

INDUSTRY WIDE LABOR-MANAGEMENT SAFETY COMMITTEE

SAFETY BULLETIN #17

WATER HAZARDS

This safety bulletin outlines the recommended practices used to identify both physical as well as biological hazards when working in water, including, but not limited to, ponds, rivers, lakes, swamps, bogs, oceans, pools, and tanks.

Production Management, in conjunction with the Location Manager, will review or inquire about any special precautions concerning the body(ies) of water where work will take place, obtain any necessary permits with the applicable Authority Having Jurisdiction (AHJ), acquire necessary permissions, and identify and possibly engage a laboratory or environmental consulting company.

All personnel scheduled for water work shall be notified in advance.

Production workers who are uncomfortable working in or around water should notify their supervisor prior to that day's call. All cast and crew maintain the right to refuse work reasonably and in good faith deemed to be unsafe and to consult with production safety personnel.

Environmental Concerns

Whenever there is underwater work in a natural environment, extreme care should be taken around marine flora and fauna, as well as protected underwater ecosystems such as coral reefs.

All personnel should be advised to keep all potential contaminants away from the water, including paints, thinners, gasoline, oils, etc. Contaminants can also come from specific production activities and runoff from nearby production base camps.

Physical Hazards

When work in a body of water is contemplated, Production Management should identify, and be familiar with, the natural and man-made hazards in the area, including but not limited to:

- Depth
- Water clarity
- Sub-surface objects (e.g., rocks, debris)
- Underwater life (e.g., sharks, jellyfish, alligators)
- Water beds (bottom of lakes/ponds)
- Upstream activities (e.g., dams, waste disposal sites, agriculture, chemical plant discharge sites, flash flood dangers, floating objects)

Water Temperature

The temperature should be monitored when cast and crew are expected to be working in water. Prolonged exposure to water can become hazardous. Cast and crew should be monitored for signs and symptoms of both hyperthermia and hypothermia.

Production Management should take steps to prevent hyperthermia (elevated body temperature) and hypothermia (reduced body temperature). While hyperthermia can occur, hypothermia is a more likely hazard.

When the temperature starts to drop, the body can start to shiver. Shivering is the body's attempt to warm itself. Once the body starts to shiver, it can take a long time to recover. It is an automatic

defense against cold temperatures.

Symptoms of hypothermia include:

- Shivering
- Slurred speech or mumbling
- Slow, shallow breathing
- Weak pulse
- Clumsiness or lack of coordination
- Drowsiness or very low energy
- Confusion or memory loss
- Loss of consciousness
- In infants—bright red, cold skin

There are multiple methods to mitigate the hazards of hypothermia. Wetsuits and dry suits may be necessary for those working in water. Cast and crew may be required to take periodic breaks from the water to regulate their body temperature. Heated showers, dry towels, and areas with heated air (such as vehicles) are options to raise body temperature for workers when they come out of cold water.

Symptoms of hyperthermia:

- High body temperature
- Altered mental state or behavior
- Sweating
- Nausea and vomiting
- Flushed skin
- Rapid breathing
- Elevated heart rate
- Headache

Methods for preventing or treating hyperthermia include stopping physical activity, drinking plenty of fluid, using cool compresses/ice packs/immersion in cool water, and avoiding certain medications such as aspirin and acetaminophen.

Seek medical assistance if someone is exhibiting signs of hypothermia or hyperthermia.

Water Flow (tide/current)

When it is necessary for personnel to work in fast-moving water, production safety personnel and equipment should be available/on-site for emergency rescue.

Boating Traffic

Where boating traffic is anticipated, all applicable safety regulations should be complied with, including those mandated by the appropriate AHJ. ([See Safety Bulletin #15 - Guidelines for Boating/Watercraft Safety for Film Crews](#))

Electrical Hazards

All electrical connections should be made by, or under the supervision of, a qualified person. ([See Safety Bulletin #23 - Guidelines for Working With Portable Power Distribution Systems and Other Electrical Equipment for additional electrical safety information](#)).

Special care must be used whenever alternating current (AC), or direct current (DC) supplied equipment is used in or around water. Consider the use of electrical equipment that operates at less than 50 volts, such as battery-powered, or remote power-supplied LED lighting fixtures. All

electrical cables and lights in close proximity to water should be properly secured to prevent tipping and falling. All wiring and all electrical equipment and devices that will or may be subject to a submerged condition should be approved for underwater use, be watertight, have no exposed live connections, and be constructed such that there is no shock hazard under any likely conditions of use. All applicable provisions of the National Electric Code should be followed. If applicable, local regulations may be more restrictive and should be followed.

Ground Fault Circuit Interrupters (GFCIs)

When lighting, electrical distribution, or any electrically powered equipment is used in close proximity to water or can make contact with water, the use of a GFCI should be determined by a qualified person. This includes all areas where water hazards exist. When persons, wardrobe, props, or equipment are wet, the need for GFCI protection should be determined.

GFCIs will not operate on DC and are usually not compatible with circuits supplied by dimmer systems. GFCIs should not be used on circuits where removal of power may create a greater hazard, such as airbags, decelerators, emergency egress lighting, etc.

Emergency Procedures

A person qualified to administer emergency medical assistance shall be present or readily available when production workers enter bodies of water described at the top of this document. Production Management should consider engaging an ambulance in case emergency transportation to the nearest hospital is needed.

If a potential safety hazard is found, Production Management should take appropriate steps to mitigate it. Appropriate water safety devices (e.g., life vests, life preservers, safety rings, safety hooks, buoys) should be available for all personnel working in or around water. When necessary, the Production Management should implement a plan to account for personnel in the water, such as a "buddy" or a check in/check out system.

Biological Hazards

Prior to personnel entering a body of water, all efforts should be made to determine whether the water quality meets the regulatory standards for "recreational full body contact."

This determination may be made by one or more of the following: direct water sampling, contact local health authorities, and/or detailed knowledge of the other uses and water sources supplying the body of water.

The US Environmental Protection Agency has a standard for water quality called the Recreational Water Quality Criteria (RWQC). Guidance on water quality may be found here: <https://www.epa.gov/wqc/recreational-water-quality-criteria-and-methods>.

Additionally, local and/or state authorities may have more restrictive requirements that must be followed.

Testing

To ensure the safety of cast and crew, it is recommended that water quality testing be conducted by a certified water testing laboratory prior to accessing any body of water.

- Consult with the laboratory or environmental consulting company, as early as possible, about the body of water intended for use to determine the appropriate testing to be done.
- The laboratory will inform the production of testing standards and protocols.

- Samples should be taken as near as feasible to the point of entry as the production personnel entering the water.
- Consultation with the testing laboratory should inform the production about the testing timeline. Testing should be conducted as close to the time of entry as possible, typically at least 48-hours prior to the commencement of production activities in the body of water, but always with enough time for the results to be reported back. To this end, laboratory availability, capabilities and speed should be considered.
- At a minimum, to determine bacterial levels in fresh water, Escherichia coli (E. coli) and enterococci testing should be completed.
- Additional testing may be required as necessary.
- An alternative to independent testing is utilizing pre-existing testing from a government or Non-Governmental Organization (e.g., Heal the Bay, Surfrider Foundation) that provides current and timely water quality testing.
- A well-maintained body of water, such as a swimming pool or hot tub, should not require bacterial testing to be conducted. However, pH and/or chlorine levels should be tested with a conventional pool testing kit and adjusted as necessary.
- Purpose-built water tanks for filming should be tested and maintained to ensure appropriate water quality standards are met. If not already being done, chlorine and pH levels should be tested in these bodies of water.

Limitations of Testing

There are many factors that can lead to contamination thereby making water quality test results unreliable. The test is a “snapshot” of the water quality. Some of these factors include:

- Heavy rains
- Fast-moving bodies of water
- Potential hazards from the surrounding environment
 - Examples can include nearby farms, factories, or bird nests
 - Pre-existing environmental impacts (e.g. lead)
- Proximity to marinas

If elements in the environment near the body of water could lead to contamination (manmade or natural), include these in the sampling plan and request that these parameters are included in the analysis and test results.

The rationale for the lack of testing must be articulated to the cast/crew prior to use and in advance of physical production occurring (e.g., failed test, pre-existing conditions).

Interpreting Water Quality Test Results

Understanding what qualifies as water suitable for occupational use can be confusing. Water sampling results and acceptable water quality criteria shall be made available upon request.

When necessary, Production Management should consult a Safety Professional (e.g., a Certified Industrial Hygienist, Certified Safety Professional, laboratory, environmental consulting company, or Studio Safety Representative) to determine whether a body of water is safe relative to lab test results. The production should follow the guidance of the EPA, state, and local environmental agencies.

Poor Water Quality

When water quality results are poor or unknown, Production Management should implement the following guidelines:

- Provide full body protection, in the form of dry suits and body orifice closures (e.g., wax earplugs, nose plugs) to anyone who will be, or could be, **fully submerged**.
- Provide appropriate Personal Protective Equipment (PPE) (e.g., dry suits, waterproof clothing such as waders, gloves, and footwear) for those who may be **partially submerged**.
- Provide a readily accessible method of post-submersion cleaning (e.g., freshwater portable showers, hoses with or without sprayers and/or other portable/fixed freshwater supply with soap and water).
- Any open sores or wounds should be fully protected from water intrusion.
- All equipment that makes contact with the water shall be properly cleaned after use.
- Do not allow any worker to eat, drink, or smoke, etc. until they have completely decontaminated post-water exposure.
- Request that cast and crew monitor their health and report any signs or symptoms of waterborne illness to set medic or Production Management.