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COMPARISON OF REACTOR DESIGNS FOR BIOLOGICAL EX-SITU SOIL TREATMENT

Carl Potter
U.S. Environmental Protection Agency
Risk Reduction Engineering Laboratory
Cincinnati, OH 45268
(513) 569-7231

Roy Haught
IT Corporation
11499 Chester Road
Cincinnati, OH 45246
(513) 569-7067

The goal of this project is to evaluate the potential of biological *ex-situ* soil treatment systems to remediate soils contaminated with hazardous chemicals. A laminar-type flow pilot-scale reactor with volume of 3 cu. yd has been constructed at EPA's Test & Evaluation (T&E) Facility in Cincinnati. Laminar-type flow from one side of the reactor to the other may provide even aeration to all areas of the reactor while avoiding the use of pipes inside the reactor. This design greatly facilitates loading and unloading the reactor and is readily scalable to larger systems.

Passing smoke through the reactor for visual observation of flow indicated uniform flow in the empty reactor. Further testing involves filling the reactor with vermiculite, flushing with Argon, and then passing air through the reactor at about 1 volume change per day to evaluate air flow through this uniform solid matrix. Oxygen probes, located at 27 positions within the reactor, provide information on air progression through the system. Analysis of gas flow through an empty reactor and through a uniform matrix (vermiculite) allows separation of reactor flaws from soil inhomogeneities as causes of any nonuniform aeration of the reactor space. Soil contaminated with polynuclear aromatic hydrocarbons (PAHs) from The Reilly Tar Pit Superfund Site in St. Louis Park, MN has been shipped under the samll quantity treatability exemption to the T&E Facility for research on soil aeration and effectiveness of this *ex situ* reactor design for biological treatment of contaminated soils.

FOR MORE INFORMATION

Carl L. Potter, U.S. Environmental Protection Agency, Risk Reduction Engineering Laboratory, Cincinnati, Telephone (513) 569-7231, FAX (513) 569-7105.