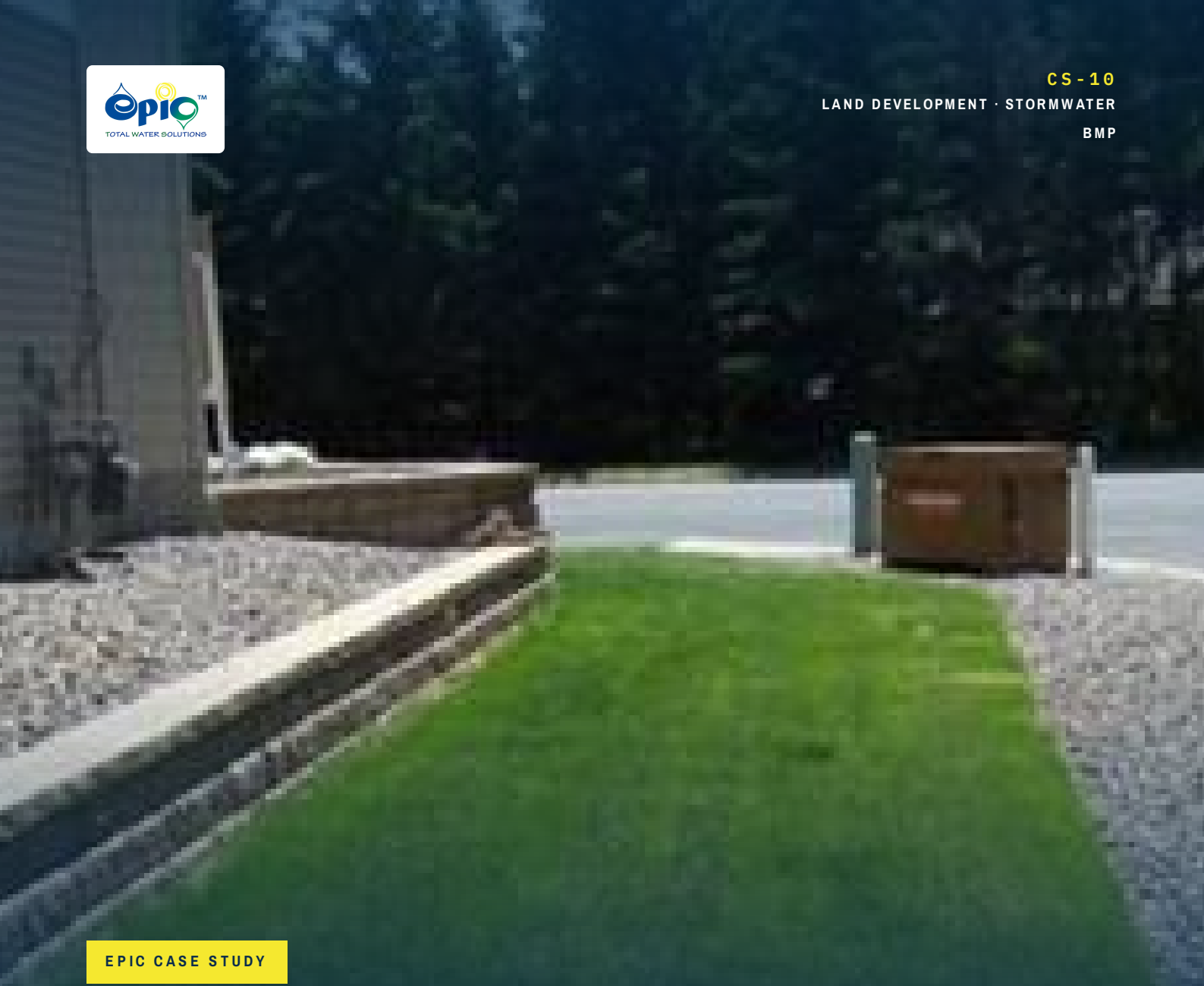


EPIC CASE STUDY

WILDWOOD COMMONS

WHITEHORSE DEVELOPMENT CORPORATION · CITY OF WILLERNIE, MINNESOTA, USA · 2006

The first project in the seven-county Minnesota metro to rely on a single BMP for a whole site's stormwater, on a contaminated infill lot beside a wetland.

56%	85%	First
SITE RUNOFF REDUCTION	PHOSPHORUS LOAD REDUCTION	SINGLE-BMP SITE
16 Jun to 24 Sep 2007	11 Aug to 20 Sep	In the 7-county MN metro

EVIDENCE LEVEL

MEASURED · Modelled potential vs actual outflow, runoff and phosphorus · engineered and permitted by RESI

The finished EPIC green strip, Wildwood Commons, Willernie, Minnesota.

PROJECT RECORD

DEVELOPER	WhiteHorse Development Corporation; Mr Tim Jawor, President
LOCATION	McGregor Avenue × Stillwater Road (Wildwood / CSAH 12), City of Willernie, Minnesota
DEVELOPMENT	Two townhome buildings, nine units total; constructed 2006
SITE	A small vacant 30,000 sq ft lot, formerly a gas station and engine repair shop. Site plan label: "¾ Acre, 80% Impervious, Adjacent Wetlands"
JURISDICTIONS	City of Willernie, Willernie City Engineer Mr Les Mateffy, Rice Creek Watershed District, Washington County, MPCA
RECEIVING WATER	Drains toward White Bear Lake, Minnesota
ENGINEERING	"RESI then engineered the project and managed the approval process." Technical paper by William McCully PE, of RESI, the project engineer

THE PROBLEM

An infill development on a vacant lot, on a boundary between two cities, in a sensitive watershed with a popular recreational lake. It attracted significant opposition, and that opposition focused on how the developer would mitigate stormwater impacts and avoid the adjacent wetland.

A significant wetland wrapped tightly around the north-east property corner. There were reasonable environmental concerns that if the site was contaminated, infiltration practices would make things worse by carrying pollutants into the adjacent wetland water bodies.

Contamination was in fact found during the works, and was officially remediated with TetraTech, Inc. working with the MPCA.

The project fell below the Rice Creek Watershed District's one-acre threshold for a stormwater permit. The developer chose to meet the standard anyway.

WHAT EPIC BUILT

One stormwater management system for all site runoff. The EPIC system was installed in all green areas on the site, providing immediate biological and sand filtration and harvesting site runoff for irrigation.

Stormwater from the roofs, the impervious road surfaces and the rear driveways is sand-filtered and treated. Excess filtered stormwater discharges into a 4-inch PVC storm line to an existing street catch basin, via two lines entering from north and south of the buildings.

The irrigation is gravity fed. No pumps are part of the design; there is nothing to winterise or summerise and no moving parts to break or freeze. At its normal water level the system can provide the vegetation above with up to three weeks of irrigation water, delivered to the roots by capillary action.

By design on this project the EPDM liner prevents infiltration. On a remediated site, that is the point: the system caps the remediated soil against further leaching or plume movement toward the wetlands or groundwater.



Chambers and connectors on the EPDM liner, tight to the building.



Sand over the chambers: the green area is the stormwater system.

56%
SITE RUNOFF REDUCTION

85%
PHOSPHORUS LOAD REDUCTION

First
SINGLE-BMP SITE IN THE 7-COUNTY MN METRO

THE RECORD

Site performance from the project engineer's technical paper. Both tables compare a modelled *potential* baseline against the EPIC system's *actual* outflow.

SITE RUNOFF REDUCTION	PRECIPITATION	POTENTIAL RUNOFF	EPIC ACTUAL OUTFLOW	REDUCTION
16 Jun to 24 Sep 2007	13.55 in	32,181 cu ft	14,172 cu ft	56%

Potential runoff is the modelled runoff for Wildwood Commons; actual outflow is the outflow from the EPIC system over the same period. The reduction is calculated from the two volumes.

TOTAL PHOSPHORUS (TP) REDUCTION

PERIOD	POTENTIAL TP LOAD	EPIC SYSTEM TP LOAD OUTFLOW	REDUCTION
11 Aug to 20 Sep	0.2 lbs	0.019 lbs	85%

Total reduction as given in the engineer's paper. Calculated from the two rounded loads shown, the reduction is 90.5%.



22 May 2006 The infill site under construction.



The finished EPIC green strip along the driveway edge.

ALSO ON THE RECORD

- **A first for the region.** "This is the first project in the 7 county metro area of MN to solely rely upon one BMP for the entire sites stormwater management system."
  Technical paper, William McCully PE, RESI

- **Regulatory endorsement.** "Having the City Engineer, Mr. Les Mateffy comprehensively understand and approve the EPIC™ system, essentially endorsed the EPIC™ system for the City of Willernie. With their approval, all other issues with the MPCA, Washington Soil and Water Conservation District and RCWD were overcome."
  Same paper

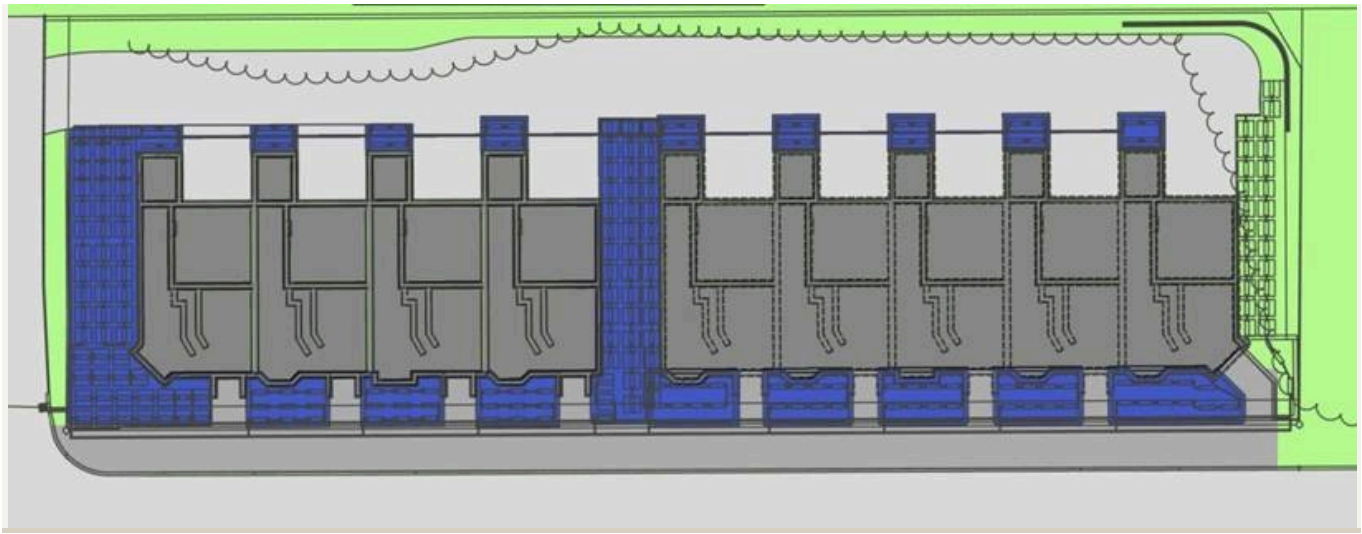
- **No mosquito habitat, as a design goal.** One of the developer's stated goals was "Allow effective stormwater management without producing a mosquito breeding habitat."
  Same paper

- **Provenance of the technology.** Jonas Sipaila received a patent in 1999 for the first pipe designed specifically for contact with sand, combining sub-surface irrigation, sub-surface drainage and capillary movement through sand. Other sub-surface systems had always had clogging problems; this invention eradicated them.
  Same paper

- **Irrigation water, in general.** The paper states that the system "saves the end user 50-85% over current irrigation water usage". This is a general statement about the EPIC system, not a measurement at Wildwood Commons.
  Same paper



Planting over the system in a raised bed beside a brick building.



The site plan: the EPIC system, shown in blue, in the green areas around the two townhome buildings.

RECORDS Technical paper on Wildwood Commons by William McCully PE, RESI, with the site performance table for 2007; Wildwood Commons case study and testimonial sheet; construction photographs, May 2006.