



# The United Sludge-Free Alliance Health, Food, & Water

## **WATER – DON'T FLUSH WHERE YOU DRINK**

**By Darree Sicher**

Without water, we are without life – so why don't we treat our water sources and systems with the respect for maintaining our survival? As more viruses, pathogens, hormones, pharmaceuticals and toxic chemicals are discovered in the waters that sustain us, the need to re-evaluate of the role of the bureaucracies that are charged with protecting our health, safety and communities is called into question.

In 2006, water borne diseases world-wide were estimated to cause 1.8 million deaths annually, while about 1.1 billion people lacked proper drinking water. If the water we drink is of questionable quality, what is the quality of the water that we introduce back to our communities *after* we have used it? What does water quality have to do with land application of sewage sludge?

In some United States communities, water standards have not changed since the 1970's, when the concept of 'safe' drinking water was recognized as an impact to health. By setting a low legal standard for what is considered 'safe' in the water and sewage sludge released from the waste water treatment plants back into a community, municipalities avoid the expense of updating facilities and industries avoid the expense - and responsibility - of eliminating toxic products. Instead, all expenses are passed on to the health and safety of our citizens and the environment that sustains us.

Everything that goes down the drain of homes, businesses, industries, hospitals and mortuaries collects at the municipal waste water treatment plants (WWTP). WWTP were created and intended to separate the liquids from the solids to 'clean' the water in order to return it to the community. Water returned into the community is called effluence and is often poured directly into waterways, stream and river or used to water crops or lawns. The solid remains from the WWTP are called sewage sludge or "biosolids". The term "biosolids" was created by the sludge industry as a cozier way to promote the solid byproduct of sludge after they were forced to stop ocean dumping because it was poisoning the oceans. Unfortunately, the minimal testing requirements actually do not guarantee the health or safety of the water being returned to your community.

In 1981, the Environmental Protection Agency (EPA) published a study expressing concerns about widespread contamination. The EPA paper, written by Mark Meckes discusses sewage sludge, "Several researchers have pointed out that waste water, treated or untreated, is a primary contributor of bacteria to the aquatic ecosystem. Other studies have been conducted which demonstrate that significant numbers of multi-drug-resistant coliforms occur in rivers, bays, bathing beaches and coastal canals. Waters contaminated by bacteria capable of transferring drug resistance are of great concern since there is the potential for transfer of antibiotic resistance to a pathogenic species."

The message: the cleaner the released effluent, the dirtier the sewage sludge/biosolids.

The Clean Water Act, helpful in halting the ocean dumping of sewage sludge, stipulates that US EPA must identify and regulate toxic pollutants that may be present sewage sludge at levels of concern for public health and the environment.

The EPA survey, called the "Targeted National Sewage Sludge Survey", sampled WWTP in 35 states from 2006 to 2007. This annual survey determines which chemicals are present in sewage sludge to estimate national concentrations and exposures to citizens by testing samples for 145 compounds, including 28 metals, 11 flame retardants, 72 pharmaceuticals, and 25 steroids and hormones.

The antimicrobial triclocarban was detected in all 84 samples collected, while its cousin triclosan is found in 79 out of 84 collected samples. Triclocarban was found to have the highest concentrations ever detected in sewage sludge. The antibiotic, ofloxacin, had the third highest concentration. Why does this matter? Because the known toxins and antibiotics found by the EPA in sewage sludge have no regulations, remain untested for the impact on human health and are introduced into our food and water supply through land application as a fertilizer option. Instead, the EPA maintains that the minimal testing requirements of nine elements – arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc – and two pathogens – salmonella OR E. coli – are sufficient in “estimating” our health risk. No federal, state or government agency has ever conducted conclusive scientific studies that prove pouring known toxic waste on our food, water and communities is safe. The use of sewage sludge on any open land means that these antimicrobial compounds, as well as the host of other heavy metals, pharmaceuticals and hormones, may be absorbed by crops and find their way up the food chain and into human diets. What compounds are being found in our waterways?

## WAR ON DRUGS - ENDOCRIN DISRUPTORS & PHARMACUETICALS

The endocrine system is the system of glands and hormones that regulates bodily functions including growth, response to stress, sexual development and behavior, production and utilization of insulin, rate of metabolism, intelligence and behavior, and the ability to reproduce. When ‘endocrine disruptors’ are introduced into our physical bodies and the environment that grows our food and water, they ‘disrupt’ or upset the hormonal balance that the body needs to function properly. Examples of endocrine disruptors infiltrating our water sources, such as displaced pharmaceuticals and chemical waste, are numerous and relentless.

World-wide, scientists have found sexual abnormalities in wild animals exposed to sewage effluence and industrial contaminants. Repeatedly, scientists are discovering sexually abnormalities, especially in male species of animals like frogs, fish and alligators. The effects of hormone disrupting chemicals and pharmaceuticals introduced into our communities, landscapes and waterways are becoming apparent. In 2008, Children’s Hospital of Philadelphia reported findings of genital defects in baby boys doubled in the last 30 years, while a 2007 study in the Journal of Clinical Endocrinology & Metabolism notes a drop in testosterone levels in American men – both are related to environmental exposures. National watershed studies have found pharmaceuticals in the watersheds of 28 major metro areas. Yet, there are no standards, no mandates, and no controls to test, treat or limit pharmaceuticals in water. Think you’ll just purchase “clean” water once your hometown source or well has become contaminated? The bottled water industry faces the same federal standards for pharmaceuticals as tap water – none.

Johns Hopkins Bloomberg School of Public Health reported in a 2006 study that 75% of triclocarban, a known toxic substance when ingested, passes through the waste water treatment plant and is now traced to contaminating rivers and streams. Triclocarban and its cousin triclosan - used in products including antibacterial hand soap, cosmetics, clothing and toys - are linked to hormonal disruption. In mammals, including humans, triclosan has also been found in urine, umbilical cord blood and breast milk.

Along coastal bays and waterways in California, fish have developed liver tumors and the sexual slurring of female reproductive parts found in male species from the chemical nonylphenols, a common ingredient in detergents, cosmetic products, and spermicides. The Los Angeles Times brought a startling discovery to the public’s attention

in 2005: scientists found male flatfish with female characteristics. The intersex fish, found near the three massive wastewater outfalls that dump treated sewage effluent into the Pacific Ocean, serve Los Angeles and adjacent Orange County. Scientists speculate that the daily 4 billion gallons WWTP discharge is disrupting the endocrine systems of the fish.

“All the intersex fish were found between the Los Angeles and Orange County outfalls,” says biologist Steve Bay, of the Southern California Coastal Water Research Project. “No such sexual defects were found elsewhere. Two-thirds of the male turbot and sole caught near Orange County’s sewage outfall had vitellogenin, or egg-producing proteins, more commonly found in female fish. In laboratory experiments, male fish exposed to ocean sediment collected from the same area all produced vitellogenin.”

Regardless of the scientific findings and the concerns of health professional world-wide, the water regulations remain relatively unchanged. During flu season, it's not surprising that Tamiflu is detected in waterways. A 2008 Associated Press investigation found prescription drugs have been detected in the drinking water supplies of 41 million Americans living in 24 major metropolitan areas. These drugs include the hormones found in birth control pills, antibiotics and psychotropic medications. Treatment systems can remove some, but not all of the drugs; in fact, chlorine used to disinfect water can make some drugs more toxic. Nonylphenols are chemicals that mutate and increase potency from mixing with other chemicals at the waste water treatment plant. Other countries, including the European Union and Canada have effectively banned or classified nonylphenol as a toxic chemical, restricting uses in waterways. In the U.S., allowable levels of nonylphenol are twice the allowable levels of Canada.

The government has set no national standards for how much of any pharmaceutical is too much in waterways or taps. Drugs in the environment are "not currently a priority" of the National Center for Environmental Health, says spokesman Charles L. Green, at its parent U.S. Centers for Disease Control.

#### BACTERIA, SALMONELLA & E. COLI

Hospitals discharge considerable amounts of chemicals and microbial agents in their wastewaters. Problem chemicals in hospital wastewater belong to different groups, such as antibiotics, X-ray contrast agents, disinfectants and pharmaceuticals. Many of these chemical compounds resist normal wastewater treatment and none, with the exception of salmonella *O* *E. coli*, are required testing by the EPA.

According to medical geo-hydrologist Dr. Edo McGowan, "(Bacteria) end up in surface waters where they can influence the aquatic ecosystem and interfere with the food chain. Humans are particularly exposed by the drinking water produced from surface water. Microbial agents of special concern are multi-resistant microbial strains. The latter are suspected to contribute to the spread of antibiotic resistance."

The development of antibiotic resistance within sewer plants is well known. Dr. Amy Pruden's work showed that antibiotic resistant genes are developed within sewer plants, pass into the environment, are picked up in fresh water intakes, and end in the potable water supply. Dr. McGowan, Dr. Amy Pruden, of Colorado State University, and Dr. Joan B. Rose, of Michigan State University, all served on a US EPA expert team looking at the subject of pathogens in sewage sludge/biosolids.

"Testing of finished recycled water (effluence) demonstrated that the water had acquired antibiotic resistance. The bugs were resistant to 11 of 12 antibiotics," says Dr. McGowan. "Unfortunately, what we are facing is now a major biological, not chemical issue. That issue is antibiotic resistance and increased virulence. Dilution does not work well for pollutants that have the capacity for vast multiplication and adaptation to environmental niches."

Researchers at the University of Georgia in Athens (UGA) report a rise of salmonella in rivers and streams after rains carry contaminated runoff from landscapes. Salmonella, found in 79 percent of water sampled from rivers and streams in southern Georgia, had the highest concentration during the steamy summer months. Salmonella bacteria, also responsible for food poisoning of citizens throughout America, are awash in the waterways that sustain human, plant and animal life.

"If the (tainted) water is used to irrigate crops, it would likely contaminate the crop," says Michael Doyle, director of UGA's Center for Food Safety. Polluted water used to irrigate or clean produce has been linked to salmonella.

In 2006, studies funded by the sludge industry Water Environmental Research Foundation (WERF) - formerly known as the Federation of Sewage Workers - noted that sludge/biosolids that were dewatered by centrifuge created a material that passed standard bacteria tests, yet just 20 minutes after dewatering, showed substantial increase in bacterial counts. WERF also released findings that confirm the re-growth of fecal coliform after treatment. Rocket science? Hardly - bacteria re-grow after treatment.

Studies funded by sludge industry recognize the limitations of their own products and the false marketing of 'stabilized' sewage sludge from WWTP. Scientific studies and warnings by independent scientists are ignored. The industry and bureaucracy continues to resist responsibility for providing real safety to the America public.

University of Minnesota (UNM) scientists, including Kris McNeill and Bill Arnold, presented 2009 studies linking PBDE flame retardants exposed to waste water treatment can transform to generate dioxin, a

chemical known to cause birth defects, endocrine disruptors and cancer. Experts agree that both the dioxins and the compounds that produce them, hydroxylated PBDEs (OH-PBDEs), could be impacting aquatic wildlife and humans.

Supporting these findings is a report by the U.S. National Atmospheric and Oceanic Administration (NOAA), which documents PBDEs in U.S. coastal waters. John H. Dunnigan, assistant administrator of NOAA's National Ocean Service, notes "Scientific evidence strongly documents that these contaminants impact the food web and action is needed to reduce the threats posed to aquatic resources and human health." Toxicity studies have connected PBDEs to liver, thyroid, and neurobehavioral development impairments and, "show the potential for adverse human health effects."

"It's logical to assume if you have PBDEs [in wastewater], you'll have OH-PBDEs...and if the OH-PBDEs are exposed to sunlight, you're going to get brominated dioxins formed in the water," UNM scientist Arnold says. And remember, the 2007 EPA "Targeted National Sewage Sludge Survey" found flame retardants in *every* sewage sludge sample test.

Terms like 'natural' and 'organic' have suffered as the chemical and industrial interests 'greenwash' America's vocabulary for monetary gain. For instance, arsenic and lead are natural, organic compounds. Both cause negative, even deadly, health effects. Johns Hopkins Bloomberg School of Public Health, analyzed research data from 2004, linking arsenic in US drinking water to increases in diabetes. Arsenic also affects nearly all the organs in the body, causing ailments including lung, skin and kidney cancer, internal bleeding and heart damage, kidney and liver failure, and birth defects. Disregarding advances in science and technology that make it possible to strengthen regulations, the EPA stated in 2003, "The agency decided that changes to these standards would not provide a meaningful opportunity for health risk reduction." The EPA has also recognized the hormone-disrupting chemicals must be studied in combination with other toxins, yet refuse to reevaluate their own testing and regulation requirements.

#### WATER, WATER EVERYWHERE - BUT TOO TOXIC TO DRINK?

Constant pollution comes from constant sources – paved surfaces, overflowing waste water treatment plants, industry, agricultural run-off, legal and illegal dumping of toxic waste into the waters that sustain America. In fact, every industry can legally pour 33 pounds of hazardous waste down the drain a month without reporting to any government body. Recent examples of our constant chemical flush into our waterways include: Dec. 2007 – Merck Pharmaceutical fined \$20 million for polluting Delaware River, Philadelphia, PA drinking supply; Nov. 2008 - sludge applied to flood plain area in Prescott, AZ; Nov. 2008 - Tahlequah, OK applies sludge that was tested for salmonella, even as the test failed for fecal coliform; April 2009 – Atlantic State Cast Iron Pipe Company of Phillipsburg, NJ \$8 million in fines for contamination of the Delaware River; Sept. 2009 – MRSA found on beaches in Washington state; Oct. 2009 - Thompsonville, NC 15.9 million gallon sewage sludge spill into Yadkin River.

Sadly, these examples are a minute representation of the constant challenges to the health and safety of our water. In 2005, Congress voted to exempt the oil and gas industry from complying with the Safe Drinking Water Act. Consider that many cities and municipalities gather their drinking water from the very rivers that receive their sewage treatment effluence. Storm water related violations of the Clean Water Act, including overflowing waste water treatment plants, pollute waterways and rivers and are the leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards. From both land and storm sewer systems, polluted runoff is discharged, often untreated, directly into local water bodies. Since the late 1990's, the federal government has issued consent decrees to communities for their 'Sanitary Sewer Overflows'. Negotiated consent decrees between major American cities and the federal government exempt cities from the Clean Water Act, allowing sewage overflow into the very rivers that provide drinking water for the community.

Cited for failing to comply with federal requirements for land disposal of sludge/biosolids, some municipalities are 'fined' for breaking the law. Excessive application of sludge can result in nitrate contamination of surface or ground water, as well as expose people and animals to unsafe levels of pathogens, such as bacteria and viruses. The following communities were 'fined' for breaking the law in 2009:

- Sheffield Utilities, in Sheffield, Ala. (civil penalty of \$900)
- City of Perry, Fl. (civil penalty of \$1,600)
- City of Cartersville, Ga. (civil penalty of \$900)

- City of Sandersville, Ga. (civil penalty of \$900)
- Town of Rutherfordton, N.C. (civil penalty of \$900)

Do these 'fines' actually discourage pollution or make a mockery of the democratic process by claiming to 'get tough' on violations?

The wastewater industry seems to be the last industry to want to clean up its act. Discharging contaminated waste water effluents back into the community from the WWTP infects the communities, food and water source of America. Science, both inside and outside of the sludge industry, recognizes the reality and magnitude of the problem – we are poisoning the very waters that sustain us. It's no mystery how we have created and introduced new, powerful bacteria and pathogens. It's no mystery that we have created rampant health challenges by creating environmental Petri dishes of our communities. Our wildlife and landscape are merely the warning system of what we are doing to ourselves.

Tell your elected officials to make real laws about the safety of sewage sludge and the effects on your water, food and community. Our modern toxic waste does not belong in our food and water. Make the EPA and your state environmental agencies - paid with your tax dollars - accountable for real, safe disposal of sewage sludge. Our very life depends on it.