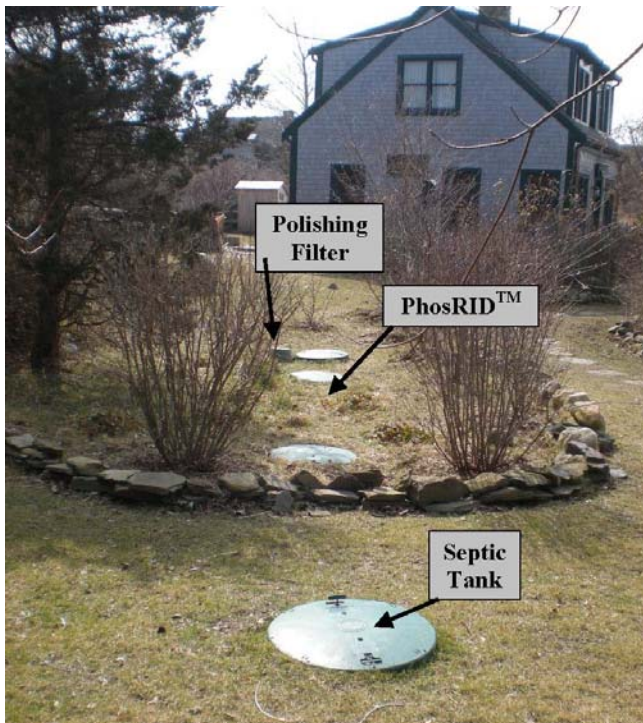
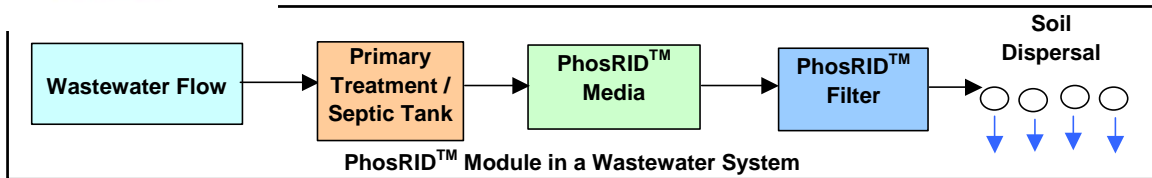




PhosRID™ Passive Phosphorus Wastewater Removal System



The PhosRID™ system removes phosphorus from water through reductive iron dissolution and mineralization of phosphorus.

Septic System Test Center, MA Project

Project Description

Lombardo Associates, Inc. (LAI) and the University of Waterloo installed a demonstration PhosRID™ phosphorus removal system at the Massachusetts Septic System Test Center. Data collection and analysis was performed by the Barnstable County Health Department.

Project Application Data

- Location: Otis Air Force Base, Massachusetts
- Site Application: Massachusetts Septic System Test Center
- Installation Date: August 2002

Design Profile

- Design Wastewater Flow: 330 gpd
- Wastewater Treatment Process: Septic Tank - PhosRID™ - Media Filter - Leaching Trench

Site	Total Phosphorus (mg/l)	
	Influent	Effluent
MA #1	4.2	0.4
MA #2	5.77	0.08
MA #3	4.18	<0.04
MA #4	2.4	0.11

PhosRID™ Treatment Performance

The PhosRID™ installed at the Massachusetts Septic System Test Center has reduced phosphorus in the effluent by an average of 94% over the one year that it has been in operation. In addition, the PhosRID™ has reduced the Total Nitrogen by 54% and BOD in the effluent by 86%.

Date	Influent to RID						RID Filter					
	PO4 - 3 (mg-P/L)	BOD 5 (mg/L)	Total P (mg/L)	TSS (mg/L)	TN (mg/L)	Temp C	PO4 - 3 (mg-P/L)	% Ortho P Removal	Total P (mg/L)	% BOD Removal	% N Removal	Temp C
Average (mean)	4.2	150.0	5.7	23.2	33.3	8.7	0.4	94%	0.4	86%	54%	9.4
Std Dev	0.6	67.9	2.6	7.3	3.9	6.5	0.2	7%	0.3	15%	9%	6.8
Minimum	3.1	46.0	3.8	4.4	26.2	1.5	0.1	79%	0.0	37%	40%	1.8
Maximum	5.5	277.0	16.0	40.7	37.2	21.9	0.8	100%	1.0	99%	63%	22.5

Nantucket, MA Projects

Lombardo Associates, Inc. (LAI) designed RID system components to be integrated with the property's septic tank and soil absorption system. The RID system components include PhosRID™ Treatment System, a Pump Chamber, a Sand Filter, one pump and controls. The design flows is 440 gpd for Sites 1 and 2 and 330 gpd for Site 3. The performance summary is presented below.

Date	Site #1		Site #2	
	Septic Tank Effluent TP (mg/l)	PhosRID™ Effluent TP (mg/l)	Septic Tank Effluent TP (mg/l)	PhosRID™ Effluent TP (mg/l)
6/1/2007				
7/5/2007	1.83	0.12	1.30	<0.02
8/9/2007	9.5	0.1	4.10	0.08
9/11/2007	9.5	0.11	5.00	0.04
12/17/2007	8	0.07	6.30	<0.02
3/26/2008			9.50	0.03
Average	5.77	0.08	4.18	<0.04

Date	Site #3	
	Septic Tank Effluent TP (mg/l)	PhosRID™ Effluent TP (mg/l)
5/14/2008	2.4	0.11

The PhosRID™ technology has proven extremely effective at removing phosphorus from septic tank effluent. In addition, PhosRID™ also provides nitrogen reduction, BOD reduction and reduction in the total suspended solids.

Lombardo Associates, Inc. is a full-service environmental engineering firm with wastewater and water projects in numerous states from New England to Florida to California. Lombardo Associates has been the Engineer of Record for over \$200 million of wastewater and water projects and Chief Engineer for over \$100 million of design, build and operate (DBO) projects. Lombardo Associates is a recipient of the prestigious American Consulting Engineer's Council Engineering Excellence Award for its innovative wastewater project. An *Engineering News Record* Construction Man of the Year candidate, Pio Lombardo was also designated an Entrepreneur of the Year finalist.

Environmental Engineers/Consultants

LOMBARDO ASSOCIATES, INC.

49 Edge Hill Road

Newton, Massachusetts 02467

(617) 964-2924

Portable: (617) 529-4191

Fax: (617) 332-5477

E-mail: pio@LombardoAssociates.com
