

SUMMARY OF COMMENTS AND AGENCY DECISIONS

Title: Protection from Wildfire Smoke – OAR 437-002-1081 and OAR 437-004-9791

Department of Consumer & Business Services
Oregon Occupational Safety & Health Division

Administrative Order Number: 4-2022

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Effective Date: July 1, 2022

1. Executive Summary

Oregon OSHA is adopting these rules to address worker exposure to unhealthy and hazardous levels of the primary air contaminant of concern in wildfire smoke, fine particulate matter (PM_{2.5}). While significant exposures to wildfire smoke can be unhealthy for anyone, workers with pre-existing health conditions such as asthma, chronic obstructive pulmonary disease (COPD), or heart disease are at increased risk of serious or fatal health effects when exposed to high levels of PM_{2.5} in wildfire smoke. The Oregon Department of Environmental Quality (DEQ) released a report in July 2021 “Wildfire Smoke Trends and the Air Quality Index”¹ documenting that Oregon’s air quality in 2020 was the worst on record. Additionally, the report states that, “large wildfires have been increasing across the western United States in the last decade and are expected to become more frequent, according to the National Interagency Fire Center.” Therefore, these rules, one for general industry (Division 2) and one for agricultural activities (Division 4), are needed to help protect workers from the hazards of PM_{2.5} stemming from major wildfire events, which are projected to increase in frequency and duration as well as increase the number of “unhealthy air quality days” in affected areas of Oregon.

On March 10, 2020, Governor Brown issued Executive Order (EO) 20-04² that directed certain state agencies to, among other things, mitigate the impacts of climate change. EO 20-04 included a directive to the Oregon Health Authority (OHA) and Oregon OSHA to jointly develop a proposal for rules to protect employees from workplace exposures to excessive heat and wildfire smoke. In response to EO 20-04, Oregon OSHA, in collaboration with OHA, a rulemaking advisory committee, and stakeholders, developed these rules to protect employees from the potentially detrimental health effects from exposure to unhealthy and hazardous levels of wildfire smoke. Due to concerns of possible worker exposure to wildfire smoke during the later portion of Oregon’s 2021 wildfire season, on August 3, 2021, Oregon OSHA adopted OAR 437-002-1080 and 437-004-9790, Temporary Rules to Address Employee Exposures to Wildfire Smoke (Administrative Order 9-2021). Both rules were in effect from August 9, 2021, through February 4, 2022. With the temporary rules in place, Oregon OSHA continued to

develop the permanent rules to further provide employers with clear direction on how to protect their workers from unhealthy wildfire emissions during work activities, including how to provide appropriate respiratory protection.

These rules apply to all workers in Oregon covered under the Oregon Safe Employment Act (OSEA). OAR 437-004-9791 applies to employers covered under Division 4 (Agriculture), while OAR 437-002-1081 applies to work activities covered under Division 2 (General Industry). As worker exposure to hazardous air quality conditions from wildfire emissions is not limited to a specific industry, work activities covered under Division 3 (Construction) and Division 7 (Forest Activities) would also be required to comply with OAR 437-002-1081, per additional applicability requirements under OAR 437-003-0005 and OAR 437-007-0004, respectively.

2. Application of Statutory Requirements

This rulemaking falls within Oregon OSHA's statutory authority, and Oregon OSHA has fulfilled all its related obligations under the OSEA and the Administrative Procedures Act.

Summary of Oregon OSHA's Statutory Authority and Obligations under the OSEA:

The purpose of the OSEA and of all rules adopted under that law is found in ORS 654.003, which describes the law's general purpose as

... to assure as far as possible safe and healthful working conditions for every working person in Oregon, to preserve our human resources and to reduce the substantial burden, in terms of lost production, wage loss, medical expenses, disability compensation payments and human suffering, that is created by occupational injury and disease.

In discussing that purpose, ORS 654.003(3) states that one of the Legislative Assembly's intents is to "Authorize the Director of the Department of Consumer and Business Services and the designees of the director to set reasonable, mandatory, occupational safety and health standards for all employments and places of employment."³

This general statement about rulemaking is further amplified by ORS 654.035(1), which indicates that the director may

(a) Declare and prescribe what devices, safeguards or other means of protection and what methods, processes or work practices are well adapted to render every employment and place of employment safe and healthful.

(b) Fix reasonable standards and prescribe and enforce reasonable orders for the adoption, installation, use and maintenance of devices, safeguards and other means of protection, and of methods, processes and work practices, including, but not limited to, work practices qualifications for equipment, materials and

activities requiring special competence, to be as nearly uniform as possible, as may be necessary to carry out all laws relative to the protection of the life, safety and health of employees.

(c) Fix and order reasonable standards for the construction, repair and maintenance of places of employment and equipment that will render them safe and healthful.

(d)

(e) Require the performance of any other act that the protection of the life, safety and health of employees in employments and places of employment may demand.

The current rule explicitly addresses “safe and healthful working conditions” in Oregon, and it represents Oregon OSHA’s determination of appropriate “safeguards or other means of protection...well adapted to render...safe and healthful” the affected workplaces.

The OSEA also provides for consultation with stakeholder advisers to assist “in establishing standards of safety and health,” indicating that Oregon OSHA “may adopt and incorporate in its regulations, rules and standards such safety and health recommendations as it may receive from such advisers.”⁴

3. Summary of Oregon Administrative Procedures Act (APA) Requirements:

The rulemaking provisions of the Oregon Administrative Procedures Act⁵ include a number of provisions related to public notice and comment periods, explaining the circumstances where the agency can take immediate action or where the agency can dispense with the need for public hearings. In relation to the current rulemaking, those latter exceptions to public hearing requirements do not apply and the agency has not suggested otherwise.

The law both encourages and, in some respects, requires that affected stakeholders be involved in the development of proposed rules⁶ – the current proposal is the product of an almost year-long process of discussion with stakeholders to explore the issues involved. The law requires that notice be given when a proposal is made⁷ and Oregon OSHA gave such notice.⁸ The law requires that a set of specific elements be included in the notice⁹ particularly in relation to the anticipated fiscal impact of the proposal.¹⁰ The law does not require a discussion of the merits of the rule – beyond the initial Statement of Need filed with the original proposal – nor does it require a written response to the public comments provided in writing or in public testimony. Finally, the law does not require an evidentiary record nor a written explanation of the decision made.¹¹ However, as has been its practice in the past, Oregon OSHA has provided such an explanation and discussion of the available evidence in the form of this document.

The law does include a policy statement that state agencies shall seek to retain and promote the unique identity of Oregon by considering local conditions when adopting rules, while at the same time promoting a policy “that agencies attempt to adopt rules that correspond with equivalent federal laws and rules.”¹² As this document’s discussion of the rule as adopted reflects, the present rulemaking provides exactly the sort of balance between deference to federal requirements and consideration of “local or special conditions” envisioned by the statute. As noted above, there is no federal law that protects employees from exposure to excessive heat.

Finally, the law prescribes the manner in which notice of the rulemaking decision will be made,¹³ and Oregon OSHA has complied with those requirements as part of the rule adoption filing.

4. History of the Current Rulemaking

Shortly after EO 20-04 was issued, Governor Kate Brown issued a State of Emergency in Oregon related to the global COVID-19 pandemic. The pandemic delayed the start of the rulemaking activity until March 2021. Oregon OSHA convened nine virtual rules advisory committee (RAC) meetings. The RAC for Wildfire Smoke included more than 100 stakeholders representing labor and business interests in addition to representatives from OHA. Over the course of several months, Oregon OSHA shared multiple rule drafts and conducted a fiscal impact survey to assess the estimated financial impact of the proposed rules. Throughout this process, including the fiscal impact analysis, Oregon OSHA sought and solicited feedback from RAC members. In addition, Oregon OSHA hosted four virtual listening sessions, with Spanish translators, in May and September 2021, which provided additional opportunities for stakeholders to share their experiences about the hazards and challenges posed by wildfire smoke as it relates to workplace exposures, including the impact of the temporary wildfire smoke rules.

In January 2022, Oregon OSHA proposed permanent rules to replace its temporary wildfire smoke rules. Oregon OSHA held three virtual hearings (including one in Spanish) in March 2022 to solicit public comment on the proposed rules. Additionally, stakeholders were provided the ability to submit public comments by mail, email, or by recorded voicemail message. The public comment period for these rulemakings closed on March 18, 2022.

Oregon OSHA’s public comment record includes a number of “form letters” and other template communiques of various types. In evaluating the proposed rules, Oregon OSHA considered all public comments and have evaluated potential costs, and has determined that while the costs of complying with the rules will likely increase certain costs for many employers, those projected costs assessed in Oregon OSHA’s fiscal impact analysis and provided by the RAC were determined to be manageable. In considering the record in its totality, and having evaluated the arguments made by all

the commenters in the extensive rulemaking record, Oregon OSHA is ultimately persuaded that the rules are both reasonable and practical. The scope of the rulemaking decisions being made by Oregon OSHA in these instances is limited in at least three important ways:

- Oregon OSHA's expertise and rulemaking authority is limited by its worker protection mission – the Oregon Safe Employment Act provides a broad, but not unlimited, mandate;
- Oregon OSHA's rulemaking authority is limited by its specific ability to regulate safe and healthy work practices – not to prohibit certain types of work; and
- Oregon OSHA's decision on the present rules are limited by the public notice requirements of the Administrative Procedures Act, which restricts an agency's ability to adopt additional rule requirements which do not fall within the general notice parameters of either rule as it was originally proposed, including the fiscal analysis.

Oregon OSHA endeavors to make its decisions with as complete an understanding of the available information, including research, related to the subjects at hand. Oregon OSHA does recognize that science itself will generally not dictate the need for policy decisions, and the answers to certain questions may at times be either unclear or unavailable. Nonetheless, policy decisions should be informed by the available science and made in a manner that reflects an understanding of the science involved. The present rulemakings are firmly rooted in such an understanding of the relevant science as it relates to workers' safety and health.

5. Description of Changes to the Proposed Rules as Adopted

The adopted rules apply to all workers in Oregon covered under the Oregon Safe Employment Act (OSEAct). OAR 437-004-9791 applies to employers covered under Division 4 (Agriculture), while OAR 437-002-1081 applies to work activities covered under Division 2 (General Industry). As worker exposure to hazardous wildfire emissions is not limited to a specific industry, work activities covered under Division 3 (Construction) and Division 7 (Forest Activities) would also be required to comply with OAR 437-002-1081, per additional applicability requirements under OAR 437-003-0005 and OAR 437-007-0004, respectively.

OAR 437-002-1081 and OAR 437-004-9791 (Protection from Wildfire Smoke), are adopted and consistent with the rules as proposed in its overall approach and with regard to most specific elements, which are summarized below:

- Like the proposed rules, section (1), scope and application, is unchanged.
- Like the proposed rules, subsection (1)(a), full exemptions, is largely unchanged.
- Like the proposed rules, subsection (1)(b), partial exemptions, is largely unchanged.

- Like the proposed rules, section (2), definitions, is largely unchanged. However, the definitions of “feasibility” and “greater hazard” to define employer responsibilities to implement communication and exposure control requirements were removed. The requirements containing these terms were changed with more clarifying language.
- Like the proposed rules, section (3), exposure assessment, is largely unchanged. However, language was added to better clarify when monitoring is needed and its purpose.
- Like the proposed rules, section (4), information and training, is largely unchanged. However, language was added to clarify who must receive training. Also, the note indicating that Oregon OSHA makes available online wildfire smoke training was removed. However, the agency will continue to make such online training available in English and Spanish.
- Like the proposed rules, section (5), training documentation, is largely unchanged. However, language was added to clarify whose training must be documented, along with a note that clarifies that the documentation may be maintained in an electronic database provided that the required information is retained in the database. Language was also added limiting the retention of the documentation to one year.
- Like the proposed rules, section (6), employer two-way communication, is largely unchanged. However, language was added to better clarify the type of information to communicate. A note was also added that explains that the employer’s emergency medical plan or medical services provisions to comply with OAR 437-002-0161(4), 29 CFR 1926.50, OAR 437-007-0220, or OAR 437-004-1305(4) must address the types of medical situations that employees could encounter, including those conditions relating to wildfire smoke exposure.
- Like the proposed rules, section (7), exposure controls, is largely unchanged. However, the following changes were made for clarification:
 - Subsection (7)(a), engineering and administrative controls, the word “feasible,” as was defined in section (2), definitions, and removed in the adopted rules, was replaced with language of when such control methods would not be required.
 - Subsection (7)(b), voluntary use of filtering facepiece respirators, the words “greater hazard,” as was defined in section (2), definitions, and removed in the adopted rules, were replaced with language to clarify when not to wear filtering facepiece respirators due to how its use would expose the wearer to a substantially more serious injury or illness than the potential acute health effects of wildfire smoke exposure. Notes were added to each standard that indicates the voluntary use of NIOSH-approved filtering facepiece respirators is not subject to the requirements under the applicable Respiratory Protection Standard – 29 CFR 1910.134 or OAR 437-004-1041. A note was added recommending that employer

- supplies of NIOSH-approved filtering facepiece respirators for voluntary use should include an adequate size selection for exposed employees.
- Subsection (7)(c), required use of filtering facepiece respirators in accordance with a Wildfire Smoke Respiratory Protection Program, the words “greater hazard,” as was defined in section (2), definitions, and removed in the adopted rules, was replaced with language to clarify when not to wear filtering facepiece respirators due to how its use would expose the wearer to a substantially more serious injury or illness than the potential acute health effects of wildfire smoke exposure. Reference to the Division 4 Respiratory Protection Standard, OAR 437-004-1041, was added to the 437-004-9791 standard.
 - Subsection (7)(d), required use of respirators in accordance with the Respiratory Protection Standard – 29 CFR 1910.134, or OAR 437-004-1041 for employers covered under Division 4, the words “greater hazard,” as was defined in section (2), definitions, and removed in the adopted rules, was replaced with language to clarify when not to wear filtering facepiece respirators due to how its use would expose the wearer to a substantially more serious injury or illness than the potential acute health effects of wildfire smoke exposure. Reference to the Division 4 Respiratory Protection Standard, OAR 437-004-1041, was added to the OAR 437-004-9791 standard.
 - Like the proposed rules, Appendix A, Mandatory Workplace Guidance for the use of filtering facepiece respirators to address wildfire smoke, is largely unchanged. However, the note that allowed KN95 masks to be used to substitute for NIOSH-approved filtering facepiece respirators for exposures under $500.4 \mu\text{g}/\text{m}^3$ (AQI 500) when such respirators are unavailable, was removed. Reference to the Division 4 Respiratory Protection Standard, OAR 437-004-1041, was added to the OAR 437-004-9791 standard. A note was added recommending that employer supplies of NIOSH-approved filtering facepiece respirators for required use under this standard, should include an adequate size selection for exposed employees.
 - Like the proposed rules, Appendix B, Information for Wildfire Smoke Protection, is largely unchanged. However, a note was added to explain the applicability of the EPA AQI, and a reference to the Division 4, Respiratory Protection Standard, OAR 437-004-1041, was added to the OAR 437-004-9791 standard.

6. Summary of Comments and Agency Decisions

Oregon OSHA received approximately 286 comments on the proposed wildfire smoke rules. Approximately 120 comments are opposed to the rules in some form, while approximately 160 comments are generally in support of the rules in some form with some modifications. However, the rule adoption process is not a tally of comments in favor vs. opposed, but rather about the merits of the comments.

6.1 Section (1), scope and application

Some comments received suggested that wildfire smoke is an environmental hazard and not an occupational hazard, and as such, Oregon OSHA does not have the regulatory authority to regulate employee exposures to wildfire smoke.

Hazards need not be human or workplace-caused in origin to be covered by OSEA. Environmental hazards are addressed in a number of Oregon OSHA rules including, but not limited to, wind speed affecting the safe operation of cranes and danger trees associated with forest activities. While wildfire smoke is typically generated from the burning of trees and other ignitable foliage, its primary toxicant of concern, PM2.5, is a well-established human health hazard. Other toxicants which can be contained in wildfire smoke are not addressed in these standards. Smoke emissions from large scale wildfire events can significantly impact exposed workers. PM2.5 is an occupational hazard to exposed workers, whether it is antropogenic or environmental (e.g. via lightning strikes) in cause or origin. Therefore, PM2.5 exposures in the workplace is a hazard that can be addressed by Oregon OSHA under the authority provided by the OSEA.

Some comments received recommended expanding the scope of rules to either include ozone or smoke from controlled burns.

The adopted rules are triggered when employees *are or will be* exposed to PM2.5 at 35.5 µg/m³ that primarily comes from wildfires. This standard does not address other air contaminants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide. The adopted rules do not address PM2.5 from controlled burns.

Some comments received recommended adding the anti-retaliation protections language of the Oregon Safe Employment Act.

Since anti-retaliation protection of the OSEA is applicable to all Oregon OSHA workplace safety and health rules, the reference was not specifically included. Supplemental materials will include the information about anti-retaliation protections.

Some comments received recommend providing employers the flexibility to implement their own wildfire smoke protections rather than prescribing a one-size-fits-all approach to the diverse businesses in Oregon.

The adopted rules provide employers the minimum requirements to protect employees from exposures to PM2.5 wildfire smoke. The rules provide employers several means and methods to determine the air quality in their geographical area or specific work location, and the different exposure control measures to reduce exposures. Communication and training are key elements in many effective safety and health practices, and are necessary to help workers better understand the hazards they will be exposed to and how they can protect themselves.

Some comments recommended aligning Oregon OSHA's rules with Cal-OSHA wildfire smoke rule.

The temporary rules and permanent rules used Cal-OSHA's Protection from Wildfire Smoke standard (5141.1) as the starting point, as recommended by stakeholders, to build consistency with neighboring states for employers and employees who also work in California. However, subsequent rule advisory committee meetings lead

Oregon OSHA to develop more protective rules for workers in Oregon, while keeping in place many of the same requirements and exemptions as California's rule. While the scope of California's rule specifies an AQI of 151 and above, the scopes of Oregon OSHA's adopted rules specifies an AQI of 101 and above. Both state's rules only address PM2.5, regardless of the AQI for other pollutants. Both state's rules also share similar full exemptions for enclosed building and vehicles with mechanical filtration; however, Oregon's full exemptions also specify employees working at home and employers who have predetermined not to expose employees to wildfire smoke levels at or above AQI 101. Oregon's rules only provide partial exemption for wildland firefighting, emergency operations and employee exposure of less than 15 minutes in an hour at or above AQI 101 for a total exposure of less than one hour in a single 24-hour period. These partial exemptions only require employers to provide NIOSH-approved filtering facepiece respirators for voluntary use at AQI 101 and above, and employee training. California's and Oregon's rules share many similar requirements such as establishing and implementing a communication system to provide employees information such as air quality, protective measures available, and encourages employees to inform the employer of worsening air quality and any adverse symptoms that may be the result of wildfire smoke exposure such as asthma attacks, difficulty breathing, and chest pain. The adopted rules also retain Cal-OSHA's rule requirement to provide employees information and training on protection from wildfire smoke. However, while Cal-OSHA's triggers exposure control measures such as engineering, administrative, and voluntary use of NIOSH-approved filtering facepiece respirators at AQI 151, Oregon OSHA's adopted rules triggers the same control measures at AQI 101. Also, while Cal-OSHA's rule requirement for mandatory use of NIOSH-approved respirators is triggered where the current AQI exceeds 500, Oregon OSHA's rules for mandatory use is triggered at AQI 251. Both state's rules require a full respiratory protection program when the current AQI exceeds 500. However, it is worth noting, that Cal-OSHA has indicated they are considering reducing their trigger for required respirator use to AQI 301.

Subsection (1)(a), scope and application (full exemptions):

Some comments recommended not including buildings with negative pressure since they draw in smoke, or add an acceptable indoor PM2.5 concentration range for air filtration system.

The adopted rules include a full exemption for enclosed buildings and structures that does not specify a filtration performance requirement for the mechanical ventilation required, or excludes buildings with negative pressure. Doing so would effectively require all indoor workplaces to monitor indoor air quality and possibly implement engineering controls to maintain ambient air concentration levels for PM2.5 below 35.5 $\mu\text{g}/\text{m}^3$ (AQI 101) to mitigate wildfire smoke episodes that are typically short duration. The exemption does not apply to building and structures where portable mechanical ventilation equipment are solely used to filter indoor air. Such portable air purifying equipped with HEPA filters would be considered an engineering control.

Subsection (1)(b), scope and application (partial exemptions):

Some comments received recommended including firefighting of cultivated land and rangeland in the exemption, or clarify that the intent between 1(b)(A) and 1(b)(B) is to cover all firefighting activities which may cross between rangeland, wildland, and cultivated lands.

The partial exemption for wildland firefighting in the adopted rules does not include firefighting activities conducted solely on cultivated land. Firefighting activities of a fire that includes both wildland and cultivated land would be covered under the partial exemption. Unplanned rangeland fires would also be covered under the partial exemption.

A comment received recommended not limiting the partial exemption that allows intermittent exposures of less than 15 minutes in an hour for a total exposure of less than one hour in a single 24-hour period, but rather also allow a single hour of exposure within a 24-hour period to provide employers more flexibility without increasing risk factors for exposed employees.

During the Rule Advisory Committee (RAC) meetings, the exemption for intermittent exposures was discussed that included concerns regarding the length of a single exposure when the exemption did not include an upper PM2.5 exposure level limit. Long exposures to high concentrations levels of PM2.5 can overwhelm respiratory clearance mechanisms. To address this concern, the less than one-hour exposure in a single 24-hour period was limited to less than 15 minutes in an hour to allow employees respiratory system to better recover. Increasing the 15-minute exposure time to a single 1-hour exposure would increase the potential for employees to experience negative health effects when there is no limit on the concentration of wildfire smoke. Establishing such a limit would effectively require all employers in the state (outdoor and indoor) to follow the entire standard, even during very short and often unpredictable periods of time. In addition, also factored into the decision not to include an upper PM2.5 limit was that the ability of an employer to eliminate or postpone every short-term duration task during higher PM2.5 concentration levels may not be functionally possible. For example, brief exposures walking between mechanically ventilated buildings, or walking to and from vehicles.

6.2 Section (2), definitions:

A number of comments received recommended clarifying or removing the word feasible, or amending its definition to addresses financial feasibility.

Oregon OSHA received comments expressing concern with the definition of “feasibility.” Oregon OSHA already evaluates whether something is feasible on a case-by-case basis. In response, Oregon OSHA has removed the definition of “feasibility” and the word from the rules as it is unnecessary. Additional details were added to the circumstances that utilized the word “feasibility” to provide more clarifying details as to what is expected.

A comment received stated that the definition of PM2.5 in the context of the proposed rules are overbroad, and that requirements are triggered by an AQI of 101 for PM2.5 which includes wildfire smoke particulates. However, the definition of PM2.5 makes no mention of including wildfire smoke.

The scope of the adopted rules clearly specifies that the PM2.5 being addressed is from wildfire smoke. Employers concerned with differentiating workplace smoke conditions between wildfire smoke versus non-wildfire smoke, can generally expect smoke conditions with an ambient air concentration level for PM2.5 at or above 35.5 $\mu\text{g}/\text{m}^3$ (AQI 101) during wildfire season is primarily from wildfires. According to the study "*Mortality associated with wildfire smoke exposure in Washington state, 2006–2017: a case-crossover study*,"¹⁴ wildfire smoke days were defined as all days with assigned monitor concentration above a PM2.5 value of 20.4 $\mu\text{g}/\text{m}^3$ (approximately an AQI value of 69). Oregon OSHA's discussions with air quality experts with the Oregon Department of Environmental Quality (DEQ) indicated that Oregon and Washington have generally similar air quality conditions, and it is Oregon OSHA's and Oregon DEQ's perspective that during wildfire season, air quality levels that trigger the lowest requirement in the standard (at or above AQI 101 for PM2.5), will be comprised of PM2.5 primarily from wildfire smoke.

6.3 Section (3), exposure assessment:

A comment was received that indicated that monitoring exposure at the start of each shift and as needed does not work for many businesses that do not have typical shifts, such as on call emergency service and repair employees, or when employees are deployed from home. They also indicated that "as needed" is so vague as to be useless as a reasonable effort defense.

Employers with employees on call who would likely be exposed to wildfire smoke would need to notify employees of the air quality at their work location that would necessitate an increase or decrease in the level of exposure controls

A couple of comments received indicated that the types of monitoring systems listed in the proposed rules will not provide the kind of accurate data employers will need in order to make appropriate decisions on needed work-related communications, or actions required by the proposed OR-OSHA rules.

As the adopted rules note, occupational wildfire smoke exposures can occur in particularly dynamic situations. The rules address these concerns by allowing employers to use direct monitoring devices or use the 5-3-1 Visibility Index to determine the actual or estimated PM2.5 ambient air concentration or AQI value to communicate the appropriate exposure controls instead of relying on AQI measuring station data or a direct monitoring device. The four monitoring options provide for flexibility for the various work environments that both employers and employees can face. The 5-3-1 Visibility Index¹⁵ is a recognized estimation tool when other methods of air quality monitoring are not available or reliable for the conditions at a given location.

A comment received indicated that the proposed rules require employers to monitor exposure to wildfire smoke, but uses the AQI metric for PM_{2.5} as the trigger for various requirements. Employers have no means of determining if wildfire smoke particulates are present in the PM_{2.5} AQI at a given worksite.

As stated in response to the second comment above under 6.2 Section (2), definitions, employers concerned with differentiating workplace smoke conditions between wildfire smoke versus non-wildfire smoke, can generally expect smoke conditions with an ambient air concentration level for PM_{2.5} at or above 35.5 µg/m³ (AQI 101) during wildfire season is primarily from wildfires.

A comment received recommended that rules should not utilize a metric for triggering regulatory requirements, literally on a minute-by-minute basis, when the creator of that metric has indicated that it is not valid even on an hourly basis.

The adopted rules clarify that the current *average* and forecasted AQI value for PM_{2.5} is to be checked. An explanatory note was added to Appendix B, Information for Wildfire Smoke Protection, Table 1: *“The AQI, as used in this standard, is a recognized proxy to identify worker exposure to PM_{2.5} for which traditional occupational exposure limits have not been established. The EPA AQI risk category labels were specifically developed to advise the public of the community health risk levels associated for air quality conditions in a general population setting. The AQI calculation allows for a measurement that is easily accessible to both employers and employees.”*

6.4 Section (4), information and training:

A comment was received to change the information and training to reflect the same training requirements found in the proposed Heat Illness Prevention rules.

The adopted rules were changed to clarify who must receive training.

A comment received recommended that Oregon OSHA should develop wildfire smoke training material and make it available at no charge (with certification) online, and that employees should be required to view as often as the rules mandate, on their own time. If the state only provides the training in English and Spanish, then private employers should not be required to supply this training in any other languages.

Once available, Oregon OSHA will provide a free Wildfire Smoke Online Course in English and Spanish and free materials employers can use for training elements under subsections (4)(a) through (4)(e), similar to the training course provided for the 2021 temporary rules, to augment in-house employer training. However, employers must still provide workplace-specific information and (4)(f) through (4)(j). The Oregon OSHA online training provides a Certificate of Completion that is emailed to the attendee’s designated email address if they go through the registration process. As with all training required by Oregon OSHA’s workplace

safety and health rules, employees must be compensated for their time, following applicable Oregon Bureau of Labor & Industries (BOLI) Wage and Hours laws.

A comment received suggested that the rules could be further strengthened by including provisions for workers with documented underlying conditions. For these workers, no exposure above 101 would be acceptable. This would be consistent with the concept of “reasonable accommodation” for workers with certain documented disabilities.

The adopted rules do not require employers to request employee medical information of underlying conditions that could be exacerbated by wildfire smoke exposure. If an employer has documentation of an employee with a disability, they would still need to comply with any applicable and reasonable accommodation requirement under the Americans with Disabilities Act (ADA). An employee with a pre-existing illness covered under ADA should discuss reasonable accommodations with their employer, or if not covered under ADA, discuss appropriate measures to prevent a significant aggravation of the pre-existing illness that would result in a work-related illness per OAR 437-001-0700(6). The adopted rules do require that filtering facepiece respirators are to be provided when the ambient air concentration for PM_{2.5} is at or above 35.5 µg/m³ (AQI 101), and coupled with training requirements to inform employees of the health risks associated with exposure to wildfire smoke, employees would have the elements necessary to protect themselves from wildfire smoke when they have underlying conditions.

6.5 Section (5), training documentation:

A comment received requested that training be documented for individuals via a web-based training platform.

The adopted rules allow employers to maintain training documentation in an electronic database provided that the required information in section (5) of this standard is retained in the database.

6.6 Section (6), employer two-way communication:

A number of comments received recommended adding a rule that requires a written emergency medical plan or a smoke illness prevention plan for wildfire smoke exposures.

The adopted rules do not include a requirement for a written emergency medical plan. However, a note was added to the adopted rules to clarify that medical plan or medical services provisions to comply with OAR 437-002-0161(4), 29 CFR 1926.50, OAR 437-007-0220, or OAR 437-004-1305(4) must address the types of medical situations that employees could encounter, including those conditions relating to wildfire smoke exposure. Requiring additional medical plan elements was not within the fiscal analysis completed at time of proposal, and therefore, can not be adopted without reproposing the rules which will not provide protections for employees before the 2022 wildfire season.

6.7 Subsection (7)(a), engineering and administrative controls:

A few comments received recommended including a mandatory work/rest schedules to reduce workers' PM2.5 exposure and the associated health risks.

The adopted rules do not include a requirement for a work/rest schedule to reduce employee exposure to wildfire smoke. Outdoor work activities that the employer can demonstrate that administrative controls to reduce employee exposure to wildfire smoke would be functionally impossible to implement would require the employer to provide filtering facepiece respirators for voluntary or required use, depending on current air quality conditions. Such respirator use would likely need to continue during break periods at the discretion of the worker. In addition, requiring work/rest schedule was not within the fiscal analysis completed at time of proposal, and therefore, can not be adopted without reproposing the rules which will not provide protections for employees before the 2022 wildfire season.

A couple of comments received recommended adding a requirement to provide preventative "clean air" breaks to workers who are having trouble breathing or who are feeling congested in heavy smoke, even when they have masks.

The adopted rules do not include preventative "clean air" breaks. Employees experiencing difficulty breathing should notify their supervisor who must then follow established procedures included in their training for when an employee reports or exhibits health symptoms that necessitate immediate medical attention such as, but not limited to, asthma attacks, difficulty breathing, and chest pain, per subsection (4)(h) of the rules. Requiring "clean air" breaks was not within the fiscal analysis completed at time of proposal, and therefore, can not be adopted without reproposing the rules which will not provide protections for employees before the 2022 wildfire season.

Subsection (7)(b), voluntary use of filtering facepiece respirators:

A comment received indicated that sometimes wearing a mask makes it more difficult to breathe in the heat while also wearing layers of clothing, especially for work activities associated with heavy exertion.

The adopted rules require employers to have an adequate supply of filtering facepiece respirators available for exposed employees, for voluntary use, when the ambient air concentration level for PM2.5 at or above 35.5 $\mu\text{g}/\text{m}^3$ (AQI 101). Employees may use them at their own discretion for protection from wildfire smoke when air quality conditions are below 200.9 $\mu\text{g}/\text{m}^3$ for PM2.5 (AQI 251). The AQI 101-250 range for voluntary use takes into consideration the possibility that employees exposed to wildfire smoke will also be exposed to a heat index of 80 degrees Fahrenheit or more. When employees are exposed to both smoke and heat hazards, their wildfire smoke training will provide them with the information

necessary to make the appropriate decision for voluntary use based on their personal health needs.

A couple of comments received recommended that provisions should be added for employers to make filtering facepiece respirators available in a variety of styles, shapes, and sizes so that all employees can achieve a proper facial fit and seal.

While the adopted rules do not require a size selection of NIOSH-approved filtering facepiece respirators, notes recommending that such respirator supplies for voluntary and required use were added in subsection (7)(b) and Appendix A.

Subsection (7)(c), required use of filtering facepiece respirators in accordance with a Wildfire Smoke Respiratory Protection Program:

Several comments received recommended that the rule's action levels for AQI should be consistent with other states on the West Coast.

California requires voluntary use of respiratory protection at AQI 151, and required use at AQI 501. WA LNI's 2021 temporary rule for wildfire smoke protection required voluntary use at AQI 151, and had no requirement for mandatory use. While Oregon OSHA initial rulemaking used Cal-OSHA's wildfire smoke rule as the beginning framework, after receiving such recommendations from some stakeholders, during the rulemaking process, subsequent comments from stakeholders to provide more protection for workers steered the thresholds in the adopted rules to: PM_{2.5} at or above 35.5 µg/m³ (AQI 101) for voluntary use, PM_{2.5} at or above 200.9 µg/m³ (AQI 251) for mandatory without medical evaluation and fit testing, and PM_{2.5} at or above 500.4 µg/m³ (AQI 501) for mandatory use under the Respiratory Protection Standard – 29 CFR 1910.134/OAR 437-004-1041. The adopted rules maintain these thresholds.

Many of the comments received were related to the proposed threshold for mandatory respirator use of AQI 251. Many comments recommended that the threshold for required respirator use should be consistent with the EPA's AQI risk categories begin at the "Very Unhealthy" level (AQI 201) or even lowered to the "Unhealthy" level of AQI 151, while many other comments recommended that the threshold be increased to the "Hazardous" level of AQI 301 or even higher to AQI 501.

The adopted rules require NIOSH-approved filtering facepiece respirators at or above AQI 251. The most persuasive objection of having a threshold for mandatory use below this threshold (either AQI 201 or 151) is that high smoke conditions often coincide with high heat conditions, making respirator use a possible contributor to the potential acute hazard of heat-related illness. Allowing each exposed worker, who must receive wildfire smoke training, to use their training and discretion to determine when to use their provided respiratory protection when the AQI is 250 and below will likely reduce their potential of developing heat-related illness. Conversely,

increasing the threshold for mandatory respirator use to AQI 301 or 501 would expose workers to higher concentrations of PM_{2.5} which is not supported by the prevailing research^{16, 17} regarding the long-term health effects of exposure to wildfire smoke. Oregon OSHA believes that requiring respirator use at AQI 251 provides the balance of acute health effects from heat-related illness and the necessary protections from wildfire smoke. The AQI, as used in the standards, is a recognized proxy to identify worker exposure to PM_{2.5} for which traditional occupational exposure limits have not been established. The EPA AQI risk category labels were specifically developed to advise the public of the community health risk levels associated with air quality conditions in a general population setting.

Subsection (7)(d), required use of respirators in accordance with the Respiratory Protection Standard – 29 CFR 1910.134/OAR 437-004-1041:

Many of the comments received were related to the proposed threshold for medical evaluations and fit testing for required respirator use at or above AQI 501. Many comments recommended that fit testing should be required at the “Hazardous” level of AQI 301 or even lowered to the “Very Unhealthy” level of AQI 201, while other comments indicated that medical evaluations and fit testing under a full respiratory protection program at an AQI of 501 would essentially require employers to shut down operations during such air quality conditions, and that many employers cannot afford to get a medical evaluation and complete fit testing for every worker.

The adopted rules require respiratory protection that complies with the applicable Respiratory Protection Standard (29 CFR 1910.134 or OAR 437-004-1041) when employees are exposed to PM_{2.5} at or above AQI 501. This threshold is consistent with Cal-OSHA’s rule, and ensures an appropriate and reasonable level of protection for exposed employees from the increase health hazard of such rare and extreme wildfire smoke conditions. Requiring full compliance with the respiratory protection plan at AQI 301, was not within the fiscal analysis completed at time of proposal, and therefore, can not be adopted without reproposing the rules which will not provide protections for employees before the 2022 wildfire season.

6.8 Note addressing employer-provided housing:

A couple of comments received indicated that the proposed rules do not specify a mechanism for workers to determine the air quality level within their agricultural labor housing units, or that employer-sponsored housing should be equipped with sufficient engineering and administrative controls to keep the indoor AQI at or below 101.

The adopted rules exemption for enclosed buildings and structures does not include a filtration performance requirement for the mechanical ventilation required, and does not apply to buildings and structures where portable mechanical ventilation equipment are solely relied upon to filter indoor air. Such portable air purifiers

equipped with HEPA filters would be considered an engineering control. The adopted rules include a note that specifies that occupants of employer-provided housing are not required to wear respiratory protection while they are inside the housing. However, employer-provided housing in which the air is *not* filtered by a mechanical ventilation system, must comply with engineering and administrative controls when functionally possible. Additionally, during the ongoing agriculture labor housing rulemaking process, future provisions for reducing wildfire smoke intrusion into employer-provided housing will be considered.

6.9 Appendix A, Mandatory Workplace Guidance for THE USE OF FILTERING FACEPIECE RESPIRATORS TO ADDRESS WILDFIRE SMOKE:

A comment was received that requested further clarification on the level of responsibility the employer must maintain to ensure that the user has a proper seal when conducting their user seal check. Specifically, in regards to users who don a filtering facepiece respirator with facial hair.

Due to the unpredictability and often limited duration of wildfire smoke events, Oregon OSHA recognizes the difficulty employers may have to ensure their employees with facial hair, who are not otherwise required to wear respirators for non-wildfire smoke hazards, to be clean shaven to comply with the requirement for mandatory respirator use at or above an AQI of 251. It is Oregon OSHA's expectation that employers encourage employees in such situations to make every effort to utilize administrative and engineering controls when functionally possible, and maximize the effectiveness of the filtering facepiece respirators provided. In such situations, employers are encouraged to provide a supply of respirator in several sizes to better accommodate different facial hair styles. While using a filtering facepiece respirator with facial hair is normally noncompliant for all other work-related hazards that necessitates required use, Oregon OSHA strictly allows this exception only for wildfire smoke due to the effects of the exposure for the typical worker and the limited duration of filtering facepiece respirator use. While the hazard is serious to warrant efforts to reduce the risk, due to the known effects of PM_{2.5} contained in wildfire smoke on the human body, it is not significant enough to represent a respiratory hazard that triggers the full requirements of the respiratory protection standard below AQI 501. The use of a filtering facepiece respirator, even without fit testing, represents a method of reducing the meaningful risk of wildfire smoke. Other states with wildfire smoke rules do not regulate exposures as a respiratory hazard under the respiratory protection standard below AQI 501. Additionally, the rule requires a seal check to be conducted when donning the filtering facepiece respirator, which provides the user the ability to identify if the respirator is leaking and make any necessary adjustments to minimize leakage. Even without fit testing, the use of filtering facepiece respirators provides more protection, and is worth the benefits of use.

References

1. Wildfire Smoke Trends and the Air Quality Index, July 2021, Oregon Department of Environmental Quality.
<https://www.oregon.gov/deq/wildfires/Documents/WildfireSmokeTrendsReport.pdf>
2. Office of the Governor State of Oregon. Executive Order No. 20-04 DIRECTING STATE AGENCIES TO TAKE ACTIONS TO REDUCE AND REGULATE GREENHOUSE GAS EMISSIONS <https://www.oregon.gov/bcd/Documents/eo-energy-20-04.pdf>
3. The Director has, in turn, used the authority of ORS 654.025(2) and (5) to delegate the authority to implement and enforce the Oregon Safe Employment Act to the Administrator of the Occupational Safety and Health Division (Oregon OSHA) and has delegated his rulemaking authority under the OSEA to the Oregon OSHA Administrator.
4. Oregon Safe Employment Act (OSEA) Chapter 654 — Occupational Safety and Health, 2021 EDITION. ORS 654.090(2)
https://www.oregonlegislature.gov/bills_laws/ors/ors654.html
5. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties. ORS 183.325 to 405.
https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
6. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties. ORS 183.333. https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
7. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties. ORS 183.335. https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
8. <http://osha.oregon.gov/OSHARules/proposed/2016/ltr-div4-wps.pdf>
9. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties. ORS 183.335. https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
10. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties ORS 183.335(2)(b)(E), ORS 183.336, ORS 183.530, and ORS 183.534.
https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
11. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties ORS 183.335(13). https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
12. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties. ORS 183.332. https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
13. Chapter 183 — Administrative Procedures Act; Review of Rules; Civil Penalties ORS 183.355. https://www.oregonlegislature.gov/bills_laws/ors/ors183.html
14. Mortality associated with wildfire smoke exposure in Washington state, 2006–2017: a case-crossover study. Department of Environmental and Occupational Health Sciences, University of Washington, Air Quality Program, Washington State Department of Ecology,

Annie Doubleday, Jill Schulte, Lianne Sheppard, Matt Kadlec, Ranil Dhammapala, Julie Fox and Tania Busch Isaksen.

<https://ehjournal.biomedcentral.com/track/pdf/10.1186/s12940-020-0559-2.pdf>

15. Using Visibility to Estimate Health Effects, Oregon Department of Environmental Quality; <https://www.oregon.gov/deq/wildfires/Pages/Using-Visibility-to-Estimate-Health-Effects.aspx>
16. Yu-Fei Xing, Yue-Hua Xu, Min-Hua Shi, and Yi-Xin Lian (2016) 'The impact of PM2.5 on the human respiratory system,' Journal of Thoracic Diseases, Jan 2016; 8(1): E69-E74
17. Wei T, Meng T, 'Biological Effects of Airborne Fine Particulate Matter (PM2.5) Exposure on Pulmonary Immune System,' Environmental Toxicology and Pharmacology (2010), <https://doi.org/10.1016/j.etap.2018.04.004>