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November 4, 2022

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The undersigned thirty-eight organizations and thirty-five individuals (the Maryland Heat Illness Prevention Coalition) welcome the opportunity to submit comments in response to the proposed *Heat Stress Standards*. Title 09 Department of Labor, Licensing and Regulation, Subtitle 12 Division of Labor and Industry Chapter 32 .

On Friday October 7, Maryland Occupational Safety and Health (MOSH) released a proposed standard which purports to prevent heat illness and heat-related death among Maryland workers in response to HB 722 from the 2020 legislative session. This standard, as drafted, is completely inadequate and will not protect Maryland workers from heat related illnesses and death. Nor, as written, will MOSH be able to effectively enforce the standard. The standard should emphasize prevention of heat related illnesses and death, however, as written, it does not prevent workers from becoming ill or dying from heat exposure. **MOSH must withdraw this draft and develop a new effective standard to protect Maryland workers from heat exposure while on the job.**

According to the Bureau of Labor Statistics, from 1992 through 2019, exposure to excessive environmental heat killed 907 U.S. workers and seriously injured 79,584. New research demonstrates that the number of worker heat related injuries and illnesses has been vastly undercounted. The summer of 2021 was the hottest summer on record in 126 years for the contiguous United States. Temperatures of this kind are deadly for workers. The data is also clear that workplace illnesses, injuries, and death from exposure to high heat are preventable. Protecting workers from heat is not rocket science—it is implementing the basic common-sense precautions of water, rest, shade, acclimatization, training and an emergency response system.

**The proposed standard does not contain any requirements for employers to control heat exposure or prevent heat-related illness or death**

The Maryland proposed heat standard is fundamentally flawed in that it does not require employers to implement any protections to prevent work-related heat illness or death. In fact, the draft is so flawed that it may leave workers with less protection than they have now under the general duty clause of the MOSH law. This draft is an insult to all workers in the state of Maryland that are exposed to dangerous levels of heat.

The draft's purported protections are triggered only when employers think their workers might be exposed to a heat illness. The opening words of this proposal are, "This standard applies whenever an employee of an employer is reasonably anticipated to be exposed to heat illness while performing job duties." Nothing defines 'reasonably anticipated to be exposed' – in fact this seems to be worded so that employers may **not have** to implement protections until workers get sick or die from heat.

Further, if employers think their workers may be in danger, the proposed standard simply requires employers to establish and implement a program that is not in writing, with no specific requirements as to how to protect workers or prevent heat-related illness or death from occurring. The suggested provisions in the proposed standard are vague and are provisions that will not do anything to actually reduce exposure to heat that can cause serious illness or death and thus prevent such occurrences from happening.

The trigger for the proposed standard, which is found in the Scope, is simply much too high to be protective and to prevent illness or death. All other state heat stress standards have temperature triggers of 80 degrees that then require protections. The Maryland proposed standard only triggers the purported requirements in the standard at 88 degrees F, a heat index that already puts workers at risk of developing heat-related illness or death. It does not prevent exposure to dangerous heat exposures or prevent workers from suffering illness or death.

**The vague language in the Maryland proposed standard is contrary to just about every other worker safety and health standard, Federal or state OSHA, which require implementation of workplace hazard controls aimed at preventing injury, illness and death on the job. The proposed standard instead suggests provisions that address heat illness after a worker gets sick, which is too late.**

### **Other States have promulgated heat illness prevention standards.**

MOSH must look at and consider other state heat illness prevention standards and rules that have been effective at reducing work related heat illness and death when going back to redraft a new proposed rule. California, Oregon and Colorado have all promulgated effective heat illness prevention standards.

Over 16 years ago, California implemented a heat illness prevention standard for outdoor workers. That standard requires employers to provide the basic common-sense protections of water, rest, shade, acclimatization, a written plan and training, and special emergency procedures that get triggered at a higher temperature. All agricultural and construction employers in California have had to comply with this standard since 2005—showing it is feasible. The data is also clear that the [CA standard](#) has worked to decrease heat related illnesses and injuries in

California. Oregon OSHA recently promulgated a [heat standard](#) covering both outdoor and indoor workers (see page 91 of previous link) and Colorado adopted a heat standard for [agricultural](#) workers this year.

The following are comments specific to the proposed rule, as well as recommendations of how to write a new rule aimed at controlling and reducing heat exposure on the job and preventing worker heat-related illness and death.

### **The Standard Must Apply when the Heat Triggers Are Met**

The proposed standard, in the first sentence under the Scope, declares that the standard only applies if an employer anticipates that workers will be exposed to a heat illness when performing jobs. This sentence must be completely deleted. It allows each employer in the state of Maryland to decide when they must protect workers. So each employer and thus their employees will have different levels of protections – all just based on whether the employer thinks it might be dangerous for workers. Instead this standard should start with a clear temperature trigger for when all the requirements apply. Oregon OSHA provides a good example: “This standard applies whenever an employee performs work activities, whether in indoor or outdoor environments, where the heat index (apparent temperature) equals or exceeds 80 degrees Fahrenheit.”

### **The Heat Illness Prevention Program Must be in Writing.**

The proposed standard requires a heat illness prevention program but there is no requirement to put the program in writing. If the program is not in writing, there is absolutely no way for MOSH or for workers to a) know if there is a program and b) to find out what is in the program. The program can change from day to day, from minute to minute. There is nothing for MOSH to enforce should a worker file a complaint about the program, or worse, if a worker becomes ill or dies on the job from heat exposure.

Many OSHA standards and rules, both Federal and State, require programs and plans to be in writing. The purpose of a written plan is to provide clarity to workers and to OSHA regarding what must be done to achieve, in this case, reduced risk of worker heat-related illness or death. The California Heat Illness Prevention Standard requires that “the plan shall be in writing in both English and the language understood by the majority of the employees and shall be made available at the worksite to employees.” The Oregon standard also requires the plan to be in writing, and “must be made available at the worksite to employees.”

In addition, workers have no way to check on what safety protections are required or if they have been implemented in their workplace if there is no written plan or program for them to look at.

## **The proposed Standard uses a dangerously high heat level as a trigger.**

The key to preventing heat related illnesses, especially for outdoor workers, is water, rest, shade and acclimatization. The California OSHA, Oregon OSHA and Colorado worker safety and health heat standards, which all have specific requirements for water, rest, shade and acclimatization, trigger their requirements when the temperature (for California and Colorado) reaches 80 degrees F or when the heat index reaches 80 degrees F (Oregon). The Maryland draft standard doesn't require the employer to consider heat a hazard until the heat index is 88 degrees - a heat index that would put Maryland workers at a very great risk, and unnecessary risk, of experiencing a heat-related illness or death. It is critical that in a new draft MOSH reduce the trigger to at most a heat index of 80 degrees F.

## **Extreme Heat – More Protections Needed**

California, Oregon and Colorado require even more protections for workers when temperatures or the heat index rise above 80 degrees F and starts approaching 88 degrees or higher. Temperatures and heat indices at this level create a much greater risk to workers.

The Maryland draft standard provides no additional protections for extreme heat conditions – defined in other state standards as 95 degrees or above. MOSH must require, as do the other State heat standards, that employers implement a more robust system for communicating and monitoring workers for symptoms and provide for more paid breaks in the shade on high heat days.

The Union of Concerned Scientists has estimated that by mid-century Maryland will have 23-33 days each year above 100 degrees F and 10-18 days over 105 degrees F and these estimates could double by the end of the century, particularly if action on climate change is delayed or doesn't happen.

## **No Provision to provide water in quantities to protect workers**

MOSH already requires that employers provide potable water. However this proposed standard does not contain any additional specific requirements of how much water or how accessible it should be for workers exposed to high heat. It does not require employers to provide paid work breaks to access the water. It provides no protection from retaliation for workers who access and drink the water on paid work time. The California, Oregon and Colorado heat standards contain specific requirements about how much water must be made available. For example, the Oregon standard states that water must be available in sufficient quantities to allow employees to drink up to **32** ounces per hour; and that the water will be cool. The new draft Maryland heat

prevention standard must require employers to make it as easy as possible for worker to access the provided water and encourage workers to drink sufficient water.

### **Vague requirements to protect workers with shade**

Shade and cooling are critical to preventing heat-related illness and death among outdoor workers. California, Colorado and Oregon heat standards have specific requirements that shade must be provided to outdoor workers when the heat temperature or index, depending on the standard, is above 80 degrees F. The Maryland draft standard only requires employers to include, in an unwritten program, “provisions” for “shade or other means of equivalent cooling” with no definition of what this means. The draft proposal only mentions that the employer must include, in an unwritten program, “provisions for shade or other means of equivalent cooling.” There are no specifics as to where the shade is to be provided, when is shade to be provided, how and when do workers access the shade, and other important specifics. With an unwritten program, how will OSHA know what the employer has in mind with respect to shade and cooling? As a comparison, Oregon OSHA requirements for shade include requirements that it be close by and easily available when temperatures exceed 80 degrees, and that it be open or provide mechanical ventilation.

### **Work/Rest Schedules**

In addition to water and shade, the third of four critical components to protect workers from heat related illness and death is ‘rest’ and removal from high heat areas. The Maryland proposed rule contains no specifics on providing rest when employees are exposed to dangerous heat levels. This is yet another fundamental flaw in this proposed standard. This is very important for outdoor workers—construction and agriculture workers.

Rest and removal are especially important for workers who work indoors, with no air conditioning, and who may have little or no opportunity to acclimatize to a significant spike in temperature and humidity. Examples of such workers include corrections officers, kitchen staff and warehouse workers. Below is a sample work/rest break schedule that MOSH should include in the heat illness prevention standard. And unless a minimum rest break schedule is mandated, workers will be pressed to keep working despite the risk.

#### **Work/Rest Schedules Hour Basis – Simplified Method**

<b>WBGT<sub>clo</sub> Work</b>	<b>WBGT<sub>clo</sub> Rest</b>	<b>Acclimatized Workers Work: Minutes</b>	<b>Unacclimatized Workers Work: Minutes</b>

70	70	60	60
80	80	60	20
80	70	60	40
85	85	25	5
85	80	35	15
85	70	45	30
87	87	15	0
87	80	30	15
87*	70	40	30

Work: Minutes are rounded to the nearest 5 minutes, Adapted from ANSI/ASSP A10.50 draft

### **Acclimatization of workers to heat – no specific provisions in draft standard**

[Studies](#) are clear that almost one half of worker deaths from heat on the job occur during their first day on the job, and over 70% of worker deaths from heat occur during the first week. That is why ‘acclimatizing’ workers to high heat levels is one of the most important protections for workers. The MOSH proposal doesn’t have any specific requirements for acclimatization other than a vague provision in an unwritten program to “provide for monitoring of acclimatization”.

MOSH must redraft this provision and add more specifics that employers are required to follow. MOSH should use the California Heat Illness Prevention Standard and Oregon Heat Illness Prevention Standards as guides. We are including below a sample acclimatization schedule from the NIOSH Criteria Document, 2016, on heat that can be referenced in the Maryland standard. Provisions should also be included for “re-acclimatization” for workers who may be away from the hot work environment for a period of time, days or weeks, and thus lost the acclimatization they developed before they left the work environment – this may include workers who went on vacation or workers who were injured and working on a light-duty assignment in a different part of the workplace where there was no or reduced heat exposure.

<b>Day Number</b>	<b>Percent of the Work Shift Spent Working in the Heat</b>
<b>1</b>	20%
<b>2</b>	40%
<b>3</b>	60%
<b>4</b>	80%
<b>5</b>	100%

(Adapted from NIOSH Criteria Document 2016)

### **Indoor Exposures**

The draft standard does not address control of heat sources in indoor settings. Sources may include an inadequate HVAC system, a non-functioning HVAC system or no system at all used to control extreme heat including radiant heat from equipment such as hot ovens and furnaces. Exposure to extreme heat may be exacerbated in indoor spaces that have a high occupancy and density. A key to prevention of heat exposure is to control the source, including high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects and strenuous physical activities. There should be provisions for removing indoor workers from excessive heat.

### **Radiant heat factor**

Radiant heat is a critical factor in assessing heat risk. Exposure to radiant heat will significantly increase the risk of heat illness. As the table below shows, radiant heat (which is included in the WBGT but not in the Heat Index) can add 10-15 degrees to your risk exposure. Therefore, trigger levels should be much lower when radiant heat is present. This is one reason WBGT should be used instead of the Heat Index. The second table below shows the advantages of using the WBGT.

<b><u>Heat Index</u></b>	<b><u>Est. WBGT</u></b>	<b><u>Heat Index</u></b>	<b><u>Est. WBGT</u></b>	<b><u>Heat Index</u></b>	<b><u>Est. WBGT</u></b>
<u>80</u>	<u>70</u>	<u>94</u>	<u>79</u>	<u>108</u>	<u>86</u>
<u>81</u>	<u>71</u>	<u>95</u>	<u>80</u>	<u>109</u>	<u>86</u>

<u>82</u>	<u>71</u>	<u>96</u>	<u>80</u>	<u>110</u>	<u>87</u>
<u>83</u>	<u>72</u>	<u>97</u>	<u>81</u>	<u>111</u>	<u>87</u>
<u>84</u>	<u>73</u>	<u>98</u>	<u>81</u>	<u>112</u>	<u>88</u>
<u>85</u>	<u>73</u>	<u>99</u>	<u>82</u>	<u>113</u>	<u>88</u>
<u>86</u>	<u>74</u>	<u>100</u>	<u>82</u>	<u>114</u>	<u>88</u>
<u>87</u>	<u>75</u>	<u>101</u>	<u>83</u>	<u>115</u>	<u>89</u>
<u>88</u>	<u>75</u>	<u>102</u>	<u>83</u>	<u>116</u>	<u>89</u>
<u>89</u>	<u>76</u>	<u>103</u>	<u>84</u>	<u>117</u>	<u>89</u>
<u>90</u>	<u>77</u>	<u>104</u>	<u>84</u>	<u>118</u>	<u>89</u>
<u>91</u>	<u>77</u>	<u>105</u>	<u>85</u>	<u>119</u>	<u>90</u>
<u>92</u>	<u>78</u>	<u>106</u>	<u>85</u>	<u>120</u>	<u>90</u>
<u>93</u>	<u>79</u>	<u>107</u>	<u>86</u>	<u>121</u>	<u>90</u>

Adapted from: Bernard and Iheanacho (2015).

The table below shows the comparison between the Heat Index and WBGT.

#### **Differences between WBGT and Heat Index**

<b><u>Ability to take or determine:</u></b>	<b><u>WBGT</u></b>	<b><u>Heat Index</u></b>
<u>Measurements are taken in the shade</u>	✓	✓
<u>Measurements are taken in the sun</u>	✓	-
<u>Ambient temperature</u>	✓	✓



<u>Effects of relative humidity</u>	✓	✓
<u>Effects of wind or air movement</u>	✓	-
<u>Effects of cloud cover</u>	✓	-
<u>Effects of sun angle</u>	✓	-
<u>Local sources of radiant heat</u>	✓	-
<u>And assessment can integrate or use:</u>	-	-
<u>Effect of additional protective PPE/clothing</u>	✓	-
<u>Metabolic heat load</u>	✓	-
<u>Heat resistance differences between acclimatized and unacclimatized workers</u>	✓	-

Source: ANSI/ASSP A10.50

### **Workload factor**

How hard a person is working can also affect their risk of heat stress. As work intensity increases, metabolic temperature increases adding to heat stress risk. The table below shows how metabolic rate climbs with work intensity. Any heat stress standard must adjust and increase protective measures as workload increases to prevent heat illnesses. The Maryland draft makes no adjustments for workload and thus underestimates the risks for many if not most workers.

### **Categories of Metabolic Rates Based on Work Intensities**

<b>Category</b>	<b>Metabolic Rate (in Watts)</b>	<b>Examples</b>

Rest	115 (100 to 125)	Sitting, resting
Light	180 (125 to 235)	Light manual work, standing drilling small parts, light arm/hand work and casual walking on a level surface
Moderate	300 (235 to 360)	Sustained hand and arm work, hammering nails, moderate lifting, arm and leg work during operation of off-road construction equipment, plastering, pushing light wheelbarrows, normal walking
Heavy	415 (360 to 465)	Intense arm and trunk work, heavy material handling, shoveling, sledgehammer work, laying concrete blocks, pushing heavily loaded wheelbarrows, sawing, walking at a fast pace
Very Heavy	520 (>465)	Very intense activity at a fast to maximum pace, intense shoveling or digging, climbing ladders, running on a level surface

Adapted from *ISO 7243-2017*

### **Clothing factor**

Clothing worn by workers can also increase heat stress risk by interfering with the body's ability to cool itself by sweating. A very large number of jobs require the use of personal protective equipment. An example is work in a poultry plant. Many layers of personal protective equipment are required to prevent exposure to chemicals, knife cuts, and other hazards. Work in poultry plants can also involve heavy repetitive work tasks and workloads in plants that may not be air conditioned. There is an enormous use of water – steam is sometimes used in certain jobs, increasing the humidity levels. The table below shows how many degrees must be added to the WBGT index to estimate the increased risk from clothing. The Maryland draft ignores this problem and makes no adjustments for added risk from clothing.

#### **Examples of Clothing-Adjustment Factors for Clothing Ensembles (WBGT<sub>clo</sub>)**

<b>Clothing Type</b>	<b>Addition to WBGT Index</b>
Hood of any fabric with any clothing ensemble	1.8
Non-woven polyolefin coveralls as a single layer	3.6

Double-layer of woven clothing	5.4
Vapor-barrier apron with long sleeves and long length over cloth-coveralls	7.2

Adapted from draft ANSI/ASSP A10.50

### **Heat risk assessment**

The draft uses the Heat Index which does not account for the impact of radiant heat, clothing load, work load or wind speed. The WBGT is a much more accurate measure. Instruments to measure WBGT are widely available now and are relatively inexpensive (~\$150). The National Weather Service is making available satellite data which provides [WBGT estimates](#). And the OSHA/NIOSH Heat app will soon be converted to WBGT temperatures as well. Radiant heat, work load, clothing such as personal protective equipment, can contribute substantially to heat load and not including them means the standard is insufficiently protective, placing many heat exposed workers at risk.

The draft proposal also does not require the employers to monitor for heat. A daily risk assessment is necessary to determine if the protections provided will be sufficient to protect workers. Each day before work begins the employer should do a risk assessment based on the latest weather data and do a reassessment as the day goes on and the weather changes.

### **Hierarchy of controls**

Good industrial hygiene practice and protection of workers requires the use of the hierarchy of controls when trying to prevent occupational illness and injury. This mean starting protection with establishing engineering controls (e.g. air-conditioned rest areas; shielding against radiant heat from hot machinery) to reduce exposures to the extent feasible, followed by establishment of administrative controls (such as starting work earlier when it is cooler out) and using personal protective equipment (PPE) as a last resort. The Maryland draft standard makes no mention of this and ignores this science-based approach which focuses prevention efforts on the most effective methods.

### **Competent Persons**

Much of heat illness prevention is straight forward- providing water, rest and shade. But there are complications, like monitoring weather conditions and making critical decisions about providing sufficient rest, accommodating acclimatization and directing emergency operations. It

is best in such situations, as is common in many OSHA construction standards, to have a “competent person” on site who has received special training and has the authority to stop work if conditions are hazardous. A competent person requirement should be included in the Maryland heat standard to ensure proper implementation of the heat illness prevention plan.

### **Stop work authority/Right to Refuse**

To prevent heat illnesses, workers must be given explicit authority and authorization to stop work whenever they feel the signs and symptoms of heat illness, which they should have been trained on. In the event a worker has signs of heat stroke (any sign of confusion, see below) co-workers should be authorized to provide emergency first aid and to directly contact emergency services, concurrent with contacting the supervisor. This is required for a truly preventive standard. Workers are often afraid to assert their rights to refuse unsafe work, which is why this must be spelled out in the standard.

### **Emergency Preparedness and Medical Removal**

The MOSH proposal is very vague about requirements for emergency procedures that must be in place should workers exhibit signs or symptoms of heat illness or heat stress. It is clear that MOSH must include specific language, similar to that included in other state heat standards, that requires that employees be relieved from duty if they reported symptoms of heat illness or if a supervisor observes signs of heat illness. Further the employee must be relieved from duty and provided with a means to reduce body temperature. An employee exhibiting signs or symptoms of heat illness shall be monitored and shall not be left alone or sent home without being offered onsite first aid and/or being provided with emergency medical services, depending on the severity of the symptoms.

### **Physiological monitoring**

Heat exposure can increase heart rate and body temperature, both of which can be monitored by new technologies, e.g. smart watches. Trends in this data could provide early warning signs that could be used to mandate rest breaks and prevent heat illness. Physiological monitoring can be used in extreme heat situations where workers are most at risk.

### **Worker Participation / Worker Representative Participation**

The proposed standard does not provide any opportunity for workers, workers’ representatives, or collective bargaining representatives to participate in the program design or implementation. OSHA recognizes the important contribution of workers to effective safety measures designed to protect them and the workplace. Workers know intimately the way work is performed in a workplace, and the hazards that exist and that they face, and thus have important insights into

how to control hazards, and eliminate or reduce the risk of workplace injuries, illnesses and deaths. OSHA in its recommendations for Effective Safety and Health Programs states that: “To be effective, any safety and health program needs the meaningful participation of workers and their representatives. Workers have much to gain from a successful program and the most to lose if the program fails. They also often know the most about potential hazards associated with their jobs. Successful programs tap into this knowledge base.”

<https://www.osha.gov/safety-management/worker-participation>

Worker participation means that workers are involved in establishing, operating, evaluating, and improving the safety and health program. All workers at a worksite should participate, including those employed by contractors, subcontractors, and temporary staffing agencies. Not providing the opportunity for workers and their representatives to participate in a program on safety and health, undermines the effectiveness of a safety and health plan.

## **Conclusion**

We strongly urge MOSH to go back to the drawing board, scrap the current version that was published as a proposed standard, and start from the beginning – drafting a standard that is truly protective of workers, proactive in addressing heat hazards before workers get sick, considering science, data and best practices, looking to the states that have promulgated and implemented effective heat illness prevention standards. MOSH must rely on science-based standards and guidance, including the NIOSH Criteria Document on Heat, from 2016 and the ANSI A10 draft heat standard for Construction, in drafting its standard. To go forward with the current proposal is to put Maryland workers at serious, and maybe extreme, risk of suffering heat-related illness and death. These injuries and death can be prevented if a sensible, science based, directive standard is written and implemented.

### **Organizations**

AFSCME Maryland Council 3

American Bird Conservancy

American Industrial Hygiene Association (AIHA)

Association of Farmworker Opportunity Programs (AFOP)

CASA

Cedar Lane Unitarian Church, Environmentalist Church Environmental Task Force

Center for Progressive Reform

Centro de los Derechos del Migrante

Clean Water Action

Earth Ethics

Farmworker and Landscaper Advocacy Project

Farmworker Association of Florida

Laborers Local 11, Steve Lanning, Business Manager

Maryland Campaign for Environmental and Human Rights  
Maryland Catholic Labor Network  
Maryland Legislative Coalition  
Maryland Pesticide Education Network  
McDaniel Honey Farm  
MLC Climate Justice Wing  
National Council for Occupational Safety and Health (NCOSH)  
National Employment Law Project  
Natural Resources Defense Council (NRDC)  
New Labor, New Jersey  
Oregon Environmental Council  
Philaposh  
Public Citizen  
Public Justice Center  
Sierra Club, Maryland Chapter  
Takoma Park Mobilization  
Teamsters Local 96, Camp Springs, MD  
Teamsters Local 355, Baltimore, MD  
Teamsters Local 453, Cumberland, MD  
Teamsters Local 570, Baltimore, MD  
Teamsters Local 992, Hagerstown, MD  
Teamsters Joint Council 62, Baltimore, MD  
UFCW Local 400  
UFCW Local 1994  
Work Environment Council of New Jersey

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Dr. Laura Welch, former medical director of CPWR

### **Heat Stress Bibliography (sent separately as email attachments)**

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