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## "Safety Comes First" Case Western Reserve University Environmental Health and Safety

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### What happens in an EPA Inspection – Part III

### The Interview and Facility Tour

You have made it to the interview process! These steps are where the inspector will gather information about your facility and its operations. If the inspection is multimedia, all environmental aspects of your facility will be examined during the inspection. During the interview and facility tour, the inspectors will likely ask about the following: • Facility processes • Waste generation

- Air emissions
- Wastewater generation and discharge
- Problems experienced by the business
- Permit requirements

You must answer all of the inspector's questions accurately. In the event that you do not know the answer, don't make one up! You should obtain the answer from someone who can respond accurately or tell the inspector that you will provide a response after talking to appropriate facility personnel. The inspector has the legal authority to obtain samples of environmental media such as wastewater discharges, waste materials, or air emissions. The inspector will document all sampling activities, and chain-of-custody procedures will be followed to ensure the sampling results are valid. If the inspector does collect samples at your facility, then you will be offered the chance to collect duplicate or split samples of the inspector's samples and have them analyzed. You are required to provide your own analytical services and sample containers. You can expect that the inspector will use photography for documenting your facility operations and environmental activities. The inspector may take photographs of waste treatment, disposal, or storage areas; air pollution control devices; and wastewater treatment equipment.

If the inspector takes photographs, you are also permitted to take photographs of the subject. You are allowed to ask that the inspector refrain from photographing proprietary processes not essential to the inspection. If the inspector requests to take photographs of a confidential activity or operation, inform the inspector immediately so that he or she can document the request for business confidentiality. What should you expect to happen in the closing conference and after the inspection is complete? Read the next issue of the *EHS Newsletter*.

### **EPA Facts About Tritium**

#### What is Tritium?

Tritium is a form of hydrogen that is radioactive, and like hydrogen it reacts with oxygen to form water. Tritium is produced naturally in the upper atmosphere when cosmic rays strike atmospheric gases. Tritium can also be produced by man during nuclear weapon explosions, in reactors intended to produce tritium for nuclear weapons, and by reactors producing electricity.

#### What are the uses of tritium?

Tritium has been produced in large quantities by the nuclear military program. It is also used to make luminous dials and as a source of light for safety signs. Tritium is used as a tracer for biochemical research, animal metabolism studies and ground water transport measurements.

#### How does tritium change in the environment?

Tritium is not a stable element. Tritium decays by emitting a beta particle and turning into helium. The release of radiation during this decay process causes concern about the safety of tritium and all other radioactive substances. The radiation from the decay of tritium is in the form of beta particles which are of very low energy. Because of this the particles cannot pass through the skin surface. Tritium is the only radioactive isotope of hydrogen and like hydrogen it reacts with oxygen to form water. The transformation of tritium to tritiated water is a complex and slow process. Tritium is a colorless, odorless gas with a half-life of 12.3 years. Tritiated water moves through the environment like ordinary water.

#### How are people exposed to tritium?

Although large quantities of tritium have been released into the environment, the dose to humans is small. Tritium was disbursed throughout the world by atmospheric nuclear weapons tests that took place from the mid 1950s to the early 1960s. The inventory of tritium in the atmosphere peaked in 1963 and has been decreasing rapidly since then. Levels of naturally occurring tritium in the atmosphere produced by cosmic rays are constant, and it is projected that levels of manmade tritium will be comparable to natural tritium by 2030. Tritium is currently produced by reactors producing electricity. However, releases of tritium from these facilities are at fractions of the natural background production rates. Other sources of tritium include

government plants which have reprocessed reactor fuels. Individuals can also be exposed to tritium broken exit signs and luminous dial items that contain tritium. Since tritium reacts similarly to ordinary hydrogen it is incorporated into the body easily in the form of water. Overall, since current world wide levels of tritium in the environment from man-made and natural sources are low, the risk to the

"Tritium is the only radioactive isotope of hydrogen..."



### EPA Facts About Tritium, cont.

#### (Continued from page 2)

average person from tritium is typically not significant. Accidental exposure from elevated levels of tritium from broken exit signs or other concentrated sources, however can pose a health risk to individuals.

#### How does tritium get into the body?

Most tritium in the environment is in the form of tritiated water which is dispersed throughout the environment in the atmosphere, streams, lakes, and oceans. Tritium in the environment can enter the human body as a gas or as a liquid by ingestion and inhalation, and through the skin by absorption. Once entered into the body, tritium tends to disperse quickly so that it is uniformly distributed throughout the body. The tritium distribution in tissue is dependent on the amount of water contained in the tissues. Tritium is rapidly excreted over a month or two after ingestion.

#### Is there a medical test to determine exposure to tritium?

Since tritium is distributed throughout the body within a few hours after ingestion, levels within the body are measured by collecting a urine sample and analyzing it for tritium.

#### How can tritium affect people's health?

With respect to chemical reactions, tritium reacts similarly to ordinary hydrogen. Tritium therefore dilutes through the body as ordinary water. Tritium concentration in soft tissue and the associated dose to these tissues is generally uniform and dependent on the water content of the tissue. Because the water content in the body turns over frequently, tritium is rapidly cleared from tissues.

## What recommendations has the Environmental Protection Agency made to protect human health?

Please note that the information in this section is limited to recommendations EPA has made to protect human health from exposure to tritium. EPA has established a Maximum Contaminant Level (MCL) of 4 millirem per year for beta particle and photon radioactivity from man-made radionuclides in drinking water. The average concentration of tritium which is assumed to yield 4 millirem per year is 20,000 picocuries (pCi/l). If other radionuclides which emit beta particles and photon radioactivity are present in addition to tritium, the sum of the annual dose from all the radionuclides shall not exceed 4 millirem/year.

"Tritium is rapidly excreted over a month or two after ingestion."



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### CDC Newsroom: Zika Virus



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Zika virus is spread to people through mosquito bites. The most common symptoms of Zika virus disease are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting from several days to a week. Severe disease requiring hospitalization is uncommon.

Outbreaks of Zika have occurred in areas of Africa, Southeast Asia, the Pacific Islands, and the Americas. Because the *Aedes* species mosquitoes that spread Zika virus are found throughout the world, it is likely that outbreaks will spread to new countries. In December 2015, Commonwealth of Puerto Rico reported its first confirmed Zika virus case. Local vector-borne transmission of Zika has not been reported elsewhere in the United States, but cases of Zika have been reported in returning travelers.

**Zika virus and pregnancy**—Zika virus can be spread from a pregnant woman to her unborn baby. There have been reports of birth defects and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. Until more is known, CDC recommends special precautions for the following groups:

**Pregnant women** should consider postponing travel to the areas where Zika virus transmission is ongoing. Pregnant women who must travel to one of these areas should talk to their doctor or other healthcare professional first and strictly follow <u>steps to avoid mosquito bites</u> during the trip. Until we know more, if your male sexual partner has traveled to or lives in an area with active Zika virus transmission, you should abstain from sex or use condoms the right way every time you have vaginal, anal, and oral sex for the duration of the pregnancy.

**Women trying to become pregnant** should consult with their healthcare professional before traveling to these areas and strictly follow Scientists at CDC and the Pan American Health Organization are working with public health experts in Brazil and other affected countries to investigate the possible link between Zika virus infection and microcephaly.



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According to the World Health Organization, evidence that neurological disorders, including microcephaly and Guillain-Barre syndrome, are linked to Zika virus infection remains circumstantial, but a growing body of clinical and epidemiological data possibly leans towards a causal role for Zika virus.

#### Case Environmental Health and Safety

### Background On Burns (Know how to keep cool and safe)

While most burns involve skin, chemical splashes can also burn eye tissue. Workplace burn hazards include:

- Hot liquids (for example, water or grease) or steam
- Open flames (often involving a fire)
- Hot surfaces
- Contact with electricity
- Contact with corrosive chemicals (acids/bases)

Prevent burns by taking these precautions:

- Identify burn hazards related to the task or work area
- Keep alert while working
- Avoid reaching over or across hot surfaces or substances
- Wear assigned personal protective equipment to prevent exposure to chemicals and hot substances and surfaces
- Follow work rules carefully
- Read the data safety sheets (SDSs) for chemicals for burn information
- Be careful around electrical equipment
- Remember that steam can burn as well as hot liquids.

Workplace burns need prompt, proper attention. **First-degree burns** are the least serious. The affected skin may turn red and be painful. First aid involves:

- 1. Applying cool water or wrapped ice packs
- 2. Covering with a clean cloth or dressing
- 3. Taking aspirin or ibuprofen to relieve pain

**Second-degree burns** are more serious because the burn goes deeper. The affected skin will be red and blistered. First aid involves:

- 1. Removing clothing covering the burn, unless it's stuck to the burned skin
- 2. Applying cool water or wrapped ice packs
- 3. Leaving blisters alone and not breaking them
- 4. Getting quick medical attention if the burn covers a large area or is on the face, hands, or genitals

**Third-degree burns** are the most severe and may be life-threatening. The affected skin appears white or charred. You may see exposed bones and tendons. Third-degree burns require emergency medical treatment. Don't try to treat third-degree burns or remove clothing that is stuck to the burned area. Instead:

- 1. Cover the burned area lightly with a clean cloth
- 2. Elevate burned limbs
- 3. Call for emergency medical assistance
- 4. Watch for shock, and administer first aid for this condition if necessary

"Thirddegree burns are the most severe and may be lifethreatening."

## Get A Handle On Hand Tools

Hand tools—from axes to wrenches—are powered manually. But just because they don't have a power cord, that doesn't mean you can't get hurt. A few general rules of thumb will help ensure that no fingers or other body parts are injured while using hand tools.

- When using blades, knives, or other tools, always direct the tools away from aisles and away from other employees working nearby
- Keep knives and scissors sharp, because dull knives can cause more hazards than sharp ones
- Cracked saw blades must be removed from use
- Don't use wrenches if the jaws are sprung to the point that slippage occurs
- Be vigilant to the presence of sparks when using iron or steel hand tools, which can be a source of ignition around flammable substances. Instead, use spark-resistant tools where flammables are used or stored

"...it's all about using the right tool for the job."

Also, be aware that it's all about using the right tool for the job. According to the National Institute for Occupational Safety and Health (NIOSH), nonpowered hand tool use can contribute to musculoskeletal disorders. The solution is to choose the right tool for the job. Know how to identify the tools that will accomplish the specific purpose at hand.

Always be aware of the dangers of using hand tools in awkward postures, which can create unnecessary demands on the body. The best hand tool is one that requires the least continual force. This can reduce pain and fatigue by keeping the neck, shoulders, and back relaxed.

Reduce risk by using hand tools that:

- Do not have sharp edges or finger grooves on the handle
- Are coated with soft material
- Have an angle that allows work to be done with a straight wrist
- Can be used with either hand
- Have a nonslip surface for better grip

Speak up when you feel discomfort while using a hand tool (or any tool, for that matter). Advise your supervisor or member of the safety staff if you experience these symptoms:

- Tingling
- Swelling in the joints
- Decreased mobility
- Decreased grip strength
- Pain related to movement, pressure, or exposure to cold or vibration.



# Chemical Spotlight: Methylene Chloride

Methylene chloride clear and colorless with a pleasant odor. The chemical is used as a solvent in paint, varnish strippers, and degreasing agents. Methylene chloride is also used in the production of photographic films, synthetic fibers, pharmaceuticals, adhesives, inks, and printed circuit boards.

Methylene chloride vapor is readily absorbed into the lungs. It is heavier than air and may cause asphyxiation in enclosed, poorly ventilated, or low-lying areas. Exposure to high levels of methylene chloride vapor can cause severe skin and eye irritation. Prolonged dermal contact with liquid methylene chloride may produce chemical burns. Acute toxic effects, including death can result from ingestion.

In the event that methylene chloride is released into the environment:

- Evacuate all personnel and secure the entrance to the area
- Eliminate all ignition sources
- Ventilate the spill area
- For a small spill, absorb liquids in vermiculite, dry sand, earth, or other noncombustible absorbent material, and place into a sealed container
- For a large spill, dike far ahead of liquid spill for later disposal
- Prevent the chemical's entry into waterways, sewers, basements, or confined areas
- You may need to dispose of the chemical as hazardous waste. Contact your state department of environmental protection office or the U.S. Environmental Protection Agency.



Safety.BLR



"Methylene chloride vapor is readily absorbed into the lungs."



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