

Title: Evaluation of Stormwater Quality Improvement through Pervious Concrete Pavement

Principal Investigators:

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Identification & Statement of Need:

Source water protection efforts aimed at upland streams and impoundments are important objectives in a comprehensive watershed management plan. However, just as important in urbanizing watersheds are protection efforts aimed at water sources generated within the urban footprint from natural rainfall. Urban stormwater, because of its characteristically intense peak flows, has the ability to wash and scour accumulated debris and contaminants from the urban landscape across land surfaces. Unfortunately, surface-washed pollutants most often end up in urban stormwater systems as contaminated source water for downstream water bodies. By applying a source water protection approach to a major urban feature, the paved parking lot, an objective assessment of this major contaminant pathway can be made. Rainfall, often contaminated by industrial or other atmospheric urban pollution sources, falls at various depths and intensities across the landscape. Natural surface depressions and leaf interception, typically reduced in an urban setting, result in more rainfall volume available for immediate infiltration. However, soil infiltration can only occur on vegetated or other pervious surfaces. As a consequence, all rainfall not otherwise intercepted, evaporated, or infiltrated becomes active urban runoff during a storm event, increasing stream flashiness, scouring embankments, and causing flood-related property damage and water impairment downstream (Dougherty et al, 2006, 2004).

Urban ecosystem improvements that mitigate stormwater damage have included both quality and quantity protection practices. The present study focuses on one widely known but little studied stormwater mitigation technique, pervious concrete paving, which is used in place of an impervious paved surface to both reduce and potentially treat stormwater runoff flows from an urban surface. This construction technology is widely accepted as a beneficial urban stormwater mitigation practice, but has not been adequately evaluated with regard to pollutant removal efficiency, before, during, and after construction.