



State of Oregon Department of Environmental Quality

Colored Art Glass Manufacturing Summary of Comments on Temporary Rule and Brief Responses

DEQ received almost 1200 public comments on the Colored Art Glass Manufacturing Temporary Rule. The comments were divided into the broad categories below and most comments were paraphrased. DEQ did not respond to comments that were unrelated to the proposed rulemaking.

GENERAL RULEMAKING

Comment: The EQC can only adopt a temporary rule when its "failure to act promptly will result in serious prejudice to the public interest or the interest of the parties concerned." DEQ's rule does not demonstrate that a failure to act promptly will seriously prejudice the public interest. Why are the rules temporary and why didn't you provide a transparent process that included community input?

Response: *DEQ proposed temporary rules to the Environmental Quality Commission because of the potential threat to the health of people who live and work near certain glass manufacturing facilities based on DEQ air monitoring done in October, 2015. Public notice is not required for temporary rules because of the immediacy needed to prevent serious prejudice. Given the import of these proposed rules, however, DEQ and the EQC have provided a limited opportunity for public review and comment. The temporary rules, if adopted, would expire in 180 day. Should DEQ propose the rules for permanent adoption, as part of that process there will be a public notice and comment period.*

DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process.

Comment: Please pass rules to stop glass manufacturers from using arsenic, cadmium, trivalent chromium, hexavalent chromium, nickel, and other potentially toxic metals because of health effects. Require pollution control equipment for these furnaces. Do not put businesses interests over health.

Please pass rules to require pollution control equipment at glass manufacturers to protect public health and allow glass manufacturers to thrive as local employees.

Please do not pass rules that would put an unnecessary burden on small industry when larger businesses and mobile sources are not controlled. The recent OHA studies found that there was

no increased cancer risk in SE Portland, that it is unlikely that the level of metals detected in the air would cause any immediate health problems for people and current data shows long-term health risks are relatively low. Further, DEQ found no health concerns due to cadmium, arsenic, total chromium or hexavalent chromium in the soil around Bullseye's factory, the levels of which were generally below naturally occurring or background levels. DEQ's and OHA's own statements provide that the rule is not needed to prevent serious prejudice to the public interest.

Response: *The proposed rules are intended to control and reduce emissions from the use of the metals at issue to levels that are protective of public health. In this case, the rules address the following metals: arsenic, cadmium, chromium, lead, manganese and nickel. However, the October 2015 ambient monitoring in southeast Portland indicates that levels of lead and manganese are below levels of concern, so the proposed rule more stringently targets chromium III (as a potential precursor for chromium VI), chromium VI, cadmium, nickel and arsenic.*

The original proposed rules required all CAGMs subject to the rules to install emission control devices on glass-making furnaces that use arsenic, cadmium, chromium and nickel. The original proposed rules also prohibited using arsenic, cadmium and chromium VI in uncontrolled glass-making furnaces. The revised rules establish two categories of CAGMs: the larger CAGMs are referred to as Tier 2 CAGMs and the smaller CAGMs as Tier 1 CAGMs. DEQ has revised the proposed rules to require the larger Tier 2 CAGMs to install emission control devices on all glass-making furnaces that use arsenic, cadmium, chromium, lead, manganese or nickel. The proposed rules also prohibit the Tier 2 CAGMs from using arsenic, cadmium and chromium VI in uncontrolled furnaces. The smaller Tier 1 CAGMs must also install emission control devices on all glass-making furnaces that use arsenic, cadmium, chromium, lead, manganese or nickel unless they can show that they meet an exemption in the proposed rule. The Tier 1 CAGMs are also prohibited from using chromium VI in uncontrolled furnaces. To meet the exemption, the Tier 1 CAGMs must perform emission testing and dispersion modeling if source testing shows emissions concentrations over the acceptable source impact levels.

The data that DEQ collected from air monitoring in October 2015 showed elevated levels of arsenic and cadmium in the air surrounding Bullseye when compared to interim and chronic health exposure levels. The ambient air data (<http://saferair.oregon.gov/Pages/What-We-Know.aspx#air>) that DEQ has gathered since Bullseye has stopped using cadmium, chromium and arsenic show significant decreases in metals concentrations, indicating that emissions from Bullseye contributed to the high levels measured in October.

Under the conditions in glass production furnaces, some percentage of chromium III may convert to chromium VI. DEQ has found no scientific evidence that quantifies the conversion. Until that percentage of conversion is measured by a stack test, DEQ is prohibiting use of chromium compounds (both III and VI) in uncontrolled glass-making furnaces at Tier 2 CAGMs. Once that conversion is measured, DEQ has defined, in the rule, the steps Tier 2 CAGMs must take to ensure that glass-making furnace emissions are below protective health levels.

Tier 1 CAGMs are prohibited from using chromium VI compounds in their furnaces until emission control devices are installed or source testing is performed and demonstrates that emissions are below protective health levels.

DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types.

Comment: DEQ must make any signed agreements and other necessary documents available to the public before adopting the temporary rule. The public cannot evaluate the necessity of the temporary rule without understanding the terms, as well as the enforceability of those terms, of any private agreements the DEQ has reached or will reach with CAGMs.

Response: *DEQ has posted the agreement it has reached with Uroboros along with a question and answer document on the [Safer Air Oregon](#) website. Even though DEQ has entered into the agreement with Uroboros and continues to negotiate an agreement with Bullseye, these temporary rules provide DEQ with the necessary and appropriate regulatory authority to regulate and enforce regulations against any CAGM in the Portland Air Quality Maintenance Area that may be using the metals at issue..*

Comment: Adopt a program that controls all air toxics statewide from large and small businesses, new and existing businesses, not just for colored art glass manufacturers in the Portland area. Look at CA and WA programs, including barring diesel engines.

Response: *DEQ has begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process. DEQ is currently reviewing risk-based air toxics programs from California, Washington, and other states to help inform new risk-based regulation in Oregon.*

Comment: Neither DEQ or EPA have required any other US producer, of green glass to entirely stop their production without notice and perform the kind of extensive testing and modeling that DEQ is asking for. A bottle producer with emission controls would melt more chromium III each day than Bullseye uses in a year. What are we doing to halt the production by other manufacturers of glass or metals who emit chromium III?

Response: *EPA continues to work closely with Oregon officials to gather and assess information about art glass manufacturing facilities in Portland. This includes working to understand the emissions and what risks they pose to the public, if any. As a precaution, EPA has asked its 10 regional offices to gather information on similar art glass manufacturing plants across the country. Current information indicates that there are fewer than 20 other similar facilities nationwide that manufacture art glass and that may use raw materials in their processes. This information will inform EPA's actions to ensure compliance with existing regulations, determine whether any updates to rules are needed, and ensure these plants operate in an environmentally safe manner.*

Emissions of chromium III are not the primary concern. The concern is about the use of chromium III under conditions that may be conducive to conversion and subsequent emission as chromium VI. Large scale bottle manufacturers are already subject to regulations that require control devices and reductions of emissions through technology based standards. This proposed rule is applicable to a different industry with different emissions and impacts. The proposed rule has been drafted to be effective at reducing impacts from other metals, in addition to chromium,

that come from CAGMs. Additional health risk impacts from large bottle manufacturers may also be addressed as part of the permanent rulemaking mentioned in other comment responses.

Comment: DEQ has an adequate, agreed upon approach to address those concerns without this temporary rule. The Source Category rules in OAR 340-246-0110 were developed specifically for this situation. Alternatively, the air toxics safety net program could also address these individual source concerns.

Response: *The Safety Net Program applies only in areas that are not subject to a Geographic approach (OAR 340-246-0190 (1)). The Portland AQMA is considered a Geographic Area so the Safety Net rules do not apply. Even if the Safety Net program were to apply, given the data collected and the risks to public health, DEQ would still meet the justification for a temporary rule (discussed further in response to other comments). The Safety Net program provides a tool; it does not prescribe the only method the agency must use to address risk.*

The Source Category rules are, similarly, a viable method for addressing this kind of regulatory need. However, given the importance of moving quickly to provide the necessary authority to compel reductions in emissions from CAGM's, informed in part by the ambient monitoring data and the lack of established emissions factors for the addressed metals, DEQ is proposing to use the temporary rule process to establish that authority. The Source Category rules establish necessary regulatory authority to address air toxics for industrial sources, but they do not address specific regulation of specific sources or pollutants as is needed in this case.

Comment: I encourage you to enact regulations that are extremely human health risk-averse. Your decision framework should solely be focused on mitigating toxicity in our air so that there's zero risk to human health. And I don't really care if that means that manufacturing facilities can't operate within the city. I don't care if it means that our economy will suffer, or that the DEQ will have to fight lawsuits from industry. The only duty DEQ has is to ensure we breathe clean air.

Response: *The concentrations of pollutants in the rule have been developed in coordination with the Oregon Health Authority and are considered protective of public health. Risks to people from air toxics also come from a large number and type of sources. The biggest sources of risk from air toxics in the majority of the Portland Metro area are vehicles, diesel truck traffic and residential wood burning. This rulemaking is focused on reducing risks from a specific type of industrial source and for specific types of air toxics.*

DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process.

Comment: I will urge each of you to remember the original mission statement of the Oregon DEQ as you read through hundreds of comments submitted from those who do not live in our great state. There have been sponsored Facebook ads by Bullseye promoting comments on this ruling. For every comment you receive from a concerned citizen advocating for these rules and/or expanding upon them, there are more likely hundreds of others that will not be able to share their voice.

DEQ's mission is to be a leader in restoring, maintaining and enhancing the quality of Oregon's

air, land and water. DEQ works collaboratively with Oregonians for a healthy, sustainable environment.

Please remember that this issue is first and foremost about Oregon and Oregonians and take great care not to be swayed by those who do not live here, have to breathe our air and who are so quick to dismiss our very real concerns for our families and homes as hysteria.

Response: *DEQ has reviewed all the comments provided on the proposed temporary rules. DEQ takes all comments it receives seriously and is open to all sources of information that help inform effective and protective regulations. DEQ evaluates comments based on their individual merit, not on how many people made the comment.*

Comment: DEQ has become an agency that caters to industry and allows for industry to help write the rules. The public does not have a say nor are they notified of the rulemaking process.

Response: *Temporary rules are used only when DEQ determines that failure to act promptly would result in serious prejudice to the public interest or the interests of the parties concerned. Public notice is not required for temporary rules but was granted by the Environmental Quality Commission in this instance. The public comment received is being considered in proposing the temporary rules to the Environmental Quality Commission.*

TIMING

Comment: Are glassmakers getting the summer off since no permits would be required until Sept 2016? The requirement should be effective immediately, with a 30-day or similar grace period.

The rules need to be phased in, allowing time to implement changes, especially considering that there is no proposed short-term harm from the current levels of exposures. As a policy is developed, tiered requirements should be proposed, based on the level of risk of exposure.

Response: *DEQ has proposed a tiered approach in the revised temporary rule. CAGMs have been broken into two categories or tiers with different requirements for the smaller CAGMs. The smaller Tier 1 CAGMs must either install emission control devices, or demonstrate that they are exempt from the requirement to install emission control devices, by October 1, 2016. The rules prohibit the use of arsenic, cadmium and chromium VI for the larger Tier 2 CAGM's, including Bullseye and Uroboros, in uncontrolled furnaces. The rules also require Tier 2 sources to install emissions control devices, no later than September 1, 2016, on all furnaces in which arsenic, cadmium, chromium, lead, manganese and nickel are used. Between proposed adoption of the rule and when the emissions control devices are required, Tier 2 CAGM's may use lead, manganese and nickel in their furnaces; ambient air monitoring from the area around Bullseye has not shown levels of these pollutants above health based benchmarks during times when the company was using them in their furnaces.*

The September 1, 2016 date was chosen for the larger Tier 2 CAGMs to allow a short but reasonable amount of time to contract for, design, construct and install emission control devices.

The October 1, 2016 date was chosen to give the smaller Tier 1 CAGMs extra time because DEQ has not been working with them as long as with the Tier 2 CAGMs, and because DEQ expects emissions from Tier 1 CAGMs to be lower and represent a smaller potential health risk.

Comment: The proposed temporary rules as written create a new loophole by terminating before a company is required to apply for a permit.

Response: *If the Environmental Quality Commission chooses to adopt the rule on April 21, 2016 the rules would expire on October 18, 2016. Affected CAGMs will need to apply for a permit, if not otherwise required to have a permit, on or before September 1, 2016, prior to expiration of the temporary rule. Additionally, should DEQ determine that the rules should be made permanent, DEQ can propose adoption of permanent rules to the Commission before the expiration date of the temporary rules.*

Comment: The rules proposed will mean that the two facilities in question will only be able to remain in operation after September 1, 2016 if suitable protective measures for their furnaces can be approved by the DEQ and installed timely by the companies. If the two facilities are forced to close, the specialized jobs of their employees will be lost and thousands of artists across the country and around the world will be deprived of material on which their art and livelihood are based.

Response: *DEQ is confident that the deadlines in the proposed rules are achievable by all affected facilities. DEQ is also committed to work with all affected companies to issue necessary emission control device approvals and test plan approvals as quickly as possible.*

METALS

Comment: Regulate the amount of metals used or released into the environment, not the amount of glass produced. Provide language that allows the addition of new metals/toxic material in the future. Require glass companies to report the material they use in their glass annually and make it public.

Response: *The amount of glass produced is used as a production based proxy to require reductions in metals used. CAGMs follow established recipes which require a balance of materials, including metals, to create a product that meets color and other specifications. DEQ has added language to the rule requiring Tier 2 CAGMs to provide types and amounts of all metals used to DEQ until they have completed installation of the required emission control devices. All records submitted to DEQ are public records. Because Tier 1 CAGMs are not restricted on the use of metals like Tier 2 CAGMs, the recordkeeping requirements for metals usage would be implemented through the permitting process as a mechanism to demonstrate compliance with production limitations. The rule is also narrowly scoped to address identified problems around the metals identified (discussed more in other comment responses). Creating a system that assesses the risk from new materials introduced into the process would be more appropriately addressed as part of the risk-based air toxics program DEQ has committed to developing.*

Comment: How were the heavy metals included in the language chosen? Why, specifically,

were other heavy metals like nickel excluded? Please add beryllium, cobalt, lead, manganese, nickel, and selenium.

Response: *DEQ selected the original set of target metals in the rule based primarily on the data DEQ collected as part of the ambient air sampling in SE Portland in October, 2015. That data indicated that only arsenic and cadmium were present at levels that clearly raised concerns. Chromium VI was included based on the potential for risk in the absence of directly monitored levels. The measured amount of total chromium in the air did not differentiate between chromium III, a relatively non-toxic type of chromium, and chromium VI, a highly toxic form of the metal. Given the potential for chromium VI formation in the combustion conditions of a glass furnace, and in the absence of any available testing or scientifically validated direct measurement of the potential formations and emissions, DEQ included chromium compounds in the rule.*

In reviewing the available information further and in response to comments, DEQ has broadened the applicability of the proposed rules to include additional requirements for lead, manganese and nickel.

Comment: The rules are inconsistent when identifying which material is toxic. In one place they mention that the EPA lists 188 HAPs and then the rules only talk about 3 metals but not nickel.

In 2006 the air toxics program identified and set ambient benchmark concentrations for 52 pollutants. The emergency rule should address emissions of all of these 52 pollutants, with a primary focus and goal to eliminate the hot spots identified by the moss study results of 2015. The ambient benchmark concentrations established by the 2006 program should be referenced and followed with respect to levels of allowable emissions from facilities using HAPs. DEQ should consider regulating all HAPs in the temporary rule.

Response: *This temporary rule has a narrow focus to address a single area of concern where monitoring near CAGMs measured elevated levels of specific metals relative to Oregon's benchmarks. DEQ has expanded applicability of the proposed rules to include nickel. The ambient air benchmarks established in 2006 are clean air goals intended to be used in guiding long term DEQ efforts, informing resource allocation and providing a baseline dataset that can be used with area wide assessments to identify drivers of air toxics risk. DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process.*

Comment: The proposed rule allows a facility the ability to use chromium III in an uncontrolled furnace only after stack testing for chromium III and chromium VI to verify that the concentration of chromium VI in stack emissions is below 1.6 ng/m³. However the same rule imposes a blanket restriction of cadmium, arsenic, nickel in an uncontrolled furnace. The proposed rule should allow CAGM facilities to stack test for all metals in order to determine their metal-specific emission factors, from which impacts can be calculated using modeling and compared to Oregon's ambient benchmark concentrations. We further request that any rule use the ambient benchmark concentrations as criteria for determining potential risk to the public before making the facilities subject to the control aspects of the rule.

The approach requested above is consistent with DEQ's existing Air Toxics Program methodology. The result will allow facility-specific emission factors to quickly set facility-specific metal usage limits that are protective of public health and allow the facility to continue to operate while they design and implement control devices, if needed.

Response: *The prohibitions on use of arsenic and cadmium in uncontrolled furnaces are based on the October 2015 ambient air monitoring data from SE Portland, which indicated elevated levels of these metals. Therefore, DEQ is proposing to prohibit the use of these metals in uncontrolled furnaces at Tier 2 CAGMs.*

Chromium VI is treated differently in the rule based on uncertainty and lack of data about the possible conversion of chromium III in the furnace combustion chamber to chromium VI, and the very significant difference of impact on human health between those two forms of chromium. Chromium III is a fairly inert and non-toxic compound while chromium VI is highly toxic to humans. Conversion of chromium III to chromium VI is possible, but DEQ does not have scientifically valid information to either prove or disprove this conversion at the CAGMs, or to quantify how much conversion may occur. Therefore, DEQ has taken the protective approach of prohibiting use of chromium III in uncontrolled furnaces at Tier 2 CAGMs until source testing is done to quantify how much chromium VI is actually emitted when chromium III is used and appropriate chromium III usage limits are established.

Tier 1 CAGMs are prohibited from using chromium VI in uncontrolled furnaces but are not prohibited from using chromium III. The largest Tier 1 CAGM produces approximately 1/40th as much glass as the largest Tier 2 CAGM. In addition, the Tier 1 CAGMs use electrically heated furnaces which reduces the likelihood of conversion of chromium III to chromium VI because there is no flame present. Although the furnace temperatures are approximately the same in an electrically heated or fuel heated furnace, in a fuel heated furnace the chromium III is potentially exposed directly to a flame. The temperature within a flame is considerably higher than the overall furnace temperature; the higher flame temperature increases the likelihood of conversion from chromium III to chromium VI. With no flame present in an electric furnace, the maximum temperature that chromium III may be exposed to is lower.

Comment: The proposed rules should give DEQ emergency authority to act prior to consulting with OHA to limit CAGM's use of metals of concern.

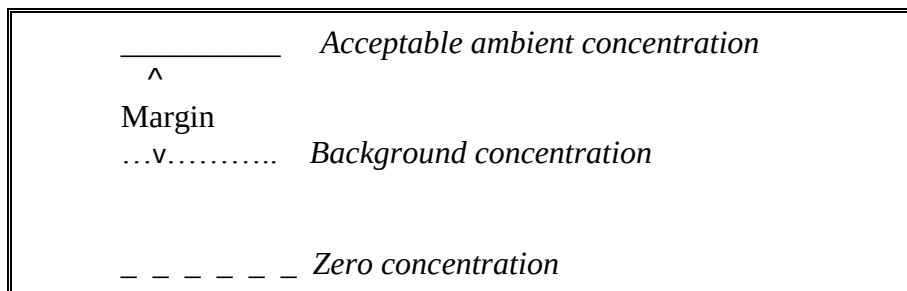
Response: *DEQ consulted with OHA to set protective ambient concentrations for the temporary rules. OHA was very responsive and DEQ does not anticipate that such consultations will cause any delays. DEQ is an environmental regulatory agency, not a health agency so consulting with OHA is critical to establish protective concentrations. DEQ will partner with OHA in the rulemaking process for a statewide risk-based air toxics program that will cover many industry types.*

Comment: These rules do not reflect a health-based approach to regulating emissions from colored glass making facilities. The rules require the implementation of emissions controls which is a technology-based approach and not a health-based approach. While perhaps a technology-based approach to regulation is acceptable in these temporary rules, DEQ has already committed itself to taking a health-based approach in the permanent rules.

The proposed rules also allow for the emissions of chromium VI from an uncontrolled furnace based on whether those emissions would cause ambient concentrations of chromium VI to exceed 1.6 ng/m^3 at receptors that DEQ specifies. This number is also not reflective of human health risks and is 20 times greater than the existing ambient benchmark concentration for chromium VI in DEQ's air toxics regulations. The temporary rules should set a pattern of using at least the Oregon benchmarks as the basis for standards.

Response: *DEQ has begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process. The approach proposed in the temporary rule is a combination of risk and technology based approaches. It requires the installation of an emission control device to reduce the rate at which CAGMs emit metals, which is a technology-based requirement. It also incorporates elements of a risk-based program by establishing health based acceptable source impact levels as explained below. The proposed rules also contain elements of a risk-based program in allowing Tier 1 CAGMs to demonstrate that their emissions of metals are not above the acceptable levels. DEQ consulted with OHA on the levels in order to ensure they are protective of public health.*

DEQ has reconsidered the approach to chromium VI in the original proposed rules, and also considered the approach to other metals when proposing the exemption option for the Tier 1 CAGMs. Ambient concentrations of a metal result from many possible sources, some natural such as rock and soil erosion, and some anthropogenic. All of these possible sources create the ambient concentration of the metal, which is (generally) considered the "background" concentration. The emissions from a single facility are considered to add to this background. Hopefully, though not always, the background concentration is below the concentration that is considered acceptable. The difference between the background concentration and the acceptable ambient concentration then provides a margin for the increased concentration that may result from a facility's emissions. This concept is illustrated below:



Acceptable ambient concentrations are a human-health risk-based concentration of pollutants in the air; they are used as a protective goal that ideally should not be exceeded. When background concentrations are below the acceptable level it does not make sense to use the entire remaining margin as the total allowable impact. Instead, to be protective, a fraction of the margin is used;

this fraction establishes the acceptable source impact level.

When background concentrations are above the acceptable ambient concentration it means that there are likely other sources of the emissions, and even if emissions from the source in question were completely eliminated, the ambient concentration would still exceed the acceptable level. In this situation, a single source should not be prevented from operating while other sources are allowed to continue. Instead, emissions from all sources affecting the area should be assessed and reduced, if possible, to minimize the total impact, and the contribution from the source in question should be held down to an acceptable level, which may be the same as the acceptable source impact level discussed in the preceding paragraph.

DEQ has determined that the proposed acceptable source impact levels address the current situation with the CAGMs, and do not represent a recommendation to use the same approach for the statewide risk-based rules.

Ambient Benchmark Concentrations (ABCs) are not mandatory maximum allowed ambient concentrations; rather, they are goals to be used for program planning purposes. The ABCs are based on one in a million additional cancer risk for carcinogens and a non-cancer hazard quotient of one. DEQ cannot predict whether the same levels will be recommended for the statewide risk-based rules, and other regulatory programs around the nation use other levels ranging from one in ten thousand to one in ten million for cancer risk.

DEQ proposes to establish both annual and daily (24-hour) acceptable source impact levels.

DEQ proposes to use the ABCs, which are annual average values, as the annual acceptable source impact levels for the metals addressed in the proposed rules, except lead. Lead is a unique case because the ABC is also the National Ambient Air Quality Standard. A National Ambient Air Quality Standard is a level that is not to be exceeded, so it is not appropriate to use this as the acceptable source impact level. DEQ therefore proposes to use 1/10th of the ABC, or 15 ng/m³, as the acceptable source impact level. As with the other acceptable source impact levels, this does not represent a recommendation to use this approach in the statewide risk-based rules.

DEQ proposes to use the Oregon 24-Hour Screening level for chromium VI as the daily acceptable source impact levels for chromium VI in the proposed rules. Toxicologists at OHA and DEQ selected the Oregon 24-Hour Screening levels, developed by other municipalities, because they are designed to be compared against 24-hour samples. They are also based on health endpoints other than cancer, which is important because there is too much uncertainty about the impact of a 24-hour exposure to cancer risk over the course of a lifetime. To establish this list, OHA and DEQ toxicologists chose the lowest from among: 24-hour Ambient Air Limit from New Hampshire's Code of Administrative Rules, Ontario's Ministry of the Environment 24-hour Ambient Air Quality Criteria (AAQC), short-term Environmental Screening Level (ESL) developed by the Texas Commission of Environmental Quality, or the Agency for Toxic Substances and Disease Registry's (ATSDR) Acute Minimal Risk Level (MRL). As with the other acceptable source impact levels, this does not represent a recommendation to use this approach in the statewide risk-based rules. For the purpose of the proposed rules, only the chromium VI of

36 ng/m3 Oregon 24-hour Screening level is used.

Finally, with respect to the smaller Tier 1 CAGMs, DEQ has proposed an exemption from the requirement to install emission control devices if they can demonstrate that their emissions will not cause an ambient impact greater than the proposed annual acceptable source impact levels. The dispersion modeling relies on screening models that give a worst-case result. If the worst case result is below the annual acceptable source impact level, then daily ambient impacts will also be below the annual acceptable source impact level.

Comment: DEQ has admitted it did not know enough about the glass making process to conclude that chromium III is converted to chromium VI in the processes that Bullseye Glass uses saying only that in some oxidizing reactions, the conversion can occur. If that reaction were to occur in the glass making process, the glass would be ruined – it would not get the desired color that only chromium III gives, so Bullseye takes care that that reaction does not occur. An independent professor of glass science, Dr. William LaCourse of Alfred University concurs that chromium III does not get converted into chromium VI in colored glass manufacturing.

Even when directly asked by the panel to address the letter by Dr. LaCourse, the DEQ side-stepped the issue. Ignoring the hard evidence, DEQ proposed to halt use of safe chromium III until it could run its own tests, which could take more than the 180-day temporary ruling and a potential permanent ruling until they could complete their tests.

Two days after the March 15 meeting, DEQ stated that levels of toxic metals were much lower than the October tests and that this decrease was attributed entirely to Bullseye voluntarily not using certain metal additives. Urine tests did not indicate immediate health problems. With so much disparate data, ignoring of the science that the chromium III to chromium VI conversion is not part of the colored glassmaking processes, the willingness of Bullseye Glass to take steps to work with the DEQ to monitor and mitigate any problems, the potential crippling of an entire industry created in Portland and of worldwide reputation, the potential layoffs of many good workers in the glass making industry, and the harm to hundreds of local glass artisans and thousands around the world...doesn't it make sense to work with Bullseye and other glass companies to minimize any possible impact while still keeping the industry viable rather than sacrificing the glass industry as a political scapegoat.

Response: *DEQ is not concerned or focused on the chromium compounds that remain in the glass. The proposed rules regulate the chromium that is emitted from the glass making process and so, naturally, does not remain in the glass. The ambient monitoring data and consideration of the temperature and air flow environment within a glass furnace's combustion zone supports the conclusion that there are chromium emissions from the process. Of chromium that is emitted there is no available information or emissions data that quantifies the amount of chromium emissions that are emitted in the form of chromium VI. DEQ's proposal includes requirements to test for and provide that information.*

At the meeting the DEQ stated that they "ran their initial air quality tests in October so that they could get the highest readings". Why October was never explained.

Response: *As explained on DEQ's website about the ambient monitoring project, October was selected based on historic monitoring data from other areas that showed relatively higher levels of cadmium in the ambient air in October as compared to other months. Additionally the weather in October is often (and was for 2015) relatively cold and stagnant, conditions which reduce the possibility of immediate dispersion and dilution.*

The DEQ said they had no comparison of results after Bullseye stopped using certain metals.

Response: *This was true at the time of the meeting. Since then DEQ has released data and continues to do so on a weekly basis. The data is available on <http://saferair.oregon.gov>. The data, collected from times when Bullseye had stopped using cadmium, chromium and arsenic compounds shows significantly lower concentrations of those same pollutants when compared to the October 2015 data.*

Newspaper articles stated there was no correlation between elevated cadmium levels near Uroboros and the use of cadmium by Uroboros in their glass making. The DEQ did not compare air test results to metal additive usage by Bullseye Glass.

Response: *In some media coverage media outlets excerpted part of DEQ's 2011 follow up to monitoring that was done in North Portland as part of the PATs process. The assessment done at the time was looking at much lower levels of cadmium monitored in the air and was assessed in the absence of the moss data provided by the United States Forest Service (USFS). The moss data, which showed a more refined picture of potential dispersion, and potential attribution, informed where DEQ placed the monitor for October 2015 sampling.*

DEQ acknowledges that there was no October 2015 ambient monitoring in the vicinity of Uroboros and that there is no data at this time to conclusively show that emissions from Uroboros result in unacceptable ambient concentrations of metals. In the proposed temporary rule, Uroboros would be regulated as a Tier 2 CAGM because Uroboros is more similar to Bullseye than it is to the Tier 1 CAGMs.

A citizen spoke about the north Portland arsenic hotspot near Uroboros. A newspaper article said this hot spot forced one family to move. Uroboros has stated that they don't use arsenic. No reason was given for this arsenic hot spot. Perhaps the colored glassmaking industry is not the culprit.

Response: *In the arsenic maps DEQ has seen and reviewed there is no arsenic hotspot surrounding the Uroboros facility.*

At the time of the March 15 meeting, results from moss samples, soil samples, and air samples differed greatly on the levels of metals. Clearly more testing must be done before making conclusions.

Response: *DEQ agrees in part with this comment and has continued to collect additional data to assess the condition of the environment in the areas surrounding Bullseye and Uroboros and to assess the potential impact of glass manufacturing on the concentrations of metal in the air.*

The temporary rule also includes requirements for sources to perform testing of their stacks for emissions levels. This will further DEQ and public understanding of CAGM emissions. The level of data and information currently available are sufficient to support taking action to propose these rules.

The DEQ did not distinguish between benign chromium III and toxic chromium VI in their samples.

Response: *For the October data DEQ agrees that this is accurate. For subsequently collected data DEQ has sampled for both chromium III and chromium VI. Additionally the testing required in the rule is focused on chromium VI, the compound that is of greater concern for public health.*

The DEQ also stated in Portland there were elevated levels of benzene and other toxic materials. Some they attributed to wood stoves; problems too big to deal with so they focused on the colored glass industry.

Response: *DEQ has continued efforts that promote the reduction of air toxics from woodstoves and other wood combustion, as well as efforts to reduce diesel emissions, another source of air toxics that impacts public health. These efforts are not exclusive of DEQ's efforts to address industrial sources of air toxics, in this case, CAGM's.*

Bullseye Glass Company is working hard to be a responsible community member while manufacturing a world class product. Please work with them to verify that their emissions are not harming the community.

Response: *The rules, in addition to the agreement DEQ is negotiating with Bullseye, will help provide certainty about regulatory requirements and will collect data that DEQ and the public need to understand impacts.*

Comment: Representatives of Bullseye Glass and Professor William C. LaCourse of Alfred University claim that the use of chromium III should not be restricted to controlled furnaces because when chromium III is melted in reductive conditions, the probability that chromium III will convert to chromium VI is minimized. This ignores what might be happening in the exhaust flue, especially near the top, where chromium III can combine with oxygen under conditions which are still relatively hot and the result is that chromium VI will be released into the atmosphere outside the glass factory. There is at least one study documenting the conversion of chromium III to chromium VI at temperatures as low as 200C to 300C, temperatures that are very possible inside the exhaust flue of a furnace operating at 1300C (<http://www.ncbi.nlm.nih.gov/pubmed/16297546>). Permitting the use of chromium III in uncontrolled furnaces does not account for potential atmospheric and soil conversion. Chromium III and chromium VI should never be used in an uncontrolled furnace. Also why is Bullseye being restricted when they are not the only glass manufacturer?

Response: *DEQ has not received any quantitative information from Bullseye or Dr. William LaCourse that proves the claim that chromium III does not convert to chromium VI in glass-*

making furnace combustion zones. DEQ is requiring CAGMs to test their stack(s) to scientifically prove whether this conversion occurs and to what extent. Requiring sources to test the emissions from equipment is standard procedure for DEQ, even for pollutants that are not air toxics. Bullseye is not the only glass manufacturer that may be affected by the proposed temporary rules. The proposed rules apply to any CAGM that meets the applicability section of the proposed rules.

Comment: In order to limit other metals, a number of conditions would have to be met, all at the same time. First, DEQ would have to find that the emission posed an unacceptable risk to human health. Second, the emission must be from an uncontrolled furnace. Third, it must be a contributing factor to that risk. These conditions are roadblocks to limiting the emissions, and there are even more roadblocks; DEQ must consult with OHA, another agency which is no longer trusted; and it can only limit the emissions by agreement or permit. These rules are so convoluted that they have no meaning or effect and must be rejected.

Response: *The rules do include a number of steps that ensure the thorough and proper assessment of other potential metals of concern. These procedures are in place to support a process that is driven by data and informed by quality toxicological work. DEQ uses permits to implement regulations that apply to companies; this provides a mechanism to make sure the regulations are applied as appropriate to an individual operation (not all aspects of every rule apply to every company) and provides DEQ with a more usable and helpful tool in compelling compliance in the case of violations. The rules also require the reduction of emissions through the use of control devices, or the demonstration that emissions are below health impact levels. Rules that have multiple parts or requirements can still be effective at reducing emissions and protecting public health.*

Comment: DEQ could enter into interim agreements with glass manufacturers until final regulations are adopted. Bullseye is willing to enter into such an agreement. It will commit to restrict its weekly usage of chromium III. If DEQ's ongoing monitoring detects chromium VI, Bullseye will agree to stop using or further reduce chromium III use, even though other sources of chromium VI are in the immediate area. Bullseye is also willing to only use raw materials containing chromium III in controlled furnaces until testing demonstrates chromium III does not convert.

Response: *DEQ supports putting voluntary agreements in place and they can be an effective tool. However, DEQ and Bullseye have not yet entered into an agreement and Bullseye is not the only CAGM that would be regulated by these rules. DEQ is proposing temporary rules to cover all CAGMs that may emit metals at levels that should be regulated to ensure protection of public health.*

Comment: The proposed rules require that glass companies test under the "most oxidizing combustion conditions," which are undefined. The "most oxidizing combustion conditions" are not normal operating conditions for Bullseye. 40 CFR Part 63 Subpart SSSSSS, which applies to continuous glass manufacturing operations, requires sources to "conduct the performance test while the furnace is producing glass that has the greatest potential to emit the glass manufacturing metal HAP from among the glass formulations that are used in any of the identical furnaces."

Response: *The testing conditions outlined by the commenter from 40 CFR Part 63 Subpart SSSSSS are designed to create conditions for the worst case emissions of a targeted metal HAP. DEQ's proposed rule requires the conditions for the worst case chromium VI emissions. DEQ anticipated that a glass with the maximum chromium III content might not be normally made under the most oxidizing conditions and that it might be necessary to strike a balance between maximum chromium III content and most oxidizing conditions. Therefore, DEQ included the language requiring "most oxidizing combustion conditions" to ensure that goal was met. In oxidizing combustion conditions, chromium compounds have a greater likelihood to convert into, or remain as, chromium VI emissions.*

Comment: Please consider all the following data when regulating chromium:

Chromium VI is the ninth most toxic chemical on a pound-for-pound basis on the EPA's list of 423 chemicals with inhalation toxicity weights. (EPA)

When assuming a linear dose-response relationship between exposure to chromium VI compounds and lung cancer, no safe level of chromium VI can be recommended. (World Health Organization)

NIOSH rules state that the first step to control chromium VI in the workplace is to eliminate its use. All chromium VI compounds are considered to be occupational carcinogens.

Chromium VI is a well-established carcinogen associated with lung, nasal, and sinus cancer. A hierarchy of controls, including elimination, substitution, engineering controls, administrative controls, and the use of personal protective equipment, should be followed to control workplace exposures.

Dermal exposure to Cr(VI) should also be prevented to reduce the risk of skin irritation, corrosion, ulcers, sensitization, and allergic contact dermatitis.(NIOSH)

The stability of chromium is very dependent on conditions like pH (related to other chemicals being present or not) and temperature. Chromium III can convert to chromium VI under certain conditions and chromium VI can reduce to chromium III.

Chromium VI is not a simple thing to monitor and requires special filters and careful attention to procedure. This EPA document describes the procedures which include special filter media and refrigeration of samples. The rules should reflect this.

Define acceptable levels of risk in alignment with known authoritative sources, such as the CDC's NIOSH list. The CDC includes formulas for calculating risks in great detail. The DEQ information releases have been further complicated by multiple statements made by OHA that soil and air are safe, almost all of which have proven incorrect and/or based upon faulty research. A common set of specifications is transparent and will eliminate some of the confusion.

Response: *For the proposed temporary rule, DEQ consulted with OHA to set protective ambient concentrations. The Ambient Benchmark Concentration for chromium VI is 0.08 ng/m³ on an average annual basis, meaning the average monitored concentration over a whole year should be used for comparison. When data is averaged over a whole year, very high and very low values are smoothed out. Annual average concentrations are typically modeled using an annual average emission rate, even though the actual emission rate might vary over hours of a day, days of a week, or seasonally. This approach gives a reasonably accurate annual concentration. The form of the National Ambient Air Quality Standards for Criteria Pollutants (carbon monoxide, nitrogen oxides, particulate matter, and sulfur dioxide) requires an annual average averaged*

over multiple years, usually three to allow for inter-year meteorological variability. A more accurate annual average concentration could be estimated by modeling the time varying emissions with the actual meteorology occurring during those emission episodes. For a small glass manufacturer who might produce more glass in the winter than in the summer, the annual average production, and associated annual average emissions, would be used in the model to estimate an annual average concentration.

The ambient concentrations monitored near Bullseye are daily concentrations, not average annual concentrations. Therefore, comparing the daily ambient concentration to an average annual concentration is like comparing apples to oranges. To establish a basis for a more accurate assessment of shorter term risks, DEQ, in consultation with OHA, originally chose 1.6 ng/m³ for chromium VI on a rolling two-week average. This value is 20 times the ABC for chromium VI. Based on further examination, DEQ is proposing to use the Oregon 24-Hour Screening Level for chromium VI selected by toxicologists at OHA and DEQ because the Oregon 24-Hour Screening Levels are designed to be compared against 24-hour samples but developed by other municipalities. The 24-hour screening levels are also based on health endpoints other than cancer, which is important because there is too much uncertainty about the impact of a 24-hour exposure to cancer risk over the course of a lifetime.

DEQ's authority, rules and programs regulate emissions and are informed by established environmental impact limits; DEQ does not regulate worker exposure. DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process.

PERMITTING

Comment: Require permits granted under the temporary rule to be renewed once more comprehensive permanent rules are established. The permanent rules should cover all hazardous air pollutants and these companies should not be grandfathered under more limited standards that are not health based.

Response: Most air quality permits are issued for 5 years. Simpler permits are issued for 10 years. DEQ will be evaluating air quality permits (including those for CAGMs) for potential modifications once the risk-based air toxics program rules are adopted using an implementation schedule.

Comment: The temporary rules should prohibit the emissions of heavy metals from the source category unless and until the source obtains a permit from DEQ authorizing those emissions. There should be no authorization to pollute granted to a facility by DEQ other than a permit that is subject to public notice and comment.

Response: The proposed rules prohibit the use of arsenic, cadmium and chromium VI in uncontrolled furnaces. This prohibition was included because the ambient concentrations of arsenic and cadmium from the October 2015 monitoring were at levels that are considered unacceptably high. The prohibition on the use of chromium VI in uncontrolled furnaces was included to be protective in light of the absence of reliable data on chromium VI emissions from

CAGMs. There are no prohibitions on the use of lead, manganese and nickel because the ambient levels of these metals in the October 2015 data were either well below or only slightly above the ABCs. The proposed temporary rules would require all CAGMs to apply for a permit by September 1, 2016.

Comment: Lower the amount of emissions requiring installation of a baghouse from 10 tons per year to one ton per year.

The threshold for being covered by these rules should be lowered from facilities using more than 10 tons of raw materials per year, not including recycled glass or cullet. It is unlikely that a hobby glass maker would process even a single ton of material in a year. Recycled cullet should be considered a raw material to avoid creating an artificial distinction between facilities using recycled glass and those starting from raw materials.

Response: *The proposed threshold in the rules is 10 tons per year of colored glass manufactured, not the amount of pollutants emitted. DEQ does not agree that recycled cullet should be considered a raw material but has changed the definition of cullet to clarify that certain glassified metals used as a coloring agent should be considered raw materials. Some CAGMs purchase and add metals as coloring agents that are bound in a glass state. These products contain significantly higher concentrations of metals than finished glass product and are used as an explicit replacement for other raw materials.*

Comment: If DEQ determines the ambient concentration of another metal poses an unacceptable risk to human health and that emissions from an uncontrolled furnace at the CAGM are a contributing factor, then DEQ must limit the CAGM's use of the metal of concern in uncontrolled furnaces. This rule does not provide for an immediate backstop should uncontrolled emissions prove to be an immediate health risk. This should be rewritten to prohibit the interim use of the metals of concern until the appropriate emission control technology is installed.

Response: *Based on the October 2015 ambient monitoring data from SE Portland and the health-protective levels that were determined by DEQ in consultation with OHA, the metals of concern are arsenic and cadmium. In addition to arsenic and cadmium, chromium is considered to be of concern because DEQ cannot discount the possibility that some unknown portion of chromium III may convert to chromium VI. Therefore, the temporary rules restrict a CAGM's ability to use these metals until emission control devices are installed or source testing and dispersion modeling shows that the ambient impacts are lower than protective levels. The ambient concentration of nickel was below the level that is considered protective but was above the Ambient Benchmark Concentration, so to be very protective, nickel usage limits were established in the agreement with Uroboros. The ambient concentrations of the other metals were below levels of concern and the Ambient Benchmark Concentrations. Should monitoring show concerning levels of other metals, DEQ will take appropriate action to ensure the public is protected.*

Comment: Include penalties for violators, strong enough to encourage businesses to install control devices (\$50,000 per violation) and require public notification if a violation should occur.

Response: *Oregon Revised Statutes provide DEQ authority to take enforcement actions,*

including assessment of civil penalties, in accordance with rules adopted by the EQC, against businesses or individuals that fail to comply with Oregon's environmental statutes and rules. Those rules are adopted as Oregon Administrative Rules (OAR) Chapter 340, Division 12, which prescribe DEQ's enforcement process and penalty calculation for specific violations. In the agreement signed with Uroboros, DEQ established penalties of \$1,600 for each day that Uroboros breaches a provision of the agreement and \$800 for each breach of maximum weekly usage levels, levels that are consistent with the penalty provisions of those rules.

DEQ has no legal requirements to provide public notice for violations or enforcement actions as it does for permitting and rulemaking. Generally, DEQ issues news releases for every penalty issued. All DEQ enforcement actions are public information and can be made available upon request.

Comment: Hire enough staff at DEQ to review all notices of Intent to Construct to prevent default approval within 10 days after receiving the Notice and provide public notification. Require all glass-making furnaces to be tested to insure all are operating within guidelines and alert the public in the surrounding area to the date of this test since the furnace will be uncontrolled at time of test. Have a DEQ staff member perform all tests, not company employees.

Provide expedited review, testing/analysis, and approval of the current glass factory situation to ensure that residents are reassured about the safety of the air and soil and glass factories are able to resume safe production as quickly as possible.

Response: *DEQ has currently assigned all colored glass-making facilities to permitting staff who will review all Notices of Intent to Construct before default approval occurs. The procedures for approving Notices of Intent to Construct do not require public notice because these construction projects are usually small and cannot increase emissions above permitted levels. Permit modifications/renewals that include the construction approvals provide an opportunity for public input.*

The proposed rules require all CAGMs which are required to install an emissions control device to test the emission control devices and show compliance with the proposed rules. Tier 1 CAGMs that elect to exempt out from the requirement to install a control device must test their exhaust stacks to show their metals emissions are below levels of concern. All source test plans must be submitted to DEQ for approval before the source testing takes place and DEQ also reviews all the results of the source test for accuracy. DEQ staff are designated to review the modeling results and to establish maximum chromium III usages. DEQ will post the results of the source testing at CAGMs subject to the proposed rule, if adopted, on Saferair.oregon.gov.

Comment: Citizens have a right to know what is going into their air as permits are under consideration. DEQ needs more detailed guidance regarding public notification and public hearings. Citizens and communities should have notification when DEQ learns air quality is compromised. For polluters, there needs to be consistent and regular fence monitoring.

Permit costs should take this additional cost of notification into account. It should be expensive to pollute so it makes more fiscal sense for a business to implement pollution control than to

pollute unabated.

Response: *DEQ is required to provide public notice for new, renewed and modified permits. DEQ does this through display ads in the local paper, hard copies of the proposed permits in the local library and a GovDelivery email for interested people who sign up for the notice. Requirements for public notification and public hearings are contain in OAR 340 Division 209 Public Participation (http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_209.html).*

Permitted facilities are required to report emissions annually and these reports are available to the public.

DEQ sets fees for permitted facilities through a separate rulemaking process which includes opportunity for public involvement. The fees are assessed on an annual basis for smaller sources. They are not based on the amount of emissions a company is responsible for. DEQ's air quality program is also partially funded though General Fund appropriations.

DEQ is currently continuing to monitor in the areas around Bullseye and Uroboros. DEQ does not have the resources to provide ambient monitoring at every regulated facility. DEQ's limited ambient monitoring capabilities must be deployed around the state for the benefit of all Oregonians and this requires DEQ to relocate ambient monitors from time to time.

MONITORING

Comment: At the EQC meeting, DEQ said that they didn't have resources to fund the air study themselves so they enlisted a professor from Reed College to have students do some monitoring which included borrowing equipment.

Did the professor have current knowledge of this particular equipment to be able to teach the students how to run it for the students' science project? Was the machine in good working order? Was the professor able to certify that this borrowed machine could be calibrated to make sure it was in working order? How did they assure that the machine was collecting reliable data?

Response: *All air monitoring equipment used at SE 22nd and Powell near Bullseye Glass in October 2015 belonged to DEQ. Before operating the air toxics monitor at this location, DEQ worked with a chemistry professor at Reed College on two projects to train her students on how to use the equipment. DEQ calibrated and audited the equipment. Reed students collected samples because DEQ staff were not available to come to the monitoring site frequently. DEQ trained Reed students to store the filters in a temperature logged refrigerator. The Reed students were paid by the college to collect and set up filters. DEQ then collected all the filters from the secure temperature logged refrigerator at Reed and sent them to Desert Research Institute for analysis. DEQ paid for this analysis.*

Comment: The monitoring equipment was placed in an open, unsecured parking lot adjacent to Bullseye Glass.

Response: *The air monitoring equipment was secured by a fence and lock. Security guards hired by Fred Meyer patrol the parking lot where the monitoring equipment was located.*

Comment: Was the equipment left unattended?

Response: *It is global standard practice to leave air monitoring equipment secured, but unattended. Staff tended to the equipment every third day to ensure it had not been tampered with and was protected by a locked fence.*

Comment: Could people walking by the lot interfere with the equipment or meddle with the machine?

Response: *It is unlikely that people would interfere with monitoring equipment. There was no evidence of tampering and no reports of any interference with the monitor by Fred Meyer security. Additionally, there was a fence around the monitor.*

Comment: Could the data be compromised?

Response: *There is no easy way to manipulate the air monitoring equipment to influence levels of metals on the particulate filters. Any tampering with the air inlet would likely cause collection of large particles and insects on the filter. The filters were visually inspected for large particles and insects, and none were found.*

Comment: When looking at chromium VI monitoring data: it is recommended that you use the maximum measured percentage of chromium VI rather than the highest average of the range observed across samples.

Response: *The risk from exposure to toxic air pollutants can be both short-term (acute) and long-term (chronic). Acute effects are effects that may result from a short duration but high concentration exposure. Daily, or other short-term monitoring, is the appropriate monitoring for acute risk. Chronic effects are effects that may result from long duration but low concentration exposure, and are often based on lifetime exposure. Long term average, such as annual average, is the appropriate monitoring for chronic risk.*

Comment: The rules do not specify how and where the ambient concentration limit of metals is to be measured. Is it an instantaneous measurement? Does the equipment need to gather a volume over time to compute an average? Are the averages broken into time buckets where the ambient measurement cannot exceed the limit? Is there a specific piece of equipment operated a certain way that determines the implementation of the limit? Are you referencing a published standard for measuring from another agency? It will be important to provide references used to set the ambient air concentration numbers, and explain them to all of the stakeholders.

Response: *DEQ is currently operating ambient monitoring equipment in areas around Bullseye Glass and Uroboros. The full sampling plans for both of these areas are available on the Safer Air Oregon website (<http://saferair.oregon.gov/Pages/What-We-Know.aspx#air>). These plans, and some of the supporting documents referenced in them, detail how DEQ is collecting and analyzing samples, the intended use of the data (and how the sampling will support that use) and references methodologies that are followed in different steps of the monitoring process (e.g. sample collection, sample analysis, data validation, etc.). Results from the monitoring efforts are also available on the website and are updated on a regular basis as validated data is available.*

Comment: The efforts of these industries will try to downplay the pollution by drawing attention away from the drastically high air/moss samples to those of soils samples. The soil samples that were taken in one of the wettest seasons of the year. They do not represent long term data, like the moss, but rather a moment in time. To truly ensure that the soil is not contaminated, more testing over longer periods of time must be done. OHA lifted the vegetable warning for the SE Portland area but questions linger.

Response: *DEQ will continue to evaluate the moss data to determine whether air monitoring is needed at certain sites. Because the industrial sources using metals that were found at high levels in the moss data and in the air monitoring emit these metals via stacks into the air, this temporary rulemaking seeks to restrict air emissions. When the source of those emissions stops or is reduced then the concentrations in the surrounding air reflect that reduction in a short period of time (on the order of hours or days, depending on the weather).*

The full correlation between concentrations of metals in moss and concentrations in the air is still not fully understood. The data and understanding that DEQ has so far is part of what informed our earlier monitoring efforts and our continued follow up. Data collected in moss samples represents only those contaminants absorbed over the lifetime of the moss tissue sampled. The concentrations of metals in moss will accumulate somewhere in the range of 10-20 months, a medium term period time. For more in depth information on the data and methodologies of using moss you can review the USFS work on their website (<http://www.fs.fed.us/pnw/research/2016/mar/index.shtml>).

The moisture content of the soil samples does not affect the results of the laboratory analyses. Soils accumulate contaminants over a long period of time and are a good indicator of a variety of impacts that may have occurred over time. The samples DEQ collected and analyzed were taken at various depths and are reflective of that cumulative impact of activities in the area. An example of the cumulative impacts is many soil samples taken near roadways still exhibit signatures from the historic use of leaded gas. Repetitive sampling of soils is unlikely to discover new information. Stopping a source of emissions will not result in a reduction in concentrations of pollutants in soil; it will simply stop the addition.

Comment: Direct DEQ in conjunction with the Forest Service to do another round of moss testing in Portland and a first round in various other Oregon cities.

Response: *In the initial moss sampling survey (early 2015), the Forest Service collected moss throughout Portland. The Forest Service has not yet released the moss data for areas outside the two areas where they identified high levels of metals around colored glass manufacturers. DEQ is working with the Forest Service to understand how DEQ can use moss sampling as a screening tool in future studies. DEQ received some funding to allow for this work in the future.*

Comment: My heavily amended organic soil revealed that although my soil is at DEQ background levels for lead, cadmium and arsenic, my plant tissue: chard, kale, parsley and borage, tested at toxic levels for cadmium and arsenic. For years we have eaten daily from this garden. I queried a plant pathologist about this: Dr. Robert Amundson, who worked through Cornell studying the effects of air pollution on soils. He surmises that very small heavy metal particulates could embed themselves in the waxy tissues of plants and may not wash off. DEQ

and OHA need to set up a standard protocol for soil collection of at least two cups of soil, collected in a zigzag pattern from at least ten different spots, at six inches or deeper throughout these hotspots along with at least two cups of leafy material from gardens from random plants.

It is outrageous that the DEQ and OHA still insist our air has been safe when moss samples show quite plainly this has not been true. Other plant tissue collected in these hotspots will likely reveal the same concern. I find it also astonishing that residents have still not been directly notified at their door or via mail that these hotspots exist.

Response: *DEQ's soil sampling plans were designed to provide a thorough evaluation and different depths of any potential impacts from the glass facility emissions to soils. Those sampling plans are available here: <http://saferair.oregon.gov/Pages/What-We-Know.aspx>. The website also contains information about how you can minimize your exposure to any contaminants that might be present in your garden soils and produce grown there.*

OHA, in coordination with DEQ, is basing health recommendations on the best available information and data and is continuing work to collect additional data and keep the public informed about the state of the air. DEQ has also worked with local partners to perform outreach through many avenues and has participated in numerous public meetings throughout affected areas.

Thank you for sharing your soil and vegetable testing results with us. If you would like help with the interpretation of these results or potential implications for related health-risks, please let us know how you would like to be contacted by staff with the Oregon Health Authority.

Comment: The same standards of real time air and soil monitoring along the Johnson Creek should be available to the public. The public has the right to know the volume of toxic air releases and the tonnages of heavy metals allowed by DEQ permit and the long term consequences of living nearby the most toxic polluter of Portland. The smelters throughout the area that work in conjunction with Precision Castparts need monitoring and no doubt contribute to the heavy metal toxic load that Portland suffers from. Please equip the DEQ monitoring station on SE Lafayette with toxics monitoring equipment.

Response: *Appropriate environmental standards and benchmarks will be used to evaluate data that will be obtained in and around the PCC Johnson Creek facility. Those values will be the same as values used to assess air and soil data around the two glass manufacturing sites that are undergoing monitoring now. Potential emissions data and monitoring reports can be made available for public review if requested, and the PCC permit is viewable online (<http://www.deq.state.or.us/aq/permit/alphalist.htm>). DEQ is placing toxics monitors around the PCC facility to evaluate its current emissions. Additional air toxics sampling locations are being reviewed state wide for inclusion into an updated air monitoring strategy.*

Comment: I don't quite understand the path you are taking with the glass factories, if you found 5 sites that contained high levels and only two are near glass factories, what is near the other 3 and why are we not notified what is near those spots that are responsible for those areas. Why are we just ruling out glass factories?

Response:

While the moss data indicates five areas where the ambient air concentrations may be of concern, DEQ has so far only been able to monitor near Bullseye and Uroboros. The monitoring near Bullseye in October 2015 confirmed that ambient concentrations of metals were elevated, and DEQ took action to address the concerns raised by these elevated concentrations. DEQ will be evaluating other areas from the moss study and using data to determine whether monitoring is needed in those areas. If and when concerns at other locations are confirmed, DEQ expects to take the necessary actions to address those concerns.

Comment: I would support a third party of experts to set out a program for confirming if there is a problem from wherever it is coming from and how to fix it.

Response: *The methods and approach DEQ uses to collect data, either in ambient monitoring programs or through requiring companies to test smokestacks, follow established methods with developed quality assurance and quality control criteria. In some cases in the proposed temporary rule DEQ is requiring CAGMs to submit protocols to DEQ which will define how the test is performed. The rules also prescribe, in some instances, the testing methods that must be used to collect the data. DEQ reviews those plans, audits tests and ensures that the information collected meets standards for being considered accurate and valid.*

MODELING

Comment: The proposed rules require a CAGM to perform dispersion modeling to determine the ambient concentrations of the CAGM's air emissions at nearby and adjacent receptors. There is a lack of specificity as to the modeling requirements imposed on the manufacturers. First, the modeling is required regardless of whether chromium VI is detected. If chromium VI is not detected, it is not clear what or how a source is required to model. Second, modeling air impacts require meaningful background data but the rule doesn't discuss way how background will be established or by whom. It could take well over a year of ambient air monitoring and modeling to establish background concentrations.

Response: *The analytical (chemistry) methods used in source testing are not capable of giving a true "zero" result because the methods become less precise at very low concentrations. As a result, even if there really is no chromium VI in the sample, the method is still likely to give a non-zero result, and modeling will be required.*

With respect to the background concentration for the modeling, DEQ has revised the proposed rule to specify acceptable source impact levels that are not dependent on the background concentration. DEQ anticipates that the future air toxic rules may be applied in locations where ambient monitoring data is not available. This approach of specifying acceptable source impact levels eliminates the need to actually know the background concentration. The acceptable source impact levels are discussed in more detail elsewhere in these responses.

Comment: The proposed rule is silent on the averaging time for the modeling evaluations and risk comparison. Knowing the intended averaging time is essential to consistency in the rule's application.

Response: *DEQ has revised the proposed rule to specify averaging times.*

EMISSION CONTROL DEVICE/TESTING

Comment: There should be no allowance for facilities to emit chromium VI or any other HAP from an uncontrolled furnace. The permanent rules must carry forward these technological standards and must also provide for the possibility of additional operating restrictions in the event that emissions continue to threaten human health.

Response:

The proposed temporary rule imposes requirements on CAGMs to either install pollution control devices or, in the case of Tier 1 CAGMs to test the exhaust stack of an uncontrolled furnace for each identified metal and demonstrate that the concentration of pollutants in the exhaust is below health impact thresholds. Different types of furnaces have different potential emissions and the quantity of emissions is also affected by production levels. The tiered approach provides a means to scale emissions control requirements to appropriately address impacts to health.

Comment: Filtering with a baghouse is not enough to control chromium VI and other emissions. In addition to baghouses, electrostatic precipitators, and acid scrubbers should be used. The UNECE Best Available Technologies document describes in detail specific measures for glass factories.

In its April 27, 1990 proposal for Standards for Owners and Operators of Hazardous Waste Incinerators and Burning of Hazardous Wastes In Boilers and Industrial Furnaces, USEPA wrote:

The existing regulations control metal and some organic emissions through the performance standard for particulates. Metals can be contained in particulates or condense out onto particulates and are then captured by air pollution control devices. The present particulate standard of 180 milligrams per dry standard cubic meter may not provide adequate protection if a substantial percentage of the particulate is composed of toxic metals. Further, in the case of volatile metals such as arsenic, mercury, and chlorides of lead and cadmium, the particulate standard may provide little control.

Studies have shown that depending on which heavy metal salt or oxide is at issue that between 10 to 50% of the heavy metal introduced to the furnace as raw material will volatilize in the furnace exhaust and will bypass any filter designed only to remove solid particulate matter. A standard that requires removal of particulate will do nothing to reduce emissions of toxic metals from Bullseye and Uroboros.

Response: *Commenters forwarded the following papers with their comments. Staff reviewed the papers and have the following responses:*

Collection and Analysis of Hexavalent Chromium in Ambient Air

Prepared by J. Swift, M. Howell, D. Tedder

Eastern Research Group, 601 Keystone Park Drive, Suite 700, Morrisville, NC 27560

Response:

This paper is on ambient monitoring for Cr VI. The authors compared different filter materials and suggested improvements to the ambient monitoring protocol. DEQ did not find anything in this paper to support the comment.

Assessments of technological developments:

Best available techniques (BAT) and limit values

Prepared by:

Katja Kraus (Chair, Germany), Stefan Wenzel (Germany), Grace Howland (Canada), Ute Kutschera (Austria), Stanislaw Hlawiczka (Poland), André Peeters Weem (The Netherlands), Chuck French (United States of America)

Submitted to the Task Force on Heavy Metals

UNECE Convention on Long-range Transboundary Air Pollution

April 06, 2006

Response:

This paper considers Best Available Techniques (BAT) for controlling emissions from a number of industrial sectors. From the section on glass manufacturing:

“165. This category covers installations for the manufacture of glass using lead in the process with a melting capacity exceeding 20 tonnes per day.”

“174. In general, BAT for controlling PM emissions from furnaces in the glass industry is the use of either an ESP or FF, operating where appropriate, in conjunction with a dry or semi-dry acid gas scrubbing system.”

The paper also states:

Although generally a FF is expected to achieve at least 99% efficiency for removal of PM, this level is not achieved at the high temperatures and fine PM characteristic of the glass manufacturing industry. However, a FF can be engineered to achieve similar results (e.g., fitted with high-temperature resistant, acid gas resistant filters).

The parameter of most concern in ensuring the baghouses (referred to in the UNECE document as FF – short for fabric filter) in the applications for CAGMs is the temperature. The proposed rule contains a requirement that if a baghouse is the chosen emission control device, then it must be designed in a way that inlet glass is sufficiently cooled and is within the temperature design range of the bags and baghouse. This is in part to ensure that metals that were transformed into vapor phase in the glass furnace have re-condensed into solid phase, and to protect the installed bags from temperature related damage (which could range from non-visible damage that reduces control efficiency to complete and noticeable failure). DEQ’s intent was to include inlet temperature monitoring as a required parameter in monitoring baghouse performance. To provide clarity, DEQ has added to the rule that “each emission control device must be equipped with an inlet temperature monitoring device, and any other monitoring device....”

The paper indicates that fabric filters (FF, i.e. baghouses) are considered BAT for controlling PM emissions from glass furnaces. DEQ has determined that most if not all metals in the glass furnace exhaust will condense to particulate matter at or above the inlet temperature of a baghouse (approximately 250°F) and will be captured by the filter material.

Metals Emissions Control Technologies For Waste Incineration

J.R. Donnelly

Davy Environmental

San Ramon, California

Keywords: Incineration, Heavy Metals, Air Pollution Control

Response:

This paper discussed emission control technologies for waste incinerators. With respect to metals, the following excerpts summarize the types of emission control devices that can be used, as well as raising a concern about heavy metals possibly being in a vaporized form and therefore passing through fabric filters (i.e. baghouses):

“The high combustion temperature employed in modern incinerators will cause many of the metal compounds present to volatilize and be carried out of the incinerator device with the hot flue gases. These compounds then condense out as fine particulate matter or in some instances can leave the system still in the vapor form.”

“Heavy metals emissions from municipal and hazardous waste incinerators are controlled primarily through the use of particulate collection devices (electrostatic precipitators, fabric filters, wet scrubbers) or acid gas control systems (dry injection, spray dryer absorption, wet scrubbing). The major fraction of heavy toxic metals in the flue gas exists as fine particulates and is effectively controlled by properly sized electrostatic precipitators or fabric filters. Additional control of vaporized toxic metals is achieved in spray dryer absorption system or wet scrubbers.”

DEQ acknowledges that metals in the vapor state may not be effectively controlled by baghouses. However, DEQ notes that the paper cited above states “The major fraction of heavy toxic metals in the flue gas exists as fine particulates and is effectively controlled by properly sized electrostatic precipitators or fabric filters”. DEQ agrees with this; further, most if not all metals in the glass furnace exhaust will condense to particulate matter at or above the inlet temperature of a baghouse (approximately 250 degrees F). For the smaller (Tier 1) CAGMs that elect to install baghouses, the inlet temperature will be even lower, approximately at the temperature of the air in the furnace room workspace.

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40 CFR Parts 260, 261, 264 and 270

[FRL-3358-6 EPA/OSW/FR/90-007J

RIN 2050-AB90

Standards for Owners and Operators of Hazardous Waste Incinerators and Burning of Hazardous Wastes In Boilers and Industrial Furnaces

Response:

The commenter highlighted the following:

I. Particulate Emission Limits

A. Consideration of Controlling Metals with a Particulate Standard

The existing regulations control metal and some organic emissions through the performance standard for particulates. Metals can be contained in particulates or condense out onto particulates and are then captured by air pollution control devices. The present particulate standard of 180 milligrams per dry standard cubic meter may not provide adequate protection if a substantial percentage of the particulate is composed of toxic metals. Further, in the case of volatile metals such as arsenic, mercury, and chlorides of lead and cadmium, the particulate standard may provide little control.

As stated elsewhere most, if not all, metals in the glass furnace exhaust will condense to particulate matter at or above the inlet temperature of a baghouse (approximately 250 degrees F).

Combustion characteristics of tannery sludge and volatilization of heavy metals in combustion*

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Response:

This paper is on the incineration of tannery waste sludge, which contains a number of metals. The authors evaluated the volatilization of the metals during incineration, and concluded that some metals volatilize more than others. At 900 C (1650 F), the following percentages of metals were volatilized (approximately): chromium, 25%; manganese, 60%; lead, 60%; and cadmium, 70%.

DEQ's ambient monitoring tends to show that there are metal emissions from CAGMs and such emissions are the result of the combustion process in the CAGMs' furnaces when processing metals. Whether one metal volatilizes more than another does not affect the approach that DEQ is recommending. As stated elsewhere most, if not all, metals in the glass furnace exhaust will condense to particulate matter at or above the inlet temperature of a baghouse (approximately 250 degrees F).

Comment: Independent third party monitoring and testing of a capture system should be part of the permit fees.

Response: DEQ requires facilities to do monitoring to show compliance with permit conditions. Facilities that have Title V permits (larger emitting facilities) must have a "responsible official" certify compliance with all permit conditions. Significant penalties, including imprisonment, apply to those providing false certifications. Smaller facilities, such as the CAGMs under the proposed temporary rules, must also do periodic monitoring and send in annual reports.

The regulations that apply to a facility and the amount of emissions determine how frequently a facility has to test its emission stacks. Almost all facilities hire contractors to test the stacks to

show compliance with permit conditions. The tests require special equipment and trained personnel so facilities pay source test companies for these services. As stated above, DEQ's source test coordinator reviews source test plans before the test occurs, frequently audits the tests while they are being performed, and reviews all the results of the source test for accuracy. The test plans and the rules outline which standards and established testing methods must be used and include quality assurance parameters that must be met in order for the results to be considered valid.

Comment: The proposed rules lack continuous air quality monitoring requirements that are as stringent as or more stringent than the standards used by the EPA. The proposed rules should require any emission control devices to be properly maintained and inspected, and all inspection records produced be made public. Emissions control equipment should include leak detection and automatic shut-off controls.

Response: *DEQ has added requirements to periodically monitor the inlet temperature to the emission control device(s), and to conduct inspections of the ductwork, housing and interior at least once every 12 months. DEQ is confident that the proposed temporary rules will eliminate the immediate risk of harmful air emissions from these CAGMs in the short term. DEQ will further consider what level of monitoring is appropriate for CAGMs, and for other sources of toxic air emissions, as part of the overall air toxics rulemaking process that it has initiated.*

Comment: Emissions monitoring, such as with a device that can measure at least 1/10 of the ABCs of any HAPs filtered by the emission control device, should be required. DEQ's air monitoring strategy is not accurate enough to be used as the primary monitoring system due to many variables; wind direction and dissipation; positioning of the monitor equipment; timing of the monitoring; and temperature inversions. Filtration with source monitoring as a back-up is the only efficient way to protect the public health.

Response: *DEQ does not agree that this type of monitoring should be required, nor is DEQ aware of any practical monitoring device that could accomplish what the commenter suggests. DEQ believes the testing required by the rule is sufficient to demonstrate the performance of the emission control devices.*

Comment: The rules only require source testing on one controlled furnace per facility to demonstrate compliance. Every controlled furnace used to melt cadmium, arsenic, chromium, or nickel needs to be source tested to demonstrate compliance.

Response: *The rules impose a requirement for a CAGM to test at least one baghouse to determine the efficiency and the operating parameters under which the baghouse will achieve 99% reduction in emissions. The design and monitoring parameters required by the conditions of OAR 340-244-9070 apply to all installed baghouses so the testing performed on one baghouse will be representative of the control efficiency performance of other installed baghouses. The testing will demonstrate the ability of the baghouse to meet, given its design and operation, the requirement to control 99% of the emissions.*

Comment: I am concerned that the 99% filtration limit in the proposed temporary rules will still permit emissions of toxic metals at levels higher than health standards permit. Please clarify in the final temporary rules how we can verify that emission levels do not exceed pre-existing health standards.

Response:

The term “standards” usually refers to levels that must not be exceeded. There are no ambient air health standards in Oregon for hazardous air pollutants. As stated elsewhere in these responses, the Ambient Benchmark Concentrations (ABCs) are not mandatory maximum allowed ambient concentrations. Rather, they are goals to be used for program planning purposes. In the proposed temporary rules DEQ has taken an approach that includes some technology-based elements and some risk-based elements.

The technology based element is the requirement to install emission control devices that have a removal efficiency of at least 99 percent. This requirement will ensure that the emissions will be reduced which will also significantly reduce the ambient impacts from the facilities. It is possible that ambient impacts of some metals will still exceed the ABCs. In the ambient monitoring DEQ has been performing there are metals that are above the ambient benchmark concentration even during times when Bullseye was not using those metals in their process. There are many sources of air toxics, including metals, in ambient urban air. As mentioned before, the ABC’s are not ambient air standards and, in this rule making, DEQ is not establishing such a standard. In the requirement to install a baghouse DEQ is estimating that the 99 percent reduction in emissions will result in a comparably significant reduction in ambient air impacts. DEQ is also continuing to monitor the ambient air and will continue to provide that data to the public as it is available.

The risk-based approach has been used in two specific areas: (1) the exemption from installing emission control devices for the Tier 1 CAGMs, and (2) for chromium VI at the Tier 2 CAGMs. For the exemption, DEQ had to set maximum acceptable source impact levels in the proposed rule that would provide assurance that uncontrolled emissions from the Tier 1 CAGMs would not create an unacceptable risk. As discussed elsewhere in these responses, DEQ is proposing to use the ABCs (1/10th of the ABC for lead) for this purpose. With regard to chromium VI at the Tier 2 CAGMs, the October 2015 ambient monitoring did not include monitoring for chromium VI, so DEQ has no data on the ambient impact of Tier 2 CAGM chromium VI emissions. For this reason, and because of a lack of information about how much chromium VI is emitted, DEQ has taken an approach that is similar to the approach taken for the Tier 1 CAGM exemption. The Tier 2 CAGMs, in order to use chromium III in an uncontrolled furnace, must test for chromium VI while using chromium III and conduct dispersion modeling to determine how much chromium VI is emitted and what ambient impact it has. DEQ will establish chromium III usage limits to limit the ambient impact. In order to do this, DEQ is proposing annual and daily acceptable source impact levels for chromium VI. As discussed elsewhere in these responses, the proposed annual acceptable source impact level for chromium VI is the ABC, and the proposed daily acceptable source impact level for chromium VI is the Oregon 24-Hour Screening level.

DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that is expected to more comprehensively address risk and will establish human health risk based approach to air toxics regulation.

Comment: The proposed rules require source (stack) testing. The rule assumes that a source test can accurately and reliably measure chromium VI. However, currently reliable source test methods for chromium VI may not be available. Bullseye's oxygen fueled furnaces create operational and technical limitations on the ability to reliably measure for chromium VI. How will this be resolved if required by the temporary rule?

Response: *There are technical and operational difficulties associated with testing for chromium VI, but they are not insurmountable. The rules require CAGMs to submit source test plans to DEQ for approval before they begin the test. Any revisions to the chromium VI test methods to address any technical or operational limitations can be handled during the submission and approval of the source test plan. The source test plan must include the specific limitations now included in the revised proposed temporary rules, data supporting the limitations impact on the quality of the data, and data supporting the use of the proposed revision.*

If the commenter is referring to the atypical gas stream characteristics (e.g., high CO₂ and high moisture concentrations) anticipated from a lean-burn, oxygen fueled furnace, Bullseye will be adding dilution air to the furnace exhaust to cool the gas stream before it passes through the baghouse for bag preservation purposes. The gas streams at both the baghouse inlet and outlet sampling locations will be similar to many other combustion streams that have been successfully tested with Method 0061.

Comment: The proposed rules provide 60 days of commencing operation of emission control devices for testing along with submittal of the source test plan at least 30 days before conducting the test. If the emission control devices are not working properly at day one of commencing operation, there could be a significant public health impact that would not be identified before 60 days. This section should require testing of ECDs within 5 days of commencing operation under “representative operating conditions.”

Response: *The testing will verify that the emissions control device is achieving the required 99% reduction in emissions. DEQ's ambient air monitoring will also continue to provide directly measured concentrations of pollutants in the air.*

DEQ anticipates that CAGMs will install a baghouse if they are required to install an emission control device under the proposed rule. Baghouses are relatively simple and reliable and there is little chance that they will not function as intended. DEQ also notes that many rules allow up to 180 days to complete testing after installation of an emission control device. DEQ is proposing only 60 days for this rule.

Comment: Bullseye has proof that chromium III doesn't convert to chromium VI in the glass melting process but the report failed to mention any form of chrome bypassing the melt due to being a very fine particulate. The following test should be done to prove/disapprove prior to the new temporary rules: Run 1%-1.5% chromium III batch from non cullet source. Collect 12 hour exhaust as per EPA Method 0061 (Hexavalent Chromium in Stack Gas Emissions)

Response: *If very small particulate matter that presumably contains chromium VI is not collected in the melt and is emitted from the furnace as chromium VI, the baghouse is designed to collect this very fine particulate. The Method 0061 sampling train will collect these small particulate and therefore, the test will discern if or the extent to which the melt by-pass scenario*

that the commenter poses, will result in chromium VI emissions from the baghouse stack.

At DEQs request, Bullseye has revised their source test plan stating that no cullet will be used during the testing. The percentage of chromium will be slightly less than one percent because they do not normally make glass with that much chromium. The test runs will be approximately 16 hours, in order to capture the entire charge and melt activities.

Comment: Require Method 202 testing for condensable fraction particulate matter as well as Method 5 testing for filterable particulate matter. The effectiveness of control devices should be evaluated for both of these particulate fractions because it is possible that many of the compounds of toxic metals emitted by the high temperature furnaces could be in the condensable PM form at exhaust temperatures and will not be measured by a Method 5 test.

Response: *The temporary rules propose to require use of ODEQ Method 5 for the particulate matter testing. ODEQ Method 5, although slightly different than EPA Method 5/202, collects both filterable and condensable particulate matter. DEQ doesn't expect much condensable particulate matter because the exhaust gas temperature at the baghouse will be below 300°F and the particulate matter will have solidified at this temperature. DEQ considers EPA Method 5/202 to be an acceptable alternative to DEQ Method 5.*

Comment: The prohibition of chromium VI, cadmium, arsenic and nickel in art glass production before determining whether the production volume has any health risk creates an unreasonable burden on smaller facilities without any documented justification. The rules require a source to install control devices of either 99% control efficiency or 0.2 pounds of particulate per ton. The facility should be given the opportunity to demonstrate its ability to comply before being compelled to incur such an expense.

Response: *The proposed temporary rules have been modified to remove the option to comply with via the 0.2 pounds of particulate matter limitation. That limit does not apply to hazardous air pollutants, the target emissions of the proposed rule. DEQ has provided a pathway for smaller CAGMs (Tier 1) to demonstrate that their emissions will not result in ambient concentrations above the acceptable source impact levels. Larger CAGMs (Tier 2) are required to install control devices, in part based on the ambient monitoring data collected that showed impacts of concern in areas surrounding Bullseye Glass.*

Comment: The emission control devices are required to either remove 99% of particulate matter or 0.2 pounds of particulate matter per ton of glass produced. Does it mean less than 0.2 pounds of PM per ton emitted, or does it mean the filter catches more than 0.2 pounds per ton of glass. This requirement is not directly tied to the ambient air quality that this rule is designed to remedy. Furthermore, particulate matter is not a defined term and it is unclear whether unsafe emissions of all HAPs fall under this term. This should be rewritten to require the emission control devices to adequately filter emissions of all HAPs to the ABCs.

Response: *The 0.2 pounds per ton limit means that 0.2 pounds of particulate matter can be emitted for each ton of glass produced in a furnace. DEQ has removed this requirement from the proposed temporary rules because DEQ asserts that the particulate matter removal efficiency is directly related to the removal efficiency for metal emissions.*

Comment: Proposed OAR 340-244-9040(3) only has chromium testing while proposed OAR 340-244-9040(4) has particulate and chromium. It appears that particulate provisions are covered

in 340-244-9030 and are not needed in 340-244- 9040. Also, 340-244-9040(3) and (4) are inconsistent with each other. 340-244-9040(3) addresses uncontrolled furnaces but in (3)(a) states “at the inlet of an emissions control device.” 340-244-9040(4) addresses controlled and uncontrolled furnaces. However, this section does not address the issues of the stack cleaning as set forth in 340-244-9040 (3)(D). These sections need revision to be clear as to which circumstance they apply.

Response: *The proposed temporary rules have been changed and the source test requirements have been clarified.*

Comment: In order for Uroboros and Bullseye to be able to implement the controls in a cost effective manner, perhaps a rebate or subsidy like those given for solar energy would accomplish the goal quickly with a smaller impact.

Response: *Providing things like rebates or subsidies are beyond the scope of this rulemaking and DEQ’s air quality authority. Additionally, installing pollution control devices is part of the cost of operating that industrial facilities must face. DEQ has also begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types and which will include a fiscal and economic impact statement, something not required under temporary rule provisions. DEQ elected to use the temporary rule making process to address an urgent and proximate issue that had real and time sensitive implications for public health.*

COLORED GLASS MANUFACTURING

Comment: The EPA rules apply only to glass manufacturing plants that operate continuous furnaces and use one or more of the glass manufacturing metal HAP as raw materials. These standards have never been applied to the artisan glassmakers in Portland because the controversy lies in that periodic or pot furnaces are not part of the source category. With the lack of DEQ standards, they should fall back on using EPA standards to calculate the allowable usage of arsenic, cadmium, chromium, lead, manganese, and nickel, allow Bullseye Glass and Uroboros to resume operations within this usage while continuing to report raw materials consumption and monitor ambient air.

Response: *EPA’s rules, 40 CFR Part 63, Subpart SSSSSS - National Emission Standard for Hazardous Air Pollutants for Glass Manufacturing Area Sources, apply to continuous glass making furnaces that use arsenic, cadmium, chromium, lead, manganese, and nickel and produce over 50 tons per year of glass per furnace. The commenter is correct in stating that there has been a lack of clarity over the applicability of these rules and DEQ has requested applicability interpretation of Subpart SSSSSS (6S) from EPA. Applicability questions aside, 6S is a technology-based standard, not a risk-based standard so it is unknown whether the requirements in it are protective of health. Based on the ambient monitoring from October 2015, DEQ concluded that it is necessary to develop the proposed temporary rules to directly address the concerns raised by the monitored metals concentrations.*

Even if 6S is applicable to the types of furnaces at Uroboros and Bullseye, both have furnaces that may not be subject to 6S based on other applicability criteria. DEQ has proposed 10 tons per year of glass production as a threshold to include glass manufacturers that have greater

potential to emit metals. DEQ has also revised the rules to describe two categories, or Tiers, of CAGM's and developed different applicable regulations as appropriate and discussed in more detail in response to other comments.

Comment: DEQ must immediately inventory all additional glassmakers in the state. DEQ temporary rules should not be adopted until they are calibrated to be relevant to all glassmakers in the state.

Response: *This temporary rulemaking is intended to address the specific, identified toxic air emissions from particular sources in the Portland area. DEQ has begun the process of identifying and collecting information about glassmakers in Oregon. This information will be used to inform the way we approach future rule changes. Additionally, DEQ has calibrated the temporary rules to apply restrictions and requirements to those facilities that cause the greatest emissions of metals via a tiered approach.*

Comment: The electrical furnaces used to produce borosilicate colored glass are much different than furnaces fueled by gases. Trautman Art Glass purchases cullet (i.e., borosilicate glass that has already been made by someone else) and remelts it in small batches of 20 to 40 pounds at a time. This remelting occurs in electric furnaces so there is no fuel combustion associated with the process. Proprietary materials are added to the melted cullet (never cadmium or arsenic) and then the molten glass is formed into final product. In the world of glass manufacturing, TAG and the other Oregon borosilicate glass formulators are tiny operations. We recognize that size alone is not necessarily a reason to treat us differently from Uroboros and Bullseye. However, the numerous process differences between the borosilicate glass formulators, and the soft-glass manufacturers, mean that we have far less potential to emit.

Electric furnaces do not produce hot combustion gases which create a carrier medium for other small raw-material particles to exit the furnaces and be emitted. EPA has repeatedly recognized the inherently lower emissions of electric glass furnaces of all sizes. This is a critical distinction between the soft-glass manufacturers and what we do at the borosilicate glass formulators.

We request that DEQ revise OAR 340-244-9000 to clarify that "art glass manufacturers" are those entities that employ raw materials to produce soda ash glass using combustion processes and establish the applicability threshold based on the amount of raw material consumed.

The term "manufactured" also needs to be defined. As noted above, TAG does not manufacture glass it just re-melts and formulates glass in electric furnaces. The rule should clarify that facilities engaged exclusively in glass formulating in electric furnaces are not considered "manufacturers."

Response: *DEQ has revised the applicability section of the proposed rule to state that the rule applies to facilities that "Manufacture colored glass from raw materials, or a combination of raw materials and cullet, for use in art..." to clarify that the rule applies to facilities such as Trautman Art Glass. With this change, there is no need to define "manufacture." As described elsewhere in these responses, DEQ has also revised the proposed rule to treat the smaller (Tier 1) electrically-heated CAGMs differently from the larger (Tier 2) fuel-heated or combination fuel- and electrically-heated CAGMs. Glass making facilities that only re-melt glass without using raw materials as defined in the rule are not subject to this rule.*

Comment: How are fugitive emissions that don't go up the stack but into the room or open air when doors are open, being monitored and filtered? How are gaseous emissions being monitored and remediated, such as fluorine? A filter most likely would not capture this.

Response: *At the larger, Tier 2 CAGMs, fugitive emissions as described by the commenter would enter the workplace where they would first affect workers. The Oregon Occupational Safety and Health Division (OR OSHA) is responsible for ensuring that workers are not exposed to unacceptable levels of air pollutants in the workplace. At some Tier 1 CAGMs the fugitive emissions are captured and exhausted by a hood vent system. The commenter is correct that such gaseous pollutants would not be controlled by a baghouse or filter. The pollutants that this rule is focused on reducing are the direct metals emissions from CAGM furnaces.*

Comment: It is important to note that other glass manufacturers in the USA are known to use much higher amounts of chromium III than Bullseye on a yearly basis and this has been deemed safe, so there are precedents of previous exposure to chromium III at higher levels with low risk. This means that the lower levels of chromium III emitted by Bullseye production will also result in low risk.

Response: *Many other glass manufacturers that use chromium III are subject to 40 CFR Part 63, Subpart SSSSSS - National Emission Standard for Hazardous Air Pollutants for Glass Manufacturing Area Sources or 40 CFR Part 61, Subpart N - National Emission Standards for Inorganic Arsenic Emissions From Glass Manufacturing Plants. While both of these rules are intended to reduce health risks, neither of these rules is intended to address an individual facility's impact, so even if other glass manufacturers are complying with the rules, ambient concentrations of metals around these facilities are not necessarily safe. Ambient monitoring would need to be done to determine whether the emissions are at acceptable risk-based levels. Ambient monitoring around Bullseye showed concentrations of metals above levels of concern and DEQ has been taking action to address those risks.*

REGIONAL ISSUES

Comment: Create a regional or county air pollution authority since airsheds do not respect county boundaries. Involve multiple counties in the Portland area, including those north of the Columbia River.

Response: *DEQ is open to discussions lead by local governments and others about establishing a local air district. This kind of effort would not be lead by DEQ.*

Comment: The City of Portland and Multnomah County adopted the precautionary principle in 2004/2006. Please be reminded of that commitment. <http://www.sehn.org/pdf/portland.pdf>

"When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action." - Wingspread Statement on the Precautionary Principle, Jan. 1998

Response: *Neither DEQ, the EQC, nor the State of Oregon has adopted the precautionary principle as a binding standard. DEQ may consider applying it when appropriate. The rules proposed are adopted by and under the authority of state regulations and are not dictated by City of Portland or Multnomah County regulations or policies.*

Comment: These temporary rules do not address the identified toxic hotspots in the Cully neighborhood, which may be caused by emissions from glass manufacturers in that area. Cully is home to a very diverse and economically vulnerable population. This is an environmental justice issue so DEQ must look at this issue through its obligations under HB 420, Oregon's environmental justice law and Title VI of the Civil Rights Act.

Perhaps the DEQ is unaware of the amount and nature of the chemicals being used at the Porter Yett facility. DEQ should take a more responsive and transparent approach to protect the health of Cully residents. DEQ should restrict Porter Yet and other industries from polluting our air and endangering our health. We would further request increased monitoring and a listing of all known TAPs being used in industrial processes within 1000 feet of the Cully neighborhood boundaries.

Response: *After our work to track down the sources of cadmium in the Portland area, DEQ is following up on other locations where maps of moss samples showed elevated levels of arsenic, nickel and lead. Initial metals maps, like the ones published in news media for arsenic, nickel and lead show raw data and need further analysis to assure accuracy of locations and pollutant levels. Our current follow up process includes getting statistically refined data from the US Forest Service, investigating sources of emissions that could cause the moss hot spots, and conducting further air monitoring to confirm emission sources. One of the criteria DEQ will use to prioritize further air monitoring is the presence of sensitive or potentially vulnerable residents. After DEQ has monitoring data we will be able to work with businesses or industries known or likely to emit metals of concern. Some of these facilities will be included in the upcoming risk-based air permitting program. DEQ will share all further investigation results on <http://saferair.oregon.gov>.*

The proposed rule is limited in scope to CAGM's, among other applicability limitations and doesn't include asphalt plants. DEQ has begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types. There will be many opportunities for public input and participation in that process.

OTHER AIR POLLUTION SOURCES

Comment: Why don't you investigate the real pollutants that make our air bad - commercial diesel engines in trucks, buses and ships?

Response: *DEQ has been actively working to support and encourage movement to lower emitting diesel engines in trucks, transit buses, school buses, construction equipment, locomotives and marine vessels, primarily by providing technical advice and financial assistance. Since 2001 DEQ has overseen more than \$10 million in federal and state grants and tax credits to retrofit exhaust controls, replace engines or even vehicles and equipment. In*

addition, DEQ has played a key role in assisting other local governments and nonprofits to secure additionally several millions of dollars in federal grants for clean diesel upgrades. All of this work has been very effective, returning value in terms of avoided health and environmental costs at a rate of at least 10 to 1. However, as effective as this has been, it represents only a little more than a 2% drop in the emissions the DEQ projects is needed to protect public health to the Oregon health benchmarks. DEQ continues to explore grants as well as potential regulatory options to address this problem.

Comment: Consideration should be given to what earlier industries may have been in these neighborhoods before these glass companies were established. There is a large freight train yard very near these facilities. Exhaust from locomotive engines diesel fuel contains chromium and other air pollutants as the byproduct of combustion. Chromium VI and chromium III are used for chrome plating, dyes and pigments, leather tanning, and wood preserving. There happens to be two plating companies just three miles from Bullseye. Even if the EQC were to put into action this temporary rule, there may be many significant sources of toxic air pollution that may still be emitting from many unregulated nearby businesses in Portland. Therefore, the temporary rule may not effectively protect the public.

Response: *DEQ agrees that this rule is not designed or intended to address all sources of chromium VI in the area surrounding CAGM's. It is designed to regulate and reduce the emissions and subsequent impact of metals emissions, including but not limited to chromium VI, from CAGM's. DEQ has begun the rulemaking process for a statewide risk-based air toxics program that will cover many industry types.*

OTHER COMMENTS

Comment: Perhaps the chromium actually came from Portland Cement used in concrete. In my research I found this PDF file from the Portland Cement Association, Hexavalent Chromium in Cement Manufacturing: Literature Review, <http://web.mit.edu/cron/project/concrete-sustainability-hub/Literature%20Review/Building%20Energy/Concerte%20Industry%20Reports/PCA%20CD%20Cement%20Research%20Library%202008/reports/SN2983.pdf>
The report says that hexavalent chromium is found in cement in generally trace amounts. Perhaps some demolishing of sidewalks or buildings nearby the Bullseye plant caused the elevated levels of chromium.

Response: *The October data was for total chromium. DEQ's monitoring in February 2016 included total chromium and hexavalent chromium. The separation of the two compounds gives better information regarding the potential health effects and potential sources. There are other sources of hexavalent chromium in the area and currently DEQ's monitoring data supports that assertion. Rail traffic is another nearby potential source of hexavalent chromium. The rules will help provide information necessary to assess and understand the contribution of hexavalent chromium from CAGMs. It also has a broader scope than just chrome VI and includes other hazardous metal air pollutants which are directly attributable to CAGMs.*

Comment: How significant is the impact on air quality for pollutants emitted from this source over a three- or six-month period? If the health impacts are not acute over this time span, it would give the company the chance to take immediate measures to control pollutant output, just

as further investigation of actual long-term output and its effects could be undertaken.

If public sentiment is harsh enough to force the closure of this plant, perhaps the city or state could help find another temporary location outside populated areas for production to continue while the issues are being sorted out. I know that vibrant cities are mosaics--not just of residential and entertainment areas, but also of businesses, parks and open space, and industries. A balanced mosaic of uses keeps cities vital. Let Bullseye have the chance to show it will continue to be a good a responsible part of that mosaic.

Response: *OHA is planning to perform public health assessments (PHA's) using data from and around the Bullseye Glass Company in Southeast Portland and the Uroboros Glass Studio in North Portland. The Bullseye Glass and Uroboros Glass PHAs will both be released for public comment in fall 2016.*

The PHA process is conducted to determine whether and to what extent people have been, are being, or may be exposed to contaminants from hazardous waste sites. If there is an exposure, the assessment process is used to evaluate whether the exposure is harmful and should be stopped or reduced. Additionally, the PHA process enables the OHA to respond to community concerns and prioritize and identify actions that protect public health.

The findings are documented in a PHA report. This report is comprehensive in that OHA:

- Considers past, current, and future exposures, based on current site conditions and future plans;*
- Evaluates and documents all the ways that people might come into contact with contaminants from the site;*
- Describes in detail our process for evaluating the potential contaminants of concern in soil, air, and/or other media. This includes documenting our assumptions and other exposure factors, showing our dose and risk calculations, and more;*
- Evaluates biological data, like blood or urine samples, if appropriate;*
- Gathers and documents qualitative information from affected communities about their concerns and the site;*
- Makes conclusions and provide the basis for these conclusions;*
- Makes recommendations and identify public health actions to prevent or reduce exposures.*

DEQ does not regulate land use or require companies to relocate. If a company relocates, or a new company established operations, DEQ requires them to submit verification that their operations are in compliance with local land use laws and regulations.

Comment: Who are the affected parties? I would like to add to that list the numerous people worldwide who rely on those glass producers for their livelihood and as a recreational activity. Any restriction on the production of their glass will have a far-reaching and, in many cases, a devastating effect.

Response: *DEQ agrees that people worldwide who rely on glass producers for their livelihood are affected parties and will change the staff report to state so.*

Comment: While the wheels of toxics regulatory reform turn extremely slowly if at all at the state and federal level, communities throughout Oregon could enact right-to-know laws within the next two years if Oregon's Legislature would allow it. All it has to do is adopt Community Toxics Right-to-Know laws based on Eugene's tried-and-true model. Report toxics in, toxics out and post the information on a website. It's that simple, and it's a heck of an incentive to stop using toxics unnecessarily because everyone is watching.

Response: *Eugene's Toxics Right to Know program provides citizens with more detailed information than the federal Toxics Release Inventory program. It was approved by the voters of Eugene and is funded with fees on businesses required to report chemical use. DEQ is currently focusing our resources on developing a risk-based air toxics permitting program. While developing statewide right to know regulations is not within the scope of our current effort, it is very valuable to consider program elements that would allow people to easily get information about chemical usage and facility emissions.*

Comment: What is the health of the actual workers inside the manufacturing plants?
What are the protocols for handling these specifically mentioned materials? At the plant?
Disposal?
What is the site history of the manufacturing plant?
Could they have inherited a previous owners residue?
I do not want to be mean spirited, however how thoroughly have the claims of the children, been researched?
Could there be other sites of contamination – a school, or community facility or even locally occurring geological deposits?
Are there going to be public information forums?
Is there an organized local residential group, who might have a hidden agenda?
What are the water samples in the area showing?

Response: *Many of the commenter's questions about plant operations and worker safety have been answered in response to other comments. In response to other comments and inquiries: DEQ is focused on making sure that regulations are protective of public health and informed by quality data. The data that DEQ has collected through ambient air monitoring showed levels of concern about public health. The data further supports that some of those metals are directly attributable to CAGMs; DEQ is taking appropriate steps to ensure that appropriate regulatory authorities and tools are in place to address that risk. DEQ is embarking on a permanent risk-based rulemaking which will focus on risk to human health from air toxics across all industry sectors. Through this rulemaking process, there will be many opportunities for public input and several public informational forums.*

HEALTH

Comment: I want to know what is going on with our air and water. I have high arsenic in my urine from living near Woodstock and Caesar Chavez. I want to know what is going on and why my health is deteriorating at such a young age.

Response: *Individual health is best addressed with a health care provider. Guidance for health care providers is available at <http://public.health.oregon.gov/newsadvisories/Documents/se-portland-metals-emissions-physician-guidance.pdf>. Health care providers can also consult*

clinical toxicologists at the Oregon Poison Center to guide diagnosis and treatment.

Comment: Families that live close to the colored art glass manufacturers provided the following comments about the health effects they are experiencing:

- My 4 year old son was at the daycare less than a 1/6 mile from Bullseye. He has elevated cadmium levels (2.5 times that of 6-11 year old). How this will impact his future is unknown and terrifying. His cancer risk is increased due to this exposure, let alone countless other diseases (kidney function, respiratory, neurological) and potential lifelong impacts that may take decades to surface as a result. We will unfortunately never know what his arsenic or chromium exposure was. We will forever wonder if any abnormal illnesses/diseases that arise or difficulties he faces in regards to his health resulted from Bullseye's glass making and environmental negligence.
- I live 0.4 miles from Bullseye Glass with my wife and my 6 year old daughter for the last 9 years. I work from home so I am always being exposed to Bullseye's emissions. Since moving into the neighborhood, we have developed the following symptoms: asthmatic episodes, hyper pigmentation, peripheral neuropathy, skin sensitivities, urinary and bladder conditions, demineralization and bone loss, as well as a heart murmur. All of these symptoms have been identified as being signatures of heavy metal exposure according to our physicians and the NHANES national toxicological report. I have 2 neighbors who have battled non-genetic cancer and a third neighbor who has autoimmune diseases. The only difference between them and us it that they have lived here throughout the duration of Bullseye's 42 years of unfiltered, unregulated carcinogenic pollution fallout.
- I live 1 block from Bullseye Glass for the last 15 years. I have had kidneys infections for the last two years. I have been sick for the last 3 months. I eat healthy, I don't drink or smoke so there's no reason I should be this sick except for toxic air.
- I have lived 5 of the last 17 years on the edge of the toxic hotspot emitted from Bullseye Glass in SE Portland. I know one person and two others through her who live inside the toxic Bullseye hotspot. All three of them have pre-menopausal breast cancer. Though I have no documented chronic health issues, many people in this neighborhood do. We may not be able to prove that the unregulated emissions of Bullseye glass or Precision Cast Parts, et.al. were the cause of these illnesses, but suffice it to say that at the very least, these toxic emissions likely exacerbated the severity of them.
- I'm recovering from treatment for an aggressive form of cancer with a high rate of metastasis and my treatment contributed to a disabling neuropathy in feet. I'm doing everything I can to heal from treatment and to keep metastasis at bay. Continued exposure to known carcinogens and neurotoxins aren't part of my care plan.
- Over the past ten years I have had many tumors and several surgeries due to these tumors, including a radical nephrectomy, radical hysterectomy, bone tumor excision, etc. Some were unusual or unusually presenting tumors, and though all were determined to be benign, the kidney tumor had been bleeding and was in danger of hemorrhage, therefore life-threatening. In addition, I have had skin cancers: a melanoma, 2 squamous cell carcinomas and a basal cell carcinoma. My dermatologist dubbed me the queen of odd little things because I have had so many unusual growths. None of my siblings have had similar health issues.
- A good friend of mine lives near Bullseye, and her young son, who plays outside frequently, tested critically high for arsenic. They have to restrict his diet to make sure he doesn't get further damaged while they try to heal him. She has health issues that could very well be

related to this contamination being released into the air near her house for so long, unfiltered, for years and years and years. It's not a victimless crime, people!

- I live less than 1/2 from Bullseye Glass. I support strong controls for healthy air. My husband and I were thrilled to move in to our home last December. We thought it would be a great place for him to heal while he received intensive chemo for his cancer. Chris died Jan 2, 2016. He was 47. He should not have been exposed to toxic air. While still deep in grief, I had my urine tested for cadmium and arsenic. It was found both were elevated. I'm 100% sure that exposure to heavy metals in our neighborhood contributed to my husband's declining health. Bullseye and DEQ: you literally have blood on your hands.
- Latest science shows even incremental exposures to air toxics can harm children like mine who has asthma and a debilitating nerve disorder which can be caused by, or at the least exacerbated by, the high arsenic, cadmium, lead and other toxins emitted regularly by Bullseye. Children should not suffer for others profits.
- My daughter has had asthma since she was very young. Her health has continued to spiral downward. After many visits to many doctors and trips to the emergency room, she was finally diagnosed by an endocrinologist and a cardiologist with POTS syndrome, acronym for Postural Orthostatic Tachycardia, a form of disautonomia (nerve disorder) which is a set of symptoms including: nausea, fatigue, dizziness, faintness and a very rapid heart rate. But this is worth noting- heavy metal poisoning can cause POTS. She is being tested for heavy metals and we should have results shortly. But as the Multnomah County Health Authority admits, arsenic exposure and chromium exposure will be much harder to assess, due to the fugitive nature of these toxics. It should also be noted that she has been eating leafy greens from my garden nearly every day for years. We have very substantial medical bills and records to document these entire concerns.
- We put our 2 year old son at the CCLC daycare. Our son had detectable levels of cadmium in his urine. While we were strangely assured his levels were normal for an adult in an urban area (he is 4 so not sure how they landed there), I can't help but believe these levels are influenced by the emissions that were allowed to go on nearby. Tests for other heavy metals in our son are useless at this point, as arsenic and chromium leave the body in less than a week. We immediately changed daycares, which has been a very difficult transition for our son. The polluter's presence has turned everyone's life upside down with no real benefit, but instead we face health costs, stress, fear, and anger.

Response: DEQ and OHA care about the health of all Oregonians, and experiences like these are difficult and hard for anyone to go through. These temporary rules are being designed with the intent to prevent harmful exposures to emissions from CAGM's in the Portland area. Through the Cleaner Air Oregon effort the state is also committed to establishing regulations that apply throughout Oregon and are protective of public health. Anyone experiencing health problems should work with their health care provider and make sure their providers are aware of OHA's guidance to clinicians (<http://public.health.oregon.gov/newsadvisories/Documents/se-portland-metals-emissions-physician-guidance.pdf>) and of the Oregon Poison Center and the NW Pediatric Environmental Health Specialty Unit as consulting resources.

Comment: It is grossly unfair that our family now must pay out of pocket about \$650 for extensive urine toxic tests and hundreds of dollars for soil testing. Our family alone will spend about \$1000 before any treatment plans! This expense ought to be Bullseye's expense on proper filtration.

Response: Families living or working within 0.5 miles of Bullseye Glass have free access to urine testing for cadmium. The website (<http://saferair.oregon.gov/Pages/What-You-Can-Do.aspx#test>) explains how to access this free testing.

Comment: The state and the city ought to dismiss this "one size fits all" approach. Children are not smaller versions of adults. Children have developing immune, nerve, and bone systems much different than adults. Chemicals such as cadmium, lead, etc. can cross the placenta negatively impacting fetal development milestone processes. Chemicals can also be found in breast milk. The chemicals chromium, cadmium and lead have been identified as metalloestrogens. These toxic and carcinogenic chemicals interfere with estrogen pathways and can be associated with breast cancer, etc.

Response: This and future rules are designed with protection of the most vulnerable, including pregnant women and young children, in mind. Anyone experiencing health problems should work with their health care provider and make sure they are aware of OHA's guidance to clinicians (<http://public.health.oregon.gov/newsadvisories/Documents/se-portland-metals-emissions-physician-guidance.pdf>) as well as Oregon Poison Center and the NW Pediatric Environmental Health Specialty Unit as consulting resources.

Comment: OHA has been emphasizing only Cancer Risks. EPA looks at and OHA also must look at, considerable Non-Cancer risks of arsenic and cadmium exposure. Recent literature is exploring epidemiological evidence of significant risks from low dose exposures, according to a new paradigm that recognizes that early pre-natal and post-natal effects of such exposures cause long term poor health outcomes other than cancer. I attach our two recent Fact Sheets on Health Effects of Arsenic and Cadmium to illustrate such new developments in scientific evidence about excess exposure to these two elements. New health based standards should take these into account.

<https://data.oregon.gov/views/trwb-z8xe/files/f387c364-bf4b-4518-bb8a-88829ca2b8e7>

Response: OHA and DEQ are aware that these metals cause health effects other than cancer. Cancer is the health effect that requires the lowest dose to cause increased risk over a lifetime. Protecting against small increases in cancer risk will also protect against other health effects that happen at higher doses. As the science continues to progress, health-based standards in rules can and should be updated to reflect that science. The standards currently proposed reflect the most recent scientific information for which a quantitative relationship between dose and effect has been established.

Comment: True level of compliance must also be achieved by clandestine air monitoring, thorough toxicity testing through moss and soil sampling, plus blood/urine testing of those living nearby to get an accurate assessment of contamination and to ensure that our environment is properly cleaned up. A thorough assessment of contamination has not been done and needs to occur immediately.

Response: Through the Cleaner Air Oregon effort the state is also committed to establishing regulations that apply throughout Oregon and are protective of public health. OHA and DEQ care about the health of all Oregonians and are committed a rules process that will protect the most vulnerable Oregonians.

Environmental monitoring is continuing around the glass facilities, including air and soil sampling. Setting up ambient air monitors takes space, time and electrical requirements. The equipment takes up a fair amount of space, must be accessed regularly and generally be placed in a location where it has ample exposure to ambient air. The ambient air monitors are only one component of how DEQ is assessing the air emissions from the CAGM's. Overall assessment of emissions and impacts from Tier 2 sources includes source testing, modeling, production monitoring and ambient air monitoring. This will be sufficient to provide enough accurate and verifiable data to support health impact information and regulatory compliance. Specific methods and requirements are discussed in responses to other comments. OHA will evaluate environmental sampling data collected to assess the likelihood of long-term health effects in the surrounding communities as part of comprehensive environmental public health assessments that will be made publicly available.

Urine cadmium is the test of choice to assess lifetime exposure to this metal. Both arsenic and chromium are quickly eliminated from the body; therefore, urine testing for these is not likely to be helpful in the assessment of chronic exposure.

Upon learning about possible exposures in SE and N Portland, on February 18, 2016 the Oregon Health Authority (OHA) amended the Oregon Administrative Rules on an emergency basis to require detectable urine cadmium to be reportable to OHA by laboratories, and established a mechanism for electronic reporting of these results. Guidelines for clinicians about obtaining samples and testing have been published and updated.

Currently, some people in the communities near Bullseye Glass in SE Portland, and Uroboros Glass in North Portland have self-identified to their health care providers for testing. Results of the laboratory tests are analyzed and reported out weekly. The Oregon Health Plan (OHP) covers urine cadmium testing for members who live in the highest-risk areas, as do most private insurance plans. In addition, OHA has contracted with a health system to provide for urine sample collection and laboratory testing for people who live, work, or attend school or day care within a ½ mile radius of either glass manufacturing plant.

As of March 25, 2016, more than 400 people in Multnomah County have had urine testing for cadmium done through their private health care providers. Of these, 3.6% had any detectable cadmium and 4 (1.0%) had levels elevated enough to be of clinical concern.

OHA is in discussions with national experts from the CDC ATSDR about whether additional systematic biological testing of community members is appropriate. We will also identify a community advisory group to: 1) assure that the strengths and limitations of any such potential study are shared; and 2) understand community needs for the more detailed information that such a study would provide.

Comment: My son is on the autism spectrum and at one point I noticed that we knew several boys within close proximity who were also affected. My husband has had serious lung issues which were finally determined to be a cough variant asthma.

I have a friend who has lived in the neighborhood for many years. He had a benign brain tumor a few years ago, a meningioma, that grew large enough to be symptomatic. These are tumors that

can go unnoticed as they usually remain quite small. His brain surgeon remarked at the time that he wished he knew what was going on, as he had been seeing an extraordinary number of these tumors grow sizable enough to cause trouble.

I realize these are anecdotal accounts and that it is possible that there is no correlation to the air quality. My question is whether these other health issues are being tracked or taken into consideration in regards to the safeguarding of the public from air pollutants. I have been aware, for instance, that autism and melanoma rates have been inexplicably high in Oregon and considering the main population base is Portland, I wonder if the poor air quality could be a factor in these high statistics. I heard that decisions were being made after some preliminary looks at cancer rates (though not skin cancers) in very close proximity (a half mile) to the glass factories. My concern is that those who live further from the factories should also be considered, and that the effects of very long term exposure should be taken into account. I wonder whether the rates of not just cancer, but other health issues of the entire city are being compared to other comparably sized cities.

Response: *Based on available environmental data indicating affected geographic areas, the Oregon State Cancer Registry (OSCaR) evaluated cancer rates for the Census tracts near Bullseye Glass and Uroboros Glass factories with the highest reported environmental levels of cadmium and arsenic. These evaluations focused on lung and bladder cancers, the two cancers most strongly associated with these types of exposures to cadmium and arsenic.*

Analyses of cancer rates for the 15-year period from 1999 through 2013 showed that rates of lung and bladder cancer were generally consistent with expected rates in the identified Census tracts in SE and North Portland for each 5-year period from 1999–2013. One exception was an elevated rate of bladder cancer for the 5-year period from 1999 through 2003 in one area of N Portland that included two Census tracts near Uroboros Glass; bladder cancer rates were not elevated in this area in subsequent years.

While the medical literature reports that elevated levels of cadmium may increase the risk of kidney damage, currently there is no reporting system for kidney disease in Oregon. The lack of this reporting system makes it impossible to determine whether rates of kidney disease.

As with kidney disease, Oregon does not have a registry or reporting system for autism.

Comment: It is not acceptable that the only risk indexed is life cancer risk. All risks of toxics exposure must be assessed and prevented. Especially inexcusable is the absence of neuro-toxicity assessment and protection.

Response: *The ambient air concentration levels established in the rules are set at levels that have been determined by the Oregon Health Authority to be protective of public health. In considering what is protective OHA, considered cancer as well as many other health effects associated with each contaminant when making its determination of health protectiveness. Very often the dose of a chemical required to cause a slight increase in lifetime cancer risk is much lower than the dose necessary to cause other types of health effects. In such cases, selecting benchmark concentrations that are protective against increases in cancer risk is also protective against other health effects that are a concern at higher doses.*

