

WATER QUALITY INDICATOR DEFINITIONS

GREENE COUNTY PRIVATE WELL TESTING includes residential wells tested for bacteria by the Springfield-Greene County Health Department. Wells that have high levels of bacteria are deemed unsafe for human consumption. Samples are collected at the request of the well owner.

STREAM QUALITY monitors Greene County rivers and creeks for levels of dissolved oxygen, nitrates and E. coli. These three parameters are important for the following reasons: An adequate level of dissolved oxygen is necessary to support aquatic life. Nitrates are important because as nitrates increase, they act as a plant nutrient and cause an increase in plant growth. As the plant material dies and decomposes, dissolved oxygen levels decrease. If high levels of E. coli are present in the water, whole body contact (swimming, etc) should be avoided.

GROUNDWATER LEVEL measures the available groundwater resources for wells monitored by the Department of Natural Resources. The groundwater levels can lower as a result of drought, over pumping and wasting water for non-essential uses. An economic burden can result as these decreasing levels cause residential homeowners to drill new wells or lower existing pumps. Decreasing groundwater levels may also indicate the need to find new sources of water.

COMMUNITY WELL CHEMISTRY monitors the nitrate levels present in water. Water with nitrate levels in excess of 10.0 milligrams per liter (mg/l) is considered unsafe for drinking.

COMMUNITY HEALTH INDICATOR DEFINITIONS

GIARDIASIS is a protozoan infection occurring in the upper small intestine. Although some people do not show symptoms of the disease, it may be accompanied by chronic diarrhea, steatorrhea (excessive amount of fat in the feces), abdominal cramps, bloating, frequent loose and pale greasy stools, fatigue and weight loss. Transmission occurs by hand-to-mouth transfer, especially in institutions and daycares. Proper and frequent handwashing is recommended to aid in the control of this disease.

ELEVATED BLOOD LEAD LEVELS have been found to have detrimental effects on children, especially those under age six. Childhood lead poisoning occurs primarily as a result of exposure to lead paint dust which is ingested through hand-to-mouth activity and pica (eating of lead-based paint chips). Effects of lead poisoning include slowed growth, learning difficulties, hearing problems, mental retardation, hyperactivity, kidney disease, blindness, coma and even death. Recommendations to combat and prevent this disease are to identify and control the environmental lead sources coupled with education, proper nutrition and frequent handwashing.

FOOD SERVICE INSPECTIONS are done at least twice a year on restaurants, taverns, schools, retail, convenience and grocery stores. In 2004, 2171 inspections were conducted in an effort to identify and address problems before they could result in food-borne illness. Critical violations include improper refrigeration and cooking temperatures, cross-contamination, bare hand contact with ready-to-eat foods, inadequate handwashing and sanitation practices.

ANIMAL BITE RATE includes the reported bites of both domestic and wild animals. Diseases associated with animal bites include cat-scratch fever, tularemia, plague, tetanus and rabies. Animal bites may also transmit pathogens such as streptococci and staphylococci.

SOLID WASTE/RECYCLING INDICATOR DEFINITIONS

HOUSEHOLD HAZARDOUS WASTE (HHW) is identified by "signal words" such as danger, poison, warning, caution, reactive, corrosive, explosive, combustible, toxic or flammable. It includes products such as paints, solvents, drain opener, oven cleaner, toilet bowl cleaner, motor oil, transmission fluids, antifreeze, batteries, disinfectants, pesticides, flea collars, mothballs, rat and mouse poison, weed killer, aerosol cans, pool chemicals, shoe polish, lighter fluid, smoke alarms and furnace switches. The U.S. Environmental Protection Agency (EPA) estimates that Americans generate 1.6 million tons of household hazardous waste per year. This can result in the average home accumulating as much as 100 pounds in the basement, garage, or storage closet.

PERCENT OF HHW RECYCLED: Unfortunately, the EPA reports that household hazardous wastes are often disposed of improperly. Citizens pour them down the drain, on the ground, into storm sewers and sink holes or discard them with the trash. When household hazardous waste is disposed of in this manner, it poses a risk to both citizens and the environment. The potential risks include physical injury to sanitation workers, contamination of septic tanks or wastewater treatment systems and hazards to children and pets as well as ground and surface water contamination. Recycling of household hazardous waste is not only safe and economical but also protects and preserves the environment.

AIR QUALITY INDICATOR DEFINITIONS

CARBON MONOXIDE (CO): Major sources of CO are the burning of fossil fuels in motor vehicles, power plants and utility boilers. Even the burning of firewood in devices like wood burning stoves, inserts and furnaces can be a major concern for high CO levels in certain winter weather inversion conditions.

NITROGEN DIOXIDE (NO₂) belongs to a family of highly reactive gases called nitrogen oxides (NO_x). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers.

PARTICULATE MATTER (PM_{2.5}, PM₁₀) is fine mineral, metal, smoke, soot, and dust particles suspended in the air. In addition to reducing visibility, fine particulate matter can lodge in the lungs and cause serious, long-term respiratory illness and other health problems. Sources of PM_{2.5} and PM₁₀ in our area include road dust, vehicle exhaust, mineral quarries, grading, demolition, agricultural tilling, open burning, and other combustion sources.

SULFUR DIOXIDE (SO₂) is formed during the burning of fossil fuels like coal, oil and natural gas. The major sources in release of sulfur compounds are power generating plants, utility boilers and chemical processing plants. SO₂ reacts with rainwater causing "acid rain" in the eastern United States which can damage forests and lakes, as well as man-made structures such as buildings and bridges.

OZONE (O₃) is an air pollutant formed by chemical reactions involving nitrogen oxides, reactive hydrocarbons, and sunlight. Commonly referred to as "smog", ozone is a powerful respiratory irritant that can cause coughing, shortness of breath, headaches, fatigue, and lung damage. Children, the elderly, those with respiratory ailments, and people who exercise outdoors are especially susceptible to its effects. Ozone can also reduce crop yields and cause damage to rubber, plastics, and many common building materials.



Proclamation for Jamestown, Virginia: "There shall be no man or woman dare to wash any unclean linen, wash clothes,...nor rinse or make clean any kettle, pot or pan, or any suchlike vessel within twenty feet of the old well or new pump. Nor shall anyone aforesaid within less than a quarter mile of the fort, dare to do the necessities of nature, since these unmanly, slothful and loathsome immodesties, the whole fort may be choked and poisoned."

-Governor Gage of Virginia, 1610

Water: The Lifeblood of the Earth

The Ozarks has a long-standing reputation for being a great place to live, work and play. Our community has a great variety of opportunities for residents and visitors alike. One of the area's greatest assets is the bountiful water resources. However, with only one percent of the world's water available for human and animal use, it is important for communities and individuals to manage this precious resource responsibly. The average Greene County resident uses approximately 75 gallons of water each day. As the area continues to grow, protecting these water resources becomes more important.

HOW MUCH HAVE WE GROWN, AND HOW DOES THIS IMPACT OUR WATER?

The estimated 2004 population of Greene County was 263,415, an increase of 2% from the 2003 estimated population. To house these additional residents, there were over 1,450 new single-family homes, about 1,000 multi-family units and more than 150 non-residential facilities built in Springfield and Greene County in 2004. While this growth is a compliment to the community, it directly impacts our environment.

The Springfield city limits encompasses about 50,700 acres (79.2 square miles), and an estimated 35% (17,745 acres) of that area is covered with impervious surfaces such as building roofs, parking lots and streets. A half-inch rainfall in Springfield will produce 240,926,400 gallons of storm water runoff from those impervious surfaces alone. As this water moves, it picks up debris, oils, antifreeze, trash and other undesirable substances. This storm water runoff will move into storm drains which then carry the water, *untreated*, directly to area creeks, streams, rivers and lakes. Because these natural waterways are one of the most-enjoyed recreational attractions of the Ozarks, and are used daily for activities such as swimming, fishing and boating; they are certainly a resource that we should strive to protect. Methods to slow down or detain storm water runoff can also help stop street flooding and keep these waterways clean. (continued inside)



WHERE DOES OUR DRINKING WATER COME FROM?

These same bodies of water are our drinking water sources. Drinking water in Greene County comes from ground water (wells and springs) and surface water (lakes and rivers). Springfield City Utilities has two drinking water treatment facilities: Fulbright Treatment Plant and Blackman Treatment Plant. These two treatment plants, along with public wells, have the capacity to provide 61.2 million gallons of drinkable water each day. Treatment plant water sources are Stockton, Fellows and McDaniel Lakes, James River, Fulbright Spring, and public wells. In 2004, the total average daily yield of these water sources was 42.6 million gallons of water per day, and an average of 32 million gallons of water was pumped daily. Drinkable (also known as potable) water is distributed to industrial, commercial and residential customers through 1,126 miles of underground pipelines.



The largest portion of personal daily water usage is toilet flushing. Older toilets use 5-7 gallons of water, and newer low-flow toilets use 1.6 gallons of water per flush. Showering and personal grooming activities comprise the second largest personal water consumption category. An average automatic dishwasher uses 7-16 gallons of water per load, but a load of laundry can take 25-55 gallons depending on the size and cycle used. A garden hose will use approximately 10 gallons of water per minute.

WHERE DOES OUR USED WATER GO?

The average Springfield household puts 197 gallons of wastewater into the sewage pipelines each day. Wastewater can be effectively treated through a properly-installed and well-maintained residential septic tank system or by a municipal wastewater treatment facility. Springfield has two wastewater treatment facilities, the Southwest Wastewater Treatment Plant and the Northwest Wastewater Treatment Plant. Once the wastewater is treated, the Southwest Plant discharges clean water into Wilson's Creek which travels to James River and on to Table Rock Lake and Lake Taneycomo. The Northwest Plant discharges clean water into the Little Sac River, ultimately flowing into Stockton Lake. Both waterways connect to larger bodies of water, which are potential drinking water sources for other communities.

HOW CAN YOU HELP?

The Ozarks has a rich variety of community groups that support and protect our natural resources for all to enjoy. We should respect what nature has provided and work together to ensure the continued quality of our environment. To join in these efforts, please visit the following websites.

- www.cityutilities.net/resident/resident.htm
- www.dnr.state.mo.us/index.html
- www.epa.gov
- www.jrbp.missouristate.edu
- www.springfieldmogov.org/showmeyards
- www.springfieldmogov.org/stormwater
- www.watershedcommittee.org

Brought to you by Environmental Collaborative of the Community Partnership of the Ozarks, Springfield City Utilities, Springfield-Greene County Environmental Advisory Board, Springfield-Greene County Health Department, Springfield-Greene County Park Board, City of Springfield Public Works, City of Springfield Planning and Development, Ozark Greenways, Watershed Committee of the Ozarks
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Environmental Health Indicators

		2004	2003	2002
		NA - Not Available		
WATER QUALITY	Greene County Private Well Testing (% testing safe)	60.6	58.0	56.0
	E. Coli Testing in Streams and Rivers (% testing safe)	NA	23	63
	Range of Groundwater Levels Below the Surface			
	Springfield Observation Well (feet)	387-427	390-416	387-428
	McDaniel Observation Well (feet)	133-188	133-188	146-184
	Community Well Chemistry (nitrates mg/l, average)	0.13	0.19	0.19
	Boil Orders Issued on Community Public Wells (by MDNR)	2	0	2
Springfield Public Works Sewer Connect Permits	1,825	1,597	1,666	
COMMUNITY HEALTH	Greene County Giardiasis Cases	22	23	16
	Elevated Blood Lead (% total tested < 6 years old)	1	2	3
	Food Service Inspections (% citing no critical violations)	45	55	66
	Smoke-Free Restaurants in Springfield (%)	83	61	NA
	Animal Bite Rate (per 100,000 population)	96.4	102.2	132.0
	Miles of Trail Added	2.3	7.0	1.0
	Urban Ecosystem Analysis (trees added)	376	229	NA
Park Land Added (acres)	42.7	28.7	156.4	
SOLID WASTE/ RECYCLING	Household Hazardous Waste (HHW Total Tons. Disposed of/Recycled, est.)	52.2	46.7	49.5
	Percent of HHW Recycled (est.)	89	83	80
	Recycled Material at City Collection Sites (tons)	3,584	3,801	3,398
AIR QUALITY	Carbon Monoxide (ppm)	EPA Standards		
	2nd Max 1-Hr	35	4	4
	2nd Max 8-Hr	9	2.4	2.0
	Nitrogen Dioxide (ppm)			
	Annual Mean	0.053	0.012	0.011
	PM ₁₀ (ug/m ³)			
	2nd Max 24-Hr	150	30	39
	Annual Mean	50	17	17
	PM _{2.5} (ug/m ³)			
	24-Hr Max	85	26.6	31.1
	Annual Mean	15	10.9	11.7
	Sulfur Dioxide (ppm)			
	2nd Max 24-Hr	0.14	0.027	0.028
Annual Mean	0.03	0.003	0.003	
Ozone (ppm)				
2nd Max 1-Hr	0.12	0.077	0.091	
POPULATION GROWTH	Greene County Population (est.)	263,415	258,427	250,784
	Greene County Single Family Housing Permits Issued	1,450	1,648	1,456
	Total Single Family Housing Units in Greene County	85,110	83,660	82,012

2005

Environmental Report Card