **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?**

On Feb. 12, 2016, Bullseye Glass Company stopped using cadmium, arsenic and chromium VI. Uroboros Glass agreed to stop using all chromium and cadmium, and does not use arsenic. DEQ is gathering additional air and soil sampling data to ensure that there is no additional risk of exposure to levels that might affect your health. That data is expected to be released the week of March 7. DEQ and OHA will advise the public and make recommendations that may include steps for properly cleaning produce, or destroying it. For more information, see the OHA guide for healthy gardening: [http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/Documents/OHA\\_Healthy\\_Gardening\\_10\\_2013.pdf](http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/Documents/OHA_Healthy_Gardening_10_2013.pdf)

## **Should I have my soil tested?**

OHA is not recommending soil testing at this time. If you choose to have your soil tested, the agency has produced an information sheet with a list of soil testing companies. It is available at <http://public.health.oregon.gov/newsadvisories/Documents/soil-labs.pdf>. The Portland area has naturally occurring background levels of many metals, including arsenic, due partly to past volcanic activity. It's important to consider that a test showing a positive result for the presence of metals does not necessarily mean the levels are abnormally high for the region, or that they pose a risk to your health. DEQ is developing guidance on how to interpret soil testing results.





## **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?**

There are many parties independently collecting environmental data. These include Portland State University, Portland Public Schools, daycares, media outlets, and individuals who are having soil and urine tested. Several of these are analyzing the data they collect, or distributing the results widely. This has created opportunities for a range of people to weigh in on what this initial data may mean. All this information can potentially help us understand the public health risks, but it is not without limitations. The collection must be done in a way that meets the state's standards so we are not comparing apples to oranges.

The OHA, DEQ and MCHD are fully committed to providing the public with accurate information to address the broad range of concerns we have heard. In response to community concern, we are speeding up our regular assessment process in order to provide this scientific information as quickly as possible. We will fully consider all data provided to us to determine its validity and whether it enhances our understanding of the public health risk associated with exposure to these metals in our environment. Our top priority is to protect the health of people who have been, and may be, exposed to the emissions from the glass companies.

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

We are eagerly awaiting up-to-date results on air monitoring in the areas near the glass factories. Since they have both stopped using the chemicals detected at high levels in October 2015, we are optimistic that levels will no longer be high. The week of March 7th we will also have up-to-date information on the soil at nearby parks and schools that will provide information about safety. Since the testing done at the childcare center very close to Bullseye glass showed normal Portland area levels of metals in the soil, we hope that the same will be true for other nearby public areas.

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

Regardless of neighborhood, kids should wash their hands after 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?**

We soon will have the first set of information from soil testing and can then provide advice on school gardens. Out of an abundance of caution during this situation, we recommend holding off on eating produce from school gardens until more information is available.

## **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

Learning about an environmental exposure like this can be very stressful because of the uncertainty and the worry it causes people about their loved ones and properties.

Take care of yourself by **1)** talking to loved ones and neighbors about your 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 for more information and support. You can also call the Multnomah County Crisis Line 24 hours a day at 503-988-4888. There is also a helpful fact sheet on stress and potential environmental exposures at (<https://public.health.oregon.gov/newsadvisories/Documents/metals-emissions-stress-worry.pdf>).

## When will we know more?

We will have more information in the coming weeks and months. This situation is still developing. Every agency involved is working hard to gather needed information and determine what it means in terms of our health. Updates are posted on agency websites as new information becomes available.

## 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.healthoregon.org/metalsemissions](http://www.healthoregon.org/metalsemissions)) 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.