



Health & Safety News



Page 2
Hidden Biological Hazards



Page 3
Working at Heights



Page 4
Snake Safety



Pages 4-5
Heat Stress



As environmental consultants, it is our goal to provide the highest quality environmental services to our clients. In order to provide the best service, it is paramount to ensure the continuing health and safety of our employees and subcontractors. The health and safety success of our team assures the success of our projects. At Roux, we are dedicated to promoting a positive safety culture in the field, within our offices, and throughout our personal lives.

What You Can't See Could Hurt You – Revisiting Subsurface Clearance

By Michael Friedman, Senior Geologist – Oakland, California

With field work and construction activities increasing as we move into the middle of the warm season, now is an opportune time to revisit subsurface utility clearance. According to the Common Ground Alliance, there were an estimated 276,000 damaged utility incidents reported to the Damage Information Reporting Tool (DIRT) in 2016, the latest year for which statistics are available. That averages to a damaged utility every 2 minutes in the U.S. and is estimated to be \$1.1 billion dollars in associated costs.

The main causes of these incidents were the excavation practice was not sufficient (56%), locating practices were not sufficient (21%), or notifications to 811 (One-Call) were not made (16%).

Roux's Subsurface Utility Clearance Management Program establishes a method to ensure, to the greatest extent possible, that utilities have been identified and contact and/or damage to underground utilities and other subsurface structures will be avoided. Our program includes the following basic elements.

Before you Dig

- **Mark/stake out** your excavation area to let the utility companies know where you will be working. They will only mark utilities in this area.
- **Call 811** (or your local One-Call center) a minimum of 2 days and no more than 10 days prior to intrusive work (note that the minimum number of days varies for each state).
- **Confirm responses** from all utility owners notified by 811. Do not assume that no response means there are no utilities in the area.
- **Obtain site drawings**, utility maps, historic drawings, or other documents that can help identify utilities in the excavation area.
- **Survey the site** with a third-party subsurface locator to

verify markings and evaluate if there are additional subsurface features in the area.

- **Walk the site** and complete the Roux Utility Verification/Site Walkthrough Record.
- **Complete Roux's checklist.** Roux has a Subsurface Utility Clearance Checklist that must be completed prior to any intrusive work.
- **Pre-clear the utilities**, which means visually verifying the location of subsurface utilities using hand tools or vacuum excavation for excavations and hand augering to 5 feet below ground surface for soil borings.

As you Dig

- **Respect the markings.** All utility location markings must be maintained during the intrusive activities. If utility markings are removed then 811 must be notified and the site must be remarked by the utility owner.
- **Maintain the tolerance zone** and do not use any powered equipment within 2 feet of the outside diameter of known utilities. (The minimum distance can vary by state).
- **Renotify 811** if your subsurface work moves outside the marked area.

Having a plan and sticking to it will help prevent and hopefully eliminate damage to subsurface utilities while performing subsurface work. Always respect the marks.

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRICAL, LIGHTING CABLES
YELLOW	GAS, OIL, STEAM
ORANGE	TELEPHONE, CABLE, TV, SIGNALS, ALARMS
BLUE	POTABLE WATER
GREEN	SANITARY AND STORM WATER, CULVERT
PURPLE	RECLAIMED WATER, IRRIGATION, SLURRY



Hidden Biological Hazards

Biological hazards can pose a significant risk to workers on a job site, especially when their presence is unknown. According to the Bureau of Labor Statistics (BLS), there have been 83 fatal injuries from insects and arachnids between 2003 and 2010, and 36,100 non-fatal occupational injuries between 1992 and 1997. While the injury totals lack behind those of general construction, that does not take away from their potential severity. Roux field staff are faced with biological hazards in a wide variety of environments ranging from rural to urban settings. Understanding where these hazards can be encountered and preparing mitigative actions early in the project is paramount to ensuring the safety of our field staff. What will proceed is a general overview of some of the hidden biological hazards we can face on a day to day basis in the field.

Arachnids



Many venomous arachnids, such as the Black Widow, Brown Recluse spiders, and scorpions, hide in dark and cool habitats. Monitoring wells tend to provide desirable conditions as shown above in the photos collected by a Roux Field Geologist in Oklahoma, showing a black widow spider (circled) and a scorpion.

Typically, arachnids are non-aggressive creatures. However, they may attempt to bite when threatened. Proper planning and notification to field staff is important so they can understand the potential risks and ensure they avoid any contact with these hidden pests.

Bees/Wasps

Alternatively, bees and wasps account for the majority of insect-related injuries. This is often due to their aggressive nature, especially if their nests are disturbed. A common area we typically can find these insects is within stick up monitoring wells, as they provide a sheltered, dry space even during periods of rain. It is important to inspect the monitoring well cover for damage or holes, as these make great entry points for our winged menaces. Preventative maintenance on wells can identify and fix potential areas of entry which can significantly reduce the number of unwanted encounters in the future.

In addition, it is recommended that prior to completing any field work, any known allergies to such pests should be communicated appropriately with staff. An EpiPen should be carried by the allergy-prone individual in order to promptly alleviate the potential for a severe medical emergency.

By Raymond Olson, Staff Geologist
Illinois

Tips for Opening and Working Around Groundwater Monitoring Wells

- Clear surrounding vegetation prior to beginning work.
- Assume an insect or arachnid is inside of the groundwater well prior to opening and identify potential escape routes.
- Use an appropriate extension object to open groundwater wells, thus eliminating the need to place your hand in a compromised position.

Ticks



Although not always noticeable, ticks can hide in plain sight due to their size. In the adjacent picture, there are three areas in which ticks are present; however, at a quick glance you wouldn't notice. Ticks are usually found in overgrown

brush, grass, or wooded habitats between spring and fall. Historically, ticks are one of the most identified hazards and potential Near Losses encountered by Roux field staff. This can be attributed to the fact that ticks can be present in a wide variety of environments. Although these insects are small, there is the potential for illnesses such as Lyme disease and Rocky Mountain spotted fever should you get bit. The following tips are included as a general reminder to avoid potential tick encounters when working outdoors.

Tips for Working in Wooded Conditions

- Wear clothing that has been pretreated with permethrin, an EPA-approved insect repellent on clothing.
- Apply bug spray (containing DEET) to exposed skin. An alternative natural remedy is tea tree oil, although may not be as effective.
- Wear a light colored long sleeved shirt tucked into pants, and tuck your pants into your socks.
- Periodically check yourself and have a buddy check the back of your neck and head for ticks.
- Conduct a full body tick search on yourself when leaving the field.



Working at Heights By James Dick, Senior Scientist – Massachusetts

When thinking about Working at Heights (WaH), often the first picture that comes to mind is a worker on a steel beam of a skyscraper wearing a harness. While this isn't necessarily the type of work we perform, there are WaH scenarios that we encounter in many of the tasks we perform. This article describes some of these scenarios and provides vital statistics to emphasize the importance of WaH awareness, as well as how to protect ourselves in these situations.



Definition

In general, WaH is defined as when a worker can fall from an unprotected edge and succumb to injury. There are various fall heights that this rule applies to, depending on which industry you work in. For a majority of our work, WaH applies when the potential fall is **6 or more feet (i.e., construction)**, but also includes 4 or more feet as per the general industry standard and can be fewer feet if the potential fall is over dangerous equipment or machinery.

H&S Statistics

Based on 2016 OSHA statistics, falls are at the top of the construction's "Fatal Four" (over 1/3 of deaths), and fall-related citations comprised 5 out of the top 10 violation categories. These statistics have further shown that many of these fatalities occurred at minimal elevations (4 to 6 feet), primarily as the result of not taking sufficient precautions including improper PPE (harness type/condition, lanyard length), inadequate anchor points, and inappropriately placed equipment.



WaH in the Environmental Industry

Many of our clients require issuing a WaH permit prior to the start of work. Some activities where a WaH permit applies include (distances are measured from a person's feet to the ground, deck, or platform):

- Work above 6 feet without guardrails
- Work from a suspended scaffold
- Work over water
- Work less than 6 feet from an unguarded edge (excavations/trenches/roof tops)
- Work on a roof with a grade more than 20% or less if slippery

- Work from a ladder above 6 feet
- Climbing a ladder above 20 feet

These situations may also apply to, but are not limited to, working on a fragile surface, near an opening in a floor or a hole in the ground (e.g., manholes, catch basins), retention walls, culverts, powered platforms, manlifts, atop frac tanks, soil vac boxes, liquid vac trucks, refueling points on heavy equipment, or as mentioned previously, above dangerous equipment or machinery.

Fall Protection

When WaH, there are three primary fall prevention systems:

1. Guardrails
2. Safety Nets
3. Personal Fall Arrest Systems

For these systems, there are additional regulations and requirements that must also be understood where an expert may be needed. For example, one important requirement is the use of a proper anchor point. This point must be able to withstand a weight of 5,000 pounds of force for each tie-off, which may require an analysis done by a Professional Engineer.

Secondary fall prevention systems must be employed if a primary system is impracticable. Secondary systems consist of administrative controls, whereas primary systems are engineered controls. Secondary systems may include the following:

- Controlled Access Zones
- Safety Monitoring (i.e., a spotter)
- Warning Lines
- Hole Covers – must be demarcated and secured

Note, that regardless of which system is employed, the system is only as effective as the user, inspection/maintenance, training, equipment selection, awareness of potential hazards, and stewardship of these processes.

As we all know at Roux through our training programs and philosophy, a company's safety culture directly influences worker behavior. Companies with strong safety cultures are less prone to accidents, but not immune. When it comes to WaH (along with all safety aspects), it takes continuous engagement and unified recognition that strong safety culture is a business enabler rather than a burden. This is demonstrated through a company that cares about the health, safety, and well-being of workers; where training and supervision are taken seriously and management is regularly involved, solicits feedback, and provides coaching and mentoring. It is through this culture that motivates oneself and unifies each other in making our workplace safer.



Snake Safety By Andrea Berlinghof, Project Engineer – Long Beach, California

The National Institute of Occupational Safety and Health (NIOSH) has estimated that approximately seven to eight thousand people are bitten by venomous snakes every year in the United States, resulting in at least five fatalities. Venomous and non-venomous snakes are present in many U.S. regions, so training on how to prevent, protect against, and treat snake bites is universally important. In the Long Beach office, snakes have been seen or heard at multiple jobsites. Several precautions have been taken to mitigate the risk to our employees, including grubbing the site and wearing additional personal protective equipment (PPE) such as snake gaiters.

Snake Bite Prevention and Protection

While assessing a jobsite for potential hazards, piles of rocks, leaves, and wood/tall grasses should be considered potential snake habitats. If a site has this type of terrain, consider hiring a company to clear or grub the site prior to conducting work.

While on-site, personnel should be aware of their surroundings and look and listen for signs of snakes, including rattling, movement of underbrush, and snakeskins. Watch where you are placing your hands or feet while walking around a site. If possible, stay on paths or cleared areas.

On hot days, snakes may be in shady, cool areas such as under a car or beneath piles of wood or debris. On cool days, and during the morning and early evening, snakes are more likely to be sunning themselves on a rock or driveway. A snake's striking distance is typically half of its body length, but do not test this approximation. If you see or hear a snake in your work area, step back a significant distance and allow the snake to proceed naturally. Do not try to move the snake from your workspace or direct it to a different area.

PPE can help protect against snakebites, including work boots, snake gaiters (pictured), and heavy work gloves. Snake gaiters are worn over your lower pant legs (below the knee) and/or boots, made of tough material to prevent penetration of snake fangs through a pantleg. When purchasing a snake gaiter, it is important to make sure there is no gap between the top of your boot and the bottom of the gaiter.

Snake Bite First Aid

If bitten by a snake in the field, do not panic—staying calm and still can help to slow the spread of potential venom. Seek medical attention immediately. If unable to get to the hospital right away, appropriate first aid includes keeping the victim comfortable and relaxed, washing the bite with soap and water, covering the bite with a clean, dry dressing, and positioning the bite below the level of the heart.

There are many myths surrounding snake bite treatments and first aid. Never, never, never: apply a tourniquet, cut the bitten area, suck the venom out of the bite, apply ice, soak the bite in water, take non-steroidal anti-inflammatory drugs (NSAIDs) for pain, or drink caffeinated beverages.

In general, snakes are afraid of you and will not strike unprovoked. Keep your eyes and ears open and wear appropriate PPE to protect yourself against snake bites.



Heat Stress By Scott Wright, Project Geologist – New Jersey

It's a great feeling waking up on sunny summer morning knowing that you're going to spend the day outside enjoying a day of fieldwork. On the other hand, groundwater sampling on asphalt in 90-degree temperatures while wearing personal protective equipment (PPE) is not always ideal in the sense of body temperature regulation.

When a cool summer morning quickly turns into a sweltering hot summer afternoon, heat stress can become serious if precautions aren't taken. Physical exertion, environmental factors, and clothing all contribute to heat stress by elevating core body temperatures over a prolonged period.

What is heat stroke?

Elevated core body temperatures may cause rash, cramps, and heat exhaustion, which if left untreated can lead to heat stroke. Heat stroke is the most serious heat-related illness and should be treated as an immediate medical emergency. Some signs of heat stroke can include a body temperature above 103° F; hot, red, dry, or damp skin; nausea; rapid strong pulse; ceased sweating; and/or loss of consciousness.

During heat stroke, a heat-related fever causes a rapid rise in

body temperature; the body's mechanisms for cooling fail. Mental and physical abilities become severely diminished. Heat stroke can cause death or permanent disability if emergency medical treatment is not given. If you or a co-worker is experiencing heat stroke, seek immediate medical attention.

How do you prevent heat stress and heat stroke?

There are many heat stress factors outside of a worker's control. What we can control is being prepared for potential heat exposure by checking the weather, applying sunscreen, hydrating prior to exposure, taking routine breaks, and identifying symptoms prior to escalating conditions. Knowing the forecasted temperatures and UV index prior to fieldwork is the first step to prevention. Being caught off-guard by extreme temperatures will only accelerate the heat exhaustion process. Also, if able, schedule more strenuous work activities during the early morning hours when it is cooler.

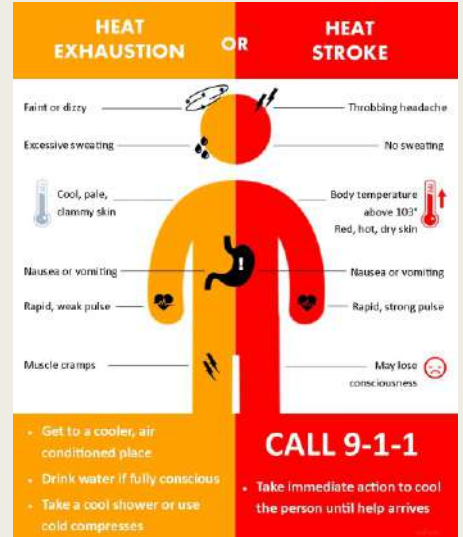
Sun screen with UVA/UVB protection should be applied 15 minutes prior to sun exposure, and should be reapplied based on the manufacturers guidance; typically, this is every 60-80 minutes.

Heat Stress (Continued) By Scott Wright, Project Geologist – New Jersey

Proper hydration starts the night before heat exposure and continues throughout the day. You don't have to get hydrated if you stay hydrated. Urine color can be used to indicate hydration levels. Often when physical signs of dehydration occur, it is too late, and can take your body up to one hour to reach normal hydration levels.

Prepare a schedule

Implementing a mandatory work/rest ratio based on physical and environmental factors can be an effective tool to limit heat stress. Remember, all employees have stop work authority if heat stress symptoms occur. Be prepared and know the symptoms.



2nd Quarter H&S Message

By Brian Hobbs, CIH, CSP, Corporate Health and Safety Manager

With the influx of our new summer hires, I thought this would be a good time to discuss the onboarding and continued mentoring of our new employees that are entering into the work force. In addition to our standard regulatory trainings provided in the first few weeks, our new hires are enrolled in a Short Service Employee (SSE) Program. The SSE Program provides a structured framework to assist with the development of our new staff and to instill our safety culture into their lives. Typically, a short service worker is anyone with less than six months of continuous service in the same job type. Upon enrollment in the program, SSEs are assigned a mentor and attend additional targeted safety and technical trainings to further develop their growth and knowledge base. The role of the mentor is to provide ongoing support and demonstrate safety leadership; they are a first line of communication when the SSE has any questions. The purpose of the SSE Program is to foster a continued learning experience and ensure our workers and projects continue to maintain a high level of health and safety excellence. It is important that all employees, whether they are new to Roux or veteran workers, understand their responsibilities under the SSE Program. If you have any questions regarding this program, please review the policy located on Clarity or speak with your Office Health and Safety Manager, Office Manager, or myself.

