



February 14, 2016

Governor Kate Brown
254 State Capitol
Salem, OR 97301-4047

Dear Governor Brown:

Thank you for the opportunity to describe what the Department of Environmental Quality has and will be doing to address concerns and impacts of high levels of cadmium, arsenic and other air toxics in the Portland area. The information that we now have and the knowledge that these emissions have the potential for elevated risks, is hard to hear, especially for those who live, work, learn and play in affected neighborhoods. DEQ is charged with protecting the environment and public health and takes both the concerns of the public and the impact of these emissions seriously.

Since getting the directly measured air sampling data about metals emissions DEQ has been working to:

- Provide accurate, supportive and timely information about air quality to our partners at the Oregon Health Authority (OHA) and Multnomah County and to the community directly.
- Take determined and informed actions that are protective of public health, and which meet the public's, and our own, expectations about understanding and protecting the quality of the air.
- Evaluate how health or risk based standards for air toxics impacts from industrial facilities will address a gap in current state and federal regulations.

Below we have addressed each of your requests in more detail:

What were the circumstances leading to the discovery of abnormally high levels of arsenic and cadmium in the air in Southeast Portland and elsewhere in the city?

DEQ, in follow up to its own research, actively pursued an opportunity to partner with the US Forest Service as they were developing a potentially innovative and low cost tool (moss sampling) that could be used to inform DEQ and the public about air quality in an urban setting. DEQ requested that the US Forest Service include cadmium and arsenic in their moss study to further develop our understanding of both pollutants in Portland's air. This forward looking research has never, to our knowledge, been done before and is an example of how data driven research can quickly and effectively identify problems.

This recent partnership and focus on cadmium and arsenic is the result of sustained and long term efforts to identify air toxics problems in the Portland area and find ways to reduce their impact. A more detailed timeline explaining the circumstances is attached.

Ultimately, DEQ received initial analytical results from a contract lab, with capabilities to analyze such samples, on January 15, 2016. This was the first time DEQ had any directly measured air sampling data indicating the concentrations of cadmium and arsenic in the air near Powell Park in SE Portland. DEQ received final quality control validated results from the contract lab on February 1, 2016.

What was the timeline of activity, starting with when data indicating high levels of cadmium and arsenic were first detected in the air and in other media; when the agencies were notified; the timing of actions triggered by that information; when the agencies and the county were engaged to inform the public; and when and how the public was informed initially?

DEQ received and evaluated initial data, worked with partners to interpret results

- January 15, 2016: The DEQ lab received initial analytical data from Desert Research Institute and began reviewing them for validity and quality.
- January 19, 2016: DEQ Lab staff sent results to Air Quality Planning staff.
- January 20, 2016: DEQ Air Quality Planning staff received results from the lab, and notified DEQ Northwest Region Administrator and Air Quality managers that one month of air monitoring data was available from samples taken at SE 22nd Ave. and Powell Blvd.
- January 20, 2016: DEQ determined that cadmium and arsenic concentrations were roughly 50 and 150 times above DEQ's ambient benchmark concentrations, respectively. This information was cause for immediate concern.
- January 21, 2016: DEQ Air Quality Planning staff informed OHA about monitoring results.
- January 22, 2016: DEQ, OHA, USFS and Multnomah County Health participated in a conference call to discuss data and determine next steps, including the need for maps to help identify potential areas of concern.

DEQ planned and began external communication about air monitoring data

- January 26, 2016: AQ Planning staff and NW Region AQ staff discussed results and continued planning for information dissemination.
- January 28, 2016: OHA briefed DEQ about its initial interpretations of the limited data (i.e. one month of air monitoring data with no calculated area of impact), and the two agencies began planning public outreach and communication for the week of Feb. 1, 2016.
- January 30, 2016: DEQ staff visited Powell Park and neighborhoods near Bullseye Glass Company to better understand the neighborhood, residences, other businesses, and proximity of the childcare facility.
- February 1, 2016: OHA, DEQ and Multnomah County Health worked to finalize data and health related information and a news release.
- February 2, 2016: OHA informed the Creative Children's Learning Center and its headquarters office about the monitoring results and planned communications. DEQ notified the Fred Meyer corporate office.

- February 3, 2016: DEQ and OHA issued a joint news release, continued coordination on additional data needs and began planning for additional monitoring.

DEQ conducted additional site visits and requested additional information

- February 1, 2016: DEQ performed an unannounced inspection at Bullseye Glass Company to verify compliance, observe operations and discuss sampling results.
- February 5, 2016: DEQ provided one hour notice to Bullseye Glass Company before performing an announced inspection.
- February 6, 2016: DEQ conducted an unannounced onsite visit at Uroboros in North Portland to observe operations.

Facilities ceased using cadmium, arsenic, and some chromium

- February 4, 2016: Bullseye Glass Company voluntarily suspended its use of cadmium and arsenic.
- February 8, 2016: Uroboros voluntarily suspended the use of cadmium and stated that it has not used arsenic for 20 years.
- February 8-10, 2016: DEQ began researching additional metals used in the glass manufacturing process, developing soil sampling plans, and considering public input. DEQ consulted with national experts who expressed concern about the potential for trivalent chromium to oxidize into hexavalent chromium. DEQ determined that hexavalent chromium was a potential contaminant of concern and requested Material Safety Data Sheets (MSDS) from Bullseye Glass Company and Uroboros.
- February 11, 2016: DEQ reviewed MSDS sheets provided by Bullseye Glass Company and Uroboros, and concluded there was enough uncertainty about the companies' use of hexavalent and trivalent chromium compounds to warrant a request to each company to voluntarily cease the use of all chromium compounds.
- February 12, 2016: Bullseye Glass Company agreed to suspend use of hexavalent chromium, and further agreed to stop using cadmium and arsenic; Uroboros agreed to suspend their use of all chromium compounds and cadmium, and does not use arsenic.

DEQ participated in interagency public outreach and education efforts

- February 9, 2016: Multnomah County Public Health and Portland Public Schools hosted a Community Open House meeting at Cleveland High School with DEQ, OHA and the US Forest Service invited to provide information and answer participants' questions. DEQ worked with partner agencies to identify a date for a similar meeting in North Portland.
- February 12, 2016: DEQ and OHA issued a joint news release inviting media to a news conference to provide updated information about the facilities' use of chromium compounds.

What are the next steps the agencies and the county will take to address these contaminants, when will they be taken, and how will the public be notified they are safe from these emissions?

It is important to DEQ that people be informed about the risks from all sources of air toxics. DEQ has in the past and will continue to provide information to the public about the level and

types of risks from air toxics considering all sources, including industrial facilities, cars and trucks and wood burning as examples. In light of our recent research and a better understanding of the level of risks to communities in close proximity to industrial sources, and more immediately surrounding glass manufacturers in SE and N Portland, we have begun taking steps outlined below. The actions we are taking here are to be responsive to public concerns, protective of public health and to inform how DEQ can best address these problems in other areas.

DEQ additional air and soil sampling in Southeast and North Portland

- Week of February 8, 2016: DEQ prepared air and soil sampling plans for SE Portland to collect data on cadmium, arsenic, chromium and other metals and began preparing similar sampling plans for North Portland.
- February 12, 2016: DEQ deployed air sampling equipment and began taking soil samples in SE Portland.
 - Air sampling for metals will be conducted for two weeks. It will take an additional two weeks to complete analysis of the samples.
 - DEQ will continue additional sampling, making potential changes to the sampling plan as informed by data collected during the initial two week sampling event. Soil sampling will be completed by February 19, 2016.
 - DEQ will have the data analyzed with comparisons to risk levels within three weeks. The results will inform what additional sampling or specific actions which may be needed at that time.
- Week of February 15, 2016: DEQ will complete additional air and soil sampling plans for North Portland, and plans to deploy monitoring equipment by Friday, February 19, 2016. DEQ will process the samples as expeditiously as possible.
- DEQ will use the results of all air and soil sampling to define additional sampling needs, support public health partners and inform actions to reduce public health impacts.

DEQ is currently compiling a list of facilities permitted to emit hexavalent chromium and other metals to ensure an understanding of what additional actions the agency may take based on the data collected. DEQ is also researching what other facilities may be using the compound, have the potential for emissions and which are not otherwise regulated.

DEQ will continue our collaborative work with Oregon Health Authority and other local partners to provide information that will inform analysis and determinations about public health implications and actions and to participate in public forums.

DEQ has also engaged with the US Environmental Protection Agency (EPA) to help inform and support the initiation of a national investigation into potential emissions from art and architectural glass manufacturing.

DEQ will continue to use the information and priorities established through the Portland Air Toxics Solutions project to inform and guide other area wide research and air toxics reduction.

DEQ will continue to notify the public with updates and additional information through a variety of ways including web postings, emails, phone calls, news releases, and public meetings as appropriate.

What are the actions and timeline for the Oregon Health Authority, working with Multnomah County Health, to inform the public about possible health risks from these emissions and actions people should take to address health concerns?

As mentioned above, DEQ has been working diligently to provide our Health Authority partners with the data they need to be able to provide accurate and specific health information and recommendations to the public.

What are the concepts for longer-term steps, in terms of policy change and resources, needed to more effectively address the issue of hazardous air emissions in the Portland area?

While DEQ continues to develop our understanding of air toxics in the Portland metro area and this has informed how we have prioritized our resources to address air toxics, the unexpectedly high levels of metals in the air around these glass manufacturers shines new light on the problem of localized impacts of industrial emissions, or hot spots. California and Washington, for example, have addressed this problem directly by establishing health or risk based standards for air toxics impacts from industrial facilities. Such action in Oregon will address a gap in current state and federal regulations.

DEQ will, using our current statutory authority, expeditiously and thoughtfully craft an Oregon specific program through rule making that ensures industrial hot spots are sufficiently controlled. Like all rule making, it will be data and science driven and ensure input from communities, health agencies and regulated parties to help define the specifics of this program. Geographic area, levels of protectiveness and timeline for implementation will be considerations of this robust program. The program will also provide a platform for discussion with local governments about their potential roles and levels of formal or informal involvement.

DEQ will actively seek funding and resources to design, establish and implement this approach to regulating air toxics as well as a more robust monitoring program.

Our work on air toxics in the past has resulted in some successes in reducing impacts in the Portland area but, particularly in light of the recent information about localized hot spots, it now suggests and supports that a more aggressive approach is needed to make the necessary progress to reduce air toxics impacts from industrial sources.

DEQ remains committed to working with all stakeholders going forward to explore solutions that result in regulations that are protective of Oregonians and the environment.

Sincerely,



Dick Pedersen
Director



State of Oregon
**Department of
Environmental
Quality**

Timeline for Portland metals investigation

Feb. 14, 2016

Following is a timeline of the activities performed by the Oregon Department of Environmental Quality (DEQ) and others leading to discovery of cadmium and arsenic concentrations in Portland, Oregon's air approximately 50 and 150 times above benchmark levels, respectively.

DEQ conducted baseline and ongoing air toxics monitoring in Portland – 2003 to present

- Since 2003 DEQ has operated an air quality monitor continuously at North Roselawn near Jefferson High School.
- In 2005, with EPA funding, DEQ measured concentrations of air toxics, including metals, at six locations in the Portland area, finding levels of many pollutants above clean air benchmarks.
 - Benchmarks are Oregon's protective "clean air" goals that were developed by DEQ to address toxic air pollutants. There are no direct regulatory requirements associated with benchmarks. Air quality standards are set at the federal level by the US Environmental Protection Agency (EPA) nationwide for a different category of pollutants called criteria pollutants, which include: Particulate Matter, Ozone, Carbon Monoxide, Lead, and other pollutants.

DEQ convened Portland Air Toxics Solutions Project - August 2009 through October 2011

- In 2009, DEQ convened the Portland Air Toxics Solutions Project (PATS) and worked with local communities to develop air toxics reduction strategies for the Portland region, including portions of Multnomah, Washington and Clackamas Counties. That work resulted in high priority recommendations including wood smoke reduction, measures to decrease car and truck emissions, developing policy proposals to accelerate the use of clean diesel engines in highway and construction equipment, and conducting additional research on the sources of cadmium and arsenic in Portland.
- During the PATS process, DEQ performed computer modeling which predicted air pollution concentrations, based on assumptions about the amount of emissions from potential sources and the ways pollutants might move through the environment. To validate these computer models, DEQ compared the results to information collected from air sampling. The concentration levels of cadmium and arsenic measured in the air did not match the results obtained from the computer modeling; the modeling predicted lower values than the air samples showed. This confirmed the need for additional data collection, described below.
- Since 2012, DEQ has been implementing several of the Portland Air Toxics Solutions Project (PATS) high priority recommendations, such as voluntary diesel retrofits, and working with local governments to implement woodstove curtailment programs.

EPA performed air toxics monitoring at Harriet Tubman School in North Portland - 2009 and 2011

- Beginning in 2009, EPA conducted two separate air toxics monitoring efforts at Harriet Tubman School in North Portland as part of its nationwide school monitoring study. The first study occurred Aug. 23 to Nov. 3, 2009.
- EPA's second monitoring effort took place May 27 to July 17, 2011 for air toxics, including cadmium, at Harriet Tubman School. EPA noted that levels of cadmium measured at Tubman school were "well below levels of significant concern" for both short term and long term exposures. However, the findings were about 2-3 times above Oregon's more protective benchmarks for cadmium, prompting the need for additional monitoring and ongoing identification of sources.

DEQ focused research and analysis on cadmium in Portland - June 2012 through September 2013

- DEQ analyzed existing monitoring, meteorology and data from facilities with air pollution permits in an attempt to locate the sources of cadmium in the Portland area.
- DEQ concluded that there were likely multiple sources of cadmium, and recommended additional monitoring to identify specific sources.

DEQ and U.S. Forest Service collaborated to test new air pollution detection methods for urban settings – February 2013 to present

- DEQ and the U.S. Forest Service (USFS) developed a project to analyze samples of moss taken from Portland trees, and to compare moss data to monitored and modeled air pollution data in Portland. The research and collaboration to compare moss data to air monitoring results is ground breaking. This sophisticated spatial and statistical analysis has not been performed anywhere else in the country to understand urban sources of air pollution.
- The project initially focused on a class of pollutants called polycyclic aromatic hydrocarbons (PAHs), which result from combustion of carbon-containing fuels. In DEQ's ongoing efforts to identify specific sources of cadmium and arsenic emissions in Portland, DEQ requested that the US Forest Service analyze the moss samples for cadmium, arsenic and other metals.
 - December 2013 through June 2014, the USFS collected, analyzed, and received raw results for 346 moss and soil samples in Southeast Portland.
 - November 2014 through August 2015, the USFS collected, analyzed, and received raw results for 164 additional moss samples from Portland Public Schools.

DEQ received initial moss cadmium concentration data from U.S. Forest Service - May 15, 2015

- USFS informed DEQ about raw cadmium moss results and its intention to collect additional samples in Southeast Portland to improve data, and map cadmium and other metals with greater definition. This was a new approach and no standard operating procedures or established methods applied to conclude what the concentrations in air may have been based on the concentrations in moss.

DEQ identified glass facilities as potential sources of cadmium and arsenic – June 2015

- DEQ researched industrial facilities in the proximity of pollutant hot spots on USFS moss concentration maps.

- DEQ obtained and sent precise geographic information about art glass facilities to USFS resulting in a geographic overlay of moss hot spots with art glass facilities, which indicated a correlation between cadmium hot spots and Bullseye Glass Company and the area near Uroboros.

U.S. Forest Service presented draft research findings at a technical forum - June 25, 2015

- USFS presented raw cadmium and PAH maps at a Northwest Airquest air quality technical meeting for methodology discussion.
- Requests for more information about the moss maps should be directed to the USFS, Yasmeen Sands, Public Affairs Specialist, Forest Service, Pacific Northwest Research Station, p: 503-808-2137, c: 206-450-0319, ysands@fs.fed.us.

DEQ planned air monitoring in Southeast Portland - August and September 2015

- August 26, 2015: Because the data from moss samples did not indicate actual concentrations of pollutants in the air people were breathing, DEQ needed to sample the air itself. DEQ met with Reed College, Portland State University and USFS researchers to create an air quality monitoring plan for Southeast Portland.
 - DEQ selected the Southeast Portland location because it showed the highest concentrations of cadmium in moss.
 - DEQ conducted sampling in October because results from the Portland North Roselawn air toxics monitor showed a pattern of elevated cadmium concentrations at other locations during the fall months, particularly in October.
- In September 2015, DEQ planned its monitoring by analyzing locations, obtaining permission from the landowner, locating equipment, securing a power source, and assigning staff to perform monitoring.

DEQ conducted air sampling at SE 22nd Ave. and Powell Blvd. - October 6 to mid-November, 2015

- DEQ set up and operated sampling equipment at Southeast 22nd and Powell Blvd. beginning October 6, 2015. The equipment collected 18 twenty-four hour samples between Oct. 6 and Nov. 2.
- After sampling was completed, DEQ weighed and packaged samples at the DEQ laboratory, and sent them to Desert Research Institute (DRI), a laboratory with analytic capabilities to evaluate such samples. DRI analyzed samples within a standard 45-day processing time period.

U.S. Forest Service conducted additional moss monitoring in Southeast Portland

Oct. 10 to Nov. 9, 2015

- USFS collected, sent for analysis and received results for 25 additional moss and soil samples in Southeast Portland. The additional samples added detail and accuracy to the research database.
- Nov. 15, 2015 - DEQ receives additional moss monitoring data. USFS sent DEQ preliminary maps of new moss data.

DEQ received and evaluated initial data, and worked with partners to interpret air monitoring data from SE 22nd Ave. and Powell Blvd. – January 2016

- January 15, 2016: The DEQ lab received initial analytical data from DRI and began reviewing them for validity and quality.
January 19, 2016: DEQ Lab staff sent results to Air Quality Planning staff.

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 - DEQ will have the data analyzed with comparisons to risk levels within three weeks. The results will inform what additional sampling or specific actions which may be needed at that time.
- Week of February 15, 2016: DEQ will develop additional air and soil sampling plans for North Portland, and plans to deploy monitoring equipment by Friday, February 19, 2016. At this time, DEQ is not able to project an exact time frame for analysis of air and soil samples for the North Portland location.
- Results of all air and soil sampling will continue to inform DEQ's actions and decision process for subsequent sampling and analysis.