IN THE SUPREME COURT OF MISSOURI

No. SC92581

WILLIAM DOUGLAS ZWEIG, et al.,
on behalf of themselves and all others similarly situated,

Plaintiffs-Respondents/Cross-Appellants,

v.

THE METROPOLITAN ST. LOUIS SEWER DISTRICT,

Defendant-Appellant/Cross-Respondent.

Appeal from the Circuit Court of the County of St. Louis
Cause No. 08SL-CC03051
Hon. Dan Dildine (by order of the Missouri Supreme Court)

SUBSTITUTE BRIEF OF AMICUS CURIAE
MISSOURI COALITION FOR THE ENVIRONMENT FOUNDATION
IN SUPPORT OF DEFENDANT-APPELLANT/CROSS-RESPONDENT

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INTEREST OF THE *AMICUS CURIAE*

Amicus Missouri Coalition for the Environment Foundation and its members advocate for the protection and restoration of the environment through education, public engagement, and legal action, both locally and statewide. Since 1969, this independent citizens' group has maintained involvement in a broad range of environmental policy issues including advocating for policies that reduce water pollution and protect and restore aquatic ecosystems. throughout the state of Missouri.

The Coalition supports Metropolitan St. Louis Sewer District (MSD's) assessment of a stormwater fee to cover the increasing costs of maintaining a functioning stormwater drainage system, and contends that MSD's imposition of the fee is necessary and lawful.

SUMMARY OF ARGUMENT

In 1954, MSD was formed and was first charged with developing and maintaining an integrated sewer system for the City of St. Louis and portions of St. Louis County. At the time, this seemed like a reasonable task; however, in recent years, as MSD's responsibilities have grown, its revenue-raising abilities have been largely circumscribed by the Hancock Amendment, an amendment to the

Missouri Constitution limiting the ability of public utility companies to raise rates without prior consent of the taxpayers.[1]

The Missouri Supreme Court has, however, returned some revenue-raising autonomy to public utilities. In *Keller v. Marion County Ambulance District*, 820 S.W.2d 301 (Mo. 1991), the court held that the collection of "true user fees" does not constitute a tax under the Hancock Amendment. To be deemed a user fee, a charge must, among other things, exhibit a relationship with the level of service provided to customers. Subsequent case law has interpreted this to denote that there must be a "direct relationship" between the charge levied and the level of services provided to customers.[2]

In 2008, MSD replaced its former stormwater funding program with the Stormwater User Charge. Because this Charge is directly related to the stormwater services provided by the stormwater utility to property owners, the charge unquestionably constitutes a "true user fee," as defined by the Missouri Supreme Court. To wholly comprehend these stormwater services, however, one must first appreciate the nature and complexity of stormwater management in urbanized

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[1] Mo. Const. art. X, § 22 (a) [hereinafter "the Hancock Amendment"].

[2] *Beatty v. Metro. St. Louis Sewer Dist.*, 867 S.W.2d 217, 219 (Mo. 1993) (en banc).

areas. One must also understand the nature and effects of of impervious surfaces' contributions to stormwater runoff and stream composition, its devastating impacts on stream ecology, hydrology, and property, and the expense of the damage.

To better identify the services provided by MSD, the Coalition will first show how impervious surfaces contribute to the deterioration of infrastructure and the pollution of natural waterways. Second, the Coalition will demonstrate that total impervious area —used by MSD in assessing its fee—is a cost-effective, accurate, and commonly used metric for calculating stormwater charges. Finally, in light of this understanding, the Coalition will demonstrate that the trial court and the Court of Appeals were incorrect in adopting an unduly narrow definition of "direct relationship," and that such a direct relationship *does* exist between the Stormwater User Charge and services rendered by MSD. Additionally, the Coalition will demonstrate that the Court of Appeals incorrectly held that the Stormwater User Charge was not a fee even though the receipt of services and charge of fee are connected.

ARGUMENT

I. IMPERVIOUS SURFACES CONTRIBUTE TO THE DEGRADATION OF DRAINAGE INFRASTRUCTURE AND OVERALL STREAM HEALTH.

A. Impervious surfaces increase the volume of water entering streams as runoff, causing erosion and increasing the cost of maintaining adequate stormwater services.

Urban development necessarily results in the creation of impervious surfaces: large swathes of land blanketed by man-made coverings such as asphalt and stone roadways, parking lots, patios, and rooftops. Aside from the visible effects of development on natural landscapes, impervious surfaces greatly alter the natural flow and composition of water systems. Significantly, the addition of impervious surfaces to a watershed reduces the infiltration of runoff—the natural absorption of water into the ground—by covering surfaces that would naturally be able to absorb and store rainwater. As a result, precipitation such as rainfall and melted snow becomes stormwater runoff, flowing directly over land into streams. Research has shown that stormwater runoff originating from impervious surface areas can contribute significantly to channel erosion and contamination of waterways.[3] The deeply cut banks of urban streams attest to this erosive dynamic.

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[3] Michael O'Driscoll, Sandra Clinton, Anne Jefferson, Alex Manda, & Sara McMillan. *Urbanization Effects on Watershed Hydrology and In-Stream Processes in the Southern United States*, 2 WATER 605, 618 & 625-26 (2010). *See also* Christopher J. Walsh et al., *The Urban Stream Syndrome: Current Knowledge and the Search for a Cure*, 24 J. N. AM. BENTHOLOGICAL SOC'Y 706, 710-14 (2005).

Increased runoff from impervious surfaces alters the way that streams flow. Streams coursing through urban environments with a high percentage of impervious area receive more overland runoff than streams in undeveloped areas – and they receive it faster because urban landscapes are built to shed water and drain quickly. More and faster flow causes high frequencies of "erosive water flow," increased magnitude of "high flow" and "flashiness," or high variability in flow resulting from even the smallest of precipitation events.[4] In short, increased impervious surface area leads to stronger, higher and less predictable streamflow, all indications of "urban stream syndrome," a term used to describe the characteristics of streams in dense urban areas.[5] The resulting flow events are powerful, and in some instances, capable of altering the structure of an entire waterway. Extreme flow events erode stream channels, making waterways both deeper and steeper along the bank, and, notably, making them more vulnerable to erosion in the future. Erosion undercuts drainage pipes, sewer lines, roads and adjacent properties. MSD is charged with maintaining the drainage system which, by necessity, includes our urban streams. Increased runoff has strained St. Louis' overtaxed drainage system, contributing significantly to MSD's maintenance and operation costs.

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[4] Walsh, *supra* note 3 at 709-710

[5] *See generally* Walsh, *supra* note 3.

St. Louis' Fishpot Creek watershed, located in the southwest portion of MSD's service area, demonstrates the degree to which increased runoff can erode a waterway and destroy neighboring property. A thirty-year period of urbanization in the Fishpot Creek Watershed has resulted in large impervious areas, which have led to increased flood flow and channel instability.[6] Figure 1, found at page A-4 of the Appendix, illustrates the downstream effects of urbanization where Fishpot Creek has cut so deeply into its bank as to expose a telephone line and threaten the stability of Vance Road. As the watershed has become more and more developed, more stormwater runoff has entered the neighboring waterway, eroding stream banks and public structures such as the Vance Road Bridge, near Pepperdine Court.

Figure 2, found at page A-5 of the Appendix, depicts homes in Pepperdine Court, a residential area downstream of the Vance Road bridge. Here, increased streamflow has dramatically eroded away the stream bank and the backyards of the homes adjacent to the creek. MSD has actively attempted to stabilize this section of the drainage channel to prevent additional property and infrastructure damage. Many areas are still subject to aggressive erosion.

[6] Steve Gough, Geomorphological Reconnaissance, Fishpot Creek, St. Louis County, Missouri, A app. at 1-3 (2001).

Figure 3, found on page A-6 of the Appendix, shows the same area from above. The houses by the eroded bank are to the immediate right of the Creek. MSD has reportedly invested more than $700,000 dollars stabilizing the bank. The project remedied less than 1,000 linear feet of the 12-mile stream. This, of course, is only a tiny portion of the land area in the Fishpot Creek watershed. Figure , found on page A-7 of the Appendix, shows the area after the bank-stabilization project.

The Fishpot Creek watershed continues to have major problems. In 2003, Intuition and Logic, llc, an engineering firm, conducted a study of the watershed as part of a project commissioned by the St. Louis County Soil and Water Conservation District in cooperation with MSD, and state and federal regulators. Intuition and Logic identified 62 projects at a total cost of $23 million needed to stabilize Fishpot Creek. The majority of the recommended projects have not been implemented.

If MSD is unable to continue to properly maintain the area's drainage infrastructure, the public, including local property owners, will inevitably incur the cost of repairing damaged roads, bridges, underground utilities, and public and private property. Aside from maintenance and operation costs, property values in the area will continue to risk devaluation due to more frequent flooding and increased erosion. The cumulative damage of increased runoff is not limited to just those properties downstream or at lower elevations. Man-made pipes drain man-made developments, and they are laced into the drainage system of the land itself- both concrete and the streams form a system in which the failure of one part affects the other. Because the service area largely is the watershed and because the streams are the drainage infrastructure, with manmade pipes draining from man-made developments into them, everyone in the watershed is connected to the drainage system. Thus, all properties with impervious area contribute to stormwater issues, and, therefore also contribute to the costs for MSD to deal with these issues.

B. **Impervious surfaces affect the natural composition of streams and contribute to the degradation of stream health.**

The impervious surfaces that accompany urban development necessarily lead to increased stormwater runoff, which can be destructive to the biological and chemical composition of waterways. In recent years, as the Greater St. Louis Area has become highly urbanized, these harmful effects have become increasingly prevalent.

Under natural circumstances, precipitation falling on *permeable* surfaces can infiltrate into soil, flow into streams, or evaporate. Water that infiltrates into the soil often enters nearby streams slowly through subsurface groundwater flow and feeds the streams during dry spells. Impervious surfaces are, however, a significant barrier to water infiltration, causing water to run off immediately into nearby streams without filtering through soil. As direct runoff, water comes in contact with and can transport pollutants typical in urban environments such as street littler, fertilizers, pesticides and metals. [7]

Recent research acknowledges that streams surrounded by areas exhibiting a high percentage of impervious cover experience reduced overall stream quality.[8] Thomas Schueler, in 1994, proposed that streams in areas with less than ten percent total impervious cover serve as "sensitive streams," or streams capable of maintaining excellent hydrologic function.[9] As impervious cover increases above this ten percent benchmark, however, streams become increasingly "impacted" or

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[7] Melissa Carle, Patrick N. Halpin, & Craig A. Stow, *Patterns of Watershed Urbanization and Impacts on Water Quality*, 41 J. AM. WATER RESOURCES ASS'N 693, 693-694 (2005). *See also* Walsh, *supra* note, at 714. ("In this context, rain, litter (leaf and human-derived), and pollutants that drop on or adjacent to impervious surfaces connected to drains are likely to be delivered directly to streams.").

[8] O'Driscoll, *supra* note 3, at 618 & 625-26.

[9] Thomas R. Schueler, *The Importance of Imperviousness*, 1(3) Watershed Protection Techniques 100, 108-09 (1994).

"nonsupporting."[10] Schueler's findings are illustrated in his Impervious Cover Model, found on page A-8 of the Appendix.

More recently, in a review of current research, Scheuler re-examined his prior findings regarding the effect of impervious surfaces on the health of urban waterways.[11] Examining sixty-five recent research studies, Schueler confirmed that the impervious cover model remains an effective metric for predicting several key characteristics indicative of the health of urban streams.[12] In Figure 6, found on page A-9 of the Appendix, Schueler reformulates the Impervious Cover Model from 1994 to reflect the variability of stream responses to urban changes and stream health in areas with low impervious cover.

As seen in the Reformulated Impervious Cover Model above, stream quality can begin to decline *at even very low levels* of total impervious cover.[13] Moreover,

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[10] *Id.*

[11] *Id.* at 309.

[12] *Id.* at 311.

[13] *Id.* at 313. Schueler has identified three considerations that should be taken in applying the Impervious Cover Model. First, use of the ICM should be limited to the three smallest types of alluvial streams--small streams that travel on beds of sediment (gravel, rock, sand) and which are constantly shaping and reshaping their banks and channels. Second, the ICM may not function as effectively in

in light of this review of recent research, Schueler affirms the use of the Impervious Cover Model as a watershed planning tool and notes that the challenge for scientists now is not whether stream quality will predictably degrade with land development, but, rather, how management practices can be implemented to mitigate such degradation.

As a watershed region becomes increasingly developed, physical, chemical and biological characteristics of water quality are adversely affected.[14] Streams fed by stormwater runoff in dense urban areas, for example, commonly contain abnormally high levels of phosphorous, nitrogen and dissolved oxygen variability.[15] Indeed, these chemicals contaminate and alter the health and stability of waterways, potentially leading to disastrous results. Increased phosphorus and

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subwatersheds with extensive dams or major point sources of pollutant discharge such as where facilities that pipe industrial or municipal wastes into waters. Third, Schueler notes that the ICM is *most* effective when applied to subwatersheds located within regions with similar terrain, rock types and geologic structures (physiographic regions).

[14] Gerard McMahon & Thomas F. Cuffney, *Quantifying Urban Intensity in Drainage Basins for Assessing Stream Ecological Conditions* 36 J. AM. WATER RESOURCES ASS'N 1247, 1247 (2000).

[15] Carle, *supra* note 7, at 693. *See also* Walsh, *supra* note 3, at 708-10.

nitrogen concentrations, for instance, may contribute to "hypoxia," an event characterized by a deficiency in the amount of oxygen available for organisms in the waterway.[16] In addition to the impacts on the biological health and safety of the waters, these substances fuel algae blooms and often leave waters covered in unsightly green slime. Over a period of time, the effects accompanying increased water runoff have great potential to diminish the habitat of a waterway.[17] These waterways are generally incapable of sustaining sensitive invertebrates, such as mayflies and crawfish, whose presence is generally indicative of a healthy freshwater system.[18] Subsequently, streams in watersheds with a high percentage

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[16] Michael Mallin, Virginia L. Johnson, Scott H. Ensign, & Tara A. MacPherson, *Factors Contributing to Hypoxia in Rivers, Lakes, and Streams*, 52 LIMNOLOGY & OCEANOGRAPHY 690, 697-99 (2006). In moderation, phosphorus serves as a beneficial fertilizer; however, when phosphorus concentrations are too high, streams experience nutrient overloading. Unnecessarily high levels of nutrients trigger algal blooms—rapid increases in the population of algae in a water system—which are manifested by the green scum common to urban waterways. Algal blooms deplete oxygen supplies quickly, overwhelming other organisms and upending the preexisting food chain.

[17] *Id.* at 690.

[18] Walsh, *supra* note 3, at 708, 712.

of impervious surface area are left with a dense population of a few highly pollution-tolerant organisms such as leeches.

As noted, research has repeatedly demonstrated that impervious areas have the ability to affect the natural composition and function of streams. As development continues in St. Louis City and County, a region already exhibiting high percentages of impervious surface, these debilitating effects are becoming increasingly prevalent in local waterways.

C. **Because Impervious Surfaces Increase the Stormwater Damage to Surrounding Areas, the Courts Below Incorrectly Analyzed the Service Provided to the Fee Payers in the Second Factor of *Keller*.**

In light of the aggregate damage from increased stormwater runoff to the surrounding area, the Court of Appeals incorrectly applied the second *Keller* factor. The second factor states that a user fee "is likely to be charged only to those who actually use the good or service for which the fee is charged." *Keller*, 820 S.W.2d 301, 304 n. 10. The Court of Appeals found that some people benefited from the MSD services who did not pay for them. That is not the correct inquiry.

Missouri law does not require that the fee must be charged to every user who benefits from the service, especially those who benefit in a secondary manner. Many services can provide these secondary benefits to nonusers; for instance, wastewater sewer services reduce numerous public health problems associated with pooled sewage or improper sanitary flow. These services benefit all individuals in the area, whether or not they are connected to the sewers.

The appropriate inquiry here is whether those that actually receive the service—here, the mitigation of additional runoff from impervious surfaces—are the ones who pay for the service. "[T]hose who actually use the good or service for which the fee is charged" are clearly those whose property leads to an increased need for greater stormwater capacity.[19] The property owners in the watershed with greater impervious surfaces contribute to an increased need for MSD's services and capacity. Impervious surfaces lead to more and speedier runoff. If the drainage services are not maintained to accommodate this excess flow, property and watershed damage can occur as a result. The increased capacity minimizes resulting property, infrastructure and watershed damage. Just because some residents receive secondary benefits from reduced stormwater runoff does not mean that those who are paying are not the ones receiving the service.

Finally, Missouri courts have held that "almost all" of the residents can be charged and it still be a user fee, especially for services that many individuals receive, like those provided by MSD.[20] MSD's Stormwater User Charge was

[19] *Keller*, 820 S.W.2d 301, 304 n. 10.

[20] *Beatty*, 867 S.W.2d at 220.

targeted at those individual properties that make the contribution to the drainage problem, which are those with impervious surfaces. The Court of Appeals incorrectly emphasized the wrong aspect of the service when analyzing the fee payer.

II. MSD'S STORMWATER MANAGEMENT PROGRAM SERVES AN IMPERATIVE PUBLIC FUNCTION AND, THUS, REQUIRES ADEQUATE FINANCIAL SUPPORT.

A. The Stormwater User Charge generates revenue necessary to provide essential public services to St. Louis residents.

Prior to the creation of the Stormwater User Charge, revenues from MSD's *ad valorem* tax were insufficient to fund an adequate stormwater management system. At the time, MSD was incapable of performing necessary repairs or replacements, let alone modernizing its drainage infrastructure. MSD's desire to meet the community's increased need for stormwater services—a demand driven by the increase in impervious surfaces—necessitated the creation of the Stormwater User Charge. For example, if upstream landowners had not installed impervious surfaces, the homes at Pepperdine Court would still enjoy their once-ample backyards and the gently meandering creek.

The services funded by revenues from this fee—maintenance, development and day-to-day operations—are important because they maintain the safety and integrity of its stormwater drainage system and preserve nearby properties and infrastructure investments. Because it is difficult to identify the level of services provided on a property-by-property basis, the Environmental Protection Agency has advocated that stormwater managers take a holistic view that analyzes the improvements from the vantage of the entire watershed. [21] From this big picture view, the value of the services provided by MSD to its customers is readily apparent.

MSD has adopted this holistic approach in both its management of stormwater and its allocation of fees. Stormwater systems are incapable of expanding and contracting on the basis of a particular rainfall. Rather, drainage infrastructure must be designed to operate continuously, and with the ability to handle the largest flow events—much in the same way that power plants are designed to provide continuous power. Power plants are designed to provide

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[21] NATIONAL RESEARCH COUNCIL, URBAN STORMWATER MANAGEMENT IN THE UNITED STATES (2008). The National Research Council and the EPA advocate that municipal stormwater services adopt a holistic, watershed-level view of stormwater maintenance, rather than taking a parcel-by-parcel view, which has its own limitations and is costly to maintain. Because stormwater runoff fails to abide by arbitrarily determined property lines, stormwater management must be planned in the context of an entire watershed.

services to broad regions of customers through the operation of integrated power grids. Such power grids must be continuously developed and maintained, and, importantly, must have the capacity to provide power during low and peak hours. Similarly, water management infrastructure must be designed to service customers region-by-region, rather than property-by-property. Also, because stormwater drainage infrastructure cannot vary from one flow to another, waterways must be designed to handle the largest of water flows. To develop this infrastructure, MSD must secure financing for long-term development, maintenance, and day-to-day operation of St. Louis' stormwater drainage infrastructure.

To maintain these services, MSD charges individuals for the cost of managing additional runoff originating from impervious surfaces on their property. Notably, MSD does not charge for stormwater generated by runoff from pervious surfaces; rather, the Stormwater User Charge is determined solely by the cost of servicing *additional runoff that originates from impervious surfaces* on a fee payer's property. Whereas the services provided by MSD to ratepayers are difficult to measure on a property-by-property basis, the cumulative impact of impervious surfaces throughout local watersheds has driven the cost of and demand for stormwater services significantly. In comparison to the value of these necessary services, the Stormwater User Charge (at $0.14 per 100 square feet) is reasonable and accurately reflects the incremental cost that impervious surfaces place on MSD's drainage system.

B. Total impervious area is cost-effective, accurate, and is commonly used by watershed planners.

In calculating the Stormwater User Charge, MSD utilizes total impervious area as described above in section I.A. Impervious area is a metric that is utilized by watershed managers in levying user charges and utility fees and is the most common used by U.S. stormwater utilities; it is a metric that is easily understood and balances simplicity and accuracy. [22]

Effective impervious area —a metric that encompasses only impervious surfaces that are in *direct connection* with a stream—has the potential to serve as a more precise metric. However, total impervious area is regarded as a common and readily accessible metric for watershed management.[23] For these same reasons,

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[22] Melissa Keeley, *Using Individual Parcel Assessments to Improve Stormwater Management*, 73 J. AM. PLANNING ASS'N 149, 152-153 (2007).

[23] Roy Schiff & Gaboury Benoit, *Effects of Impervious Cover at Multiple Spatial Scales on Coastal Watershed Streams*, 43 J. AM. WATER RESOURCES ASS'N 712, 716 (2007).

MSD elected to use total impervious area in measuring its Stormwater User Charge.[24]

Moreover, in recent years, total impervious area data collection has become increasingly accurate and accessible. Data collection methods, such as aerial photography, satellite images, and geospatial information systems, have become more readily available to watershed planners.[25] As mapping technologies continue to develop, total impervious area will feasibly become even more accurate and more accessible. Total impervious area's affordability, accessibility and history of use by stormwater utilities make total impervious area an effective, real-world

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[24] While the Plaintiff's expert, Jonathan Jones, individually assessed runoff on several properties this individualized approach would be unrealistically costly to implement. To implement Mr. Jones' methodology across the 525 square miles and dozens of watersheds in MSD's service area, it would cost between $2.4 and $4.8 billion dollars; even if the analysis was only done on ten percent of the properties, it would still cost $240 to $480 million. (MSD Post-trial Brief). In light of the annual revenue of the Stormwater User Charge of $40 million, these costs are completely untenable.

[25] Elizabeth Brabec, Stacey Schulte, and Paul L. Richards, *Impervious Surfaces and Water Quality: A Review of Current Literature and its Implications for Watershed Planning*, 16 Journal of Planning Literature 499, 505 (2002).

metric on which to base stormwater user charges. As shown below, MSD correctly and legally assessed its Stormwater User Fee through this method.

III. THERE IS A DIRECT RELATIONSHIP BETWEEN MSD'S STORMWATER USER CHARGE AND THE LEVEL OF SERVICES PROVIDED TO MSD CUSTOMERS.

According to Missouri law, to be considered a user fee, a charge should, among other things, exhibit a direct relationship with the level of service provided to fee payers. MSD's use of TIA in calculating the Stormwater User Charge meets this standard, as the metric correlates closely with the level of services that MSD provides to offset the cost of managing additional runoff originating from impervious surfaces.

A. The trial court incorrectly declared the law in adopting an unduly narrow definition of "direct relationship," and the Court of Appeals incorrectly affirmed that misapplication of law.

In distinguishing a true user fee from a tax, the *Keller* court considered the relationship between the charge imposed on and the level of services provided to a fee payer.[26] Subsequent interpretations of *Keller* have found that, to constitute a

[26] *Keller*, 820 S.W.2d at 304 n.10.

true user fee, the charge imposed on fee payers must have a "direct relationship" with the level of services provided.[27]

The Stormwater User Charge is a variable fee designed to represent the additional cost contributed by impervious surfaces to MSD's provision of stormwater services. A landowner's stormwater charge is a straightforward calculation, varying solely on the total impervious area on an individual's property. As such, it is fair. As noted in Sections I and II, MSD selected impervious area as a metric for calculating its Stormwater User Charge because impervious surfaces—and the additional stormwater runoff that they contribute to streams—drive both the cost of and demand for its stormwater services. In light of the cost of managing increased levels of stormwater runoff caused by impervious surfaces, it is clear that MSD's Stormwater User Charge has a direct relationship with the services provided to fee payers. More impervious surfaces mean more stormwater runoff, requiring a greater level of stormwater management by MSD.

In spite of these widely accepted facts about the relationship between impervious surfaces and stormwater runoff, the trial court nonetheless found, incorrectly, that there was no direct relationship between the Stormwater User Charge and the level of services provided to MSD customers. Relying entirely on

[27] *Beatty*, 867 S.W.2d at 221.

Plaintiffs' experts, the court found that the relationship between impervious area and stormwater runoff was insufficiently "direct" to meet the standard set forth in *Keller*, as interpreted by *Beatty*. This testimony was unsupported and misleading at best.

First, the Plaintiffs' expert witnesses testified that, because there are multiple factors that share a relationship with stormwater runoff, there could be no direct relationship between impervious area and stormwater runoff.[28] But Missouri law does not require there only be one factor influencing the outcome for a "direct relationship." That gloss on this Court's standard – whether adopted implicitly or explicitly by the trial court and by the appellate majority– is a misreading of *Keller* and *Beatty*. *Beatty* requires only the existence of *a* direct relationship, not the existence of only *one* direct relationship, nor even the existence of the *most* direct relationship.[29]

Further, the Plaintiffs' expert Debo testified "to a reasonable degree of engineering certainty" that in order for a "direct relationship" to exist, impervious surface area had to exhibit a one-to-one relationship with total water runoff (e.g., a relationship in which a doubling of impervious area leads to a doubling of *total*

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[28] Pls' Tr. Ex. 66-17.

[29] *Beatty*,867 S.W. 2d at 221.

rainwater runoff).[30] The trial court found, in reliance on this testimony, that "[t]he results of the calculations demonstrated that where the impervious area at the site was doubled, quadrupled or increased by a factor of six, the stormwater runoff did not increase correspondingly."[31] The reference to "increase correspondingly" refers to the one-to-one relationship that Professor Debo discusses in his testimony. In crediting his testimony, the trial court implicitly adopted this standard; a standard found nowhere in the Hancock Amendment or case law.[32] The appellate panel erred in concluding otherwise.[33]

B. There is a direct relationship between the Stormwater User Charge and the level of services provided to MSD customers.

A direct relationship between two variables may be found when a positive change in one variable correlates with a positive change in the other variable, and vice versa. In other words, a direct relationship simply requires a positively sloped

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[30] *Zweig v. Metropolitan St. Louis Sewer District*, No. 08SL-CC03051, slip op. at 17, ¶ 61 (St. Louis Cty. Jul. 9, 2010).

[31] *Id.*

[32] *Id.* at 29, ¶¶113-14.

[33] *Zweig v. Metropolitan St. Louis Sewer Dist.*, No. ED96110, slip op. at 8-9 (Mo. Ct. App. E.D. Mar. 27, 2012).

relationship (as plotted on the X and Y axes of a Cartesian coordinate system) in which the change in one variable correlates with change in another variable—positive change correlating with positive change, and negative change correlating with negative change. Significantly, the degree of change in each variable need not be the same, nor proportionate. Change need only be in the same direction. There are several types of direct relationships (including one-to-one relationships), *each exhibiting a different degree of correlation* between variables.

A direct relationship exists between impervious area and stormwater runoff: as the impervious area on a property increases, the quantity and rate of *additional* stormwater runoff increases.[34] Additional runoff, or runoff that wouldn't exist but-for the addition of the impervious surface, is the significant cost-driver. Additional runoff demands increased maintenance, infrastructure development, and more costly day-to-day operations. MSD considers only this *additional runoff* in calculating its Stormwater User Charge. Indeed, impervious surface area bears a direct relationship to the services provided by MSD and, notably, contributes significantly to the demand for stormwater services.

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[34] O'Driscoll, *supra* note 3, at 611.

The rational method[35] (also used by Professor Debo, Plaintiffs' expert witness) relates rainfall and runoff via the formula $Q = CiA$, where

Q = runoff

C = standardized runoff coefficient

i = rainfall intensity

A = area

Consider total runoff (Q_{total}) for a parcel consisting of areas of varied permeability, where A_i = impervious area and A_{ii}, A_{iii}, etc. = pervious areas;[36] this may be modeled as follows:

$$[1] \qquad Q_{total} = \underbrace{C_i i A_i}_{\text{Impervious area}} + \underbrace{C_{ii} i A_{ii} + C_{iii} i A_{iii}}_{\text{Pervious area}} + \ldots$$

Although total runoff includes the runoff generated from all areas of a property, regardless of the individual surface's permeability, *property owners are only charged for runoff originating from impervious surfaces* on their property (A_i).

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[35] The rational method formula is a standard calculation for stormwater runoff. It is found in most basic hydrology textbooks.

[36] The pervious areas may have different rate of infiltration, and the multiple variables represent the different possible pervious areas in one property.

Runoff from pervious areas on a property (A_{ii}, A_{iii}, etc.) is not charged, so it is essentially "free" to residents.

This can be expressed as:

$$[2] \qquad Q_{total} = \underbrace{Q_{charged}}_{\text{Impervious area}} + \underbrace{Q_{free}}_{\text{Pervious area}}$$

Where,

$$[3] \qquad Q_{charged} = C_i\, i A_i \quad \text{and,}$$

$$[4] \qquad Q_{free} = C_{ii} i A_{ii} + C_{iii} i A_{iii} + \ldots$$

Now take, for example, a hypothetical one-acre property and assume that one quarter acre (10,890 square feet) is covered by impervious surface with a runoff coefficient (C_i) of 0.95[37], as shown in Figure 7 found on page A-10 of the Appendix. The remaining three quarters of the acre is covered by a flat lawn on heavy soil with a runoff coefficient (C_{ii}) of 0.15. Assume that rainfall intensity, *i*, remains constant across the property.

Once again,

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[37] This coefficient is a standard coefficient for impervious surface runoff. *See* PHILIP B. BEDIENT, WAYNE C. HUBER, BAXTER E. VIEUX, HYDROLOGY AND FLOODPLAIN ANALYSIS 381 (2008).

[5] $$Q_{total} = \underbrace{C_i i A_I}_{\substack{\text{Impervious} \\ \text{(Charged)}}} + \underbrace{C_{ii} i A_{ii}}_{\substack{\text{Pervious} \\ \text{(Free)}}}$$

Therefore:

[6] $$Q_{total} = \underbrace{(0.95)(0.25)i}_{\substack{\text{Impervious} \\ \text{(Charged)}}} + \underbrace{(0.15)(0.75)i}_{\substack{\text{Pervious} \\ \text{(Free)}}}$$

[7] $$Q_{total} = \underbrace{0.24i}_{\substack{\text{Impervious} \\ \text{(Charged)}}} + \underbrace{0.11i}_{\substack{\text{Pervious} \\ \text{(Free)}}}$$

[8] $$Q_{total} = 0.35i$$

[9] $$Q_{charged} = 0.24i$$

And the Stormwater User Charge, based on the area of impervious surfaces, results in:

[10] ________ ________

Now, assume that the impervious area on the parcel is doubled to half an acre (21,780 square feet), while the flat lawn surface is reduced to half an acre, as shown in Figure 8 on page A-11 of the Appendix.

Using the same equations as the previous case, here:

[11] $$Q_{total\ expanded} = \underbrace{C_i i A_i}_{\substack{\text{Impervious} \\ \text{Charged}}} + \underbrace{C_{ii} i A_{ii}}_{\substack{\text{Pervious} \\ \text{Free}}}$$

[12] $$Q_{total\ expanded} = (0.95)(0.50)i + (0.15)(0.50)i$$

[13] $$Q_{total\ expanded} = \underbrace{0.48i}_{\text{Impervious Charged}} + \underbrace{0.08i}_{\text{Pervious Free}}$$

[14] $$Q_{total\ expanded} = 0.56i$$

[15] $$Q_{expanded\ charged} = 0.48i$$

and the Stormwater User Charge, reflecting the increase in total impervious area, results in:

[16] Charge $_{expanded}$

As total impervious area increases by a factor of two, the additional runoff from *only the impervious surfaces* ($Q_{charged} = 0.24I$, and $Q_{expanded\ charged} = 0.48I$) increases by a factor of two as well. The fee levied by MSD *also increases by a factor of two* (Charge = \$15.25, and Charge $_{expanded}$ = \$30.49). Examining the *total* runoff from these two hypotheticals ($Q_{total\ expanded} = 0.56I$ to $Q_{total} = 0.35I$), as total impervious area increases by a factor of two, total additional runoff from the property (from both pervious and impervious surfaces) increases by only a factor of 1.6.[38] But the total runoff calculation, used by the Plaintiff's expert, neglects the fact that runoff from pervious surfaces is not charged under the user fee. The appropriate analysis centers on the change in additional runoff from the portion where the fee is charged, the impervious surfaces; it is clear there that as impervious surface area increases by a factor of two, the additional runoff also increases by a factor of two.

These calculations illustrate an important point: There is a direct relationship between the Stormwater User Charge and MSD's stormwater management services. The fee levied by MSD only charges for runoff originating from impervious surfaces, which is the significant cost driver. Plaintiffs' expert witnesses treated the Stormwater User Charge as though MSD *did* charge for pervious areas on a landowner's property, and relied on this incorrect assumption to reach their conclusion that the fee does not bear a one-to-one relationship to stormwater runoff. Therefore, even though Missouri law nowhere requires that a "direct relationship" be a "one-to-one relationship," these calculations demonstrate that the Stormwater User Charge does have such a relationship with the total impervious surface on a landowner's property, and, thus, with the services provided by MSD. The Stormwater User Charge clearly meets the "direct

[38] Note though that this still is a positively correlated increase and thus evidence of a direct relationship.

relationship" standard, and should properly be deemed a fee, and not a tax on this basis.

CONCLUSION

The courts below erred in accepting an overly narrow and conclusory definition of the "direct relationship" standard. Additionally, the courts below erred in advancing the Plaintiff's misconceived formulation of the service and fee payer, with consideration for the significant effect that impervious surfaces have on the cost of maintaining waterways, the Stormwater User Charge undoubtedly has a direct relationship with the level of stormwater services provided by MSD, constituting a true user fee as defined by the Missouri Supreme Court. The additional runoff generated by impervious surfaces creates additional damage to surrounding areas that affects all residents, regardless of whether they are connected to the sewer system. The Coalition supports MSD's assessment of a stormwater fee, which will, as development inevitably continues, become increasingly necessary to finance the development and maintenance of St. Louis' stormwater drainage system.

Respectfully submitted,

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CERTIFICATION OF COMPLIANCE WITH COURT RULES

The undersigned counsel certifies that (1) the information required by Rule 55.03 has been included in the signature block and on the cover of the brief; (2) that this brief conforms to the requirements of Rule 84.06(b). According to the word count feature of Microsoft Word, this brief contains 5863 words.

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PROOF OF SERVICE

In accordance with Rule 103.08, this **SUBSTITUTE BRIEF *AMICUS CURIAE* MISSOURI COALITION FOR THE ENVIRONMENT FOUNDATION IN SUPPORT OF DEFENDANT-APPELLANT/CROSS-RESPONDENT** has been served on counsel of record below who are registered users of the Court's electronic filing system.

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