

 <b>BOISE STATE UNIVERSITY</b> <small>ENVIRONMENTAL HEALTH, SAFETY AND SUSTAINABILITY</small>	GUIDANCE DOCUMENT  <b>HEAT SAFETY AWARENESS</b>
College/Dept: FO&M and Auxiliaries	Division: Campus Operations
	Revision: June 2015

**Approval**

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**Overview**

This SOP summarizes safety procedures for outdoor workers during times of high heat. The recommendations set forth in this document are to be followed by all Boise State University personnel, and those contracted to work for Boise State University. Working in extreme heat stresses the body and can lead to illness or even death in severe cases. Exposure to heat can also increase the risk of other injuries. Every year thousands of workers become sick from heat exposure and a number of workers die. Most heat-related health problems can be prevented, or the risk of developing them can be reduced.

**Potential Hazards**

<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> Thermal	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Electrical	<input type="checkbox"/> Slip/Trip	<input type="checkbox"/> Biological
<input type="checkbox"/> Mechanical	<input type="checkbox"/> Radiation	<input type="checkbox"/> Pneumatic	<input type="checkbox"/> Fire	<input type="checkbox"/> Fall	<input type="checkbox"/> Other
Hazard Specifics:					

**Engineering Controls (EC)**

<input type="checkbox"/> Guarding	<input checked="" type="checkbox"/> Shielding/Barriers	<input type="checkbox"/> Local Exhaust or Paint booth	<input type="checkbox"/> Lockout	<input checked="" type="checkbox"/> Other
EC Specifics:	<ul style="list-style-type: none"> <li>Set up shaded areas (air-conditioned vehicles, buildings, or shaded areas outdoors)</li> <li>Drink often and BEFORE you are thirsty.</li> <li>Drink water every 15 minutes one pint per hour is needed</li> <li>Avoid beverages containing caffeine</li> <li>Provide shade if possible, use canopies or umbrellas to block sun when working in stationary locations</li> </ul>			

**Personal Protective Equipment (PPE)**

<input type="checkbox"/> Safety glasses	<input type="checkbox"/> Safety goggles	<input type="checkbox"/> Face shield & safety glasses	<input type="checkbox"/> Face shield & safety goggles
<input type="checkbox"/> Respirator	<input type="checkbox"/> Shoes	<input type="checkbox"/> Fall protection	<input checked="" type="checkbox"/> Other
PPE Description:	<ul style="list-style-type: none"> <li>Wear light-colored, loose-fitting, breathable clothing such as cotton (avoid synthetics)</li> <li>Wear a light hat and use damp or chilled towels to cool the skin</li> </ul>		

HEAT SAFETY AWARENESS

- Wear sunscreen and use other precautions to protect skin from direct sunlight and avoid sunburn (which can make the body more susceptible to heat-related illness).

**Emergency Response Equipment & Supplies**

- Eyewash       Fire extinguisher       First aid kit       Other:

Description:      • If symptoms of heat stress are identified, take immediate action (as described in “signs and symptoms below”) and contact emergency medical services by dialing 9-1-1 immediately if necessary.

**Risk Factors**

**Weather/Working Conditions:** The risk of heat stress is relative to temperature, humidity, sunlight, and wind speed. High temperature, high humidity, direct sunlight and low wind speed make the worst combination. If possible, schedule heavy work for the coolest parts of the day.

**Personal Factors and Physical Demands:** The risk of heat stress increases with physical demands. A worker who is lifting and carrying heavy items is at the greatest risk. Older workers, obese workers, and persons taking certain types of medication, such as antihistamines, are at a greater risk for heat illness.

**Signs and Symptoms of Heat Related Illness**

SIGNS AND SYMPTOMS	TREATMENT
<p><b>Early Heat Illness</b> Mild dizziness, fatigue, or irritability; decreased concentration; impaired judgment</p>	<ul style="list-style-type: none"> <li>• Loosen or remove clothing</li> <li>• Rest in shade for 30 minutes or more</li> <li>• Drink water</li> </ul>
<p><b>Heat Rash</b> Tiny blister-like red spots on the skin; prickling sensation, commonly found on clothed areas of the body</p>	<ul style="list-style-type: none"> <li>• Clean the skin and allow it to dry</li> <li>• Wear loose clothing</li> <li>• Rest in a cool place</li> </ul>
<p><b>Heat Syncope</b> Fainting of an un-acclimated working when standing still in the heat</p>	<ul style="list-style-type: none"> <li>• Lie down until recovered</li> <li>• Moving around, instead of standing still in the heat will reduce recurrence</li> <li>• Acclimate to heat</li> </ul>
<p><b>Heat Cramps</b> Painful spasms of the muscles; occurs when workers drink large amounts of water without replacing salts. May occur during or after work hours.</p>	<ul style="list-style-type: none"> <li>• Drink electrolyte liquids (sports drinks)</li> <li>• Rest</li> <li>• Massage affected areas</li> <li>• May require intravenous salt solutions if determined by a doctor</li> </ul>
<p><b>Heat Exhaustion</b> Extreme weakness or fatigue, giddiness, nausea, or headache. Moist, clammy skin. Pale or flush complexion. Normal or slightly elevated body temperature.</p>	<ul style="list-style-type: none"> <li>• Rest lying down in a cool place</li> <li>• Loosen or remove clothing</li> <li>• Splash water on body</li> <li>• Massage legs and arms</li> <li>• If conscious, drink water or sports drink but not salt or salt water</li> <li>• If unconscious call 911 and begin to treat for Heat Stroke below.</li> <li>• Anyone who collapses due to heat should be seen by medical personnel.</li> </ul>

**Heat Stroke**

Often occurs suddenly. Sweating stops. Mental confusion, very aggressive behavior, loss of consciousness, convulsions or coma. Fast pulse and rapid breathing. Skin may appear hot, red, mottled or bluish. Worker may resist treatment.

- Immediately summon medical attention
- While awaiting help, move victim to cool area, soak clothing with cool water, fan vigorously to increase cooling and elevate legs.
- Treat for shock after their temperature drops
- If conscious have them drink as much water as possible.
- Prompt first aid can prevent permanent injury to their brain and vital organs.

**Heat Safety Procedures**

**General Heat Safety Tips and Responsibilities:**

To protect workers from heat stress, Boise State (as the **EMPLOYER**) will:

- Schedule hot jobs for the coolest part of the day.
- Acclimatize workers by exposing them for progressively longer periods to hot work environments.
- Reduce the physical demands of workers during times of heat wave.
- Use relief workers or assign extra workers for physically demanding jobs.
- When possible, rotate difficult work tasks in hot conditions between two or more employees.
- Provide cool water or liquids to workers.
- Provide rest periods with water breaks.
- Provide cool areas for use during break periods.
- Monitor workers who are at risk of heat stress.
- Provide heat stress training that includes information about: Worker risk, prevention, symptoms, the importance of monitoring yourself and coworkers for symptoms, treatment and personal protective equipment

To prevent heat stress, **EMPLOYEES** should:

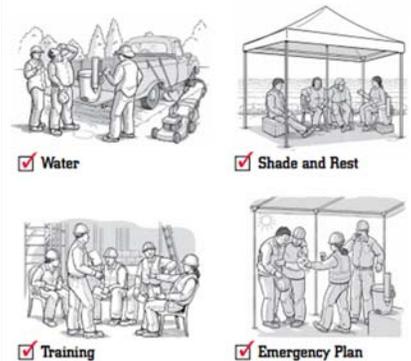
- Wear light-colored, loose-fitting, breathable clothing such as cotton.
  - Avoid non-breathing synthetic clothing.
- Gradually build up to heavy work.
- Schedule heavy work during the coolest parts of day.
- Take more breaks in extreme heat and humidity.
  - Take breaks in the shade or a cool area when possible.
- Be aware that protective clothing or personal protective equipment may increase the risk of heat stress.
- Monitor your physical condition and that of your coworkers.

**Hydration:**

- Pre-hydrate by drinking 8-16 ounces of water before working in the heat.
- Keep water or an electrolyte drink (i.e. Gatorade) within easy reach and consume about 8 ounces (1 cup) every 15-20 minutes, not just during rest breaks. Drink enough that you never become thirsty.
- Avoid coffee, tea, or soda, which act as diuretics and further dehydrate the body.
- Monitor your urine output. Large volumes of relatively clear or light-colored liquid indicate proper hydration. Small volumes and/or dark urine may be indicators of dehydration.

**Adequate Rest Periods**

**Heat illness can be prevented!**



**Preventing Heat-Related Illness**

(Photo courtesy: [www.osha.gov](http://www.osha.gov), Publication 3422-10R 2011)



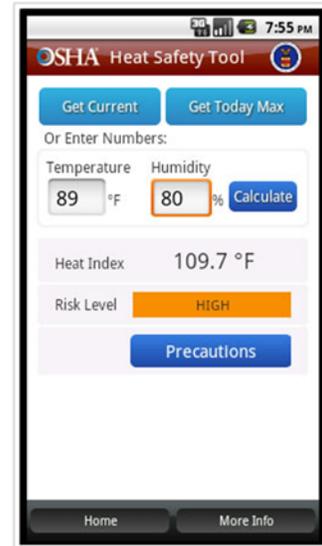
- Avoid overexertion and work at a steady pace. Heed the body’s signals. Take plenty of breaks in shaded or cooler areas.

### Signs and Symptoms of Heat Related Illness

Heat Index	Risk Level	Protective Measures
Less than 91°F	<u>Lower</u> <u>(Caution)</u>	Basic heat safety and planning
91°F to 103°F	<u>Moderate</u>	Implement precautions and heighten awareness
103°F to 115°F	<u>High</u>	Additional precautions to protect workers
Greater than 115°F	<u>Very High to Extreme</u>	Triggers even more aggressive protective measures

There’s an app for that!  
(iPhone and Android)

Heat Safety Tool  
Smartphone App



OSHA Safety and Health Topics: Occupational Heat Exposure (Photo courtesy: <https://www.osha.gov/SLTC/heatstress/index.html>)

Heat index:

<b>LOW</b> ( < 91°F )	<ul style="list-style-type: none"> <li>• Provide adequate water close to work area</li> <li>• Ensure medical services are available (9-1-1 or trained personnel)</li> </ul>
<b>MODERATE</b> (91°F to 103°F)	<ul style="list-style-type: none"> <li>• Alert workers to the heat index anticipated for the day and identify each precaution in place at the work site to reduce the risk of heat-related illness.</li> <li>• Provide adequate amounts of cool water and disposable cups.</li> <li>• <b>Remind workers to drink small amounts of water often</b> (before they become thirsty). Approximately 4 cups per hour.</li> <li>• Ensure medical services are available (9-1-1 or trained personnel)</li> <li>• <b>Respond to heat-related illness and medical emergencies without delay. Workers who show symptoms of heat-related illness need immediate attention. Treating milder symptoms (headache, weakness) early by providing rest in a shaded area and cool water to drink can prevent a more serious medical emergency. Call 911 immediately if a worker loses consciousness or appears confused or uncoordinated. These are signs of possible heat stroke. Heat stroke is fatal if not treated immediately.</b></li> <li>• <b>Review heat-related illness signs and symptoms and site-specific precautions during daily meetings or toolbox talks.</b> Be sure everyone knows procedures for responding to possible heat-related illness.                             <ul style="list-style-type: none"> <li>○ What steps to follow if a worker exhibits signs and symptoms of heat-related illness</li> <li>○ Who to call for medical help</li> <li>○ Who will provide first aid until the ambulance arrives</li> </ul> </li> <li>• <b>Identify break areas and schedule frequent rest breaks in cool, shaded areas.</b> For low humidity, 15 minute breaks every hour should be adequate.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Acclimatize new and returning workers.</b> If the heat index increases suddenly, allow all workers more frequent breaks for a few days while they become accustomed to the warmer conditions.</li> </ul>
<p><b>HIGH (103°F to 115°F)</b></p>	<p>Follow the steps above, with the following additions:</p> <ul style="list-style-type: none"> <li>• <b>Hydration</b> – follow the standard of 4 cups of water per hour. Workers will need the greatest amount of water if they must work in direct sunshine, during peak exertion, and during the hottest part of the day. <i>Under most circumstances extended hourly fluid intake should not exceed 6 cups per hour or 12 quarts per day. To maintain worker hydration, it is particularly important to reduce work rates, reschedule work for a time when the heat index is lower, or enforce work/rest schedules when work must continue during periods of extreme risk for heat-related illness.</i></li> <li>• <b>Emergencies</b> – follow guidance above, AND have a knowledgeable person onsite who is well-informed about heat-related illness and authorized to modify work activities and the <u>work/rest schedule</u> as needed.</li> <li>• <b>Establish and enforce <u>work/rest schedules</u></b> to control heat exposure and allow workers to recover. Consider the level of physical exertion and type of protective equipment being used. Advise workers of the work/rest schedule and make sure supervisors enforce rest breaks.</li> <li>• Provide air conditioned or <u>cool, shaded areas</u> close to the work area for breaks and recovery periods.</li> <li>• <b>Adjust work activities</b> to help reduce worker risk: <ul style="list-style-type: none"> <li>○ <b>Schedule heavy tasks</b> earlier in the day or at a time during the day when the heat index is lower. Consider adjusting the work shift to allow for earlier start times, or evening and night shifts.</li> <li>○ Where possible, <b>set up shade canopies</b> over work areas in direct sunshine or <b>move jobs</b> that can be moved to naturally shaded areas.</li> <li>○ <b>Permit only those workers acclimatized to heat to perform the more strenuous tasks.</b> Rotate physically demanding job tasks among acclimatized workers.</li> <li>○ <b>Decrease the physical demands and pace of jobs.</b> If heavy job tasks cannot be avoided, change work/rest cycles to increase the amount of rest time.</li> <li>○ <b>Add extra personnel to physically demanding tasks</b> so that the shared work load is less intense. This will lower the workers’ risk of heat-related illness.</li> <li>○ <b>Rotate workers to job tasks that are less strenuous or in cooler/air conditioned setting</b> for part of the work shift.</li> </ul> </li> <li>• <b>Acclimatize workers</b> - Take steps that help all workers become acclimatized to the heat, particularly if the weather turns hot suddenly. Gradually increase workloads and allow more frequent breaks during the first week of work. Closely supervise new employees for the first 14 days, until they are fully acclimatized.</li> </ul>
<p><b>VERY HIGH to EXTREME (&gt; 115°F)</b></p>	<p>Follow the steps above, with the following additions:</p> <ul style="list-style-type: none"> <li>• <b>Reschedule all non-essential outdoor work</b> for days with reduced heat index.</li> <li>• <b>Move essential outdoor work</b> to the coolest part of the work shift. As able, alter the work shift to allow for earlier start times, split shifts, or evening and night shifts.</li> <li>• <b>Prioritize and plan essential work tasks carefully</b> – strenuous work tasks and those requiring the use of heavy or non-breathable clothing or impermeable chemical protective clothing should not be conducted when the heat index is at or above 115°F.</li> <li>• <b>Stop work</b> if essential control methods are inadequate or unavailable when the risk of heat illness is very high.</li> <li>• <b>Physiologically monitor all workers</b> by establishing a routine to periodically check heart rate, temperature, or other physiological signs that may indicate overexposure.</li> </ul>

## HEAT SAFETY AWARENESS

- **Provide workers with personal cooling measures** (e.g., water-dampened clothing, cooling vests with pockets that hold cold packs, reflective clothing, or cool mist stations).
- **Set up a buddy system** to enable workers to look out for signs and symptoms of heat-related illness in each other. Often, a worker will not recognize his own signs and symptoms.
- **Instruct supervisors to watch workers for signs of heat-related illness.** Check routinely (several times per hour) to make sure workers are making use of water and shade and not experiencing heat-related symptoms.
- **Maintain effective communication with your crew** at all times (by voice, observation, or electronic communications). Confirm that communication methods are functioning effectively.

### References and Additional Resources

1. Center for Disease Control and Prevention (CDC) Workplace Safety and Health Topics “Heat Stress.” <http://www.cdc.gov/niosh/topics/heatstress/>
2. California Department of Industrial Relations (CAL-OSHA) “Employer Sample Procedures for Heat Illness Prevention,” May 2015, [http://www.dir.ca.gov/dosh/dosh\\_publications/ESPHIP.pdf](http://www.dir.ca.gov/dosh/dosh_publications/ESPHIP.pdf)
3. Occupational Safety and Health Administration “Heat Illness Prevention” <https://www.osha.gov/SLTC/heatillness/index.html>
4. University of Nebraska, Lincoln “Heat Stress SOP,” August 2013. <http://ehs.unl.edu/sop/s-heatstress.pdf>