

THE ATTORNEY GENERAL'S SYMPOSIUM



Protecting Water Quality at the Lake of the Ozarks:
An Environmental Road Map for the Future

August 17-18, 2010



On August 17 and 18, 2010, I hosted a symposium entitled, “Protecting Water Quality at the Lake of the Ozarks: An Environmental Roadmap for the Future.” My concept for the symposium arose from my strong commitment to the protection of Missouri’s natural resources and my belief that we must work together as citizens of this state in a positive, respectful manner if we are to successfully address the multitude of challenges we currently face.

The Lake of the Ozarks is one of Missouri’s most important natural resources. Water quality is its foundation. Recent questions regarding the Lake’s water quality and the public’s outpouring of support for the Lake’s preservation have produced an atmosphere ripe for positive action. I felt strongly that the time was right to bring people together in a forum to begin developing a road map to guide us as we collectively address the challenges and opportunities for protecting and preserving water quality at the Lake of the Ozarks for future generations.

My goals for the symposium included the following: (1) establish an understanding of the Lake’s current health; (2) learn what additional water quality monitoring or studies may be needed in the future; (3) discuss the laws that exist to protect water quality and the effectiveness of current enforcement; (4) determine what changes in state law may be needed to afford better long-term protection; and (5) gather information and ideas to address challenges and opportunities for water quality preservation on a long-term basis.

Over the course of the symposium’s two days, I brought together a diverse group of interested parties, including scientists; engineers; scholars; attorneys; public officials from state, county, and city governments; and engaged citizens. Experts spoke on topics such as pollution sources, water quality monitoring, water-borne illnesses, the Lake’s historical and geological framework, water quality regulation and enforcement, demographic and economic projections, nutrient management, biological impacts on fisheries, on-site sewage disposal systems, available wastewater treatment, regional wastewater treatment options, and funding sources for wastewater infrastructure. All of these issues relate to protection of water quality, and a broad range of knowledge and expertise is critical to the formulation of a viable road map for the future.

During the symposium, I heard testimony that was particularly persuasive. Most compelling was the evidence that the water quality at the Lake of the Ozarks is, *generally speaking*, safe for recreational use. While stressed on occasion, I learned that increased *E. coli* levels are caused by localized, typically transient events that depend upon a range of factors. While the Missouri Department of Natural Resources (“MDNR”) has appropriately closed public beaches at the Lake of the Ozarks State Park due to temporarily elevated *E. coli* levels, MDNR is aggressively studying the cause of elevated bacteria levels and working toward a better monitoring system to provide the most accurate information to the public. MDNR has made significant strides in improving its communication with the public with regard to the status of its state park beaches.

Another intriguing issue discussed during the symposium involved on-site sewage disposal systems around the perimeter of the Lake. Many of these systems are exempt from minimum construction standards required by state law because they were installed prior to the enactment of such standards in 1995. The actual number of these pre-1995 systems is unknown, but is estimated to be in the tens of thousands. These old and often inadequately maintained systems will be pushed to their limits as baby boomers retire and move to the Lake over the next ten to twenty years. Failing on-site sewage disposal systems are widely viewed to be the primary challenge to the Lake’s future water quality. I heard extensive testimony about how local city and county governments are handling on-site sewage disposal system issues. Many participants at

the symposium expressed strong support for a regional authority to provide sewer coverage around the Lake of the Ozarks.

During the course of the symposium, I became convinced that water quality monitoring of the entire Lake is critical to continue to develop our understanding of the Lake's current and future health and to evaluate the effectiveness of protective measures as they are implemented. Moreover, I believe that targeted microbial source tracking of bacteria to determine the sources of bacterial contamination is an important and necessary tool that should be utilized. Understanding the sources of bacteria is imperative for developing a road map for future protection.

Based on the information presented at the symposium, the thirty public comments I received, and a review of previous related studies, I am making a number of recommendations in this paper. Some of these recommendations require consideration from the Missouri General Assembly, such as strengthening the authority of the Missouri Department of Health and Senior Services with respect to on-site sewage disposal systems and increasing funds provided to MDNR so that it may hire more enforcement inspectors. Others recommendations require action by state agencies, such as MDNR adopting a predictive modeling tool to assess water quality at state park beaches. Many of these recommendations may be implemented immediately, while others require more public input and planning before they will be ready for implementation. All of the recommendations are intended to provide a clear and workable framework for specific action that will ensure the long-term protection of water quality at the Lake of the Ozarks.

All Missouri citizens receive benefits from the Lake of the Ozarks, whether those benefits are economic, recreational, or emotional. It is our collective responsibility to protect this outstanding resource from degradation. Based on the dedication of the citizens I met and with whom I spoke during the symposium, I have no doubt that we are on the right track and will achieve our goal.

I would like to thank Governor Jeremiah W. ("Jay") Nixon for his leadership and passionate dedication to protecting Missouri's natural resources, as was illustrated by his inspirational opening remarks at the symposium. I would like to thank MDNR and the Lake of the Ozarks Watershed Alliance, Inc. ("LOWA") for their assistance in planning the symposium. Special thanks are also extended to Tan-Tar-A Resort for donating the beautiful facilities for the symposium and for hosting a reception with LOWA after the conclusion of the first day's presentations. Most of all, I would like to thank all of the presenters, as well as the organizations they represented, for donating their time to provide us with their knowledge and thoughtful insights. All of the presentations were of the highest quality, and they demonstrated a level of dedication and commitment to the issue of water quality of which all Missourians should be proud.

Respectfully,



Chris Koster
Attorney General

DEFINITIONS

DED – Missouri Department of Economic Development

DHSS – Missouri Department of Health and Senior Services

EPA – Environmental Protection Agency

FERC – Federal Energy Regulatory Commission

Grandfathered system – on-site sewage disposal systems installed prior to September 1, 1995

LOWA – Lake of the Ozarks Watershed Alliance, Inc.

MDC – Missouri Department of Conservation

MDNR – Missouri Department of Natural Resources

NRCS – Natural Resource Conservation Service

Non-point source – sources of pollution that involve discharges of water contaminants from sources other than traditional pipe or discernible channels

On-site sewage disposal system – any system handling or treatment facility receiving domestic sewage which discharges into a sub-surface soil absorption system and discharges less than 3,000 gallons per day¹

Permitted system – on-site sewage disposal systems installed after December 30, 1995, pursuant to a permit obtained from local health officials verifying that the on-site systems meet minimum construction standards

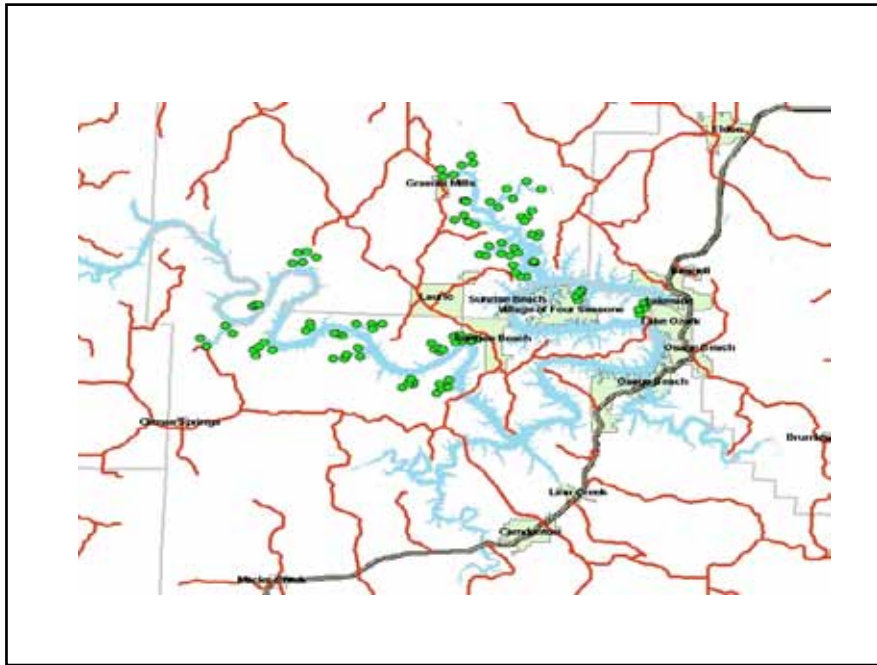
USDA – United States Department of Agriculture

USGS – United States Geological Survey

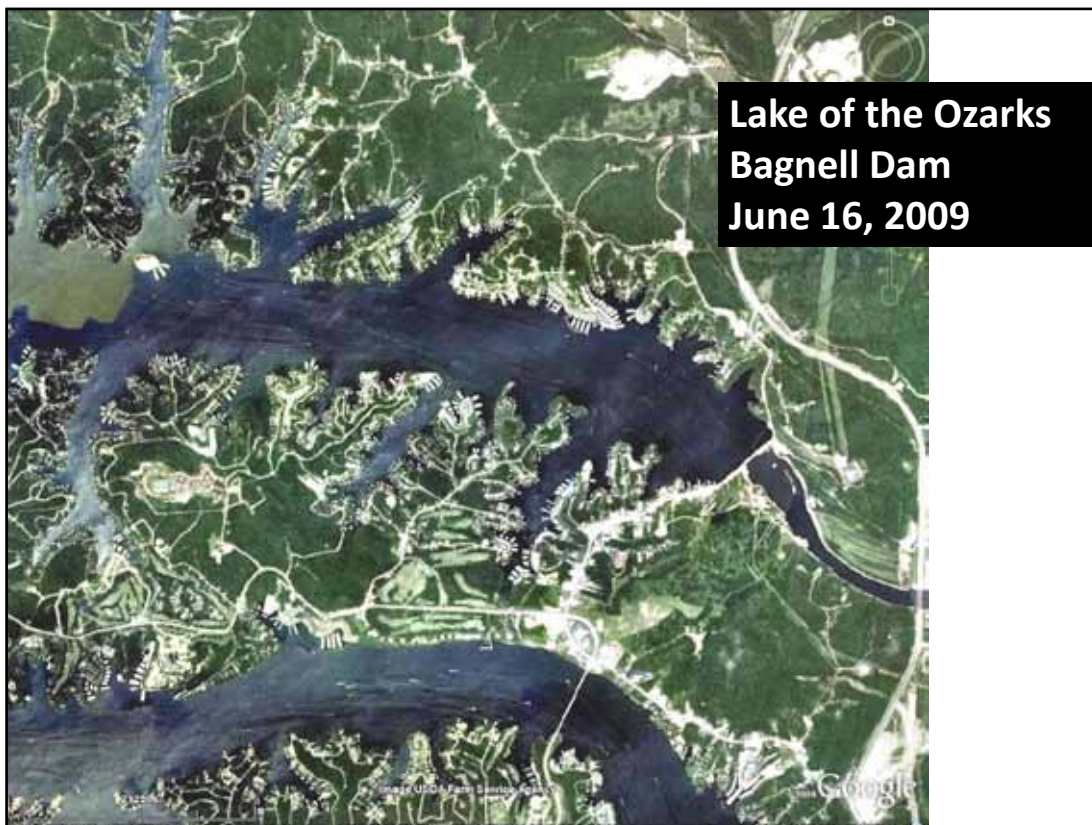
Watershed – that area where precipitation falls on the land and drains or flows to a common or specific area²

¹ MO. REV. STAT. § 701.025(8) (2000).

² Robert Broz, *Attorney General's Symposium, Protecting Water Quality at the Lake of the Ozarks: An Environmental Road Map for the Future*, in I Transcript of Proceedings at 24 (Aug. 17, 2010). All future references to the transcript of the symposium's proceedings will be cited as "Transcript of Proceedings."



2010 Monitoring Sites for the MDNR/LOWA Monitoring Program
(Recommendation No. 4)



Google image showing development around the perimeter of the Lake of the Ozarks.
(Recommendations 1, 2, and 8)

EXECUTIVE SUMMARY

The Attorney General is making twelve recommendations, classified in the following categories: Regionalization, Monitoring and Public Health, and Statutory Actions. The recommendations are prioritized within each category.

Regionalization

RECOMMENDATION NO. 1

Because the greatest threat to long-term water quality at the Lake of the Ozarks comes from thousands of aging and poorly maintained on-site sewage disposal systems, the commissions of Camden, Miller, Morgan and Benton counties should move forward with the formation of a regional sewer district.

RECOMMENDATION NO. 2

The University of Missouri-Extension should conduct a study to determine how many on-site sewage disposal systems are currently located around the perimeter of the Lake of the Ozarks, and of those systems, the number that were constructed prior to the enactment of minimum construction standards in 1995. The University should publish a report of its findings, so the information is widely available for planning purposes.

Monitoring and Public Health

RECOMMENDATION NO. 3

During the 2011 and 2012 recreational water seasons, the Missouri Department of Natural Resources should conduct microbial source tracking at the Lake of the Ozarks based on a targeted sampling plan developed by the United States Geological Survey and the University of Missouri-Columbia.

RECOMMENDATION NO. 4

Pursuant to its FERC licensing agreement, AmerenUE currently funds the water quality monitoring regime at the Lake of the Ozarks. AmerenUE's commitment expires in March 2012. As the Lake's leading private steward, the Attorney General requests AmerenUE commit to funding water quality monitoring at the Lake of the Ozarks for an additional five years.



RECOMMENDATION NO. 5

Over the next six months, the Missouri Department of Natural Resources should engage the expertise of the Missouri Department of Health and Senior Services in evaluating whether a health advisory system should be adopted to manage public health risks at Missouri state park beaches.

RECOMMENDATION NO. 6

Over the next three years, the Missouri Department of Natural Resources should adopt a predictive modeling tool to assess recreational water quality at the Lake of the Ozarks State Park beaches. This predictive modeling tool will record real-time environmental data that has been shown to be highly correlative to *E. coli* bacteria levels. Over the next five years, the Missouri Department of Natural Resources should work toward implementing this predictive modeling tool at all state park beaches where *E. coli* levels most frequently exceed standards.

RECOMMENDATION NO. 7

The commissions of Camden, Benton, Miller, and Morgan counties should work together to address non-point sources of nutrient loading in the Lake of the Ozarks. Specifically, they should collectively encourage or require through ordinances, education, and/or financial incentives low-impact development landscaping around the perimeter of the water's edge. The commissions should also consider ordinances, education, and/or financial incentives to encourage or require homeowners and businesses around the Lake's perimeter, particularly golf courses, to use low-phosphorus or phosphorus-free fertilizer. Such an incentive program could include a special designation or recognition, such as "Lake Protector," for any person or entity utilizing low-impact landscaping or low-phosphorus fertilizer.

Statutory Changes

RECOMMENDATION NO. 8

The Missouri General Assembly should enact legislation requiring owners of on-site sewage disposal systems to pass an inspection at the time of sale for all real estate transactions located within 2,500 feet of the Lake of the Ozarks. While this undertaking would require a significant legislative effort, from environmental, public health, and economic perspectives, requiring mandatory inspections at the time of sale is the best way to protect this recreational water body.

RECOMMENDATION NO. 9

The Missouri Department of Natural Resources should hire, and the Missouri General Assembly should fund, additional full-time inspectors dedicated to the investigation and enforcement of violations of the Missouri Clean Water Law in the Lake of the Ozarks watershed. Currently, the Missouri Department of Natural Resources has only two inspectors charged with the protection of 1,150 miles of Lake of the Ozarks shoreline.

RECOMMENDATION NO. 10

The “On-Site Disposal System Law” in chapter 701 of the Revised Statutes of Missouri should be amended to better accomplish the goal of protecting water quality and public health in the state of Missouri. To this end, the Missouri General Assembly should amend chapter 701 to enhance the Missouri Department of Health and Senior Services’ inspection authority and enhance civil and criminal enforcement authority for county prosecutors.

RECOMMENDATION NO. 11

The Missouri General Assembly should consider implementing a tax credit/deduction for individuals who own grandfathered on-site sewage disposal systems and wish to construct properly engineered, sited, and permitted systems within 2,500 feet of the water’s edge at the Lake of the Ozarks. The tax credit/deduction should be prioritized according to individuals who are (1) financially disadvantaged, (2) operating a grandfathered on-site sewage disposal system, and (3) unable to hook up to a centralized sewer system.

RECOMMENDATION NO. 12

The Missouri General Assembly should increase criminal penalties for violations of the Missouri Clean Water Law, chapter 644, Revised Statutes of Missouri, if the violation creates a substantial likelihood of endangering human health, the environment, or property.



Regionalization

RECOMMENDATION NO. 1

Because the greatest threat to long-term water quality at the Lake of the Ozarks comes from thousands of aging and poorly maintained on-site sewage disposal systems, the commissions of Camden, Miller, Morgan and Benton counties should move forward with the formation of a regional sewer district.

The greatest threat to long-term water quality at the Lake of the Ozarks is failing on-site sewage disposal systems (“on-site systems”)³ around its perimeter. The proximity and density of homes surrounding the Lake is unique in comparison to other recreational lakes in Missouri.⁴ The threat from on-site systems arises from the discharge of inadequately treated wastewater, or sewage, from aging or failing systems directly into the Lake, its tributaries, or groundwater. The complex karst geology and natural hydrology of the region exacerbate the problem.⁵ Soils around the Lake are not appropriate for most on-site systems.⁶



Local leaders and citizens have long recognized the need to address this problem. In 1999, the Lake Group Task Force, an entity created by joint resolution of the Commissions of Camden, Miller, Morgan, and Benton counties, commissioned the *Lake of the Ozarks Water and Wastewater Conceptual Plan*, which documented the need to eliminate these systems.⁷ While the total number of on-site systems surrounding the Lake is unknown, most estimate the total between 15,000 and 20,000.⁸ Many of these systems were

³ Mo. REV. STAT. § 701.025(8) (2000) (defining “on-site sewage disposal system” as “any system handling or treatment facility receiving domestic sewage which discharges into a subsurface soil absorption system and discharges less than three thousand gallons per day”).

⁴ See Donna Swall, II Transcript of Proceedings at 300 (Aug. 17, 2010); see also Donna Swall, Welcome to Lake of the Ozarks, Slideshow (Aug. 17, 2010), available at http://ago.mo.gov/agriculture/pdf/symposium/Day2/1_Grassroots/1_Swall.pdf.

⁵ See generally Joe Gillman, I Transcript of Proceedings at 197-210 (During his testimony, Mr. Gillman noted that the karst geology is exhibited on the surface in features such as springs, sinkholes, caves, and losing streams. The surface topography is typically steep hillsides, with bedrock close to the surface and stony permeable soils that allow the rapid movement of water through them.); see also LAKE OF THE OZARKS WATERSHED ALLIANCE, INC., LAKE OF THE OZARKS WATERSHED MANAGEMENT PLAN 25-31 (March 2010), available at <http://www.soslowa.org/2010WMPJune.pdf> [hereinafter LOWA’s WATERSHED MANAGEMENT PLAN] (documenting sixty-nine percent of soils in the Buck Creek and Lick Branch watershed management units as “highly or potentially highly erodible” with slow infiltration rates).

⁶ See generally JAMES E. VANDIKE, JOHN W. WHITFIELD, DONALD H. MEIR & CYNTHIA ENDICOTT, Mo. DEP’T OF NATURAL RES., DIVISION OF GEOLOGY & LAND SURVEY, AN ENGINEERING GEOLOGIC APPROACH TO EVALUATING GROUNDWATER AND SURFACE-WATER CONTAMINATION POTENTIAL AT LAKE OF THE OZARKS, MISSOURI (1985), available at <http://www.soslowa.org/pastreport1985.pdf>.

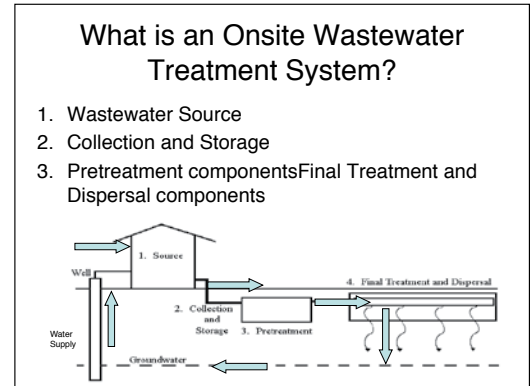
⁷ HNTB CORPORATION, LAKE OF THE OZARKS WATER AND WASTEWATER CONCEPTUAL PLAN FOR THE LAKE FORCE TASK GROUP (1999) (hereinafter HNTB Study), available at <http://www.soslowa.org/pastreport1999.pdf>.

⁸ *Id.* at ES-2; Beverly Thomas, II Transcript of Proceedings at 376-77 (Beverly Thomas reports that of the 27,436 parcels surrounding the Lake of the Ozarks, 17,722 parcels are located in Camden County. Of the 17,722 lots in Camden County, 12,413 lots contain private homes, with 4,641 permitted on-site systems installed after December 30, 1995.).

installed prior to the enactment of minimum construction standards for on-site systems in 1995 and often receive little to no maintenance.⁹

Currently, many existing on-site systems serve weekend residences and are not required to service average, daily wastewater flows. However, most believe this will change as baby boomers retire and move to the Lake as permanent residents, thereby increasing the stress on inadequate systems. The 2000 Census estimated the Lake area population at 79,924.¹⁰ If growth continues at the same rate as it has over the last ten years, the Lake area population could reach 180,000 by 2050.¹¹ At least through 2030, the Lake area is projected to have a greater share of the older population than the state average.¹² These startling population projections, when considered with the known, inadequate wastewater treatment infrastructure, require state and local leaders to plan for future wastewater treatment needs of the Lake region now. To be sure, local governments have made substantial and commendable progress in providing sewer coverage around the Lake.¹³ Yet, many large, developed areas are not located within reasonable proximity of any of the existing sewer districts.

Since at least 1996, the concept of a regional sewer district to service a geographically defined area around the entire Lake has risen to the forefront of public discussion.¹⁴ Supporters believe a regional sewer district at the Lake of the Ozarks would address the estimated 15,000 to 20,000 on-site systems that are aging and often poorly maintained. Rather than replacing or repairing those systems as they fail over the next 10 to 20 years, at an estimated cost of over \$150 million,¹⁵ resources could be spent on a wastewater infrastructure that would eliminate failing on-site



⁹ See MO. REV. STAT. §§ 701.025 to 701.059 (2000). Chapter 701 is administered by the Missouri Department of Health and Senior Services (“DHSS”). Regulations implementing chapter 701 were adopted on December 30, 1995, and are codified at Missouri Code of Regulations, title 19, section 20-3. On-site wastewater systems installed prior to September 1, 1995, are excluded from regulation. *Id.* § 701.037.2. Chapter 701 also exempts from regulation “the owner of a single-family residence lot consisting of three acres or more, or the owner of residential lot consisting of ten acres or more with no single-family residence on-site sewage disposal system located within three hundred sixty feet of any other on-site sewage disposal system and no more than one single-family residence per each ten acres in the aggregate, except lots adjacent to lakes operated by the Corps of Engineers or by a public utility” (i.e. the Lake of the Ozarks). *Id.* § 701.031.

¹⁰ See Marty Romitti, *Sustaining Economic Recovery: Lake Area Economic and Demographic Trends*, Slideshow 20 (Aug. 17, 2010) [hereinafter Romitti Slideshow], available at http://ago.mo.gov/agriculture/pdf/symposium/Day1/5_Economic%20Projections/1_Romitti.pdf.

¹¹ *Id.*

¹² *Id.* at 19.

¹³ See Missouri Department of Natural Resources Map of Missouri State Operating Permitted Facilities and Service Areas, II Transcript of Proceedings at 356 (on file with the Missouri Attorney General’s Office); see also Nick Edelman, Mike Nichols, Beverly Thomas & Randy Pogue, II Transcript of Proceedings at 357-402 (discussing the existing and proposed sewer coverage areas for the cities of Osage Beach and Camdenton, the three sewer districts within Camden County, and the city of Warsaw, respectively).

¹⁴ See THOMAS M. UTTERBACK & EDWARD EDGERLY, AN EVALUATION OF THE TECHNICAL, POLITICAL, AND REGULATORY ISSUES REGARDING WASTEWATER DISPOSAL AT THE LAKE OF THE OZARKS, REPORT TO THE LAKE GROUP FOR CLEAN WATER AND ECONOMIC DEVELOPMENT (1996), available at <http://www.soslowa.org/pastreportpart11996.pdf>; see also HNTB Study, *supra* note 7.

¹⁵ This figure is based upon a conservative assumption that the replacement and/or repair cost for at least 15,000 on-site systems would average \$10,000.00. Many we spoke with during the symposium estimated the average replacement cost between \$15,000.00 and \$30,000.00.

systems and the threat they pose to water quality.¹⁶ A regional sewer district would also serve to eliminate the approximately 419 private wastewater treatment facilities that are currently discharging into the Lake pursuant to a permit issued by the Missouri Department of Natural Resources (“MDNR”).¹⁷ This in turn would eliminate the necessity of administering and enforcing those permits.

Based on information learned and recommendations made during the symposium, the numerous studies conducted on regionalization and water quality at the Lake of the Ozarks over the last twenty-five years, and the need to ensure the long-term protection of the Lake of the Ozarks’ water quality, the Attorney General recommends that the commissions of Camden, Miller, Morgan and Benton counties work together to create a regional sewer district that would provide centralized sewer service to the currently unserved portions of the Lake region.¹⁸ Economies of scale, efficiencies of operation, and fairness to rate payers across the region suggest that one district would best serve the region. The Lake of the Ozarks Watershed Alliance, Inc. (“LOWA”), an active and dynamic citizen’s group dedicated to protecting the Lake of the Ozark’s water quality, fully supports regionalization. LOWA has hosted several, well-attended meetings on regionalization and recently formed a Four County Wastewater Task Force to develop support for a regional sewer district covering an area around the entire Lake perimeter in all four counties.¹⁹ To the extent additional public outreach and education is needed to secure the public’s approval of any new sewer district, LOWA and its Four County Wastewater Task Force should be able to assist with such an effort.



Two statutory mechanisms are readily available to create a regional sewer district. First, the Camden County Commission could file a petition in Camden County Circuit Court to form a “common sewer district,” as the majority of the proposed regional sewer district is situated in Camden County.²⁰ Within thirty days after receiving the petition, the circuit court would appoint a three-person commission, one of whom must be a civil engineer or surveyor, which would be charged with laying out and defining the boundaries of the proposed district.²¹ The district boundaries would be based upon a natural drainage basin or natural drainage area.²² After an opportunity for public hearing, the commission would file a report and map with

¹⁶ The Attorney General is also recommending legislation that would require inspections of on-site systems at the time of sale, Recommendation No. 8, discussed below. To reconcile the need to eliminate these systems with the need to discover if they are working properly, the Attorney General is recommending that any on-site system that is failing at the time of sale should not have to be repaired or replaced if the property is located within the master plan of a regional sewer district and the property owner posts a bond to pay for connection to the sewer district when it becomes available. Alternatively, property owners who replace their failing on-site system should be given a fifteen year window during which they would not be required to connect to any regional sewer district.

¹⁷ MO. DEP’T OF NATURAL RES., LAKE OF THE OZARKS WATER QUALITY INITIATIVE REPORT 5, 3 (2009) available at <http://www.dnr.mo.gov/loz/initiative-final.pdf>.

¹⁸ The term “Lake region” as used herein includes those portions of Camden, Miller, Morgan and Benton counties within at least a five mile radius of the Lake of the Ozarks.

¹⁹ Jim Rogers, II Transcript of Proceedings at 487-89.

²⁰ MO. REV. STAT. § 204.250 (2000). See also David Martin, II Transcript of Proceedings at 567-68.

²¹ MO. REV. STAT. § 204.260 (2000).

²² MO. REV. STAT. § 204.250 (2000). This would accommodate the current discussion of a regional sewer district encompassing a five-mile perimeter around the Lake. David Martin, II Transcript of Proceedings at 568.

the Camden County Circuit Court and, if approved by such court, the county commissions of each county in which a portion of the proposed district is situated.²³ The circuit court would then order an election in each effected county of the voters of the proposed district. For the proposed district to be formed, it must be approved by a majority vote by voters within the proposed district in Camden County. For the proposed district to include such portions of other counties as are set out in the commission's report and map, it must be approved by a majority vote within the portion of the proposed district located in each of such counties. If the election is successful in Camden County, but not in one or more of the other counties, then the non-approving counties would be removed from the district boundary map.²⁴ Once the common sewer district is approved by the voters, the Camden County Commission would appoint a five-member board of trustees, which would then be responsible for managing the district. If any of the other three counties approved the district, then the presiding county commissioner of those counties would serve as an additional board member.²⁵

Second, a "reorganized common sewer district" could be formed by order of the Camden County Circuit Court (as the county having the largest portion of the acreage contained within the proposed district) upon receipt of a petition signed by at least fifty voters or property owners within the proposed district. Before submittal to the court, the petition would first have to be approved by the four county commissions.²⁶ The petition must set forth a description of the boundaries of the proposed district, an estimate of the number of customers of the proposed district, the necessity for the formation of the district, the probable cost of acquiring or constructing sanitary sewer improvements within the district, an approximation of the assessed valuation of taxable property within the district, and whether the board of trustees will be elected or appointed.²⁷ Additionally, the petition must be accompanied by a plat of the proposed district. After holding a hearing on the petition, the circuit court will make a finding as to whether or not the district should be formed. If the court enters a decree of incorporation, then the issue will be submitted for approval by a two-thirds vote at an election of the voters residing in the district.²⁸ Once a reorganized common sewer district is formed, it possesses all of the same powers and authority as a common sewer district.²⁹ The reorganized common sewer district is governed by a five-member board of trustees, either elected or appointed as provided in the circuit court decree. Regardless of whether the five-member board is appointed or elected, the presiding commissioner of any adjacent county in which the district lies, or a citizen appointed by the county commission of such adjacent county, would serve as an additional board member.³⁰

²³ Mo. REV. STAT. § 204.270 (2000).

²⁴ Mo. REV. STAT. § 204.280 (2000). Bonding authority has different voter approval requirements. System revenue bonds require approval by four/sevenths of the voters within the district. General obligation bonds require voter approval by four/sevenths or two-thirds, depending upon the election. Mo. REV. STAT. § 204.370 (2000); Mo. CONST. art. VI, § 26(b).

²⁵ Mo. REV. STAT. § 204.300 (Supp. 2009).

²⁶ Mo. REV. STAT. §§ 204.600, 204.602 (Supp. 2009). See also David Martin, II Transcript of Proceedings at 569-70. If any county commission rejects the petition, then no further action on the petition would occur in that county. Mo. REV. STAT. § 204.602.1 (Supp. 2009).

²⁷ Mo. REV. STAT. § 204.602 (Supp. 2009).

²⁸ *Id.* Only a simple majority is required if the petition does not seek authority to issue general obligation bonds. Mo. REV. STAT. § 204.602.9 (Supp. 2009).

²⁹ Mo. REV. STAT. § 204.600 (Supp. 2009).

³⁰ Mo. REV. STAT. § 204.610 (Supp. 2009).

There are several benefits to be derived from both of these entities. A primary benefit is that both entities are eligible to receive state and federal funding.³¹ Another significant benefit is that both types of districts are managed and controlled by a board of trustees, not the county commissions. This relieves the county commissioners from the extra burden of managing a sewer district, in addition to a county. With regard to funding, both types of entities have the statutory authority to issue system revenue bonds and general obligation bonds.³² The board of trustees of either entity would have sufficient authority to consider and implement solutions to some of the difficult questions discussed at the symposium, such as establishing a phased approach to implementation that would consider public health risks, density, terrain, water quality impairment, and available technology. Also, either board of trustees would have the statutory authority to contract with public agencies, individuals, private corporations, and political subdivisions inside and outside their boundaries to allow such entities to connect to and use the district's facilities according to rates and terms established by the district.³³ This authority will be beneficial when coordinating with existing sewer systems around the lake, which would not be included within the district at first, but which could be served in the future by mutual agreement.

A few key differences between the common sewer district and the reorganized common sewer district make the latter type of district a more attractive option for the Lake region. The reorganized common sewer district may be formed without concern for whether the area within its boundaries constitutes a "natural drainage basin" or "natural drainage area."³⁴ Reorganized common sewer districts have greater flexibility in issuing system revenue bonds than do common sewer districts. Unlike a common sewer district, a reorganized common sewer district may be formed with the ability to issue system revenue bonds by resolution of the board of trustees without the expense and delay of calling an election. In the alternative, if voter approval is desired as a limitation on the authority of the reorganized common sewer district to issue system revenue bonds, that requirement can be included in the decree of incorporation issued by the circuit court.³⁵ One further benefit of the reorganized common sewer district structure involves representation for Miller, Morgan, and Benton counties on the board of trustees. A common sewer district established in Camden County with boundaries extending into Miller, Morgan, and Benton counties would automatically include the presiding commissioners of Miller, Morgan, and Benton counties as additional members of the board of trustees, while a reorganized common sewer district would allow the county commission of each such county the option to appoint a county resident to serve on the board of trustees instead of the presiding commissioner.³⁶

There was some discussion at the symposium regarding the need for legislation to address the unique challenges facing a regional sewer district from the lake's topography, population distribution and seasonal demands. While the current statutory schemes described above provide the basic framework needed to

³¹ MO.REV. STAT. § 644.101 (2000). See also Sallie Hemenway, II Transcript of Proceedings at 553-554 (counties may apply for Community Development Block Grants on behalf of organized, recognized districts).

³² David Martin, II Transcript of Proceedings at 567-70.

³³ Mo. REV. STAT. § 204.330.4 (common sewer district) and § 204.618.4 (reorganized common sewer district) (2000 and Supp. 2009, respectively).

³⁴ Compare Mo. REV. STAT. § 204.602 (Supp. 2009) (reorganized common sewer district), with Mo. REV. STAT. § 204.250 (2000) (common sewer district).

³⁵ Mo. REV. STAT. § 204.602 (2009), compare with Mo. REV. STAT. § 250.070 (Supp. 2009) (authorizing common sewer district to issue system revenue bonds only after approval by a four/sevenths vote).

³⁶ Compare Mo. REV. STAT. § 204.300 (2000) (common sewer district) with Mo. REV. STAT. § 204.610 (Supp. 2009).

create a regional sewer district, the Attorney General agrees that statutory changes could facilitate a regional sewer district's success. One such statutory change could be to give the district the authority to generate revenue from a sales tax. The greatest demand for sewer services occurs during the summer tourist season. It is reasonable to require those benefitting from the system to pay for the system through a sales tax. Consequently, the Attorney General recommends Chapter 204 be revised to allow certain sewer districts to impose a general sales tax as follows:

Board of trustees of certain districts, power -- sales tax.

1. The board of trustees of any common or reorganized sewer district whose boundaries include a first class county and one or more third class counties and which is located adjacent to a lake or reservoir operated by a public utility, notwithstanding any other provision of this chapter, shall have the authority to impose a sales tax on all retail sales within its district. The board of trustees may, by a majority vote of its board, impose a tax not to exceed one-half of one cent on all retail sales subject to taxation pursuant to sections 144.010 to 144.525, RSMo, for the purpose of funding the establishment, construction, reconstruction, improvement, repair, operation and maintenance of its sewer systems and treatment facilities within the boundaries of the district. The tax authorized by this subsection shall be in addition to all other sales taxes allowed by law. No tax pursuant to this subsection shall become effective unless the board of trustees submits to the voters of the district, at a county or state general, primary or special election, a proposal to authorize the tax, and such tax shall become effective only after the majority of the voters voting on such tax approve such tax.

2. In the event the district seeks to impose a sales tax pursuant to this subsection, the question shall be submitted in substantially the following form:

Shall a cent sales tax be levied on all retail sales within the district for the establishment, construction, reconstruction, improvement, repair, operation and maintenance of its sewer systems and treatment facilities within the boundaries of the district?

YES NO

If a majority of the votes cast on the proposal by the qualified voters voting thereon are in favor of the proposal, then the tax shall become effective. If a majority of the votes cast by the qualified voters voting are opposed to the proposal, then the board of trustees shall have no power to impose the tax unless and until another proposal to authorize the tax is submitted to the voters of the district and such proposal is approved by a majority of the qualified voters voting thereon. The provisions of sections 32.085 and 32.087, RSMo, shall apply to any tax approved pursuant to this subsection.

3. As used in this section, “qualified voters” or “voters” means any individuals residing within the proposed district who are eligible to be registered voters and who have registered to vote under chapter 115, RSMo, or, if no individuals eligible and registered to vote reside within the proposed district, all of the owners of real property located within the proposed district who have unanimously petitioned for or consented to the adoption of an ordinance by the governing body imposing a tax authorized in this section. If the owner of the property within the proposed district is a political subdivision or corporation of the state, the governing body of such political subdivision or corporation shall be considered the owner for purposes of this section.

The Missouri General Assembly should also consider granting certain reorganized and common sewer districts the authority to impose special assessments on real property benefitted by specific sewer projects and the authority to issue bonds payable from the special assessments. Special assessment financing would allow the district to address the specific challenges presented by various locations in the Lake region on a more local level.

The public's desire to create a regional sewer district appears to be high. With or without statutory changes suggested above, the Attorney General believes the county commissions should act now to capitalize upon the current momentum in favor of water quality protection.



RECOMMENDATION NO. 2

The University of Missouri-Extension should conduct a study to determine how many on-site sewage disposal systems are currently located around the perimeter of the Lake of the Ozarks, and of those systems, the number that were constructed prior to the enactment of minimum construction standards in 1995. The University should publish a report of its findings, so the information is widely available for planning purposes.

As discussed in Recommendation No. 1, failing on-site sewage disposal systems (“on-site systems”) around the perimeter of the Lake are widely recognized as the greatest threat to long-term water quality preservation. Some estimates put the number of on-site systems around the Lake between 15,000 and 20,000.³⁷ Many of these systems were installed prior to December 30, 1995, when the Missouri Department of Health and Senior Services (“DHSS”) promulgated minimum construction standards for on-site systems.³⁸ These “grandfathered systems” are not required to meet minimum construction standards because the state statute designating the standards specifically exempted on-site systems in operation prior to September 1, 1995.³⁹ The minimum construction standards contain specific requirements for water quality protection, such as set-back distances, system capacity, site evaluation, and soil absorption systems.⁴⁰ Dr. Randall Miles, Associate Professor of Environmental and Atmospheric Science at the University of Missouri-Columbia, believes a high percentage of these grandfathered systems would not be able to meet current, minimum construction standards.⁴¹

Information regarding the number, location, and age of on-site systems around the Lake is critical to the planning and development of a regional wastewater system and/or to expansion planning for existing community-operated systems. To date, no organization has undertaken a coordinated effort to identify the location of these systems and determine their approximate ages. Such an effort must occur to give policymakers and elected officials the information needed to prioritize those areas posing the greatest risk to water quality and demonstrating the greatest need for centralized sewer collection.

The highest priority of the study should be to identify on-site systems within 500 feet of the water’s edge. In addition, the study should identify systems within a five-mile perimeter of the shoreline, as these systems may also pose risks to the Lake’s water quality, and local stakeholders have considered using a five-mile perimeter as a possible boundary line for a regional sewer district.⁴² Consequently, identifying on-site systems within this range could serve as an essential master-planning tool for any regional sewer district that may be created in the future.

³⁷ HNTB Study, *supra* note 7, at ES-2.

³⁸ Mo. CODE REGS. tit. 19, § 20-3.060.

³⁹ See Mo. REV. STAT. §§ 701.025(3), 701.031 (2000) (The exemption does not apply to major modifications or repairs on existing on-site sewage disposal systems.).

⁴⁰ *Id.*

⁴¹ Randall Miles, II Transcript of Proceedings at 445 (testifying that he thought that a high percentage of pre-1996 on-site systems would not comply with the minimum construction standards). Authors of the *HNTB Study* reported local and state officials thought this percentage to be as high as seventy to eighty percent. HNTB Study, *supra* note 7, at 5-1. HNTB engineers cited “the size of the septic tanks, the unique geology and soil types, and the small lots primarily located in the older subdivisions” as the cause for the high percentage of on-site systems in noncompliance. *Id.* “In some situations, the size of the lot is too small to meet the minimum set-back limits set forth in the current regulations.” *Id.*

⁴² Donna Swall, II Transcript of Proceedings at 299.

The Attorney General believes the University of Missouri-Extension is the best entity to undertake this study. Funding could be provided through a contract with the Missouri Department of Natural Resources, DHSS, or both. The University should consider tools such as existing aerial photos, both present and pre-1996, county assessor records, and mail or phone surveys. On-site visits may be viewed as an intrusion by property owners and are not recommended. The Attorney General leaves the formulation and methodology for the study to the experts. The University should publish a report of its findings, so the information is widely available for planning purposes.



Randy Crawford, Senior Water Quality Scientist for Geosyntec Consultants, testifies on “Understanding Challenges to Protecting Water Quality: Pollution Sources and Monitoring Methods.”

Monitoring and Public Health

RECOMMENDATION NO. 3

During the 2011 and 2012 recreational water seasons, the Missouri Department of Natural Resources should conduct microbial source tracking at the Lake of the Ozarks based on a targeted sampling plan developed with the assistance of the United States Geological Survey and the University of Missouri-Columbia.

The United States Environmental Protection Agency sets limits for bacterial pollution in fresh-water recreational waterways in the Clean Water Act based on levels of *E. coli*. *E. coli* is “indicative of [the] simultaneous presence of pathogenic (disease producing) microbes which can pose a public health risk.”⁴³ Indeed, the public health risk from contact with human waste may be greater than from contact with nonhuman waste.⁴⁴ Scientists believe that *E. coli* or other microorganisms from humans may be more resistant to some human antibiotics than microorganisms from animals.⁴⁵ Thus, the presence or absence of human pollution is often a primary concern. The question as to whether humans are coming into contact with human fecal matter or nonhuman fecal matter (water fowl, cow, pig, domestic pets) becomes even more pressing when making important decisions, such as public beach closures.

Water quality monitoring in the Lake of the Ozarks watershed has traditionally generated information about the number of colonies of *E. coli* bacteria in a given water sample. This traditional testing methodology measures water quality generally but provides no information about the identity or location of the source of contamination or the level of risk associated with the *E. coli* present.⁴⁶ In order to help accurately assess the risk posed to human health from *E. coli* contamination in the Lake of the Ozarks, choose an effective remediation strategy, and bring polluted areas of the Lake into compliance with regulations, the Attorney General is recommending microbial source tracking at the Lake of the Ozarks. Microbial source tracking will allow stakeholders the opportunity to develop a better understanding of the bacterial inputs that potentially threaten portions of the Lake. This understanding will in turn allow stakeholders to effectively target resources to assure long-term protection of one of the state’s greatest resources.

According to Dr. C. Andrew Carson, Professor of Veterinary Pathobiology at the University of Missouri-Columbia, microbial source tracking is “a process for detection and/or measurement of human- and animal-origin fecal pollution in water.”⁴⁷ Many available microbial source tracking methodologies require several days to culture fecal indicator bacteria, such as *E. coli*, and some require reference libraries with more than 200 samples of known host-source feces collected from the source watershed for comparisons.⁴⁸ Other methods available within the Missouri University system and their federal partners, however, can offer a different

⁴³ Comment from C. A. Carson, Professor of Veterinary Pathobiology, University of Missouri-Columbia, to Concerned Stakeholders of Missouri 1 (Sept. 2, 2010) (on file with the Missouri Attorney General’s Office). Those limits are implemented in Missouri as Water Quality Standards in the Missouri Clean Water Law.

⁴⁴ H. Yampara-Iquise et al., *Use of a Bacteroides Thetaiotaomicron-specific a-1-6, Mannanase Quantitative PCR to Detect Human Fecal Pollution in Water*, 105 J. APPLIED MICROBIOLOGY 1686 (2008) (discussing purpose and application of microbial source tracking) (citations omitted).

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ Carson., *supra* note 43 (discussing purpose and application of microbial source tracking).

⁴⁸ *Id.* (citations omitted).

sampling approach. For example, at the University of Missouri-Columbia, Dr. Carson runs a laboratory with the capability of using quantitative polymerase chain reaction (“qPCR”) and standard PCR microbial source tracking tests. qPCR is a form of bacterial DNA fingerprinting that does not require cultures or libraries. This test detects and measures gene-specific DNA targets present in anaerobic bacteria, specific to the feces of particular hosts.⁴⁹ Dr. Carson chooses to emphasize anaerobic bacteria because these organisms can only survive in the environment in the absence of oxygen, and “their detection in the environment represents evidence of recent fecal pollution.”⁵⁰ Other laboratories choose to emphasize different DNA markers and are available to the Missouri Department of Natural Resources (“MDNR”). The University of Missouri-Columbia’s laboratory can test thirty water samples per week at a cost of \$115 per standard PCR test and \$150 per qPCR test.

Before water samples can be sent to a laboratory for analysis, they must first be collected according to a targeted sampling plan. Based on testimony given at the symposium, the Attorney General recommends that the United States Geological Survey (“USGS”) work with MDNR and university researchers to develop a targeted sampling plan for the Lake of the Ozarks watershed that will include microbial source tracking as an integral component. The sampling plan should consider and prioritize (1) sampling locating and frequencies, (2) the number of samples necessary and feasible to obtain meaningful results, and (3) whether an accurate assessment can be discerned from the samples taken.⁵¹ Samples should target *E. coli* hotspots and then track the source of the *E. coli* contamination from those hotspots to its origin.⁵² According to USGS, in order to obtain an accurate assessment of the microbial sources for each hotspot, several weeks of water quality monitoring will be needed at a cost of approximately \$5,000 per hotspot.⁵³ USGS estimates that, in order to gain a clear picture of human/nonhuman sources in populated areas throughout the Lake watershed, the state could spend up to \$500,000.⁵⁴

To reduce costs, any sampling plan should consider other water quality monitoring studies taking place in the Lake watershed, filling in any gaps that may be created by existing or proposed monitoring programs. For example, USGS and MDNR could partner with the Lake of the Ozarks Watershed Alliance, Inc. (“LOWA”) in the development of their microbial source tracking sampling plan. LOWA is currently working with Geosyntec Solutions, Inc. to complete a proposal for a fluourometric study for the Lake of the Ozarks.⁵⁵ The study will assess the presence of on-site system effluents along developed shorelines using optical brighteners as effluent detectors, and the study will evaluate the potential impacts of on-site system effluents on water quality.⁵⁶ Optical brighteners show whitening agents used in laundry detergents, which evidence the presence of on-site system effluent from common household products, such as laundry

⁴⁹ Carson, *supra* note 43, at 1.

⁵⁰ *Id.* (emphasis added).

⁵¹ Comment from Bob Broz, Water Quality Program Director, University of Missouri-Columbia Extension Office (Nov. 2, 2010) (on file at the Missouri Attorney General’s Office).

⁵² Interview with John Schumacher, Chief, Hydrologic Investigations, United States Geological Survey (Nov. 17, 2010) (notes on file with the Missouri Attorney General’s Office).

⁵³ *Id.*

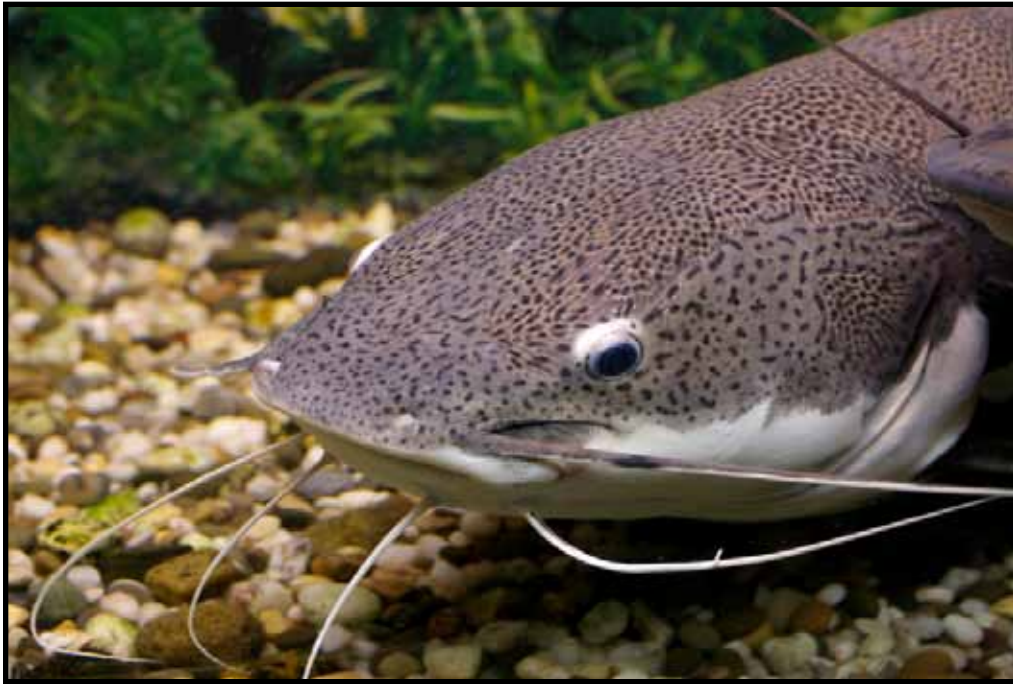
⁵⁴ *Id.*

⁵⁵ Randy Crawford, I Transcript of Proceedings at 56.

⁵⁶ *Id.* at 57.

detergents.⁵⁷ USGS and MDNR could partner with LOWA and Geosyntec Solutions, Inc. to take samples at the same or similar locations in order to ensure the efficient use of state resources and a complete dataset. More specifically, test results from these ongoing efforts could be used to focus the more resource intensive microbial source tracking efforts.

Finally, LOWA and the Lakes of Missouri Volunteer Program (“LVMP”) have been collecting water samples throughout the Lake of the Ozarks watershed for several years on a volunteer basis.⁵⁸ Any sampling plan for microbial source tracking should not duplicate these volunteer efforts; rather the plan should take advantage



of the shared resources offered by these generous volunteers. Moreover, USGS and MDNR should target the sampling plan to those populated areas of the Lake with historically high *E. coli* water sample results.

Once microbial source tracking is complete, and the data set is integrated and analyzed, stakeholders should use the data to determine where resources should be targeted during remediation efforts. Where testing reveals human sources of *E. coli* contamination, resources should be targeted toward the elimination of human effluent

discharges into the Lake of the Ozarks. Without this valuable information, the Attorney General believes any new regional wastewater entity will not be able to adequately accomplish the goal of developing a long-term, phased approach to implementing a regional wastewater system, which would address factors such as public health risk, density, terrain, water quality impairment, and available technology.

⁵⁷ *Id.* at 58; see also Randy Crawford, Pollution Sources and Monitoring Strategies, Slideshow (Aug. 17, 2010), available at http://ago.mo.gov/agriculture/pdf/symposium/Day1/1_Pollution%20Sources/3_Crawford.pdf.

⁵⁸ Donna Swall & Tony Thorpe, II Transcript of Proceedings at 294, 312.

Pursuant to its FERC licensing agreement, AmerenUE currently funds the water quality monitoring regime at the Lake of the Ozarks. AmerenUE's commitment expires in March 2012. As the Lake's leading private steward, the Attorney General requests AmerenUE commit to funding water quality monitoring at the Lake of the Ozarks for an additional five years.

AmerenUE provides \$15,000 per year to the Missouri Department of Natural Resources ("MDNR") to fund bacterial sampling in Lake coves.⁵⁹ Each year, approximately thirty coves are sampled monthly during the recreational season of May to October.⁶⁰ MDNR trains Lake of the Ozarks Watershed Alliance, Inc. ("LOWA") volunteers to take the samples, which are then analyzed by MDNR's laboratory for *E. coli* bacteria. Since July 2007, LOWA has collected and MDNR has analyzed 1,012 water samples.⁶¹ As a result of this cooperative effort, the state of Missouri has a five-year history of sampling data for the Lake of the Ozarks watershed it otherwise would not have. Unfortunately, the clock will run out on AmerenUE's original five-year commitment in March 2012. Due to the relatively low cost to AmerenUE and the extraordinary benefit to the state of Missouri, the Attorney General is requesting that AmerenUE renew its commitment to the Lake of the Ozarks and MDNR to fund water quality monitoring for an additional five years.

The Lake of the Ozarks was created in 1931 when the Union Electric Company of St. Louis constructed the Bagnell Dam, impounding the Osage River for hydropower generation.⁶² Union Electric is now part of the Ameren Corporation, of which AmerenUE is a subsidiary. AmerenUE operates the Lake of the Ozarks and Bagnell Dam under the supervision of the Federal Energy Regulatory Commission ("FERC"). AmerenUE's forty-year license was re-issued in 2007.⁶³ In addition to the regulatory requirements imposed by FERC, the state of Missouri imposes regulatory requirements on AmerenUE to operate the Lake of the Ozarks and the Bagnell Dam as a condition of its Section 401 Water Quality Certification. Pursuant to its Water Quality Certification, AmerenUE agreed to provide funding for a five-year study of bacterial levels in Lake coves.⁶⁴ Past sampling had indicated increased fecal coliform counts following significant rainfall events and in coves with periods of high recreational use.⁶⁵ Consequently, MDNR requested, and FERC ordered in its license renewal, additional water quality monitoring in coves to determine "areas of concern that may degrade water quality" at the Lake.⁶⁶

Once MDNR obtained the funds necessary to conduct this needed water quality monitoring at the Lake of the Ozarks, it approached local citizens for assistance. In 2006, LOWA came together to "preserve, protect, and improve the Lake of the Ozarks, its watershed, and natural resources, while maintaining economic,

⁵⁹ Warren Witt, Excerpts from Final Environmental Assessment for Osage Plant License 65-68 (Aug. 2006), available at http://ago.mo.gov/agriculture/Lake_Ozarks_Symposium_pp.htm.

⁶⁰ Mo. DEP'T OF NATURAL RES., LAKE OF THE OZARKS WATER QUALITY INITIATIVE REPORT 5 (2009), available at <http://www.dnr.mo.gov/loz/initiative-final.pdf>.

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.* at 5.

⁶⁵ *Id.* at 55-56.

⁶⁶ Warren Witt, Excerpts from Osage Plant FERC License Order 2 n.51 (March 2007), available at http://ago.mo.gov/agriculture/Lake_Ozarks_Symposium_pp.htm.

social, and environmental health.”⁶⁷ With LOWA’s assistance, MDNR has tripled the number of sites sampled from 20 to 120 per sampling event.⁶⁸ Due to manpower restrictions, however, sample events are limited to one section of the Lake of the Ozarks watershed per year.⁶⁹ Thus far, MDNR and LOWA have been able to show some trends, but more data is needed. In 2007, eight samples exceeded the Environmental Protection Agency’s water quality standards for whole body contact in recreational waters.⁷⁰ In 2008, only three samples exceeded the standard.⁷¹ In 2009, thirty-one samples exceeded the standard, and as of August 18, 2010, only three samples had exceeded the standard.⁷² However, these samples are only a one-time snapshot in history of one section of the Lake watershed.

For a comprehensive dataset, more water quality monitoring is needed to confirm the findings of previous year’s monitoring data and to obtain data about all parameters of concern, including total phosphorus, nitrogen, inorganic suspended solids, chlorophyll, and secchi depth.⁷³ In fact, after an in depth analysis of past water quality monitoring efforts and a recognition of the absence of baseline data, LOWA, in its thorough *Lake of the Ozarks Watershed Management Plan*, calls for more water quality monitoring at the Lake of the Ozarks.⁷⁴ Specifically, LOWA recommends testing in more coves and channels; increased *E. coli* sampling frequency to once per month at each site during the recreation season of March to October; *E. coli* testing at each sampling event with accompanying phosphorus, nitrogen, inorganic suspended solid; and total suspended solid sampling in March, June, and October.⁷⁵ As the Lake’s leading private steward, AmerenUE should continue its commitment to fund water quality monitoring for an additional five years in order to give MDNR an opportunity to investigate these water contaminants.

In addition to the extraordinary success of the partnership among LOWA volunteers, MDNR, and AmerenUE, the Attorney General would like to commend the volunteers who work with the Lakes of Missouri Volunteer Program (“LVMP”) at the University of Missouri-Columbia and the Missouri Stream Team. Volunteers with LVMP and the Missouri Stream Team—often serving double duty as LOWA volunteers—monitor sediment, nutrient levels, and temperature in lakes and streams across the state of Missouri with remarkable accuracy.⁷⁶ LVMP volunteers have assisted the University of Missouri with the development of a twenty-six-year-old, comprehensive dataset for the level of algae in Missouri’s waterways.⁷⁷

The Attorney General would like to recognize and thank AmerenUE for its past contributions and encourage it to continue its commitment to the Lake of the Ozarks into the future.

⁶⁷ Donna Swall, II Transcript of Proceedings at 294.

⁶⁸ *Id.* at 295.

⁶⁹ Tim Rielly, I Transcript of Proceedings at 139; see also Tim Rielly, Lake of the Ozarks Water Quality Data Analysis, Slideshow, available at http://ago.mo.gov/agriculture/pdf/symposium/Day1/4_Scientific%20Analysis%20of%20Water%20Quality/1_Rielly.pdf.

⁷⁰ *Id.* at 296.

⁷¹ *Id.*

⁷² *Id.*

⁷³ LOWA’s Watershed Management Plan, *supra* note 5, at 91.

⁷⁴ *Id.* at 92.

⁷⁵ *Id.*

⁷⁶ Tony Thorpe, II Transcript of Proceedings at 313, 320 (Mr. Thorpe testified that the r-squared value of a volunteers water sample compared to laboratory staff’s sample was .98 to .97, which is nearly identical. Thus “if a volunteer collects a sample or we collect a sample, there is essentially no difference.”).

⁷⁷ Dan Obrecht, I Transcript of Proceedings at 114.

Over the next six months, the Missouri Department of Natural Resources should engage the expertise of the Missouri Department of Health and Senior Services in evaluating whether a health advisory system should be adopted to manage public health risks at Missouri state park beaches.

Over the course of the last year, the Missouri Department of Natural Resources (“MDNR”), at the direction of Governor Nixon, has done an exceptional job of improving the quality and transparency of water quality monitoring at state park beaches. MDNR has developed a website to promptly inform the public of any beach closures as soon as sampling results are processed, greatly improving data accessibility and public confidence. MDNR has also made changes to its procedures, most notably, instituting a bright-line standard that, if exceeded, will result in the prompt closure of a state park beach.⁷⁸

While admirable in intent, this bright-line standard does not communicate the level of public health risk at a particular beach. This is partly due to time constraints associated with current monitoring methods;⁷⁹ partly due to the transient nature of bacteria;⁸⁰ and partly due to the nature of a bright-line test, which does not reflect degrees of risk. Additionally, beach closures sometimes generate the false impression that the entire Lake is contaminated, thereby deterring visitation and harming tourism. For these reasons, the Attorney General believes MDNR should consider bolstering its automatic beach closure policy with a comprehensive health advisory system. As part of this process, the Missouri Department of Health and Senior Services (“DHSS”) should play an integral role in determining whether a health advisory system should be adopted to protect public health and safety at public beaches.

The issue of how to properly protect the public from a potentially contaminated beach is not unique to Missouri. In 2000, in response to concerns about the safety of public beaches along the coasts and Great Lakes, Congress enacted the Beaches Environmental Assessment and Coastal Health Act.⁸¹ That Act required the Environmental Protection Agency (“EPA”) to develop performance criteria for states and local governments to conduct water quality monitoring and public notification for all coastal and Great Lakes beaches. Whenever levels of certain bacteria exceed EPA standards, state and local agencies are required to notify the public of potential health risks, either through a beach advisory warning of possible risks or by beach closure.⁸² According to the Natural Resources Defense Council, beach pollution prompted 18,682 closing and swimming advisory days at ocean, bay, and Great Lakes beaches in 2009.⁸³

⁷⁸ Bill Bryan, I Transcript of Proceedings at 74-80 (stating that the Missouri Department of Natural Resources closes beaches when single samples exceed the EPA recommended maximum of 235 *E. coli* colonies per 100 milliliters of water (235 mpn/100ml) or when the geometric mean—a rolling average of sample data—exceeds 126 *E. coli* colonies per 100 milliliters of water (126 mpn/100ml)); see also Missouri State Park Beaches and Historic Sites, State Park Beach Status, <http://mostateparks.com/beaches/index.asp> (last visited Nov. 5, 2010) [hereinafter State Park Beach Status].

⁷⁹ Bill Bryan, I Transcript of Proceedings at 77 (Water samples are taken on Monday and the results are not usually known until Wednesday. The beach remains closed until samples taken the following Monday reveal levels of bacteria under acceptable levels. Hence, during a period of rapidly changing water conditions, a beach may be closed or operated for several days when actual water conditions would not merit that action.).

⁸⁰ John Schumacher, I Transcript of Proceedings at 39-40.

⁸¹ Beaches Environmental Assessment and Coastal Health Act of 2000, Pub. L. No. 106-284, 114 Stat. 870 (codified as amended in 33 U.S.C. §§ 1346, 1375a and amending 33 U.S.C. §§ 1254, 1313, 1314, 1362, and 1377).

⁸² 33 U.S.C. § 1346(a)(1).

⁸³ Natural Resource Defense Council, Testing the Waters 2010, <http://www.nrdc.org/water/oceans/ttw/titinx.asp> (last visited Nov. 5, 2010).

States have taken widely different approaches with respect to their public beaches. According to Director of State Parks Bill Bryan, twenty-seven of the forty states MDNR surveyed handle the issue of contaminated beaches by posting advisory warnings instead of automatically closing the beach area.⁸⁴ This is also the National Park Service's policy.⁸⁵ Some states, such as Maine, have a range of possible actions, from advisory warnings to beach closures, depending on a risk assessment matrix.⁸⁶

The state of Iowa's beach monitoring program for state park beaches is particularly compelling.⁸⁷ Iowa employs a three-pronged approach that involves the posting of a swimming advisory at all beaches if the geometric mean standard for *E. coli* is exceeded. A beach advisory is also posted at "vulnerable" or "transitional" beaches if the one-time maximum standard for *E. coli* is exceeded. No advisory is posted for a one-time maximum exceedence at a "less vulnerable" beach. Vulnerable, transitional, and less vulnerable beach classifications are based upon a beach's history of *E. coli* contamination.⁸⁸ Most notably, the Iowa Department of Natural Resources reserves the right to close a beach in the event of a documented health risk including things such as wastewater by-passes, spills of hazardous chemicals, or local outbreaks of an infectious disease.⁸⁹ The public receives clear instruction from Iowa's public beach website, which employs a flagging system similar to the Missouri State Parks' website.

These examples are cited only to show that there are many different approaches to protecting public health and safety at public beaches. Any policy established by the state of Missouri to protect its citizens should



properly reflect the risks associated with the specific activity. The Attorney General believes that this recommendation should be implemented concurrently with Recommendation No. 6, which recommends that MDNR implement a predictive modeling approach to determine the likelihood of *E. coli* contamination on any given day. A predictive modeling approach would forecast beach conditions using real-time data, allowing MDNR and DHSS to take appropriate action to either post an advisory warning, or if warranted, to close a beach.

Mary Glassburner, Chief of Environmental Health Services, Missouri Department of Health and Senior Services, testifies on the "Science of Water-Borne Illness."

⁸⁴ Bill Bryan, I Transcript of Proceedings at 79.

⁸⁵ *Id.*

⁸⁶ State of Maine Healthy Beaches, Beach Status and Data, <http://www.maineoastdata.org/public/CurrentBeachStatus.aspx> (last visited Nov. 5, 2010).

⁸⁷ Iowa Department of Natural Resources, Beach Monitoring, Water Monitoring Section, <http://www.igsb.uiowa.edu/wqm/activities/beach/BeachAdvisoryPolicy.htm> (last visited Nov. 5, 2010).

⁸⁸ *Id.*

⁸⁹ *Id.*

Over the next three years, the Missouri Department of Natural Resources should adopt a predictive modeling tool to assess recreational water quality at the Lake of the Ozarks State Park beaches. This predictive modeling tool will record real-time environmental data that has been shown to be highly correlative to *E. coli* bacteria levels. Over the next five years, the Missouri Department of Natural Resources should work toward implementing this predictive modeling tool at all state park beaches where *E. coli* levels most frequently exceed standards.

One day in July, more than 1,400 people visited the Missouri Department of Natural Resources' ("MDNR") website in order to determine whether the state park beaches they planned to visit were open that day.⁹⁰ According to Director of State Parks Bill Bryan, 50,000 people use state park beaches at the Lake of the Ozarks State Park in any given year.⁹¹ As noted in Recommendation No. 5, MDNR has done an exceptional job of improving the quality and transparency of water quality monitoring at state park beaches. Using current and accepted methods for *E. coli* analysis, MDNR is able to culture water samples to determine whether *E. coli* levels exceed the Environmental Protection Agency's ("EPA") standards. However, the current methods require a minimum of twenty-four hours after sample collection before results are known. Based on information learned and recommendations made during the symposium, the Attorney General recommends MDNR investigate the feasibility of implementing a rapid, indirect method of predicting *E. coli* levels at the Lake of the Ozarks public beaches. This rapid, indirect methodology, or predictive modeling, provides real-time water quality information that can predict *E. coli* levels with more reliability than current MDNR protocol with reduced costs over time.⁹²

MDNR currently closes beaches when single samples exceed the EPA recommended maximum of 235 *E. coli* colonies per 100 milliliters of water (235 mpn/100ml) or when the geometric mean, a rolling average of sample data, exceeds 126 *E. coli* colonies per 100 milliliters of water (126 mpn/100ml).⁹³ State samples for state park beaches are taken the first of each week and processed and analyzed at MDNR's Environmental Services Program laboratory in Jefferson City.⁹⁴ MDNR must then take eighteen to twenty-four hours to culture a single bacteria cell into a colony that can be read.⁹⁵ Full beach data are updated by Friday, though some closure notifications may be made before that time as results become available.⁹⁶ MDNR notes that its testing methodology lends itself to beach closure decisions based on, at best, three-day old data.⁹⁷ The lapse in time between sample collection and beach closure creates a challenge because *E. coli* levels can change "quite dramatically" depending on hydrologic conditions during the eighteen to twenty-four hour time period.⁹⁸ Thus, according to John Schumacher with the United States Geological Survey ("USGS"), in many cases there is "virtually no correlation between the indicator level [of *E. coli*] on any given day and the

⁹⁰ Bill Bryan, I Transcript of Proceedings at 77.

⁹¹ *Id.*

⁹² John Schumacher, I Transcript of Proceedings at 51.

⁹³ State Park Beach Status, *supra* note 7.

⁹⁴ *Id.*

⁹⁵ John Schumacher, I Transcript of Proceedings at 39.

⁹⁶ State Park Beach Status, *supra* note 78.

⁹⁷ Bill Bryan, I Transcript of Proceedings at 74.

⁹⁸ John Schumacher, I Transcript of Proceedings at 39.

level two or more days later.”⁹⁹ MDNR is currently researching rapid testing methods for *E. coli* detection and should be commended for their efforts.

Two options are available to MDNR to replace its current three-day culture testing methodology. The first option involves rapid, direct methods for *E. coli* detection. The second option involves rapid, indirect methods for estimating *E. coli* levels, or predictive modeling. Predictive modeling provides real-time data to MDNR and the public that can be used for minute-by-minute risk assessment. Rapid, direct methods for *E. coli* detection, such as quantitative polymerase chain reaction (“qPCR”), and immunomagnetic separation/adenosine triphosphate (“IMS/ATP”), are capable of testing water samples for the presence of *E. coli* in a two- to four-hour time frame.¹⁰⁰ Using qPCR, scientists are able to target sequences in the DNA spectrum of the source pollution for *E. coli*.¹⁰¹ The IMS/ATP test uses magnetic beads to extract *E. coli* from the water sample.¹⁰² The beads then react with the *E. coli* and emit light.¹⁰³ Scientists can extrapolate the amount of *E. coli* in the water by analyzing the amount of light produced.¹⁰⁴ The IMS/ATP test equipment costs \$15,000 to \$20,000 per unit, but the test can be conducted by an employee with basic training.¹⁰⁵ Unfortunately, with either rapid, direct testing methodology, tests are conducted only as often as employees can visit and sample the waterway. In this challenging economic environment, minimizing human involvement is highly valuable. The predictive model could give MDNR the opportunity to greatly reduce the human involvement while providing real-time, reliable data about *E. coli* levels twenty-four hours per day, seven days each week.



Predictive models measure environmental surrogates, or variables, that correlate to *E. coli* levels.¹⁰⁶ For example, turbidity, the cloudiness in water caused by suspended solids particles, is known to be highly correlated to indicator bacteria levels in water because *E. coli* tends to be absorbed by the sediment or during rain events, sediment already contaminated with *E. coli* can run off from a field.¹⁰⁷ Other environmental surrogates include wave height, wind speed, wind direction, water temperature, and precipitation.¹⁰⁸ Water quality monitors, placed in strategic locations at state park beaches, can be equipped with sensors for each of these environmental surrogates.¹⁰⁹ The sensors can transmit data to a forecasting model, which then generates an *E. coli* prediction with up to eighty-four percent accuracy.¹¹⁰ Predictive models are currently

⁹⁹ See John Schumacher, U.S. Geological Survey: A Non-regulatory Scientific Agency, Slideshow [hereinafter Schumacher Slideshow], available at http://ago.mo.gov/agriculture/pdf/symposium/Day1/1_Pollution%20Sources/2_Schumacher.pdf (citing a 2005 EPA study).

¹⁰⁰ John Schumacher, I Transcript of Proceedings at 41.

¹⁰¹ *Id.* at 42.

¹⁰² *Id.* at 42-43.

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 44.

¹⁰⁶ *Id.* at 46; see also Schumacher Slideshow, *supra* note 99.

¹⁰⁷ *Id.*

¹⁰⁸ John Schumacher, I Transcript of Proceedings at 48.

¹⁰⁹ *Id.* at 49.

¹¹⁰ *Id.* at 51.

used for beach closure or advisory decisions at only three locations in the United States, all at Great Lakes beaches. Two of these model-based advisories are described on public websites—SwimCast and the Ohio Nowcast.¹¹¹

MDNR needs to start collecting data at the Lake of the Ozarks immediately in order to develop the dataset necessary to interpret the information generated by a forecasting model. According to USGS, three-year's worth of monitoring data is needed to develop an accurate model.¹¹² Obtaining this data will cost approximately \$450,000, which includes the cost of equipment acquisition and model parameter development.¹¹³ However, once implemented, a predictive modeling tool similar to SwimCast or Ohio Nowcast could save MDNR time and economic resources through the minimization of human and laboratory involvement in the sampling process. Moreover, the predictive modeling tool offers real-time, accurate water quality data. State park beach visitors will be able to visit MDNR's website for an update on predicted *E. coli* levels over the lunch

hour and find levels reported to the forecasting model at 11:30 a.m. rather than three days prior. MDNR should work toward implementing this predictive modeling tool at all state park beaches where *E. coli* levels most frequently exceed EPA standards and where the hydrologic setting lends itself to predictive modeling conditions. Over the next five years, MDNR should investigate whether a predictive modeling tool is a feasible alternative for *E. coli* analysis at all state park beaches throughout the state of Missouri.



¹¹¹ LAKE COUNTY, SWIMCAST, <http://www.lakecountyil.gov/Health/want/SwimCast.htm> (last visited Oct. 28, 2010); OHIO NOWCAST, <http://www.ohionowcast.info/index.asp> (last visited Oct. 28, 2010). Four of the beaches along Lake Michigan in Lake County are monitored through the utilization of SwimCast systems, which provide staff members and beach operators with real-time conditions, allowing for the most accurate and timely decisions regarding the health of Lake County beaches. Similarly, Ohio Nowcast is a system that uses near real-time information to “nowcast” water-quality conditions at two Lake Erie beaches and one recreational river. The Ohio Department of Natural Resources, USGS, EPA, and local health and environmental officials worked together to develop the predictive modeling tool for Lake Erie, which now operates with 83.7% accuracy.

¹¹² Interview with John Schumacher, U.S. Geological Survey (Nov. 17, 2010) (notes on file with the Missouri Attorney General’s Office).

¹¹³ *Id.*

RECOMMENDATION NO. 7

The commissions of Camden, Benton, Miller, and Morgan counties should work together to address non-point sources of nutrient loading in the Lake of the Ozarks. Specifically, they should collectively encourage or require through ordinances, education, and/or financial incentives low-impact development landscaping around the perimeter of the water's edge. The commissions should also consider ordinances, education, and/or financial incentives to encourage or require homeowners and businesses around the Lake's perimeter, particularly golf courses, to use low-phosphorus or phosphorus-free fertilizer. Such an incentive program could include a special designation or recognition, such as "Lake Protector," for any person or entity utilizing low-impact landscaping or low-phosphorus fertilizer.

The most immediate water quality concern at the Lake of the Ozarks is nutrient contamination. In September 2010, the Missouri Clean Water Commission added the Niangua Arm and the Osage Arm of the Lake to the state's "303(d) List of Impaired Water Bodies" because those portions of the Lake do not currently meet the state's water quality standards.¹¹⁴ The Niangua Arm is impaired by phosphorus. The Osage Arm is impaired by nitrogen. The suspected sources of these nutrients include urban and rural non-point sources.¹¹⁵ Non-point sources are sources of pollution that involve discharges of water contaminants from sources other than traditional pipe or discernible channels.¹¹⁶ One of the most recognized sources of non-point source pollution is storm water that comes in contact with pollutants as it runs over the surface of land and then discharges into a water body.

Once a water body is listed as impaired, the federal Clean Water Act requires the state to develop a "total maximum daily load," or "TMDL," for that water body. A TMDL is a calculation of the maximum amount of a pollutant that a body of water can absorb and still meet applicable water quality standards.¹¹⁷ The TMDL includes a plan to reduce the pollutant load discharged to a water body so that the water body will be able to meet the water quality criteria for its designated uses.¹¹⁸ When the sources of pollution involve non-point sources, a TMDL will often involve a watershed management approach that includes community-based public stewardship.¹¹⁹ Though the Missouri Department of Natural Resources ("MDNR") has not yet developed TMDLs for the impaired sections of the Lake of the Ozarks, it will no doubt reference or incorporate the *Lake of the Ozarks Watershed Management Plan* ("Watershed Management Plan") completed by the Lake of the Ozarks Watershed Alliance, Inc. ("LOWA") to address nutrient impairment, discussed below.¹²⁰

Before discussing the Attorney General's recommendation regarding nutrient contamination, the Attorney General would like to recognize the important symposium presentation by Mr. Greg Stoner, a Fisheries Management Biologist with the Missouri Department of Conservation.¹²¹ According to Mr. Stoner, nutrients

¹¹⁴ Mo. Dep't of Natural Res., Missouri 303(d) Streams and Lakes, www.dnr.mo.gov/env/wpp/waterquality/303d.htm (last visited Nov. 5, 2010).

¹¹⁵ Leanne Tippett-Mosby, I Transcript of Proceedings at 220.

¹¹⁶ Mo. REV. STAT. § 644.016(15) (Supp. 2009) (see definition of point source).

¹¹⁷ 33 U.S.C. § 1313(d)(1)(C); see also Mo. Dep't of Natural Res., *Water Protection Program Fact Sheet: What are TMDLs?* (Sept. 2009), available at <http://dnr.mo.gov/pubs/pub2090.pdf>.

¹¹⁸ *Id.*

¹¹⁹ *Id.*

¹²⁰ See LOWA's Watershed Management Plan, *supra* note 5.

¹²¹ Greg Stoner, II Transcript of Proceedings at 338-53.

play an important role in a balanced, healthy aquatic ecosystem. Fisheries can be harmed by nutrient deficiencies, just as excess nutrients can result in algae blooms and fish kills.¹²² The fact that a large portion of the Lake is designated as impaired due to high levels of nutrients suggests, however, that the Lake's fisheries should not be harmed by the nutrient reduction efforts discussed here.¹²³

Because the Lake has two segments designated by the state as impaired by nutrients and because the excessive nutrients can cause undesirable consequences that would be devastating for the Lake community, the Attorney General encourages all involved to take action to address this problem. LOWA's *Watershed Management Plan* contains several strategies for addressing non-point source contamination.¹²⁴ These strategies focus on reducing the volume and velocity of storm water runoff as well as improving the quality of runoff that does reach the Lake. The Attorney General is particularly persuaded by LOWA's strategies involving low-impact development and low-impact landscaping ("LOWA LILs") and its focus on promoting low-phosphorus or phosphorus free fertilizer in the watershed.



Local governmental entities should enhance LOWA's efforts by enacting ordinances and/or education and incentive programs encouraging these activities. The county commissions in the Lake's four-county region are in the best position to implement a broad-based approach that could reach citizens around the entire perimeter of the Lake. County commissions, county planning departments, and LOWA should work together to develop an educational campaign that will teach citizens, homeowners, and businesses around the Lake to implement low-impact landscaping and use low-phosphorus or phosphorus-free fertilizer at the appropriate application rates. A targeted campaign for developers and other larger property owners, such as golf courses, could focus on low impact development. The Attorney General encourages counties to work with communities in the region to develop an incentive program for low impact development. This program could include financial incentives for low-impact development and a special designation or recognition known as "Lake Protector" for any person or entity utilizing low-impact landscaping or low-phosphorus fertilizer. Counties should periodically, publicly recognize and reward property owners and businesses who are doing their part to protect the Lake's water quality.

Finally, this recommendation is intended to address urban, non-point sources of pollution. But, the Clean Water Commission has designated rural, non-point sources as an additional cause of nutrient impairment at the Lake of the Ozarks. Notably, according to Dr. Bryan Hopkins, MDNR's Director of the Soil and Water Conservation Program, tens of millions of dollars are spent annually state-wide to address soil conservation, which has a positive effect on water quality.¹²⁵ The Attorney General was encouraged by the Soil and Water Conservation Program's efforts in the Lake of the Ozarks' watershed. Over the last five years, the Soil and Water Conservation Program spent more than one million dollars on incentives for farmers who are utilizing soil conservation practices in the Lake of the Ozarks' watershed.¹²⁶ The Attorney General encourages the Soil and Water Conservation Program and the National Resource Conservation Service to continue providing incentives and funding to the agricultural community to address its contribution to non-point source pollution at the Lake.

¹²² *Id.*

¹²³ *Id.*

¹²⁴ See LOWA'S WATERSHED MANAGEMENT PLAN, *supra* note 5, at 72-90; see also Caroline O'Toole, II Transcript of Proceedings at 303-12.

¹²⁵ Bryan Hopkins, II Transcript of Proceedings at 326-37.

¹²⁶ *Id.* at 334.

Statutory Changes

RECOMMENDATION NO. 8

The Missouri General Assembly should enact legislation requiring owners of on-site sewage disposal systems to pass an inspection at the time of sale for all real estate transactions located within 2,500 feet of the Lake of the Ozarks. While this undertaking would require a significant legislative effort, from environmental, public health, and economic perspectives, requiring mandatory inspections at the time of sale is the best way to protect this recreational water body.

Based on United States Census numbers, the Missouri Department of Health and Senior Services (“DHSS”) estimates that one in four households depend upon on-site wastewater treatment because no other wastewater treatment is available.¹²⁷ However, the greatest threat to long-term water quality at the Lake of the Ozarks is failing on-site sewage disposal systems (“on-site system”) around its perimeter. To bring these pollution sources into compliance with the On-Site Disposal System Law, state and local officials must be able to locate failing systems. Unfortunately, state and local officials have no way of discovering the existence, age, or condition of any on-site system unless concerned citizens make complaints to their local health department inspector.¹²⁸ To combat this problem, some Missouri counties and the state of Iowa have enacted ordinances requiring inspection and registration of on-site systems at the time of sale for all real estate transactions.¹²⁹ The Attorney General recommends that the Missouri General Assembly do the same and enact legislation requiring mandatory inspections of on-site systems at the time of sale for all real estate transactions within 2,500 feet the Lake of the Ozarks.

Currently in Missouri, owners of on-site systems can request an inspection or a more comprehensive evaluation from a licensed inspector for the purposes of real estate transactions.¹³⁰ Property owners use these inspections to negotiate real estate prices and transaction costs, but the inspections themselves are not registered with the Missouri Departments of Natural Resources (“MDNR”) and/or DHSS.¹³¹ Thus, the public gains little to no environmental benefit from the existence of the voluntary inspection program unless the property owners fix their on-site wastewater systems as a result of the inspection. On the other hand, mandatory inspection programs, such as the program adopted in Stone County, Missouri, and the statutory scheme in the state of Iowa, eliminate illegal systems.

In Stone County, Missouri, owners of on-site systems older than ten years must obtain a property transfer certificate before they can sell property on which the systems sit.¹³² If the systems fail the certification

¹²⁷ Jim Gaughan, I Transcript of Proceedings at 231 (Mr. Gaughan added that on-site systems typically treat and recycle waste. A simple system includes a septic tank, as well as some method of distribution and a soil treatment area.)

¹²⁸ Jennifer Eblen, II Transcript of Proceedings at 414-15 (explaining that under current state law county health inspectors cannot inspect an on-site sewage disposal system without an “aggrieved party complaint”).

¹²⁹ See STONE CNTY., MO., HEALTH CODE, ONSITE WASTEWATER ORDINANCE, available at http://www.stonecountyhealthdepartment.com/codes_ordinances.html.

¹³⁰ Randall Miles, II Transcript of Proceedings at 441.

¹³¹ *Id.* at 442.

¹³² See STONE CNTY., MO., HEALTH CODE, ONSITE WASTEWATER ORDINANCE, available at http://www.stonecountyhealthdepartment.com/codes_ordinances.html.

inspection, the owners must then have the on-site systems repaired or replaced.¹³³ Similarly, in Iowa, before any property on which an on-site system sits can be transferred, the property owner must pass an inspection.¹³⁴ A copy of the inspection report must be recorded with the local county recorder's office, so local health officials can follow up with enforcement actions if necessary.¹³⁵ In both Stone County and Iowa, inspectors are privately contracted individuals certified by state and local authorities to carry out inspection services.¹³⁶

In Missouri, the General Assembly should enact legislation requiring mandatory inspections of on-site systems at the time of sale for all real estate transactions within 2,500 feet of the Lake of the Ozarks. Because the Attorney General recognizes that the replacement of on-site systems may conflict with efforts to promote a regional sewer district discussed in Recommendation No. 1, he suggests that regulations be promulgated to resolve this conflict. Specifically, when implementing the law, DHSS should promulgate regulations that give owners of failing on-site systems the option of entering into an agreement with DHSS in which the owner agrees to connect to the regional sewer system as soon as it is available and agrees to pay a bond to the regional sewer authority for the expected connection costs. Owners should only be given this option if their home or business is located within a regional sewer authority's master planning area and if there is no immediate threat to human health or the environment. Another option would be to allow owners of on-site systems that replace their failing system with a new on-site system to be granted a fifteen-year waiver before they would be required to connect to a regional sewer authority.

This recommendation is made with regard to the Lake of the Ozarks but could be considered to combat pollution concerns at Missouri's other recreational water bodies, as failing on-site systems threaten water quality across the state.¹³⁷ However, adequately managed on-site systems are a "cost-effective, long-term option for meeting public health and water quality goals, particularly in less-populated areas."¹³⁸ If the results of mandatory inspections are reported to DHSS and disclosed to the purchaser of the property, then both the public and future property owners win.



¹³³ *Id.*

¹³⁴ Randall Miles, II Transcript of Proceedings at 443. A copy of Iowa's Time of Transfer Inspection Law and more details about the Iowa Department of Natural Resource's implementation of the law are available at <http://www.iowadnr.gov/tot.html>.

¹³⁵ Randall Miles, II Transcript of Proceedings at 443; see also Interview with Dan Olsen, Iowa Department of Natural Resources (Aug. 3, 2010) (notes on file with the Missouri Attorney General's Office).

¹³⁶ See sources cited *supra* note 132.

¹³⁷ Recreational water body could include the following water bodies located within or adjacent to Missouri state parks: Lake of the Ozarks, Big Lake, Lake Wappapello, Long Branch Lake, Pomme de Terre Lake, Stockton Lake, Table Rock Lake, Truman Lake, Mark Twain Lake, Lewis and Clark Lake, and Forest Lake. Failing on-site systems threaten water quality across the state, and this water quality issue is not an exclusive challenge for the Lake of the Ozarks. Thus, in the future, this protection could be afforded to all of Missouri's recreational water bodies.

¹³⁸ Jim Gaughan, I Transcript of Proceedings at 232; see also Randall Miles, II Transcript of Proceedings at 451.

RECOMMENDATION NO. 9

The Missouri Department of Natural Resources should hire, and the Missouri General Assembly should fund, additional full-time inspectors dedicated to the investigation and enforcement of violations of the Missouri Clean Water Law in the Lake of the Ozarks watershed. Currently, the Missouri Department of Natural Resources has only two inspectors charged with the protection of 1,150 miles of Lake of the Ozarks shoreline.

The Missouri Department of Natural Resources (“MDNR”) protects the state’s rich water resources, providing important protection to our citizens, our environment, and our prosperity. The Lake of the Ozarks alone provides an annual economic benefit of \$5 billion to Missouri’s economy.¹³⁹ This represents a fraction of the value Missourians receive from the Missouri and Mississippi Rivers, their many tributaries, and the many lakes and reservoirs in the state. The state of Missouri must, therefore, assure that adequate resources are provided for the protection of the Lake of the Ozarks and all of Missouri’s water resources.

Missouri has 38 water pollution control inspectors.¹⁴⁰ These inspectors are the front line in protecting the state’s waters. Missouri has more than 13,700 facilities with water pollution operating permits.¹⁴¹ Each year, these inspectors conduct more than 5,000 total site visits, including 2,100 full inspections per year.¹⁴² On average, each inspector makes 138 individual site visits and 58 full inspections each year. An inspector will, on average, spend about half of his or her time out in the field traveling and conducting site inspections.¹⁴³

However, inspection represents only a part of the inspector’s duties. Before conducting a site visit, an inspector prepares for the visit by reviewing the permits, compliance history, discharge monitoring reports, and ongoing enforcement actions to determine the facility’s compliance status.¹⁴⁴ Following a site visit, if no violation is identified, the inspector issues an inspection report.¹⁴⁵

If the facility is out of compliance, MDNR will escalate enforcement until the facility returns to compliance. Depending on the seriousness of the violation, the inspector will issue a letter of warning or a notice of violation. If needed, these steps will be followed by attempts at conference, conciliation, and persuasion, as mandated by sections 644.076.1 and 644.079.1 of the Revised Statutes of Missouri. If noncompliance continues, or if the initial violation is serious enough, the inspector must prepare a referral request for the case to be referred to the Missouri Attorney General’s Office for enforcement.¹⁴⁶ For matters referred to the Attorney General, the inspector will be involved in case development, negotiations, and litigation, which may include preparing for and giving testimony at trial.

¹³⁹ Romitti Slideshow, *supra* note 10, at 160.

¹⁴⁰ Steve Feeler, I Transcript of Proceedings at 251.

¹⁴¹ E-mail from Kevin Mohammadi, Section Chief, Water Protection Program, Missouri Department of Natural Resources, to Jessica Blome (Nov. 18, 2010) (on file with Missouri Attorney General’s Office) (indicating that this number includes site specific, land disturbance, general and storm water permits).

¹⁴² *Id.*

¹⁴³ If a state employee were to take all leave time and holidays, the employee would work around 210 to 220 days per year. Inspectors will attempt to arrange site visits so that more than one site can be seen in a day, but that isn’t always possible. As a result, the 138 site visits and 58 full inspections each year will take about half of the inspector’s working days.

¹⁴⁴ Steve Feeler, I Transcript of Proceedings at 249.

¹⁴⁵ *Id.* at 252.

¹⁴⁶ *Id.* at 253.

The Lake region has two inspectors assigned to oversee 419 permitted facilities.¹⁴⁷ Even if the inspectors' only obligation was the inspection of the 419 permitted facilities, the current average inspection rate of



58 inspections per year would allow each facility to be inspected only once every 3.5 years. However, these 419 facilities do not represent the complete universe of inspection obligations. For example, inspectors also inspect land disturbance activity at construction sites to assure compliance with land disturbance permits. In reality, facilities with operating permits are probably inspected every four years or more, as inspectors are responsible for the overall protection of 1,150 miles of Lake of the Ozarks shoreline—more than the entire coast of California.¹⁴⁸

Inspections represent only one of MDNR's compliance tools. For example, permitted facilities are required to submit monthly written discharge monitoring reports.¹⁴⁹ However, the results of the Governor's Lake of the Ozarks Water Quality Initiative ("Lake Initiative") demonstrate that, however valuable paper reviews may be, these reviews are no substitute for on-site inspections.

During the Lake Initiative MDNR inspected every permitted facility. For the Initiative, MDNR brought in as many as thirteen additional inspectors at any one time.¹⁵⁰ The 419 facilities received 154 notices of violation and 116 letters of warning, with 69 of those resulting in referrals to the Water Protection Program's enforcement section.¹⁵¹ As of the August symposium, 28 matters were referred to the Attorney General's Office.¹⁵² Given this rate of noncompliance, it is clear that a review of monthly discharge monitoring reports and other paper submissions to MDNR is not adequate to catch all forms of noncompliance. Without the Lake Initiative, these violations would have gone undetected for years.

The inspection rates in the Lake region raise concern about the number and frequency of inspections statewide. A corresponding increase in inspections statewide would require an increase in the number of inspectors. Currently MDNR does not appear to have the resources for such an increase. The fees for the water program have remained unchanged for ten years.¹⁵³ Permit holders and applicants pay these fees for the purpose of covering the costs of overseeing their regulated activity.¹⁵⁴ As a result, these fees represent a

147 Steve Feeler, I Transcript of Proceedings at 281; Leanne Tippett-Mosby, I Transcript of Proceedings at 228.

148 AmerenUE, Osage Project: FERC No. 459, Shoreline Management Plan 8, § 1.4 (2008), available at <http://www.ameren.com/sites/aeu/lakeoftheozarks/Pages/ShorelineManagementPlan.aspx>.

149 Steve Feeler, I Transcript of Proceedings at 249; Jack McManus, I Transcript of Proceedings at 264.

150 Steve Feeler, I Transcript of Proceedings at 282.

151 Id. at 283.

152 Id. The number of AGO referrals has now increased to thirty-three.

153 Leanne Tippett-Mosby, I Transcript of Proceedings at 229.

154 Mo. Rev. Stat. §§ 644.052, 644.053 (2002).

cost of business that, if not covered by the regulated entity, will impose a cost on the state. As mentioned above, the Lake of the Ozarks alone provides \$5 billion of annual economic activity that the state cannot afford to lose. Serious consideration should be given not just to extending those fees, but also to increasing them to a level that will assure adequate protection for Missouri's priceless water resources.

The Governor is to be commended for the Lake Initiative, which brought a new level of compliance to the facilities near the Lake. MDNR must now determine what is needed to maintain that level of compliance. As valuable as the Lake Initiative was, however, its goals were realized at the cost of moving inspectors from other areas of the state to the Lake of the Ozarks. Missouri cannot maintain that level of commitment to the Lake of the Ozarks at current funding and staffing levels. In the future, the state of Missouri must protect its water resources without diminishing its commitment to water quality in one part of the state in order to increase its commitment in another.



The “On-Site Disposal System Law” in chapter 701 of the Revised Statutes of Missouri should be amended to better accomplish the goal of protecting water quality and public health in the state of Missouri. To this end, the Missouri General Assembly should amend chapter 701 to enhance the Missouri Department of Health and Senior Services’ inspection authority and enhance civil and criminal enforcement authority for county prosecutors.

Senate Bill 446, known as the On-Site Disposal System Law, was passed by the Missouri General Assembly in 1994, creating the first statewide regulation of on-site sewage disposal systems (“on-site systems”). It gave the Missouri Department of Health and Senior Services (“DHSS”), jurisdiction over on-site systems,¹⁵⁵ which included the authority to create minimum standards for construction of on-site systems, to register on-site wastewater professionals, and to inspect and enforce the on-site statutes and regulations.¹⁵⁶ The law also gave cities and counties the authority to adopt standards more restrictive than state standards.¹⁵⁷

Even though local governments are allowed to adopt more restrictive construction standards, local officials are not permitted to vest themselves with more inspection authority under the On-Site Disposal System Law, as written. Thus, the law unduly restricts state and local health departments, impairing their ability to provide the highest level of protection for human health and the environment. The Attorney General, therefore, recommends that the On-Site Disposal System Law be amended to better accomplish the goal of protecting water quality and public health in the state of Missouri. To this end, the Missouri General Assembly should amend chapter 701 to enhance DHSS’s inspection authority for health inspectors as well as civil and criminal enforcement authority for county prosecutors.

A. Enhanced Inspection Authority. Currently, the inspection authority of state and local health inspectors is limited to two situations: (1) when an investigation is necessary as part of a communicable disease investigation; and (2) when a complaint is received from an aggrieved party or an adjacent landowner.¹⁵⁸ Further restrictions are placed on health inspectors with respect to grandfathered systems.¹⁵⁹

In areas such as the Lake of the Ozarks, the terrain may be such that adjacent landowners may not be impacted by a neighbor’s failing on-site system. For example, neighbors whose on-site systems discharge directly into a water body will not directly impact adjacent landowners, but their on-site systems will have significant impacts on water quality. If a failing on-site system is polluting ground water or surface water but not affecting neighbors or “aggrieving” anyone else, state and local health authorities are powerless. Health inspectors should have the same authority to inspect on-site systems that environmental inspectors have under the Missouri Clean Water Law.¹⁶⁰ Consequently, the Attorney General proposes the following statutory amendments to sections 701.037 and 701.038 of the Revised Statutes of Missouri.

¹⁵⁵ Mo. REV. STAT. § 701.025(8) (2000) (defining “on-site sewage disposal system” as “any system handling or treatment facility receiving domestic sewage which discharges into a subsurface soil absorption system and discharges less than three thousand gallons per day”).

¹⁵⁶ See *generally* Mo. REV. STAT. §§ 701.025 to 701.059.

¹⁵⁷ Mo. REV. STAT. § 701.047 (2000).

¹⁵⁸ Mo. REV. STAT. § 701.038 (2000).

¹⁵⁹ Mo. REV. STAT. § 701.037 (2000) (existing or “grandfathered systems” may not be inspected unless the director receives a complaint *and* determines there are reasonable grounds to believe there has been a violation).

¹⁶⁰ See Mo. REV. STAT. § 644.056 (2000).

701.037. Violations, notice of, contents, prosecuting attorney to institute proceedings, when – emergency situation, when.

2. Existing systems, as defined in section 701.025, shall not be inspected, unless the director determines that there are reasonable grounds to believe that there has been a violation of any provision of sections 701.025 to 701.059.

Sewage complaints, investigation by department, when – right to inspect adjoining property, procedure requiring notice, exception.

701.038. – 1. The department of health and senior services or any of its agents may not investigate a sewage complaint except when necessary as part of a communicable disease investigation unless the complaint is received from an aggrieved party or an adjacent landowner. cause investigations to be made upon the receipt of information concerning alleged violations of 701.025 to 701.059 or any standard, limitation, rule or regulation promulgated pursuant thereto, or any term or condition of any permit and may cause to be made any other investigations that it deems advisable. The department of health and senior services or any of its agents may enter any adjoining property if necessary when they are making an inspection pursuant to this section. The necessity for entering such adjoining property shall be stated in writing and the owner of such property shall be notified before the department or any of its agents may enter, except that, if an imminent health hazard exists, such notification shall be attempted but is not required.

2. If the department or its agents make an investigation pursuant to a complaint as described in subsection 1 of this section and finds that a nuisance does exist, the property owner shall comply with state and local standards when repairing or replacing the on-site sewage disposal system.

B. Enhanced Criminal and Civil Enforcement Authority. The state law relating to the operation of on-site systems lacks real deterrence.¹⁶¹ Section 701.029, Revised Statutes of Missouri, prohibits the operation of an on-site system in a manner that may result in the contamination of surface waters or groundwater, or present a nuisance or imminent health hazard. Section 701.057, Revised Statutes of Missouri, establishes the penalty for violations of section 701.029, Revised Statutes of Missouri, and makes such violations an infraction, or at most, a class C misdemeanor. An infraction carries a penalty of \$200 or less, while a class C misdemeanor carries a penalty of \$300 or less with the possibility of fifteen days in jail.¹⁶²

These penalties are often insignificant in comparison to the cost of compliance, which can run as high as \$30,000.¹⁶³ As a result, non-compliant property owners would rather take the chance they may never be caught than pay the costs of compliance.¹⁶⁴ Given the estimated 15,000 to 20,000 on-site systems in the Lake region, the likelihood of getting caught is low, and property owners' decisions are easily understood. Unfortunately, the collective consequences can have a serious impact on pollution in the Lake.¹⁶⁵

¹⁶¹ Brian Keedy, II Transcript of Proceedings at 417.

¹⁶² Mo. REV. STAT. §§ 558.011.1, 560.016.1 (Supp. 2009).

¹⁶³ Brian Keedy, II Transcript of Proceedings at 417.

¹⁶⁴ *Id.*

¹⁶⁵ HNTB Study, *supra* note 7, at ES-2.

Chapter 701, Revised Statutes of Missouri, also provides inadequate civil enforcement tools for county prosecutors, in that the law fails to provide express authority to pursue a statutory injunction. A civil injunction would give local prosecutors the option to compel compliance without the stigma of a criminal conviction and without the need to prove intent or negligence. The Attorney General recommends the following changes to section 701.057, Revised Statutes of Missouri, of the On-site Disposal System Law, to address these problems:

Violations, injunctive relief, penalties and fines.

701.057. 1. Any violation of section 701.052, 701.053, 701.054 or 701.055 is a class A misdemeanor.

2. Any violation of section 701.046, 701.047, 701.048 or 701.050 is a class C misdemeanor.

3. Any violation of section 701.029 or 701.031 is ~~an infraction~~ a class C misdemeanor, except that a persistent violation after notification by the state or county is a class B misdemeanor.

4. The prosecuting attorney in any county may institute a civil action in any court of competent jurisdiction for the injunctive relief to prevent violation or further violation of 701.029 701.054, 701.055, 701.046, 701.047, 701.048, 701.050, 701.031, 701.052, or 701.053, or for the assessment of a civil penalty not to exceed three hundred dollars per day.



RECOMMENDATION NO. 11

The Missouri General Assembly should consider implementing a tax credit/deduction for individuals who own grandfathered on-site sewage disposal systems and wish to construct properly engineered, sited, and permitted systems within 2,500 feet of the water's edge at the Lake of the Ozarks. The tax credit/deduction should be prioritized according to individuals who are (1) financially disadvantaged, (2) operating a grandfathered on-site sewage disposal system, and (3) unable to hook up to a centralized sewer system.

Recommending tax credits in this economy is difficult, but addressing real environmental concerns with tax policy can be a tool for solving economic challenges. The Attorney General is therefore recommending that the Missouri General Assembly should consider implementing a tax credit/deduction for individuals who own grandfathered on-site sewage disposal systems (“on-site systems”) and wish to construct properly engineered, sited, and permitted systems within 2,500 feet of the water's edge at the Lake of the Ozarks. The tax credit/deduction should be prioritized according to individuals who are (1) financially disadvantaged, (2) operating a grandfathered on-site sewage disposal system, and (3) unable to hook up to a centralized sewer system.

In determining who should qualify for the tax credit/deduction, the Missouri General Assembly should limit qualified applicants to those who prove financial insolvency. According to the Missouri Department of Economic Development, 2008 Census data shows that median income levels for Benton County range from \$26,584 to \$33,993.¹⁶⁶ Median income levels for Miller, Morgan, and Camden counties range from \$33,993.01 to \$46,847.¹⁶⁷ Of the four counties that make up the areas of concern to water quality at the Lake of the Ozarks, three counties require on-site system owners to obtain permits from county authorities. In order to obtain a permit, homeowners, small business owners, and other affected county citizens must first hire an engineer. The engineer must then submit a drawing of the on-site system and proposed lateral lines to the county health department, as well as conduct a soil morphology report or percolation test.¹⁶⁸ In addition, in some counties, citizens must hire a state-licensed contractor to complete the installation of the on-site system.¹⁶⁹ The paperwork alone for an engineer-designed system can cost between \$1,000 and \$1,500.¹⁷⁰ The on-site system itself can cost as much as \$30,000. Without economic assistance, individual families and small businesses will not be able to comply with the regulations necessary to protect water quality at the Lake of the Ozarks.

As noted in Recommendation No. 5, failing on-site systems around the perimeter of the Lake are widely recognized as the greatest threat to long-term water quality preservation. However, because the counties surrounding the Lake of the Ozarks have implemented strict regulatory requirements for on-site systems, some improvement projects may not justify the allocation of the tax credit/deduction. For example, Camden County enacted its ordinance in 1996.¹⁷¹ Since 1996, Camden County has issued approximately 4,600

¹⁶⁶ MO. DEP'T OF ECON. DEV., 2008 U.S. CENSUS MEDIAN HOUSEHOLD INCOME-MISSOURI, available at http://www.missourieconomy.org/indicators/wages/mhi_08.stm (last visited Oct. 29, 2010).

¹⁶⁷ *Id.*

¹⁶⁸ Benton County Environmental On-Site Sewage Program, <http://benton.lphamo.org/environmental.htm> (last visited Oct. 28, 2010).

¹⁶⁹ *Id.*

¹⁷⁰ Tracy Rank, I Transcript of Proceedings at 269.

¹⁷¹ Jennifer Eblen, II Transcript of Proceedings at 403.

permits to individual owners of on-site systems, 2,300 of whom owned lakefront properties.¹⁷² Permits are required in Camden County for new construction and replacement of old on-site systems.¹⁷³ Benton County requires every person who intends to construct, repair, or modify an on-site system to obtain a permit from the Benton County Health Department.¹⁷⁴ Any on-site system that has been recently permitted or modified should not qualify for a tax credit. Tax credits/deductions should be reserved for those individuals wishing to replace grandfathered on-site systems described by county authorities during the symposium made from steel drums and PCP pipe.¹⁷⁵

Finally, when determining who should qualify for the tax credit/deduction, the Missouri General Assembly should consider whether centralized sewer services will be available to the applicant in the foreseeable future. Some areas around the Lake of the Ozarks, due to factors such as low population density, elevation, lack of infrastructure, and relative isolation, are not candidates for regionalization at any point in the foreseeable future.¹⁷⁶ Regional sewer authorities will develop master plans with a phased approach for sewer services in rural areas. Individuals who live in areas either unidentified in a master plan or identified in a master plan where the master plan has slated hook ups for fifteen-years out or more, should qualify for the tax credit/deduction. On-site systems are necessary in these underserved areas because homes and businesses must be equipped with compliant, functional, environmentally sound on-site systems in order to protect water quality at the Lake of the Ozarks for future generations.

In this difficult economic environment, as the Governor concludes his work with business, community, and legislative leaders on the Governor's Tax Credit Review Commission for "greater efficacy and enhanced return on investment," the Attorney General realizes the commitment a new tax credit program will require.¹⁷⁷ However, the Attorney General believes that commitment to environmental stewardship and public welfare will be worth it.

¹⁷² *Id.*

¹⁷³ Camden County, Wastewater, <http://www.camdenmo.org/wastewater/index.htm> (last visited Oct. 29, 2010).

¹⁷⁴ BENTON CNTY, WASTEWATER TREATMENT SYSTEMS ORDINANCE 1991-1, available at <http://benton.lphamo.org/ordinance.htm>.

¹⁷⁵ See Tracy Rank, Government Inspection and Enforcement Programs: Benton County Health Department, Slideshow, available at http://ago.mo.gov/agriculture/pdf/symposium/Day1/8_Enforcement/3_Rank.pdf.

¹⁷⁶ See Randall Miles, Local Solutions for Water Quality Protection: Wastewater Treatment and Dispersal, Slideshow, available at http://ago.mo.gov/agriculture/pdf/symposium/Day2/4_Local%20Solutions/4.%20Miles.pdf; see also Randall Miles, II Transcript of Proceedings at 450.

¹⁷⁷ Office of Missouri Governor Jay Nixon, *Gov. Nixon Creates New Commission to Perform Comprehensive Review of State Tax Credit Programs* (July 21, 2010), available at http://governor.mo.gov/newsroom/2010/Tax_Credit_Review_Commission.

RECOMMENDATION NO. 12

The Missouri General Assembly should increase criminal penalties for violations of the Missouri Clean Water Law, chapter 644, Revised Statutes of Missouri, if the violation creates a substantial likelihood of endangering human health, the environment, or property.

The Missouri Clean Water Law is the primary enforcement mechanism to protect the Lake of the Ozarks and other state waters. Section 644.076, Revised Statutes of Missouri, prohibits violations of the Missouri Clean Water Law and its regulations and imposes civil and/or criminal sanctions depending on the nature of the violation. However, the criminal provision does not provide an adequate sanction for the most serious types of unlawful behavior. Currently, section 644.076, Revised Statutes of Missouri, imposes a misdemeanor for the first violation of state law. As a result, polluters can only be charged with a misdemeanor regardless of the damage caused or the intent of the person who caused the violation. A person who intentionally dumps one thousand gallons of sewage from a waste hauling truck is treated the same as a person who accidentally spills a bucket of wash water.

These two acts should not be treated the same. The Attorney General recommends the following changes to section 644.076.3, Revised Statutes of Missouri, of the Missouri Clean Water Law to address this problem:

Unlawful acts prohibited--false statements and negligent acts prohibited--penalties--exception.

644.076. 1.

2. Any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be guilty of a felony and shall be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than two years ~~six months~~, or by both.

3. Any person who ~~willfully or negligently~~ commits any violation set forth pursuant to subsection 1 of this section shall, upon conviction, be punished by a fine of not less than two thousand five hundred dollars nor more than twenty-five thousand dollars per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this section by any person shall be punished by a fine of not more than fifty thousand dollars per day of violation, or by imprisonment for not more than two years, or both. Any person who willfully or recklessly commits any violation set forth pursuant to subsection 1 of this section in a manner that creates a substantial likelihood of endangering human health, the environment or property shall, upon conviction, be guilty of a felony and shall be punished by a fine of not less than five thousand dollars nor more than fifty thousand dollars per day of violation, or by imprisonment for not more than two years, or both.

Other states have adopted similar criminal provisions. For example, Delaware charges persons who “intentionally or knowingly . . . cause serious physical injury to another person or serious harm to the environment” with felonies.¹⁷⁸ Likewise, Arkansas makes the “substantial likelihood of endangering human health, animal or plant life, or property” punishable with a felony.¹⁷⁹ In fact, twelve states punish knowing violations of their state’s water laws with felony provisions.¹⁸⁰

While negligence should be punished as misdemeanor, willful violations of the state’s water protection statutes should be punishable as felonies if the violations create substantial likelihood of endangering human health, environment, or property. This standard will allow appropriate punishment for those who willfully create these dangers but will allow a more modest punishment for those who are merely negligent or who, although acting willfully, do not create a substantial likelihood of harm.



¹⁷⁸ DEL. CODE ANN. tit. VII § 6013(c) (2010).

¹⁷⁹ Ark. Code Ann. § 8-7-204(3)(A) (2005).

¹⁸⁰ National Association of Attorney Generals, *State Environmental Criminal Enforcement Statutes Database*, <http://www.naag.org/env/search/> (follow “Search” hyperlink; then select “Water” as the “Statute Type” and “Felony” as the “Violation;” then follow “Filter” hyperlink).

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