Evaluation of Water Quality Functions of Conventional and Advanced Soil-Based Onsite Wastewater Treatment Systems

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Fig. S1. (A) Schematic diagram of soil mesocosms representing a shallow narrow drainfield (SND), GeoMat® (GEO), and pipe and stone (P&S) drainfield. The wastewater input to SND and GEO was sand filter effluent (SFE), whereas the P&S received septic tank effluent (STE). The approximate location of soil horizons, ports for gas sampling, and moisture and temperature probes are indicated. Water exits the mesocosms through a hanging water column device used to adjust the height of the water table. The atmosphere in the infiltrative area is connected to a 30-cm soil column. (B) Detailed schematic diagram of the SND, GEO and P&S delivery devices. Diagrams are not to scale.
Supplemental Fig. S2

Fig. S2. Concentration of fecal coliform bacteria in inputs and outputs for the pipe and stone (P&S), shallow narrow drainfield (SND), and GeoMat® (GEO) drainfield mesocosms.

Supplemental Fig. S3

Fig. S3. Depth profile of soil pH for shallow narrow drainfield (SND), GeoMat® (GEO), and pipe and stone (P&S) mesocosms after operation for 12 months for a single mesocosm, and of soil prior to wastewater dosing.
**Supplemental Figure S4**

**Fig. S4.** Concentration of total phosphorus (TP) in inputs and outputs for the pipe and stone (P&S), shallow narrow drainfield (SND), and GeoMat® (GEO) drainfield mesocosms.

**Supplemental Figure S5**

**Fig. S5.** Concentration of BOD$_5$ in inputs and outputs for the pipe and stone (P&S), shallow narrow drainfield (SND), and GeoMat® (GEO) drainfield mesocosms. Output values are shown as the detection limit of 1 CFU/mL.
Fig. S6. Relationship between SO₄ concentration and pH of output water from pipe and stone (P&S), shallow narrow drainfield (SND), and GeoMat® (GEO) mesocosms. Values are means (n = 3). Error bars represent one calculated SD for each mean.
Supplemental Fig. S7

Fig. S7. Depth profiles of O₂, CH₄ and N₂O in pipe and stone (P&S), shallow narrow drainfield (SND), and GeoMat® (GEO) and mesocosms. Values are means for a single mesocosm from each drainfield type, measured between Aug. 2013 and Feb. 2014. Error bars represent one calculated SD for each mean. Dashed line represents ambient atmospheric gas concentration. Solid line at 0 cm represents position of the infiltrative surface.
Supplemental Fig. S8

**Fig. S8.** Flux of CH$_4$ and N$_2$O in pipe and stone (P&S), shallow narrow drainfield (SND) and GeoMat$^\circledR$ (GEO) mesocosms. Values are means for a single mesocosm from each drainfield type, measured between Aug. 2013 and Feb. 2014. Error bars represent one calculated SD for each mean.