DEQ/OHA - Cleaner Air Oregon
Non-Cancer Hazard Index
Rulemaking Advisory Committee Meeting

July 10, 2019

Facilitator's Summary of the Work Session

Purpose of Meeting

On July 10, 2019, DEQ/OHA convened a meeting of the CAO Rulemaking Advisory Committee at the University of Oregon White Stag Block, 70 NW Couch Street, Portland, Oregon. The purpose of the meeting was to:

- Provide information and grounding for evaluating Oregon's Hazard Index for noncancer health effects as proscribed by the Oregon legislature (via SB 1541); and

- Provide input regarding the State's proposed approaches to designating chemicals requiring a more health-protective compliance threshold for reducing noncancer health risks from industrial sources of toxic air contaminants.

Meeting Attendees

The meeting attendees included members of the CAO Rulemaking Advisory Committee (RAC) (see attachment 1 for RAC members in attendance), staff members from CAO, Oregon Department of Environmental Quality (DEQ), Oregon Health Authority (OHA) and members of the public.

Welcome and Introductions to Members

Donna Silverberg, facilitator from DS Consulting, welcomed the participants to the meeting. She thanked the RAC for their previous work and provided an overview of the agenda, and purpose of today's meeting.

Leah Feldon, Deputy Director, DEQ, welcomed the group. She noted that the CAO program and processes are a partnership between DEQ and OHA. In considering the need for additional rule-making, CAO staff determined that the best course of action would be to bring back the RAC members who previously worked on the CAO rulemaking.

Leah updated the group on the CAO program status and appreciated the input from the RAC on the program: A program is now in place; the Environmental Quality Commission (EQC) has adopted rules; CAO has hired permanent staff; and those staff have begun implementation. Program staff are in the process of reviewing emissions inventories from different facilities. As a starting place, staff are working with six of the existing facilities to refine their emissions inventories.

Leah also noted that CAO is seeking input today on rules for setting the hazard index benchmarks (Risk Action Levels) for existing facilities. The benchmarks that get identified will sunset in 2029. CAO has engaged Donna Silverberg, an experienced facilitator who has focused her work in health and natural resources discussions, to

support the sharing of diverse perspectives by the group to inform the rulemaking. Leah noted that CAO is not seeking consensus today, but rather is asking for input and ideas from the group.

Gabriella Goldfarb, OHA Environmental Public Health Section Manager, also welcomed the group. She remarked that CAO is a great partnership between OHA and DEQ. She noted that, as is true with most rules in this arena, a mix of science and policy is required to make program decisions. Staff will be listening carefully to input from the RAC to help inform rule-making.

RAC members and others in attendance introduced themselves. Donna reviewed suggested Discussion Protocols to support the group's sharing and hearing of diverse viewpoints. She noted her role as an impartial facilitator was to keep the group on task and allow time for important conversations to occur, while ensuring that everyone who wants to provide input has the opportunity to do so.

Assigning the Task: Scope, Charge and Process for the RAC
Keith Johnson, CAO Program Manager provided an overview of the proposed rulemaking and its parameters (See *Overview of Proposed Rulemaking*).

He noted that the CAO program has hired staff and begun implementation. CAO is now assessing new facilities and has called in 6 of the 20 existing facilities initially identified for evaluation. He and his program staff must report to the EQC in 2 and 5 years, and to the Legislature in 2026.

In March 2018, the Oregon State Legislature enacted SB 1541 which required changes to CAO's proposed rules. DEQ addressed some of the requirements in revised rules (e.g. new benchmarks for existing facilities, requirements to consider existing controls, and other parameters related to risk assessment and community engagement.) A few areas were left for future rulemaking: Area risk (SB 1541, Section 4) and Provisions for non-cancer risk from existing facilities (SB 1541, Section 7). Today's meeting will focus on rulemaking for the Section 7 provisions.

SB 1541 also provides for a sunset of any existing facility benchmarks in 2029. At that time the EQC will be required to establish new benchmarks. Keith noted that the rules also call for an update of the chemical-specific toxicity reference values every three years.

Section 7 of SB 1541 set the non-cancer benchmark, (or risk action level) at a Hazard Index (HI) of 5. Section 7 also states that the EQC may assign a benchmark other than 5, but no lower than 3, as the Risk Action Level applicable to existing facilities for emissions of toxic air contaminants identified as having:

> (a) developmental human health effects associated with prenatal or postnatal exposure;

or
(b) other severe human health effects.

David Farrer, toxicologist for OHA, clarified more about the tasks that stem from SB 1541. He noted that post-natal exposure is not an exact time event and, as a result, toxicologists consider it on a continuum basis. Toxicologists are concerned by exposure that occurs while development is still occurring, especially for critical organ systems (e.g. neural development continues until the mid-20s).

To establish a benchmark other than 5, SB 1541 requires the EQC "to establish standards and criteria for the benchmarks" and "to establish and consider the recommendations of a technical advisory committee". DEQ/OHA convened a Technical Advisory Committee (TAC) in October and December 2018 (See section on the TAC below).

Keith reviewed a graphic that demonstrated how an HI is calculated (See *Overview of Proposed Rulemaking*). An HI for a non-cancer human health effect is the summation of individual toxic impacts that that would affect the same organ systems. For example, if there are five air toxics that might result in cardiological impacts, the sum (or cumulative effects) of these five impacts is considered the HI. Impacts can be chronic and acute. Cumulative impacts to each organ system are considered separately. He noted that the concentration of chemicals in the air can be determined by either modeling or air monitoring; it is often done by modeling due to the expense of monitoring. The standard is to assume the combination of toxics is additive (i.e. toxic is equal to sum) as opposed to synergistic (toxicity is greater than sum of chemicals) or antagonistic (toxicity is less than sum). Adjustment factors for vulnerable populations, such as children and elderly, are built into the health protective level. The HI is additive within an organ system (i.e. a facility might have a neurological HI, a respiratory system HI etc.) and each organ system is evaluated individually.

SB 1541 set the current HI at 5 for existing facilities to take action to reduce air toxics emissions. Keith reviewed the Risk Action Level for existing facilities, noting that facilities having an HI of 5 must either get below this HI level OR install TBACT (Toxics Best Available Control Technology). He also noted that 1 is the standard accepted level at which toxicologists believe no health impacts are expected.

Keith reviewed the key provisions of SB 1541 that the CAO team must address for this rulemaking effort:

1. Identify the toxic air contaminants expected to have:
    a. developmental human health effects based on prenatal or postnatal exposure or;
    b. other severe human health effects.
2. Establish standards and criteria to adjust benchmarks.
3. Consider the input from a technical advisory committee.

The parameters for the rulemaking are that the rules must:

- Be consistent with statute;
- Be workable within recently adopted rules;
- Be workable within legislatively appropriated program resources (e.g. limited staff and funds to operate the program; while there is a lot of toxicological research that could be done, this takes a lot of time and resources not provided by the legislature);
- Be a timely rulemaking.

Keith noted that CAO is not looking at other changes to the existing rules; instead, the intent is to incorporate this rulemaking into what is already established. Additionally, a timely rulemaking is important to provide certainty to facilities, as they are already in the process of doing assessments.

DEQ has provided two options to illustrate possible rulemaking that they would like the RAC to discuss. These are not proposed rules; rather they are examples of how the rulemaking could be done.

Keith reviewed the next steps and timeline for the process:

1. After today's RAC meeting and discussion, DEQ will seek written input from all RAC members.
2. Fall 2019: a fiscal advisory committee will meet and provide feedback on the fiscal impact statement.
3. Fall/Winter 2019: Public comment period.
4. To be scheduled: Rules will be presented to the EQC for adoption by EQC (likely in early 2020).

Finally, Keith outlined the key questions for the RAC to consider during their discussion (see RAC Discussion below).

Grounding Information: Effort and Results of the Technical Advisory Committee
David Farrer, OHA, provided background information on the formation and efforts of the TAC. (See Technical Advisory Committee Background, a separate PowerPoint document). He was present for the formation of the TAC and attended all of their meetings. He noted that the TAC was a science-based committee, with all members having a required minimum amount of training and background. Five positions were directly recruited to ensure the committee had key technical expertise. These members included staff from EPA (IRIS), as well as individuals with clinical training in pediatrics and developmental toxicology, and a risk assessor from California's state program. At-large members applied to be on the committee and included representatives from the American Chemical Council and Delta Toxicology.

The overarching question presented to the TAC was: *"If you had to evaluate a list of chemicals for noncancer effects, and identify which ones have developmental or other severe health effects, how would you do this*?"

The TAC held two meetings in October and December 2018. David noted that while there was no consensus required, the TAC indicated some areas of majority of opinion, described below.

1. **Majority Opinion: Consider reproductive effects as developmental effects.** David explained that developmental issues happen with development of an embryo or fetus after fertilization, while reproductive issues concern all aspects of fertility. He noted that there was nearly unanimous opinion that developmental and reproductive effects should be considered as a group, not separately.

2. **Majority Opinion:** Use hazard, rather than dose, to identify toxic air contaminants with developmental or reproductive effects. Consider a toxic air contaminant to have developmental or reproductive effects even if it also causes other health effects at lower doses.

David reviewed examples with the group to demonstrate how this opinion would play out. The examples showed effects to target organs and development effects based on concentrations of chemicals. Chemicals causing any developmental effects, whether at a higher level or lower concentration level than effects observed on other organs, would be identified as a toxic developmental chemical.

David noted that fetal neurological development would be included in the development category. Using lead as an example, the neuro-developmental effect would be considered most sensitive. Additionally, if a chemical causes an asthma effect in a mother that causes a developmental effect in a fetus, this would be considered a developmental effect.

He noted that authoritative sources were relied upon to determine the hazard for developmental/reproductive impacts. If an effect is observed at any dose, then the majority opinion was that a developmental/reproductive hazard exists.

A RAC member asked what the legislative intent was behind the differentiation regarding developmental effects. Keith reported that the program did a formal review of legislative intent and they found nothing that would answer this question.

3. **Majority Opinion: No science-based process is available to determine which chemicals have "other severe human health effects"**

David noted that the TAC spent a lot of time considering what was meant by the word "severe." He noted that the word "severe" is subjective and is not used by scientists or scientific agencies. TAC members discussed ideas about what might be considered

"severe", including whether neurotoxicity might be important, or whether some organ systems could be given more weight than others. However, no one could identify an organ system that they felt was dispensable. In addition, there is a range of sensitivities within every population and some people will be more affected by a toxin than others (e.g. some people can die if they are stung by a bee, while others experience a very limited effect).

David also presented information on the CAO's (DEQ/OHA) target organ spreadsheet, developed as a tool to help identify which toxic air contaminants are expected to have developmental, reproductive, or other health effects. The spreadsheet relied upon authoritative sources identified in rule and the team's established 'inclusion criteria' for staff toxicologists to use to consistently review and verify the information. The TAC provided input on the inclusion criteria and spreadsheet. David noted that the spreadsheet included 51,000 pieces of information and took 800-1,000 hours of toxicologists' time to create. The end result is a spreadsheet that can be sorted to generate a list of contaminants by the target organs they affect.

David shared the results of the spreadsheet sorting:

- Of the 600 chemicals facilities are required to report on, only 261 have toxicity reference values (TRV) based on cancer and/or non-cancer effects.
- Within the group of 261 chemicals, 184 chemicals have TRVs for non-cancer effects.
- Within the group of 184, 141 chemicals are expected to have developmental or reproductive effects. 43 chemicals did not have developmental or reproductive effects - the question of how to define "other severe effects" would apply to these chemicals.

David noted that if RAC members would like to view more of the discussion, the TAC meeting minutes are available online. CAO staff will also be certain written comments they received from TAC members are available online.

What is DEQ Asking You to Consider

Sue MacMillan, DEQ Air Toxics Science and Policy Analyst and lead rule writer for this effort, walked the RAC through two options that DEQ provided as examples of possible rule options.

Sue confirmed there are both policy and science considerations for the rulemaking: There is no agreement on how to define "other severe human health effects"; and the legislative record does not provide any information regarding policy intent. She also noted it would be challenging to conduct additional research given limited time, financial resources, and lack of clarity on what should be researched. Consequently, CAO staff believe that a policy decision must be made regarding how to define/treat "other severe human health effects." She clarified that the options presented are not proposed rule options but rather they are examples of approaches that could be used to make this decision. She encouraged RAC members to suggest additional approaches.

Sue reviewed PowerPoint slides depicting the Options (See: *What is DEQ Asking You to Consider*).

- Option 1: All 184 toxic air contaminants with non-cancer effects are assigned an HI of 3.

- Option 2: Two different benchmarks would be used. The 141 chemicals expected to have developmental impacts would be assigned a benchmark HI of 3. The remaining 43 others not expected to have developmental impacts would remain at a benchmark HI of 5.

Sue noted Option 1 would be a more health-protective option, require less rule changes, and would provide a simple and straightforward process for risk calculations when compared to option 2. Some existing facilities might have to take actions that would otherwise not be required.

Sue noted the risk assessments for Option 2 would be more complex when a facility emits a mix of toxic air contaminants that are regulated at both an HI of 3 and an HI of 5. To calculate this risk, a DEQ risk assessor developed an exceedance ratio process to weight the two sets of chemicals. Sue noted that a TAC member also conceived of this formula independently. Option 2 is less health-protective than Option 1, and potentially fewer facilities would have to make investments in emission reductions.

- A RAC member noted the additivity of the ratio (i.e. the toxic values are equally weighted) and inquired as to whether there were any policy considerations for weighing different ratios such as 60/40. Sue noted that there has not been a specific policy discussion regarding the additivity.

- Other RAC members considered what the impacts might be for DEQ and industry regarding the calculations for Option 2: it was suggested that both the calculation method and communication with the public would likely take more time.

RAC members questioned how DEQ would assess risk from air toxics that are non-carcinogenic and would affect more than one target organ. Keith responded that DEQ will assess risk on a target organ basis. He noted that for each air toxic with a non-carcinogenic TRV, the standard is based on impact to an organ system. DEQ's current thinking is that it would assess risk based only on the target organ for which the TRV is generated. For example, if TRV is based on respiratory impacts, and the chemical is estimated to have cardiological effects at a higher level, DEQ would only assess TRV risk to the respiratory system. There are some chemicals, however, that have a single TRV that applies to more than one organ system. Therefore, in a case where a chemical has a TRV that applies to, for example, both the immunological and respiratory systems, the TRV would be used to calculate the facility HI risk to the

immunological system and the HI risk to the respiratory system.. Note, this does not mean there are multiple TRVs for one chemical; rather, there is only one TRV for each category of risk (i.e. cancer risk, chronic non-cancer risk, acute non-cancer risk, etc.) and the authoritative source indicates that the TRV is based on more than one organ system. David noted that, in practice, there are just a few chemicals that have TRVs that apply to more than one target organ or target organ system..

Keith noted that DEQ intends to revise its guidance document to clarify this current thinking and include an appendix that contains a simplified version of the target organ spreadsheet. This would include DEQ's method of assessment of noncancer risk, a list of the air toxics that have non-cancer impacts, and identify the primary target organ(s) for each chemical for which facilities need to assess risk. The revised guidance will be put out for public comment. He noted that DEQ tries to put out as much guidance as possible about how to assess risk, including examples of acceptable ways to conduct a risk assessment. He clarified that guidance does not have the force of rule.

David also informed the group that the rules require review of existing TRVs every three years, with updating as appropriate, to be certain that any new toxicological studies are considered. This also will include responsiveness to improvements in lab technology and medical knowledge.

RAC Discussion

Donna asked the RAC members to engage in a discussion focused on the questions posed by Keith during his initial presentation:

1. Are there any additional questions about the information and options presented today?
2. What are your thoughts about the options? What stands out? What is missing?
3. What are the important concepts and considerations that agencies should keep in mind?
4. Are there additional definitions of "severe" that the agencies should consider? If so, what suggestions do you have?
5. What else should DEQ and OHA consider?

RAC members sought to understand the historical precedence for this policy issue and whether there was a mandate from DEQ regarding the policy. Ali Mirzakhalili, DEQ Air Quality Administrator, shared that DEQ's mandate is to protect public health and the environment. DEQ is asking the RAC for input on factors to consider when striking a balance for that protection in regard to evaluation of noncancer risk from emissions from existing facilities. Anything above an HI of 1 is considered to have potential impacts to human health; while the benchmarks of HI 3 and HI5 are boundaries established by the Legislature. Input is needed on what should be done with the balance of 43 chemicals that do not have developmental or reproductive effects. Weight must be given to "other severe human health effects": but what does "severe" mean?

RAC members put forth the following considerations and suggestions *(note: the following were individual comments and should not be considered recommendations by the group)*:

Important (General) Concepts/Concerns:

- The policy choices are limited and the group cannot substitute anything beyond what is in the statute.
- A question was raised as to how DEQ defined "human health effects?"
    - DEQ staff noted that if a chemical has a TRV, there is health effect at some level; behavioral health is not directly considered a part of the human health as represented by TRVs. Another RAC member noted it was important to stay within the framework of the statutory charge and that the human health question has already been decided prior to this RAC meeting.
- A concern was raised about the process steps for rulemaking:
    - it was suggested that the standards and criteria should first be adopted by the EQC.
- This is about values and ethics (which were also discussed by the TAC); there is a mandate to do the most protective thing. The ethical thing would be to follow the precautionary principle: setting a standard at anything greater than an HI of 1 feels unethical.
- DEQ should reduce human health risk as much as possible. The HI is going to be based on best available science. We know the appropriate value is an HI of 1. So, how much risk are we allowing people to have? According to the SB, 3 times or or 5 times that amount. We already know certain chemicals are toxic; now we need to determine how much risk to allow.

Ideas/Input Regarding Options

- Ensure that the information is being used correctly when taking information into account for assessing an HI of 3
    - Use HI 3 for risks that are clearly developmental issues
- Each chemical should be considered individually. An HI of 3 should not be assigned just because we believe it is going to be more protective of human health; the statute allows chemicals to go down to an HI of 3, but there may be some chemicals that don't justify going down as low as HI 3.
- DEQ should do more analysis on each individual chemical.
- If the benchmark HI is dropped to 3 for all 184 chemicals, it would likely have significant impacts on the operations of existing facilities, especially in rural areas.
- Acknowledge the TAC recommendations; the TAC was using criteria and a process that would be inclusive.
- Hold existing facilities to the same noncancer Risk Action Levels as new facilities.
    - Support Option 1 as most health-protective.

- If chemicals were split into HI of 3 and 5, a company may shift to using an HI 5 chemical.
    - All need to be at an HI of 3 to prevent companies from circumventing the rules.
- Keep the HI at 5, except for where an extraordinary impact has been demonstrated and is not otherwise reflected in the TRV.

Ideas/Input regarding "Severe"

- Effects on the respiratory system should be considered "severe." Any chemicals with a TRV based on respiratory effects should be added to the list of chemicals assigned a benchmark HI of 3.
- TAC noted that no organ system was indispensable. All are connected.
    - "Severe" should be defined in a way that includes all systems.
- Any chemical that affects multiple systems.
- Assign a benchmark of HI3 to those chemicals that bioaccumulate in the environment.
- Dictionary definition: "Severe" is defined as anything that is bad, an adverse impact.
- Chemicals with debilitating effects should be considered "other severe", and assigned a benchmark of HI3.
- Only those chemicals that are well-known in the community to be severe ("significant and we know it") should be assigned a benchmark of HI3.
- If the chemical has a TRV, then it should be considered to have "severe" effects unless there's compelling evidence that the TRV is based on a transient, reversible health effect.
- Adverse effects on our most sensitive/vulnerable community members (elderly, children, individuals experiencing poverty) must be taken into account.
- Assign a benchmark of HI3 to any chemical that has both cancer and noncancer effects.
- Assign a benchmark of HI3 to any chemical that adversely affects the endocrine system.
- Assign a benchmark of HI3 to any chemical that has extraordinary effects that are not otherwise addressed via available toxicity information.
- Do more research on the literature regarding "severe effects" from toxic air contaminants.

Public Comments

Donna invited members of the public in attendance to provide comments:

Greg Sotir spoke on behalf of the Cully Air Action Team (CAAT). He noted that the Cully neighborhood is a nexus point for different sources of pollution from rail lines, the National Guard, I-205, Portland International Airport, Columbia Avenue and industrial polluters. CAAT is very diverse and includes neighbors who grow their food at home, growing families, elderly residents, and home businesses.

He advocated that the concept of "severe" should comprise any negative individual health effects as well as additive effects. Additionally, he would characterize any acute/chronic exposure as "severe." He supports Option 1, as it is the most protective measure and he feels the state should protect human health as much as possible.

Morgan Gratz-Weiser provided public comments as the Legislative Director for the Oregon Environmental Council (OEC). The OEC believes it is critical to use the most protective standard possible. She noted that Oregonians don't have a choice of what air to breath. She raised the concern that different standards could lead industry to swap out chemicals.

RAC Roundtable
RAC members shared their observations regarding the information presented and the day's discussion.

Wrap Up and Next Steps.
Donna thanked the group for their input and open discussion. Keith acknowledged and thanked RAC members and CAO staff. He also welcomed additional questions from RAC members and noted that the RAC has an opportunity to provide input in writing. He asked that written comments be provided to Sue Macmillan by 7/29/2019.

With that, the meeting was adjourned.

This summary is respectfully submitted by impartial facilitation team from DS Consulting. Suggested edits are welcome and may be sent to Nancy Pionk (nancy@dsconsult.co)

Attachment 1

Cleaner Air Oregon Rulemaking Advisory Committee Members in Attendance for all or part of 7/10/19 Rulemaking Advisory Committee Meeting	
Steven Anderson	City of Salem Neighborhood Associations
Jessica Applegate	Eastside Portland Air Coalition
Lisa Arkin	Executive Director, Beyond Toxics
Lee Fortier	Dry Creek Landfill, Inc.
Linda George	Professor of Environmental Science, PSU
Scott Henriksen	East Side Plating
Christine Kendrick	Air Quality Lead/Smart Cities Coordinator, City of Portland
Paul Lewis	Tri-county Health Officer (Clackamas, Multnomah and Washington)
Patrick Luedtke	Chief Medical Officer, Community Health Centers of Lane County
Sharla Moffett	Director, Energy, Environment, Natural Resources, and Infrastructures at Oregon Business & Industry
Huy Ong	Executive Director, OPAL Environmental Justice
Mary Peveto	President, Neighbors for Clean Air
Ellen Porter	LMI Environmental, LLC
Mark Riskedahl	Executive Director, Northwest Environmental Defense Center
Diana Rohlman	Oregon Public Health Association
Laura Seyler	International Paper Springfield Mill, LRAPA Citizens Advisory Committee
Kathryn VanNatta	Northwest Pulp and Paper Association
Thomas Wood	Co-Chair Air and Energy Committee, Oregon Business & Industry