

**THE ELUCIDATOR**

Office of Surety, Safety and Environment (SSE)  
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**Reminder**

*For all accidents, no matter how minor,  
specific forms documenting the incident must be submitted to your Safety Office.*

*Military: DA Form 285-AB-4*

*Civilian: DOL Claims Forms CA-1 or CA-2*

*All employees requiring medical attention must visit your local Occupation Health Clinic as soon as possible post mishap.*



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*"Elucidate: to give clarity through explanation and analysis."*

**NEW TECHNOLOGIES COULD  
CAPTURE CARBON DIOXIDE**

Scientists and engineers in Georgia and Pennsylvania are reporting development of a new, low-cost material for capturing carbon dioxide from the smokestacks of coal-fired electric power plants and other industrial sources before the notorious greenhouse gas enters the atmosphere. Their study is scheduled for the March 19, 2008 issue of the Journal of the American Chemical Society, a weekly publication.

In the new study, Christopher W. Jones and colleagues point out that existing carbon capture technology is unsuitable for wide use. Absorbent liquids, for instance, are energy intensive and expensive. Current solid adsorbents show promise, but many suffer from low absorption capacities and lack stability after extended use. Stronger, longer-lasting materials are needed, scientists say.

The scientists describe development of a new solid adsorbent coined a hyperbranched aminosilica (HAS) that avoids those problems. When compared to traditional solid adsorbents under simulated emissions from industrial smokestacks, the new material captured up to seven times more carbon dioxide than conventional solid materials, including some of the best carbon dioxide adsorbents currently available, the researchers say. The material also shows greater stability under different temperature extremes, allowing it to be recycled numerous times.

**CBRN RESPIRATOR STANDARD  
PROPOSED MODIFICATION**

The National Personal Protective Technology Laboratory (NPPTL) is seeking comment on a request from the DoD for a proposed modification to the Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air-Purifying Respirator (APR) Statement of Standard to allow for mechanical connectors other

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than the specified single 40-mm thread connector. The DoD is seeking modification of the CBRN APR standard to allow DoD first responders to use a newly developed respirator, the Joint Service General Protective Mask (JSGPM), for respiratory protection on military installations in the United States, or when called upon to support civil authorities. The JSGPM uses a bayonet mounted, dual filter design instead of the single standard 40-mm screw mounted canister. DoD's request is to supplement the existing NIOSH standard with an alternate design for DoD application.

Information about the public meetings available at <http://www.cdc.gov/niosh/npptl/standardsdev/cbrn/meetings.html>. The NIOSH Statement of Standard and supporting concept papers for the CBRN APR available at <http://www.cdc.gov/niosh/npptl/standardsdev/cbrn/apr/>.

Comments are due by October 16, 2008. Mail comments to NIOSH Mailstop: C-34, Robert A. Taft Lab., 4676 Columbia Parkway, Cincinnati, Ohio 45226, or additional ways to submit comments available at <http://www.cdc.gov/niosh/review/public/139/default.html>.

### SAFETY WARNING: CHILDREN SLEEP THROUGH FIRE ALARMS

You've placed a smoke alarm outside your child's bedroom door, taught her to leave the house immediately if she ever hears it go off, and practiced your family fire escape plan. You may think you've adequately protected her from a home fire. But what if she never hears the smoke alarm? What if she sleeps right through it? Approximately 640 children younger than 14 die in house fires every year, and tens of thousands more are injured. National fire safety agencies estimate that 96 percent of American homes have smoke alarms, and that about three quarters of those are actually in working order. Still, 55 percent of children under 5 who die in house fires were asleep when the fires started. The reason, according to a growing body of research, is that current smoke alarm models, with their loud beeps and piercing screams, may work to wake adults, but rarely are able to pierce the very deep sleep experienced by young children. In fact, a study by Victoria University's School of Psychology in Melbourne shows that current smoke alarm models rouse just 6 percent of children age 6 to 15. That same study found that 100 percent of the children tested woke quickly to an alarm that used their mothers' voices, while more than 94 percent responded to an alarm voiced by a female actor. Check out this video of a local news station that tested this phenomenon with a family of five small children, all of which did not wake up to the sound of a fire alarm, <http://www.youtube.com/watch?v=xTLOF6lixLc>.

Children's ability to escape a fire hinges on two things – an alarm that will dependably awaken them, and a reliable, easy-to-follow, well-practiced escape route. According to the U.S. Fire Administration, children as young as 3 years old can follow a fire escape plan if they have practiced it often. However, parents won't know how their children will react to a smoke alarm until they've tested their response to it.

Parents can prepare children to escape a house fire with a few simple steps:

1. Consider replacing standard smoke alarms with talking smoke alarms. These smoke alarms allow a parent to personalize an alert in their own voice, using the child's name, and words most likely to rouse their child.
2. Create and practice a fire escape plan. Your plan should include two exits from every room in the house, especially bedrooms. Practice your escape plan with your child. Repeat the lesson throughout the year.
3. Home fire drills are essential. Parents should activate their smoke alarms and conduct their drills at night, so they can better gauge the reaction of everyone in the household. Familiarize children with the location and sound of all smoke alarms. Evidence indicates that familiarization with the sound of the alarm and practicing escape drills increases the likelihood that a child will react appropriately when needed.
4. If your house has more than one story, or you live in an apartment or condo, be sure to provide a window exit for upper levels of your home. If your child's bedroom is on the second floor, consider a permanent, foldable fire escape, rather than a chain ladder which can be difficult for children to use.
5. Children and the elderly aren't the only ones at risk of sleeping through an alarm, she notes. Sleep-deprived college students, shift workers, teenagers, the hearing impaired, and anyone taking sedating medication, alcohol or drug-impaired individuals, might conceivably be affected, as well. Every family should know who will—and won't—wake up at the sound of the alarm so they can make special accommodations. Families should design an escape plan that assigns an adult who awakens easily to rouse the sound sleepers.



### UPCOMING COURSES AND SEMINARS

**Title:** USACHPPM Basic Waste Management Work Shop  
**Location:** Baltimore, MD **Date:** 9/16/08 – 9/19/08  
**Description:** Provides DoD or DoD contractor healthcare facility personnel with fundamental information to manage and/or supervise hazardous and medical waste in a healthcare facility. The course provides a basic overview of hazardous materials management; hazardous waste identification, management and disposal; medical waste management; and other related issues (i.e. pollution prevention, environmental audits and program management.) This course can assist in fulfilling the general training requirements initially required for HW managers by RCRA regulations. Personnel who should enroll in the course are healthcare facility personnel who generate, process or dispose of hazardous or medical waste. Typical participants are Preventive Medicine, Logistics, Environmental Services, Safety, Medical Field Unit Personnel, Environmental Coordinators, Installation level Environmental personnel and support staff involved in medical waste management. This course is tailored to the level and/or experience of the group. The course is interactive and practical exercises are used throughout. There is no registration fee charge for this course. You will, however, be responsible for your own TDY expenses, including the payment of your hotel bill when you checkout. If you have any questions concerning this course, please e-mail Teresa Lewis at [terry.lewis6@us.army.mil](mailto:terry.lewis6@us.army.mil).  
**Web:** Visit <https://usachppm.apgea.army.mil/TrainCon/datePage.aspx> for registration information.

**Title:** USACHPPM Transport of Biomedical Materials  
**Locations:** Forth Lewis, WA **Dates:** 12/08/08 – 12/12/08  
 Forth Detrick, MD 1/26/09 – 1/30/09  
 Aberdeen Proving Ground, MD 2/23/09 – 2/27/09  
**Description:** Details the provisions governing biomedical material transport. The course focuses on regulatory requirements as prescribed by the Department of Transportation (DOT), Department of Defense (DoD), and other regulatory agencies. Students learn to identify and classify hazardous materials; prepare regulated medical waste, diagnostic specimens, biological products and infectious substances for transport; prepare and certify shipping papers for all classes of hazardous materials; package samples and specimens for transport; and certify shipments of biomedical material for transport. The training is for military and civilian personnel of all services including laboratory technicians, pathologists, safety officers, warehouse workers, doctors, and nurses who work at a health care facility and handle, package, mark, label, move or prepare infectious substances, diagnostic specimens, biological products or regulated medical waste for transport. To be designated a certifier of biomedical material, students must successfully pass an opened-book examination with 75% or better. The course meets both the DoD and DOT training requirements. There is no registration fee charge for this course. You will, however, be responsible for your own TDY expenses, including the payment of your hotel bill when you checkout. If you have any questions concerning this course, please e-mail Teresa Lewis at [terry.lewis6@us.army.mil](mailto:terry.lewis6@us.army.mil).  
**Web:** Visit <https://usachppm.apgea.army.mil/TrainCon/datePage.aspx> for registration information.



### EPA REGULATORY UPDATES AVAILABLE ONLINE

EPA has posted a memorandum authorizing the posting of documents, providing on-line information on [regulations.gov](http://www.regulations.gov) about planned regulations as soon as the agency begins the development of a new rule for public access. The list of regulations newly approved for development that will be posted at roughly the end of each month. Formerly, the public had to wait for EPA's Semiannual Regulatory



Agenda, which is updated only every six months. The monthly lists are available at: <http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=EPA-HQ-OA-2008-0265>. At this site you can also register (by selecting the Notification tab) to receive an email when a new action is posted.

### THE SSE ELUCIDATOR'S MONTHLY CARELESS CALAMITIES

Welcome to the latest edition of *Careless Calamities*. This month, we have a special treat for our loyal readers. A machinist's mate third class in Charleston and some buddies: "After work," the report says, they "decided that making a large, propane-fueled potato gun would be a good way to relax." See what I mean? All the elements are there. More proof that two heads can be worse than one. The adjective "large" in conjunction with a piece of home-made ordnance. The unlikely choice of projectile. And the finishing touch: the notion that this activity would be relaxing. This impromptu gun crew made a pair of these guns and connected them to a propane tank with a Y-fitting. They used globe valves to regulate the flow of the propane, and a propane grill starter as the ignition source. The op tests for this battery spanned two nights. Initial test firings, minus potatoes, revealed that the guns didn't work consistently because the fuel-air mixture was unsat. Before actual test firings on the second night, our team developed a clearing procedure, which I want to quote, because it gets technical, and I don't want to confuse you: "After an attempt to fire the gun, a match would be thrown down the barrel. If the barrel glowed, there was a potato still in the gun. If there was propane left over, it would ignite. If neither happened, the potato was gone and there was no propane." Got it? Comfy with this trouble-shooting procedure? I'm not either. One potato was duly blasted into the heavens or the neighbor's yard, whichever came first. The clearing

procedure outlined above seemed to be working, so the gun crew broke for chow. Then the MM3 returned solo, loaded half a spud into one of the guns, and pressed the starter button. No joy. He tossed a match down the barrel. No ignition of propane, and no glowing of the barrel. He peered down the barrel to check the spark. He saw smoke so he pressed the starter button again. Incredibly (this is the part your grand-children won't believe as you tell them this tale around the campfire years hence), our MM3 was rewarded with the sight of half a potato, proceeding merrily up the barrel, assuming the word "merrily" means "faster than you can blink," and with enough force to produce a "non-displaced orbital wall fracture." I'm not sure what that is, but I know that I don't want one, thank you very much. The unfunny part is that he at least temporarily lost his vision in that eye. Docs thought the symptoms would gradually clear up, but didn't think he'd get all his vision back. The lessons learned from his misadventure are also worth quoting in full. First, "Potato guns are not a safe hobby." So far, so good. Second, "Have a way to clear the propellant. Air hole, etc." This troubles me, because that "etc" seems vague as a precaution, and I hope we aren't implying that other sorts of vegetable or non-vegetable ordnance (carrot cannon, turnip catapult, rutabaga mortar) are hunky-dory as long as you handle the propellant properly. Third, "Anytime a projectile device is used, have eye protection." Fully concur with that one.

### HAZARDOUS WASTE LISTING FOR EPINEPHRINE CLARIFIED

The common drug epinephrine is regulated as an acutely toxic listed hazardous waste when it can no longer be used for its intended purpose (e.g., expired shelf life or contaminated). Commonly known as adrenaline, epinephrine has a number of critical uses including formulations for asthma treatment and injectors to handle severe allergic reactions (e.g. insect stings) that can lead to anaphylactic shock.

The hazardous waste listing at 40 CFR 261.33 for waste code P042 shows only epinephrine with Chemical Abstracts number 51-43-4 and does not address salts of epinephrine such as the hydrochloride which is how it is typically supplied. Some hazardous waste listings apply to a base chemical and all of its salts. What about epinephrine?

According to the EPA, the listing does not extend to the salts of epinephrine but to the base compound only. Therefore, many of the formulations supplied as emergency supplies and in our medical facilities will not meet the hazardous waste listing. In a memorandum to the EPA Regional Hazardous Waste Directors dated October 15, 2007, the EPA's Director of the Office of Solid Waste, Matt Hale, explains the rationale for not including epinephrine salts in the P042. The document is available from the EPA's RCRA online system and a direct link is [http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/2F701627E873B2AB852573D2005E0B4F/\\$file/14778.pdf](http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/2F701627E873B2AB852573D2005E0B4F/$file/14778.pdf).

Questions also arise about the remaining drops in an epinephrine syringe after use; are those drops regarded as P042 hazardous waste? Again the EPA has said no in an earlier RCRA hotline report from December 1994 and available at [http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/1C1DEB3648A62A868525670F006BCCD2/\\$file/13718.pdf](http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/1C1DEB3648A62A868525670F006BCCD2/$file/13718.pdf).

By further interpretation, the EPA has extended this syringe residual interpretation to other drugs admin-

istered by syringe that may be "P" or "U" listed hazardous waste. The further interpretation applies to medicinal syringe application only where the residuals are very small. See the April 14, 2008 interpretive memo from the EPA's Robert Dellinger to Sure-Way Systems, Inc - available for download at [http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/6A5DEDF2FBA24FE68525744B0045B4AF/\\$file/14788.pdf](http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/6A5DEDF2FBA24FE68525744B0045B4AF/$file/14788.pdf).

As in all cases regarding hazardous waste regulations, remember that all states except Alaska and Iowa operate their own hazardous waste programs under the EPA oversight and authorization. Those states can be more stringent regarding waste classification and interpretive guidance.

Article adapted from: McCarley, T. *Hazardous Waste Listing for Epinephrine and Other "P" and "U" List Drugs Clarified*. Hazardous Technical Information Services. JUL-AUG 2008

**EPA'S UPCOMING EVENTS**

- September**  
National Preparedness Month
- Week**  
15 - 21 National Pollution Prevention Week
- Day**  
6 Carl Garner Federal Lands Cleanup Day  
20 International Coastal Cleanup Day  
27 National Estuaries Day
- Get a sneak peek at the revised EPA home page at [http://www.epa.gov/epa\\_home/sneak.htm](http://www.epa.gov/epa_home/sneak.htm)

## BIRD AND BAT FECES POSE HEALTH HAZARDS



Some bird-borne infectious diseases such as West Nile, Lyme disease, and avian influenza can be transmitted from birds to human directly or through intermediate vectors such as mosquitoes and ticks. Birds harbor over 40 types of parasites and can host internally over 60 types of infectious diseases. These diseases vary in seriousness from minor stomach ailments to fatal diseases such as histoplasmosis, the most common bird-borne disease now. The role of avian species in spreading disease is of particular concern to scientist because birds are ubiquitous and can move pathogens over long distances quickly.

Fortunately, human interaction with most bird species is minimal, thus drastically reducing health threats from most birds. However, a few bird species, the pigeon, starling, and house sparrow, have successfully adapted to our urban environment. They nest in our buildings and eat our food. Their adaptation to our communities has brought them into close proximity to humans, thus becoming a major nuisance in our cities and posing a serious health risk.

Bird feces accumulate wherever birds congregate to rest during the day or roost at night. Accumulation of bird manure inside buildings, under trees near human habitations, or on structures and machinery can harbor disease organisms harmful to humans and domestic animals. The high nutrient content of accumulated bird and bat manure provides an excellent growth medium for the causative organisms of cryptococcosis and histoplasmosis. Note: Bat feces present similar hazards since some of the same molds that grow on bird feces also grow on bat feces.

Dried avian feces have been recognized by environmental and safety and health professionals as a significant occupational health hazard to exposed individuals such as bird-keepers and construction workers. Potentially exposed individuals are those that are routinely caring for birds (wildlife or pets) or are involved in the renovation or demolition projects of old abandoned buildings where years of roosting has resulted in large piles of bird feces, dead birds, nesting materials, and live birds. Other jobs presenting high exposure risk may include: bridge inspectors, painters, chimney cleaners, farmers, gardeners, HVAC

system installers or service personnel, roofers and pest control workers.

**How Birds Harbor and Spread Disease** – Birds can harbor and spread disease by any of the following means: the disease is contained inside the bird and passed through defecation; the disease lives in the birds surrounding environment (nesting materials or droppings) and is spread by the birds lifestyle; or the disease lives inside a parasite that the bird harbors.

**How Diseases are Passed from the Birds to Humans** –

1. **Food and water contaminated with feces.** Contamination may occur if (e.g.) diseased birds directly defecate into a water reservoir or if birds gain access to a food processing plant. In addition to direct contamination, airborne spores from dried feces in air ducts and vents can settle on exposed food. Every year, several thousand cases of Salmonella food poison are attributed to this disease transmission route.

2. **Inhalation of fecal dust.** As bird feces and/or the contaminated soil it rests on dries or is disturbed, microscopic pieces break off and become airborne. The inhalation of avian fecal dust presents a significant potential exposure to the fungi and/or bacteria, some of which can cause serious infections in humans. When breathed into the lungs, the warm, moist environment of the lung lining provides a breeding ground for the infectious agents.

3. **Direct contact with feces.** Infection may occur when an open wound or cut is exposed to fecal dust or droppings. The wound site becomes red, puffy and puss-filled. Antibiotics are often needed to cure the infection. In some rare cases, Sepsis infection of the blood or internal infection an also occur, causing serious illness or death. Proper personal protective equipment and care must always be used when cleaning a bird site or installing bird control products. If a cut or injury occurs, thoroughly was and disinfect the wound and cover with a sterile bandage.

4. **Associated parasites.** Birds harbor ticks, fleas, mites and other ectoparasites. The parasite bites an infected animal and sucks in blood containing the germ. When the bug bites its next victim it passes along the germ to the new victim. Over forty types of

## BIRD AND BAT FECES POSE HEALTH HAZARDS



parasites live either on the birds, in their nests or in the places they roost. They are responsible for the transmission of several hundred viral and bacterial agents. These diseases include plague, encephalitis, pox, and meningitis. Parasite extermination should always be included in a bird control project, because unless the parasites are exterminated when the birds are removed from a site, the parasites will seek a new host, often the human inhabitants.

Zoonotic diseases are those diseases shared by animals and humans. The infectious agents can be protozoal, fungal, bacterial, chlamydial, or viral. Individual susceptibility and the seriousness of these various microbial infections vary with age, health status, immune system condition, and whether early treatment is sought. The ability of a microorganism to make a person sick varies with the virulence of the organism, the dose to which the person is exposed, as well as route of infection.

**Cryptococcosis**, caused by the fungus *Cryptococcus neoformans*, prefers to grow in soils enriched with avian manures. Infections are seen in many mammals, but occur most frequently in humans, horses, dogs, and cats. Transmission is usually by inhalation of this yeast-like fungus, although it can occasionally occur by ingestion. Humans can pick up cryptococcosis from exposure to old pigeon nests or droppings, which is then manifested as meningitis or meningoencephalitis, and it is usually preceded by pulmonary infection with cough, blood-tinged sputum, fever, and malaise. Symptoms include fever, cough, chest pain, and spitting of blood from the respiratory tract, followed by headache, stiff neck, and visual disturbances.

**Histoplasmosis** is a disease caused by a fungus, *Histoplasmosis capsulatum*, which grows in pigeon droppings. It also grows in soils and is found throughout the world. When cleaning droppings a person may breathe in some of the fungus, which in cases of high exposure can cause infection. Common activities, such as cleaning off windowsills, will not result in high exposures. Symptoms begin to appear about 10 days after initial infection and include fatigue, fever, and chest pains. Most people,

however, do not show any symptoms. The disease cannot be transmitted from person to person.

**Chlamydiosis**, also known as psittacosis, is a disease that affects a wide variety of bird species. It is also transmissible from birds to humans. Since the human disease is usually associated with parrots (including parakeets and cockatiels), physicians often call the infection “parrot fever” or psittacosis. In humans this disease is characterized by fatigue, fever, headache, rash, chills, and sometimes pneumonia. Symptoms develop about 10 days after exposure. Approximately 100 to 200 human cases are reported annually nationwide.

Many avian disease are transmitted by ingestion of food contaminated by fecal matter or through inhalation of fecal dust. The more susceptible groups to avian diseases are the very young, the elderly, and those with compromised immune systems. The best work practice in the prevention of avian diseases, is whenever feasible, to prevent the accumulation of manure. Therefore, whenever a colony of bats or a flock of birds is discovered roosting in a building, immediate action should be taken to seal all entry points. A variety of bird control devices are commercially available. However, devices that might unnecessarily harm or kill should be avoided.

The next step in prevention simply involves proper hygiene and sanitation. Therefore, to avoid inhaling fecal dust and coming in contact with fecal matter when working in projects that involve the removal of bird feces, respiratory protection and other appropriate personal protective equipment such as disposable coverall and gloves are recommended. It is important to note that whenever these functions are performed considerations should be take to protect both the health of the workers and the general public. Additional information about protecting workers from Histoplasmosis can be found at <http://www.cdc.gov/elcosh/docs/d0600/d000679/d000679.pdf> and information about managing health hazards associated with bird and bat excrement can be found at <http://chppm-www.apgea.army.mil/ento/tg142.htm>