Georgia Department of Public Health
Environmental Health Section

Alternative and Chamber Absorption Field Product Approvals

Product	Proprietary Name	Company	Equivalency Factor
Aggregate	Tire Chips	Various	1.0
Aggregate	Eight-Inch Modified	Various	1.5
Bio-Peat	PURAFLO	Bord Na Mona	N/A
	Ecoflo ST-650 Biofilter	Premier Tech	N/A
Bundled Pipe	Septic Stack SS-13-36	ADS, Inc.	0.67
	SS-13		0.75
	SS-11		0.90
	SS-9		1.12
	Multi-Pipe MPS-13-36	Plastic Tubing Industries, Inc	0.67
	MPS-13		0.75
	MPS-3611GS		0.75
	MPS-11		0.90
	MPS-9		1.12
Chamber	Infiltrator High Capacity	Infiltrator Systems, Inc	0.65
	Infiltrator HC Sidewinder		0.65
	Infiltrator Quick4 Standard		0.75
	Infiltrator Quick4 W Standard		0.75
	Infiltrator Quick4 High Capacity		0.65
	Infiltrator Quick4 EQ36		1.0
	Infiltrator Quick4 EQ24		1.5
	Infiltrator Quick4 Plus High Capacity		0.65
	Infiltrator Quick4 Plus Standard		0.75
	Infiltrator Quick4 Plus Standard LP		1.0
	Infiltrator Quick4 Plus EQ36 LP		1.53
	EnviroChamber SF Hi-Cap		0.65
	EnviroChamber SW Hi-Cap		0.65
	EnviroChamber Pro Hi-Cap		0.65
	EnviroChamber Pro ARC Hi-Cap		0.65
	EnviroChamber Standard		0.75
	EnviroChamber Pro Standard		0.75
	EnviroChamber Pro ARC Standard		0.75
	BioDiffuser 14” & 16” Hi-Cap		0.65
	BioDiffuser Standard		0.75
	ARC 36 Standard		0.75
	ARC 36 High Capacity		0.65

Georgia Department of Public Health
Environmental Health Section

Alternative and Chamber Absorption Field Product Approvals

Product	Proprietary Name	Company	Equivalency Factor
Polystyrene	EZflow- EZ0705H	Infiltrator Systems, Inc	1.15
	EZflow- EZ0904H		0.85
	EZflow- EZ0904HP		0.75
	EZflow- EZ1203H		0.75
	EZflow- EZ1303T		0.65
	EZflow- EZ1402H		0.75
	Flowtech FTS94H-1 and FTSG94H-1		0.85
	Flowtech FTS123H-1 and FTSG123H-1		0.75
	Flowtech FTS133T-1 and FTSG133T-1		0.65
	Flowtech FTS142H-1 and FTSG142H-1		0.75
Press. Drip	Bioline PC Emitters	Netafin Irrigation, Inc	N/A
	Wasteflow Classic Wasteflow PC	Geoflow, Inc	N/A
	Clearwater	Clearwater, Inc	N/A
Sand	Geotextile Sand filter	Eljen, Inc	N/A
	Advanced Enviro-Septic Treatment System (AES)	Presby Environmental, Inc.	N/A

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: EZflow Drainage System Products:
EZ0705H, EZ0904H, EZ0904HP, EZ1203H, EZ1303T and **EZ1402H**

Issued To: **Infiltrator Systems, Inc**
6 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475

In accordance with provisions established in the Department of Human Resources Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the EZflow **EZ0705H, EZ0904H, EZ0904HP, EZ1203H, EZ1303T** and **EZ1402H** are approved for use in on-site sewage management systems under the following conditions:

I. System Description

The EZflow Drainage System utilizes wastewater absorption trenches that contain bundles of loosely bound expanded polystyrene (EPS) aggregate in place of rock aggregate. The aggregate shall consist of "Patented EZflow Beads" recycled EPS with a particle density of 1.0 pound per cubic foot, or greater, ranging in size from one-half (1/2") inch to two (2") inches across any axis.

Cylindrical bundles range from a nominal 7-inch to a 14.5-inch diameter, depending on system configuration. The length of the cylindrical bundles range from a minimum of 5 feet to a maximum of 15 feet. The expanded polystyrene aggregate (EPS) is held in a cylindrical shape with high strength polyethylene netting. The netting shall be strong enough to retain the shape of the bundles during system installation and backfilling, corrosion resistant, and of a mesh size to prevent loss of aggregate. At least one cylinder bundle shall contain a perforated flexible plastic pipe for connection to adjacent sections to form a continuous absorption field system. The perforated flexible plastic pipe shall meet ASTM F 405, Standard Specifications for Corrugated Polyethylene Pipe. A series of three holes 5/8" in diameter spaced 120 degrees around the circumference are located every 4 inches along the lateral length of the pipe. Based on the manufacturer's recommendation, the hole orientation during installation may be random.

Alternative System Configurations

EZ0705H Drainage System consists of five, 7-inch diameter cylinder bundles across the bottom of a 36-inch wide absorption trench. Four cylinder bundles contain EPS aggregate only (aggregate bundles may be substituted with pipe aggregate bundles) and one cylinder bundle consists of EPS aggregate and a three inch diameter perforated flexible plastic pipe. The perforated pipe is centrally located within the aggregate bundle with approximately 2 inches of EPS aggregate between the outside of the pipe and the outside of the cylinder. The pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. System may be installed with pre-manufactured geotextile barrier material inserted between the EPS

aggregate and enclosed netting. Geotextile material shall span approximately 120 degrees along the top of each cylinder.

EZ0904H Drainage System consists of four, 9-inch diameter cylinder bundles across the bottom of a 36-inch wide absorption trench. Three cylinder bundles contain EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles) and one cylinder bundle consists of EPS aggregate and a four inch diameter perforated flexible plastic pipe. The perforated pipe is centrally located within the aggregate bundle with approximately 2.5 inches of EPS aggregate between the outside of the pipe and the outside of the cylinder. The pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. System may be installed with pre-manufactured geotextile barrier material inserted between the EPS aggregate and enclosed netting. Geotextile material shall span approximately 120 degrees along the top of each cylinder.

EZ0904HP Drainage System consists of four, 9-inch diameter cylinder bundles across the bottom of a 36-inch wide absorption trench. The four cylinder bundles each consist of EPS aggregate with a four inch diameter perforated flexible plastic pipe. The perforated pipe is centrally located within the aggregate bundle with approximately 2.5 inches of EPS aggregate between the outside of the pipe and the outside of the cylinder. One central bundle shall act as the conveyance pipe in the trench and must be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. The system may be installed with pre-manufactured geotextile barrier material inserted between the EPS aggregate and enclosed netting. Geotextile material shall span approximately 120 degrees along the top of each cylinder.

EZ1203H Drainage System consists of three, 12-inch diameter cylinder bundles across the bottom of a 36-inch wide absorption trench. The central cylinder bundle contains EPS aggregate and a four-inch diameter perforated flexible plastic pipe. The pipe is offset so there is approximately 6 inches of EPS aggregate from the bottom of the pipe to the bottom of the cylinder, and 2 inches of EPS aggregate from the top of the pipe to the top of the cylinder. The pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. The cylinder bundles on each side of the central cylinder bundle contain EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles). System may be installed with pre-manufactured geotextile barrier material inserted between the EPS aggregate and enclosed netting. Geotextile material shall span approximately 120 degrees along the top of the cylinder.

EZ1303T Drainage System consists of three, 13-inch diameter cylinder bundles placed in a 30-inch wide absorption trench. Two cylinder bundles containing EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles) are placed along the absorption trench bottom. A third cylinder bundle contains EPS aggregate and a four-inch diameter perforated flexible plastic pipe which is centered and placed on top of the two bottom cylinder bundles to form a triangle shape. The pipe is centered or offset, so there is approximately 7 inches of EPS aggregate located between the bottom of the pipe and the bottom of the cylinder, and approximately 2 inches of EPS aggregate is located between the top of the pipe and the top of the cylinder. The pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. System may be installed with pre-manufactured geotextile barrier material inserted between the EPS aggregate and the enclosed netting. Geotextile material shall span approximately 120 degrees along the top of each cylinder.

EZ1402H Drainage System consists of two, 14.5-inch diameter cylinder bundles placed across the bottom of a 29-inch to 36-inch wide absorption trench. One cylinder bundle contains EPS aggregate and a four-inch diameter perforated flexible plastic pipe. The pipe is centered or offset so there is

approximately 6 inches of EPS aggregate between the bottom of the pipe and the bottom of the cylinder, and approximately 4 inches of EPS aggregate located between the top of the pipe and the top of the cylinder. The pipe shall be interconnected by an internal connection device, or other approved device, to allow continuous flow from one section to the adjacent section. A second cylinder bundle with EPS aggregate only is placed beside the first cylinder bundle (aggregate only bundles may be substituted with a pipe and aggregate bundle). System may be installed with pre-manufactured geotextile barrier material inserted between the EPS aggregate and the enclosed netting. Geotextile material shall span approximately 120 degrees along the top of each cylinder.

II. Site Criteria

The EZflow Drainage System may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the absorption trench bottom.

III. Installation Criteria

The EZflow Drainage System shall be installed in the configurations in Section I, in absorption trenches constructed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines.

The excavated trench width shall be as indicated in Section I for the selected configuration. The EZ0705H and EZ1402H system bundles shall be placed adjacent to one undisturbed trench sidewall. The void space between the bundles and the opposite trench sidewall shall be backfilled first to hold the two bundles together in place prior to covering the system.

The EZflow Drainage System shall only be utilized for domestic waste as defined in Chapter 290-5-26-.02(rr) Rules and Regulations for On-Site Sewage Management Systems.

The barrier cover for any EZflow configuration shall be as designated by the manufacturer.

IV. Absorption Field Sizing

The sizing of the EZflow Drainage System shall be based upon the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption fields are to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon encounter at the aggregate and soil interface along the sidewall and trench bottom area to a depth 1 foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

The following equivalency factors shall be used for the EZflow Drainage System Products:

System Configuration	**Equivalency Factor**
EZ0705H	1.15

EZ0904H	0.85
EZ0904HP	0.75
EZ1203H	0.75
EZ1303T	0.65
EZ1402H	0.75

Trench Installation:

Step One: Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the sidewall and trench bottom area interfacing with the product infiltrative surface to a depth 1 foot below the trench bottom.

Step Two: Determine the linear length required for a conventional 36-inch wide gravel absorption field system based on the percolation rate identified in step one.

Step Three: Identify the EZflow configuration to be installed. Multiply the product equivalency factor for the EZflow configuration to be used by the linear length of the conventional system determined in step two. The result is the linear footage required for the EZflow configuration selected.

Example:

Assume: 3-bedroom house and a percolation rate of 45 minutes per inch.

Then: Absorption field square footage required for a conventional 36-inch wide absorption field from Table DT-2 for a 45 minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house. The linear length required for the conventional 36-inch wide absorption field is 300 linear feet.

The minimum required linear footage (for this example) of the EZflow Drainage System is:

EZ0705H	300 ft. x 1.15 = 345 ft.
EZ0904H	300 ft. x 0.85 = 255 ft.
EZ0904HP	300 ft. x 0.75 = 225 ft.
EZ1203H	300 ft. x 0.75 = 225 ft.
EZ1303T	300 ft. x 0.65 = 195 ft.
EZ1402H	300 ft. x 0.75 = 225 ft.

By: _____ Date: 9/08/2010

Chris Kumnick, Program Director
Land Use Unit
Environmental Health Section

Revised 9/08/10

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: Eight Inch Modified Gravel Absorption Field System

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On Site Sewage Management Systems, Chapter 290-5-26, the DHR Technical Review Committee approves the eight inch modified gravel absorption field system for use in on site sewage management systems, under the following conditions:

I. System Description

The eight inch modified gravel absorption field system means a system composed of perforated pipe surrounded by gravel or stone masking for the infiltration of effluent into adjoining bottom and side soil areas.

System configuration

The eight inch modified gravel absorption field system shall be installed in absorption trenches dug 36 inches wide. Washed gravel meeting the requirements established in the Department's Manual for On Site Sewage Management Systems shall be used as aggregate. The minimum depth of aggregate shall be eight (8) inches with two (2) inches below the perforated pipe and filled to two (2) inches above the pipe. A four (4") inch diameter perforated pipe meeting the requirements in the Department's Manual for On Site Sewage Management Systems shall be laid in the center of the trench with perforations oriented toward the bottom of the trench.

II. Siting Criteria

The eight inch modified gravel absorption field system may be utilized on sites determined to be suitable for conventional absorption field systems as defined in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the trench bottom.

III. Installation Criteria

The eight inch modified gravel absorption field system shall be installed in excavated trenches 36 inches wide constructed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems.

IV. Absorption Field Sizing

The sizing of the eight inch modified gravel absorption field system shall be based on the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption field system is to be located. The design absorption rate shall be based on the most

hydraulically limiting naturally occurring soil horizon encountered at the sidewall and trench bottom area interfacing with the gravel aggregate and extending to a depth of 1 foot below the trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

Sizing the Absorption Field

Step 1. Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the side wall and trench bottom area interfacing with the product infiltrative surface to a depth one (1) foot below the trench bottom.

Step 2. Determine the linear length required for a conventional 36-inch wide gravel absorption system based on the percolation rate identified in step one.

Step 3. Multiply the product equivalency factor 1.5 by the linear length of the conventional system identified in step two. The result is the linear length required for the eight inch modified gravel system

Example: Assume a 3-bedroom house and a 45-minute percolation rate

Then: Absorption field square footage required for a conventional aggregate system from Table DT-2 for a 45-minute percolation rate is 300 square feet per bedroom or 900 square feet for a three-bedroom house. The linear length required for the conventional 36-inch wide gravel system is 300 linear feet.

The minimum required linear footage (for this example) of the eight inch modified gravel system is:

300 linear feet x 1.5 = 450 linear feet

By: _____Date: 2/23/2007

Scott A. Uhlich, Program Director
Land Use Unit
Environmental Health Branch

Revised 2/23/2007

Georgia Department of Community Health
Division of Public Health
Environmental Health Section

Alternative System Approval

For: ICC Flowtech Drainage Systems: **FTS94H-1, FTS123H-1, FTS133T-1 and FTSG142H-1** and Composite Encasement Products **FTSG94H-1, FTSG123H-1, FTSG133T-1 and FTSG142H-1**

Issued To: ICC Technologies, Inc.
240 Boundary Road
Marlboro, New Jersey 07746

In accordance with provisions established in the Department of Human Resources Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the ICC Flowtech Drainage System **FTS94H-1, FTS123H-1, FTS133T-1 and FTS142H-1;** and Composite Encasement Products **FTSG94H-1, FTSG123H-1, FTSG133T-1 and FTSG142H-1** are approved for use in the state of Georgia under the following conditions:

I. System Description

The ICC Flowtech Drainage System utilizes wastewater absorption trenches that contain bundles of bound expanded polystyrene (EPS) aggregate in place of rock aggregate. The aggregate shall consist of EPS with a particle density of 1.00 pounds per cubic foot, or greater, ranging in size from one-half (1/2") inch to two (2") inches across any axis as submitted for approval.

The cylindrical bundles range from a nominal nine (9") inches to fourteen (14") inches in diameter, depending on the system configuration. The length of the cylindrical bundles range from a minimum of 5 feet to a maximum of 20 feet. The expanded polystyrene aggregate (EPS) is held in a cylindrical shape with either a netting or composite encasement. The encasement shall be strong enough to retain the shape of the bundles during system installation and backfilling, corrosion resistant, and of a mesh size to prevent loss of aggregate. The composite encasement product shall have netting over the lower 180 degrees of the product's circumference which is mechanically stitched to a non-woven geosynthetic filter fabric over the upper 180 degrees of the product. At least one cylinder bundle shall contain a perforated flexible plastic pipe for connection to adjacent sections to form a continuous absorption field system. The perforated flexible plastic pipe shall meet ASTM F 405, Standard Specifications for Corrugated Polyethylene Pipe. A series of three holes 5/8" in diameter spaced 120 degrees around the circumference are located every 4 inches along the lateral length of the pipe. Based on the manufacturer's recommendation, the hole orientation during installation may be random.

System Configuration

ICC Flowtech FTS94H-1 and FTSG94H-1 Drainage System consists of four, 9-inch diameter cylindrical units across the bottom of a 36-inch wide absorption trench. Three units contain EPS aggregate only and one cylindrical unit consists of EPS aggregate and a 4-inch diameter perforated flexible plastic pipe. The perforated pipe is centrally located within the drainage unit. The pipe of one unit shall be connected to the pipe of an adjacent unit by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section

(aggregate only units may be substituted with aggregate units with pipe.) The product utilizing the composite encasement shall be installed with pre-manufactured geosynthetic filter fabric facing up and the netting facing down. Geosynthetic filter fabric material shall span approximately 180 degrees along the top of each cylinder.

ICC Flowtech FTS123H-1 and FTSG123H-1 Drainage System consists of three, 12-inch diameter cylinder bundles across the bottom of a 36-inch wide absorption trench. The central cylinder bundle contains EPS aggregate and a four-inch diameter perforated flexible plastic pipe. The pipe shall be centered within the EPS aggregate and connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. The cylinder bundles on each side of the central cylinder bundle contain EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles). The product utilizing the composite encasement shall be installed with pre-manufactured geosynthetic filter fabric facing up and the netting facing down. Geosynthetic filter fabric material shall span approximately 180 degrees along the top of each cylinder.

ICC Flowtech FTS133T-1 and FTSG133T-1 Drainage System consists of three, 13-inch diameter cylinder bundles containing EPS aggregate and a four-inch diameter perforated flexible plastic pipe are placed in a 30-inch wide absorption trench. Two cylinder bundles containing EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles) are placed along the absorption trench bottom against the trench side walls. A third cylinder bundle which is centered and placed on top of the two bottom cylinder bundles to form a triangle shape. The central cylinder bundle containing EPS aggregate and a four-inch diameter perforated flexible plastic pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. The product utilizing the composite encasement shall be installed with pre-manufactured geosynthetic filter fabric facing up and the netting facing down. Geosynthetic filter fabric material shall span approximately 180 degrees along the top of each cylinder.

ICC Flowtech FTS142H-1 and FTSG142H-1 Drainage System consists of two, 14-inch diameter cylinder bundles across the bottom of a 30-inch to 36-inch wide absorption trench. The system bundles shall be placed adjacent to one undisturbed trench sidewall. The void space between the bundles and the opposite trench sidewall shall be backfilled first to hold the two bundles together in place prior to covering the system. The central cylinder bundle containing EPS aggregate and a four-inch diameter perforated flexible plastic pipe shall be connected by an internal coupling device, or other approved coupling device, to allow continuous flow from one section to the adjacent section. The cylinder bundle on the side of the central cylinder bundle contains EPS aggregate only (aggregate bundles may be substituted with pipe and aggregate bundles). The product utilizing the composite encasement shall be installed with pre-manufactured geosynthetic filter fabric facing up and the netting facing down. Geosynthetic filter fabric material shall span approximately 180 degrees along the top of each cylinder.

II. Site Criteria

The ICC Flowtech Drainage System may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil

layers, or other unsuitable environmental conditions shall be measured from the absorption trench bottom.

III. Installation Criteria

The ICC Flowtech Drainage System shall be installed in the configurations in Section I, in absorption trenches constructed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and this approval document.

The excavated trench width shall be installed in the configurations in Section I for the selected configuration. Flowtech FTSG142H-1 and FTSG142H-1 system bundles shall be placed adjacent to one undisturbed trench sidewall. The void space between the bundles and the opposite trench sidewall shall be backfilled first to hold the two bundles together in place prior to covering the system.

The ICC Flowtech Drainage Systems shall only be utilized for domestic waste as defined in Chapter 290-5-26-.02(rr) Rules and Regulations for On-Site Sewage Management Systems.

The barrier cover for ICC Flowtech configuration shall be as designated by the manufacturer.

IV. Absorption Field Sizing

The sizing of the ICC Flowtech Drainage Systems shall be based upon the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption fields are to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon encounter at the aggregate and soil interface along the sidewall and trench bottom area to a depth 1 foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

The following equivalency factors shall be used for the ICC Flowtech Drainage System:

System Configuration	Equivalency Factor
ICC Flowtech FTS94H-1 and FTSG94H-1	0.85
ICC Flowtech FTS123H-1 and FTSG123H-1	0.75
ICC Flowtech FTS133T-1 and FTSG133T-1	0.65
ICC Flowtech FTS142H-1 and FTSG142H-1	0.75

Trench Installation:

Step One: Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the sidewall and trench bottom area interfacing with the product infiltrative surface to a depth 1 foot below the trench bottom.

Step Two: Determine the linear length required for a conventional 36-inch wide gravel absorption field system based on the percolation rate identified in step one.

Step Three: Identify the ICC Flowtech configuration to be installed. Multiply the product equivalency factor for the ICC Flowtech configuration to be used by the linear length of the conventional system determined in step two. The result is the linear footage required for the ICC Flowtech configuration selected.

Example:

Assume: 3-bedroom house and a percolation rate of 45 minutes per inch.

Then: Absorption field square footage required for a conventional 36-inch wide absorption field from Table DT-2 for a 45 minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house. The linear length required for the conventional 36-inch wide absorption field is 300 linear feet.

The minimum required linear footage (for this example) of the ICC Flowtech Drainage System is:

ICC Flowtech FTS94H-1 and FTSG94H-1	300 ft. x 0.85 = 255 ft
ICC Flowtech FTS123H-1 and FTSG123H-1	300 ft. x 0.75 = 225 ft.
ICC Flowtech FTS133T-1 and FTSG133T-1	300 ft. x 0.65 = 195 ft.
ICC Flowtech FTS142H-1 and FTSG142H-1	300 ft. x 0.75 = 225 ft.

By: _____ Date: 1/05/11

Chris G. Kumnick
Director, Land Use Program
Environmental Health Section

Georgia Department of Community Health
Division of Public Health
Environmental Health Section

Chamber System Approval

For: Infiltrator High Capacity, Infiltrator High Capacity Sidewinder, Quick4 Standard Chamber, Quick4 Standard W Chamber, Quick4 High Capacity Chamber, Quick4 Equalizer24 Chamber, Quick4 Equalizer36 Chamber, Quick4 Plus Standard LP, Quick4 EQ36 LP, Quick4 Plus Standard and Quick4 Plus High Capacity Chamber

Issued To: Infiltrator Systems Inc.
6 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475
(800)221-4436

In accordance with provisions established in the Department's Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Infiltrator Systems, Inc. High Capacity Chamber, High Capacity Sidewinder Chamber, Quick4 Standard, Quick4 Standard W, Quick4 High Capacity, Quick4 Equalizer24, Quick4 Equalizer36, Quick4 Plus Standard LP, Quick4 Plus EQ36 LP, Quick4 Plus Standard and Quick4 Plus High Capacity chamber models are approved for use in on-site sewage management systems under the following conditions:

I. System Description

The Infiltrator Systems Inc. (ISI) chamber absorption field system utilizes a system of chambers with each chamber unit being a molded polyolefin plastic, arch shaped, hollow structure with an exposed bottom area, solid top, and louvered sidewall for infiltration of effluent into adjoining bottom and side soil areas.

System configuration

The Infiltrator High Capacity Chamber model is a single chamber unit 16 inches high, 34 inches wide and 6.25 feet long. The invert height is 10.0 inches. The chamber units are interlocking to form a continuous absorption field system.

The Infiltrator High Capacity Sidewinder Chamber model is a single chamber unit 16 inches high, 34 inches wide and 6.25 feet long. The invert height is 10.0 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 Standard Chamber model is a single chamber unit 12 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The invert height is 8.0 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 Standard W Chamber model is a single chamber unit 12 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The invert height is 8 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 High Capacity Chamber model is a single chamber unit 16 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The invert height is 11.5 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 Equalizer24 Chamber model is a single chamber unit 11 inches high, 16 inches wide and 52 inches long (effective length 48 inches). The invert height is 6 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 Equalizer36 Chamber model is a single chamber unit 12 inches high, 22 inches wide and 52 inches long (effective length 48 inches). The invert height is 6 inches. The chamber units are interlocking to form a continuous absorption field system.

The Quick4 Plus Standard LP model is a single chamber unit 8 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The invert height is 3.3 inches and 9 inches. The chamber has an interior load-bearing centerline column support system which increases the load-resisting capacity by distributing vertical stresses to the chamber periphery and column supports. The chambers are interlocking to form a continuous absorption field system.

The Quick4 Plus EQ36 LP model is a single chamber unit 8 inches high, 22 inches wide and 52 inches long (effective length 48 inches). The invert height is 3.3 inches and 9 inches. The chamber has an interior load-bearing centerline column support system which increases the load-resisting capacity by distributing vertical stresses to the chamber periphery and column supports. The chambers are interlocking to form a continuous absorption field system.

Quick4 Plus Standard model is a single chamber unit 12 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The chamber has an interior load-bearing centerline column support system which increases the load-resisting capacity by distributing vertical stresses to the chamber periphery and column supports. The chambers are interlocking to form a continuous absorption field system.

Quick4 Plus High Capacity model is a single chamber unit 14 inches high, 34 inches wide and 52 inches long (effective length 48 inches). The chamber has an interior load-bearing centerline column support system which increases the load-resisting capacity by distributing vertical stresses to the chamber periphery and column supports. The chambers are interlocking to form a continuous absorption field system.

All Infiltrator Systems Inc. chamber models are supported by Department approved model specific end caps and all-in-one periscope conveyance fittings.

II. Site Criteria

The ISI chamber absorption field system may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the trench bottom.

III. Installation Criteria

The Infiltrator High Capacity Chamber, Infiltrator High Capacity Sidewinder Chamber, Quick4 Standard Chamber, Quick 4 Standard W Chamber and Quick4 High Capacity Chamber absorption field systems shall be installed in 36-inch wide excavated trenches constructed in accordance with the Department's

Rules and Regulations for On-Site Sewage Management Systems, the Georgia Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines.

The Quick4 Equalizer36 Chamber absorption field system may be installed in 24 to 36-inch wide excavated trenches constructed in accordance with the Department's Rules and Regulations for On-Site Sewage Management Systems, the Georgia Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines.

The Quick4 Equalizer24 Chamber absorption field system may be installed in 18 to 36-inch wide excavated trenches constructed in accordance with the Department's Rules and Regulations for On-Site Sewage Management Systems, the Georgia Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines.

Quick4 Plus Standard LP, Quick 4 Plus Standard and Quick 4 Plus High Capacity Chamber absorption field systems shall be installed in 36-inch wide excavated trenches constructed in accordance with the Department's Rules and Regulations for On-Site Sewage Management Systems, the Georgia Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines

The Quick4 Plus EQ36 LP absorption field system shall be installed in 24 inch wide excavated trenches constructed in accordance with the Department's Rules and Regulations for On-Site Sewage Management Systems, the Georgia Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines

Individual units shall interlock together to form a continuous system. Manufacturer approved end caps shall be utilized. In non-vehicle traffic areas, units may be installed to provide a minimum of 6 inches of soil cover to support a 4,000-lb/axle vehicle load. Vehicular traffic or construction traffic may traverse the chamber system only when the chamber is covered with a minimum depth of 12 inches or more of soil to support an H-10 rating of 16,000 lbs/axle over the chambers. Upon completion of construction, temporary soil mounds used to bridge loads may be removed so that the final required minimum trench depth and cover are achieved.

IV. Absorption Field Sizing

The sizing of the ISI chamber absorption field system installed in absorption trenches shall be based on the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption field system is to be located. For residential use, anticipated peak flow of 150 gallons per bedroom is to be used. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance of one (1') foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

Trench installation:

Step 1. Determine design percolation rate. Design percolation rate shall be based on the most hydraulically limiting soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance of one foot below the absorption trench bottom.

Step 2: Determine the linear length required for a conventional 36-inch wide gravel absorption field system based on the percolation rate identified in step one.

Step 3: Multiply the product equivalency factor by the linear length of the conventional system determined in step two.

Chamber Model	Equivalency Factor
Quick4 Plus EQ36 LP	1.53
Quick4 Equalizer24	1.5
Quick4 Equalizer36	1.0
Quick4 Plus Standard LP	1.0
Quick4 Plus Standard	0.75
Quick4 Standard	0.75
Quick4 Standard W	0.75
Quick4 High Capacity	0.65
Quick4 Plus High Capacity	0.65
Infiltrator High Capacity	0.65
Infiltrator High Capacity Sidewinder	0.65

Example: Assume a 3-bedroom house and a 45-minute percolation rate

Then: Absorption field square footage required for a conventional absorption field system from Table DT-2 for a 45-minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house. The linear length required for a conventional 36-inch wide absorption field is 300 linear feet.

The minimum required linear footage (for this example) of the Infiltrator Chamber Systems is:

Quick4 Plus EQ36 LP	300 ft. x 1.53 = 459 linear feet
Quick4 Equalizer24	300 ft. x 1.5 = 450 linear feet
Quick4 Equalizer36	300 ft. x 1.0 = 300 linear feet
Quick4 Plus Standard LP	300 ft x 1.0 = 300 linear feet
Quick4 Plus Standard	300 ft. x .75 = 225 linear feet
Quick4 Standard	300 ft. x .75 = 225 linear feet
Quick4 Standard W	300 ft. x .75 = 225 linear feet
Quick4 High Capacity	300 ft. x .65 = 195 linear feet
Quick4 Plus High Capacity	300 ft. x .65 = 195 linear feet
Infiltrator High Capacity	300 ft. x .65 = 195 linear feet
Infiltrator High Cap Sidewinder	300 ft. x .65 = 195 linear feet

By: _____ Date: 02/15/2011

Chris Kumnick, Program Director
Environmental Health Branch
Georgia Division of Public Health

Revised 02/15/2011

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Chamber System Approval

For: Hancor Standard EnviroChamber, High Capacity SF EnviroChamber and High Capacity SW EnviroChamber Models

Issued To: Hancor, Inc.
401 Olive Street
Findlay, OH. 45839-1047

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Hancor Standard EnviroChamber, High Capacity SF EnviroChamber and High Capacity SW EnviroChamber models are approved for use in on-site sewage management systems under the following conditions.

I. System Description

The EnviroChamber absorption field system utilizes a system of chambers with each chamber unit being a molded polyolefin plastic, arch shaped, hollow structure with an exposed bottom area, solid top, and louvered sidewall for infiltration of effluent into adjoining bottom and side soil areas.

System configuration

The Standard EnviroChamber model is a single chamber unit 12 inches high, 34 5/16 inches wide and 74 13/16 inches long. The invert height is 7 ¾ inches. The chamber units are interlocking to form a continuous absorption field system.

The High Capacity SF EnviroChamber model is a single chamber unit 18 5/16 inches high, 34 ¼ inches wide and 74 1/4 inches long. The invert height is 13 ¾ inches. The chamber units are interlocking to form a continuous absorption field system.

The High Capacity SW EnviroChamber model is a single chamber unit 17 5/8 inches high, 33 5/8 inches wide and 75 5/8 inches long. The invert height is 13 ¾ inches. The chamber units are interlocking to form a continuous absorption field system.

II. Site Criteria

The Standard, High Capacity SF and High Capacity SW EnviroChamber absorption field systems may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the trench bottom.

III. Installation Criteria

The Standard, High Capacity SF and High Capacity SW EnviroChamber absorption field systems shall be installed in 36-inch wide excavated trenches constructed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines.

Individual units shall interlock together to form a continuous system. Manufacturer approved end plates shall be utilized. In non-vehicle traffic areas, units may be installed to provide a minimum of 6 inches of soil cover to support a 4,000-lb/axle vehicle load. Vehicular traffic or construction traffic may traverse the chamber system only when the load is bridged with a minimum depth of 12 inches of compacted soil cover over the chambers in target travel areas. Upon completion of construction, temporary soil mound used to bridge loads may be removed so the final desired trench depth is achieved. Chamber units shall have a minimum of 12 inches of soil cover to meet H-10 load requirements.

The Standard EnviroChamber may be installed at an 18 inch minimum trench bottom depth to provide the minimum 6 inches of soil cover.

IV. Absorption Field Sizing

The sizing of the Standard, High Capacity SF and High Capacity SW EnviroChamber absorption field systems installed in absorption trenches shall be based on the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption trench system is to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes in contact with the infiltrative surface of the chamber sidewall, trench bottom and for a distance of one (1') foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

Trench Installation:

Step 1. Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the sidewall and trench bottom area interfacing with the product infiltrative surface to a depth 1 foot below the trench bottom.

Step 2. Determine the linear length required for a conventional 36-wide conventional absorption field system based on the percolation rate identified in step one.

Step 3. Multiply the product equivalency factor by the linear length of the conventional system determined in step two.

	Equivalency Factor
Standard EnviroChamber	.75
High Capacity SF EnviroChamber	.65
High Capacity SW EnviroChamber	.65

Example: Assume a 3-bedroom house and a 45 minute percolation rate.

Then: Absorption field square footage required for a conventional 36-inch wide absorption field system from Table DT-2 for a 45 minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house.

This requires a 300 linear foot 36-inch wide conventional absorption field.

The minimum linear feet required for a Standard EnviroChamber system.

300 linear feet x 0.75 = 225 linear feet

The minimum linear feet required for a High Capacity SF or High Capacity SW EnviroChamber system.

300 linear feet x 0.65 = 195 linear feet

By: _____ Date: 4/27/06

Scott A. Uhlich, Program Manager
Land Use Unit
Environmental Health Section

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Chamber System Approval

For: EnviroChamber Pro Standard chamber
EnviroChamber Pro High Capacity chamber
EnviroChamber Pro ARC Standard chamber
EnviroChamber Pro ARC Hi-Capacity chamber

Issued To: ADS/Hancor
4640 Trueman Blvd.
Hilliard, OH. 43026

In accordance with provisions established in the Department of Human Resources Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the EnviroChamber Pro Standard, EnviroChamber Pro High Capacity, EnviroChamber Pro ARC Standard and EnviroChamber Pro ARC Hi-Capacity chamber models are approved for use in on-site sewage management systems under the following conditions.

I. System Description

The EnviroChamber Pro chamber systems utilize a system of chambers with each chamber being a molded polyolefin plastic, arch shaped, hollow structure with an exposed bottom area, solid top, and louvered sidewall for infiltration of effluent into adjoining bottom and side soil areas.

System configuration

The EnviroChamber Pro Standard model is a single chamber unit 11.5 inches high, 33.5 inches wide and 6.2 feet long. The invert height is 5.8 inches. The chamber units are interlocking to form a continuous absorption field system.

The EnviroChamber Pro High Capacity model is a single chamber unit 16 inches high, 34 inches wide and 75 inches long. The invert height is 11.3 inches. The chamber units are interlocking to form a continuous absorption field system.

The EnviroChamber Pro ARC Standard model is a single chamber unit 13 inches high, 34.5 inches wide and 63 inches long (effective length is 60 inches). The invert height is 7.13 inches. The chamber units are interlocking to form a continuous absorption field system.

The EnviroChamber Pro ARC Hi-Capacity model is a single chamber unit 16 inches high, 34.5 inches wide and 63 inches long (effective length is 60 inches). The invert height is 10.75 inches. The chamber units are interlocking to form a continuous absorption field system.

II. Siting Criteria

The EnviroChamber Pro chamber absorption field systems may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management

Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the trench bottom.

III. Installation Criteria

The EnviroChamber Pro chamber absorption field systems shall be installed in 36 inch wide excavated trenches constructed in accordance with DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems, and the manufacturer's installation guidelines.

Individual units snap together to form a continuous system. Manufacturer approved end plates shall be utilized. In non-vehicle traffic areas, units may be installed to provide a minimum of six (6") inches of soil cover to support a 4,000-lb/axle vehicle load. Vehicle traffic or construction traffic may traverse the chamber system only when the load is bridged with a minimum depth of twelve (12") inches of compacted soil cover over the chambers in the target travel area. Upon completion of construction, temporary soil mounds used to bridge loads may be removed so the final desired trench depth is achieved.

The EnviroChamber Pro Standard and ARC 36 chamber models may be installed at a minimum 18 inch trench bottom depth to provide a minimum 6 inches of soil cover.

IV. Absorption Field Sizing

The sizing of the EnviroChamber Pro chamber absorption field systems installed in absorption trenches shall be based on the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption field system is to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance of one (1') foot below the absorption trench bottom

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

Trench Installation:

Step 1. Determine design percolation rate. Design percolation rate shall be based on the most hydraulically limiting soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance one foot below the absorption the absorption trench bottom.

Step 2. Determine the linear length required for a conventional 36 inch wide conventional absorption field system based on the percolation rate identified in step one.

Step 3. Multiple the product equivalency factor by the linear length of the conventional system determined in step two.

	Equivalency Factor
EnviroChamber Pro Standard chamber system	.75
EnviroChamber Pro High Capacity chamber system	.65
EnviroChamber Pro ARC Standard chamber system	.75
EnviroChamber Pro ARC Hi-Capacity chamber system	.65

Example: Assume a 3-bedroom house and a 45-minute percolation rate

Then: Absorption field square footage required for a conventional absorption field system from Table DT-2 for a 45-minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house.

This requires a 300 linear foot 36-inch wide conventional absorption field.

A. The minimum linear length required for an EnviroChamber Pro Standard chamber and ARC Standard chamber system is:

300 linear feet x 0.75 = 225 linear feet

B. The minimum linear length required for an EnviroChamber Pro High Capacity chamber system and ARC Hi-Capacity chamber system is:

300 linear feet x 0.65 = 195 linear feet

By: _____ Date: 5/1/06

Scott A. Uhlich, Director
Land Use Program
Environmental Health Section

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Chamber System Approval

For: BioDiffuser Standard chamber model
BioDiffuser 14-inch High Capacity and 16-inch High Capacity chamber models
ARC 36 and ARC 36HC chamber models

Issued To: ADS/PSA, Inc.
4640 Trueman Blvd.
Hilliard, OH. 43026

In accordance with provisions established in the Department of Human Resources Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the BioDiffuser Standard, BioDiffuser 14-inch High Capacity, BioDiffuser 16-inch High Capacity, ARC36 and ARC36 HC chamber models are approved for use in on-site sewage management systems under the following conditions.

I. System Description

The BioDiffuser and ARC36 chamber systems utilize a system of chambers with each chamber being a molded polyolefin plastic, arch shaped, hollow structure with an exposed bottom area, solid top, and louvered sidewall for infiltration of effluent into adjoining bottom and side soil areas.

System configuration

The BioDiffuser Standard model is a single chamber unit 11.5 inches high, 33.5 inches wide and 6.2 feet long. The invert height is 5.8 inches. The chamber units are interlocking to form a continuous absorption field system.

The BioDiffuser 14-inch High Capacity model is a single chamber unit 14 inches high, 34 inches wide, and 75 inches long. The invert height is 9 inches. The chamber units are interlocking to form a continuous absorption field system.

The BioDiffuser 16-inch High Capacity model is a single chamber unit 16 inches high, 34 inches wide, and 75 inches long. The invert height is 11.3 inches. The chamber units are interlocking to form a continuous absorption field system.

The ARC 36 model is a single chamber unit 13 inches high, 34.5 inches wide and 63 inches long (effective length is 60 inches). The invert height is 7.13 inches. The chamber units are interlocking to form a continuous absorption field system.

The ARC 36HC model is a single chamber unit 16 inches high, 34.5 inches wide and 63 inches long (effective length is 60 inches). The invert height is 10.75 inches. The chamber units are interlocking to form a continuous absorption field system.

II. Siting Criteria

The PSA BioDiffuser and ARC 36 absorption field systems may be utilized on sites determined to be suitable for conventional absorption field systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the trench bottom.

III. Installation Criteria

The PSA BioDiffuser and ARC 36 absorption field systems shall be installed in 36 inch wide excavated trenches constructed in accordance with DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems, and the manufacturer's installation guidelines.

Individual units snap together to form a continuous system. Manufacturer approved end plates shall be utilized. In non-vehicle traffic areas, units may be installed to provide a minimum of six (6") inches of soil cover to support a 4,000-lb/axle vehicle load. Vehicle traffic or construction traffic may traverse the chamber system only when the load is bridged with a minimum depth of twelve (12") inches of compacted soil cover over the chambers in the target travel area. Upon completion of construction, temporary soil mounds used to bridge loads may be removed so the final desired trench depth is achieved.

The BioDiffuser Standard and ARC 36 chamber model may be installed at a minimum 18 inch trench bottom depth to provide a minimum 6 inches of soil cover.

IV. Absorption Field Sizing

The sizing of the BioDiffuser Chamber and ARC 36 absorption field systems installed in absorption trenches shall be based on the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption field system is to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance of one (1') foot below the absorption trench bottom

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

Trench Installation:

Step 1. Determine design percolation rate. Design percolation rate shall be based on the most hydraulically limiting soil horizon that comes in contact with the infiltrative surface of the sidewall, trench bottom and for a distance one foot below the absorption the absorption trench bottom.

Step 2. Determine the linear length required for a conventional 36 inch wide conventional absorption field system based on the percolation rate identified in step one.

Step 3. Multiple the product equivalency factor by the linear length of the conventional system determined in step two.

	Equivalency Factor
BioDiffuser Standard chamber system	.75
BioDiffuser 14-inch High Capacity chamber system	.65
BioDiffuser 16-inch High Capacity chamber system	.65
ARC 36 chamber system	.75
ARC 36HC chamber system	.65

Example: Assume a 3-bedroom house and a 45-minute percolation rate

Then: Absorption field square footage required for a conventional absorption field system from Table DT-2 for a 45-minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house.

This requires a 300 linear foot 36-inch wide conventional absorption field.

A. The minimum linear length required for a BioDiffuser standard chamber and ARC 36 chamber system is:

300 linear feet x 0.75 = 225 linear feet

B. The minimum linear length required for a BioDiffuser 14-inch, 16-inch High Capacity chamber system and ARC 36HC chamber system is:

300 linear feet x 0.65 = 195 linear feet

By: _____ Date: 4/27/06

Scott A. Uhlich, Director
Land Use Program
Environmental Health Section

Georgia Department of Public Health

Brenda Fitzgerald, MD, Commissioner | Nathan Deal, Governor

2 Peachtree Street NW, 15th Floor
Atlanta, Georgia 30303-3142
dph.ga.gov

August 26, 2015

Mr. Chris Stewart
Advanced Drainage Systems, Inc.
4640 Trueman Boulevard
Hilliard, Ohio 43026

Subject: **Absorption Field Product Listing: *ADS, Inc. Septic Stack; SS-9, SS-11, SS-13, and SS-13-36***

Mr. Steward,

Per you request by application, for name change and product listing and in recognition of prior approvals, the Department of Public Health (DPH) has listed your product, as referenced above. ADS Septic Stack products are approved for use in Georgia for the installation of on-site sewage management systems. This prior approval was granted based on printed materials submitted to the Department on the referenced configurations including specifications, testing results, design and installation criteria meeting the standards of the DPH Rules for On-site Sewage Management Systems, Chapter 511-3-1. The approval is subject to review under provisions established in the Official Code of Georgia Annotated Title 31-2-7 and the DPH Chapter Rules. If the Department initiates a review of the product's approval, Advanced Drainage Systems, Inc. will be notified.

Any changes in specifications, materials or installation criteria will void the approval and require a new product review prior to its use in the state of Georgia. Enclosed is the product approval document detailing system description, installation and sizing criteria as approved May 30th, 2006 by the Department.

If you have any questions regarding your listing and prior approval, please contact this office at 404-657-6534.

Sincerely,

Chris G. Kumnick
Deputy Environmental Health Director
Environmental Health Section
Georgia Department of Public Health

Enclosed: Septic Stack Georgia Approval, (dated 5.30.2006)

Cc: Dr. Chris Rustin
DPH District EH Directors

File

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: Advanced Drainage Systems, Inc. MPS-13, MPS-11, MPS- 9 and MPS-13-36 models

Issued To: Advanced Drainage Systems, Inc. (ADS)
71 Orchard Farm Road
York, ME 03909

In accordance with provisions established in the Department of Human Resources Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Advanced Drainage Systems, Inc. (ADS) MPS-13, MPS-11, MPS-9 and MPS-13-36 models are approved for use in on-site sewage management systems under the following conditions:

I. System Description

The Advanced Drainage System Multi-Pipe System (MPS) utilizes wastewater absorption trenches that contain bundles of four-inch diameter corrugated polyethylene perforated flexible pipe in place of rock aggregate. The pipes used to create the MPS shall come in nominal 10-foot lengths. The distribution pipe shall meet ASTM F 405, Standard Specifications for Corrugated Polyethylene Pipe. The void pipes shall be designed with both holes and slots and shall meet ASTM D-3350 and ASTM D-2412.

Alternative System Configurations

The **MPS-9 pipe system** consists of one 5-pipe void bundle, one 3-pipe void bundle and one distribution pipe placed together in a 24-inch to 36-inch wide absorption trench. This creates a system comprised of 5 void pipes along the trench bottom and 3 void pipes and one distribution pipe placed across the top of the 5 bottom void pipes. The central distribution pipe shall be connected by a built on coupler, or other approved coupling device, to allow continuous flow from one section to the adjacent section.

The MPS-11 pipe system consists of two 5-pipe void bundles and one distribution pipe placed together in a 30-inch to 36-inch wide absorption trench. This creates a system comprised of 6 void pipes placed along the trench bottom and 4 void pipes and one distribution pipe placed across the top of the 6 bottom void pipes. The central distribution pipe shall be connected by a built on coupler, or other approved coupling device, to allow continuous flow from one section to the adjacent section.

The MPS-13 pipe system consists of two 5-pipe void bundles, and one 3-pipe bundle, which consists of 2 void pipes and one distribution pipe placed together in a 36-inch wide absorption trench. This creates a system comprised of 7 void pipes placed along the trench bottom and 5 void pipes and one distribution pipe placed across the top of the 7 bottom void pipes. The central distribution pipe shall be connected by a built on coupler, or other approved coupling device, to allow continuous flow from one section to the adjacent section.

The MPS-13-36 pipe system consists of two 5-pipe void bundles and one 3-pipe bundle, which consists of 2 void pipes and one distribution pipe. The two 5-pipe bundles (three pipes down) are

placed together in a 36-inch wide absorption trench. The bands on the 3 pipe bundle are cut creating two loose void pipes and one distribution pipe. One of each of the loose void pipes are placed on the outside of each 5-pipe bundle for a total of 8 void pipes across the absorption trench bottom. The distribution pipe is placed with the green line up in the center of the second row of void pipes. This creates a system comprised of 8 void pipes placed along the trench bottom and 4 void pipes and one distribution pipe placed across the top of the 8 void pipes. The central distribution pipe shall be connected by a built on coupler or other approved coupling device, to allow continuous flow from one section to the adjacent section.

II. Site Criteria

The ADS Multi-Pipe System may be utilized on sites determined to be suitable for conventional aggregate drainfield systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the absorption trench bottom.

III. Installation Criteria

The ADS Multi-Pipe System shall be installed in the configurations in Section I, in absorption trenches constructed according to criteria established in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems for conventional absorption field systems. The system shall be installed in accordance with the manufacturer's guidelines including the placement of geotextile fabric filter over the open pipe ends.

The finished system must be completely covered with filter fabric to protect both the top and side from soil intrusion. The filter fabric should be placed over the top and sides in such a way that it drapes down covering the sides of the pipe.

The excavated trench width shall be as indicated in Section I for the selected configuration. In non-vehicle traffic areas, the ADS Multi-Pipe System may have a minimum of 6 inches of soil cover to support a 4,500-lb/axle vehicle load. Vehicle traffic or construction traffic may traverse the MPS only when the load is bridged with a minimum depth of 12 inches of compacted soil cover over the system in the target travel areas to meet H-10 load requirements. Upon completion of construction, temporary soil mounds used to bridge loads may be removed so final desired trench depth is achieved.

IV. Absorption Field Sizing

The sizing of the ADS Multi-Pipe system shall be based upon the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption fields are to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon encounter at the aggregate and soil interface along the sidewall and trench bottom area to a depth 1 foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for installation.

The following equivalency factors shall be used for the ADS Multi-Pipe System models:

System Configuration	Equivalency Factor
MPS-13-36	0.67
MPS-13	0.75
MPS-11	0.90
MPS-9	1.12

Trench Installation:
Step One: Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the sidewall and trench bottom area interfacing with the product infiltrative surface to a depth 1 foot below the trench bottom.

Step Two: Determine the linear footage required for a conventional 36-inch wide absorption field system based on the percolation rate identified in step one.

Step Three: Identify the MPS configuration for installation. Multiply the equivalency factor for the MPS configuration to be used by the linear footage required for the conventional system determined in Step Two. The result is the linear footage required for the MPS configuration selected.

Example:
Assume: 3-bedroom house and a percolation rate of 45 minutes per inch.

Then: Absorption field square footage required for a conventional aggregate field from Table DT-2 for a 45 minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house. The linear length required for the conventional 36-inch wide absorption field is 300 linear feet.

The minimum required linear footage of the MPS absorption field system is:

MPS-9	300 ft. x 1.12 = 336 ft.
MPS-11	300 ft. x 0.90 = 270 ft
MPS-13	300 ft. x 0.75 = 225 ft.
MPS-13-36	300 ft. x 0.67 = 201 ft.

By: _____ Date: 5/30/06
Scott A. Uhlich, Program Manager
Land Use Unit
Environmental Health Section

Georgia Department of Public Health
Environmental Health Section

Alternative System Approval

For: Plastic Tubing Industries, Inc. **MPS-3611GS, MPS-1336, MPS-13, MPS-11, and MPS-9**

Issued To: Plastic Tubing Industries
P.O. Box 607356
Orlando, Florida 32860-7356

In accordance with provisions established in the Department Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Plastic Tubing Industries, Inc. (PTI) **MPS-3611GS, MPS-1336, MPS-13, MPS-11, and MPS-9** models are approved for use in trenches, beds, and mounds in on-site sewage management systems under the following conditions:

I. System Description

The Plastic Tubing Industries Multi-Pipe System (MPS) utilizes wastewater absorption trenches comprised of specially engineered four inch HDPE corrugated pipes. Each model references the number of pipes in a configuration. Each configuration features a white lined distribution pipe and additional void pipes specially perforated with both holes and slots designed to replace rock aggregate. The pipes used to create the MPS shall come in nominal 7.5 foot or 10 foot lengths. The distribution pipe shall meet ASTM F-405, Standard Specifications for Corrugated Polyethylene Pipe. The void pipes shall be designed with both holes and slots and shall meet ASTM D-3350 and ASTM D-2412.

Alternative System Configurations

The **MPS- 3611GS** pipe system consists of 11 pipes total and is defined as a system with 8 pipes on the bottom tier and 3 pipes on the top in a 36 inch wide absorption trench. A 7 pipe bundle is centered in the trench positioned so that it will have 4 void pipes on the bottom and 3 pipes on top. A 4-pipe bundle of void pipe is cut open placing 2 pipes on both sides of the 7-pipe bundle in the bottom tier. In the top tier, the distribution pipe must be placed with its white line at the 12 o'clock position. The white lined distribution pipe is the only pipe that needs to be connected by its coupler ends, or an approved coupling device to allow continuous flow from one section to the adjacent section.

The **MPS-13-36** pipe system consists of 13 pipes total and is defined as a system with 8 pipes on the bottom tier and 5 on the top in a 36 inch wide absorption trench. The 2 bundles each having 5 void pipes are placed together in the center of the trench forming a valley on top. The 3 pipe bundle containing the distribution pipe is cut open and the distribution pipe is placed in the valley with its white line at 12 o'clock position. The remaining 2 void pipes are placed on the bottom tier on both sides of the system. The white lined distribution pipe is the only pipe that needs to be connected by its coupler ends, or an approved coupling device to allow continuous flow from one section to the adjacent section.

The **MPS-13** pipe system consists of 13 pipes total and is defined as a system with 7 pipes on the bottom tier and 6 on the top in a 36 inch wide absorption trench. The 2 bundles of 5 void pipes are placed together in the center of the trench forming a valley on top. The 3 pipe bundle

containing the distribution pipe is inverted and wedged between the 2 bundles in the trench with the distribution pipe on top and the white line at the 12 o'clock position. The white lined distribution pipe is the only pipe that needs to be connected by its coupler ends, or an approved coupling device to allow continuous flow from one section to the adjacent section.

The **MPS-11** pipe system consists of 11 pipes total and is defined as a system with 6 pipes on the bottom tier and 5 on the top in a 30-inch to 36-inch wide absorption trench. The 2 bundles each having 5 void pipes are placed together in the center of the trench forming a valley on top. The distribution pipe with its white line at the 12 o'clock position is placed within the valley formed**.** The white lined distribution pipe is the only pipe that needs to be connected by its coupler ends, or an approved coupling device to allow continuous flow from one section to the adjacent section.

The **MPS-9** pipe system consists of 9 pipes total and is defined as a system with 5 pipes on the bottom tier and 4 on the top in a 24-inch wide absorption trench. The distribution pipe with its white line placed at the 12 o'clock position. The white lined distribution pipe is the only pipe that needs to be connected by its coupler ends, or an approved coupling device to allow continuous flow from one section to the adjacent section.

II. Site Criteria

The PTI Multi-Pipe System may be utilized on sites determined to be suitable for conventional aggregate drainfield systems as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems. The vertical separation requirements from seasonal groundwater, rock, impervious soil layers, or other unsuitable environmental conditions shall be measured from the absorption trench bottom.

III. Installation Criteria

The PTI Multi-Pipe System shall be installed in the configurations in Section I, in absorption trenches constructed according to criteria established in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems for conventional absorption field systems. The system shall be installed in accordance with the manufacturer's guidelines including the placement of geotextile fabric filter over the open pipe ends.

The finished system must be completely covered with filter fabric to protect both the top, ends, and sides from soil intrusion. The filter fabric should be placed over the top, ends, and sides in such a way that it drapes down covering the sides of the pipe.

The excavated trench width shall be as indicated in Section I for the selected configuration. In non-vehicle traffic areas, the PTI Multi-Pipe System may have a minimum of 6 inches of soil cover to support a 4,500-lb/axle vehicle load. Vehicle traffic or construction traffic may traverse the MPS only when the load is bridged with a minimum depth of 12 inches of compacted soil cover over the system in the target travel areas to meet H-10 load requirements. Upon completion of construction, temporary soil mounds used to bridge loads may be removed so final desired trench depth is achieved.

IV. Absorption Field Sizing

The sizing of the PTI Multi-Pipe system shall be based upon the anticipated peak daily volume of treated sewage and the characteristics of the soil in which the absorption fields are to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon encountered at the aggregate and soil interface along the sidewall and trench bottom area to a depth 1 foot below the absorption trench bottom.

For lots less than three acres in size, soil horizons that exceed a percolation rate of 90 minutes per inch shall not be considered for conventional installation.

On tracts or parcels of land of three acres or more, soil horizons that exceed a percolation rate of 120 minutes per inch shall not be considered for conventional installation.

The following equivalency factors shall be used for the PTI Multi-Pipe System models:

System Configuration	Equivalency Factor
MPS-3611GS	0.75
MPS-13-36	0.67
MPS-13	0.75
MPS-11	0.90
MPS-9	1.12

Trench Calculations:

Step One: Determine the design percolation rate. The design percolation rate shall be based on the most hydraulically limiting soil horizon along the sidewall and trench bottom area interfacing with the product infiltrative surface to a depth of 1 foot below the trench bottom.

Step Two: Determine the linear footage required for a conventional 36-inch wide absorption field system based on the percolation rate identified in step one.

Step Three: Identify the MPS configuration for installation. Multiply the equivalency factor for the MPS configuration to be used by the linear footage required for the conventional system determined in Step Two. The result is the linear footage required for the MPS configuration selected.

Example:

Assume: 3-bedroom house and a percolation rate of 45 minutes per inch.

Then: Absorption field square footage required for a conventional aggregate field from Table DT-2 for a 45 minute percolation rate is 300 square feet per bedroom or 900 square feet for the three-bedroom house. The linear length required for the conventional 36-inch wide absorption field is 300 linear feet.

The minimum required linear footage of the MPS absorption field system is:

MPS-3611GS	300 ft.	x	0.75	= 225 ft
MPS-13-36	300 ft.	x	0.67	= 201 ft
MPS-13	300 ft.	x	0.75	= 225 ft.
MPS-11	300 ft.	x	0.90	= 270 ft
MPS-9	300 ft.	x	1.12	= 336 ft.

By: _____ Date: 10-01-2015

Chris G. Kumnick,
Deputy Director, Environmental Health Program
Environmental Health Section
Department of Public Health

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: Puraflo Peat Biofilter

Issued To: Bord Na Mona
P.O. Box 77457
Greensboro, NC 27417

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Puraflo Peat Biofilter is approved for use with on-site sewage management systems for domestic wastewater treatment under the following conditions:

I. System Description

The Bord Na Mona Puraflo Peat Biofilter is an integrated on-site wastewater treatment system consisting of polyethylene modules containing bio-fibrous peat treatment media. The polyethylene modules have a distribution system at the base of their arrangement for equal distribution. Wastewater from the septic tank is pumped from a state-approved dosing tank to the distribution system of the biofilter unit. The wastewater is dispersed via a flow-splitting manifold, flexible connection pipes and orifice plates, and a distribution grid in each unit. Wastewater flows through the peat filter medium and is discharged by infiltration into the ground through the absorption bed or trench.

The blue colored Puraflo modules have weep holes around the entire unit for use in an absorption bed. The green colored Puraflo modules have weep holes around half the unit so that the solid sided portion of the module may be used for sampling. The white colored Puraflo modules have no weep holes for use with absorption trenches or any pressurized disposal field.

When used for the secondary treatment of domestic wastewater, the Bord Na Mona Puraflo Peat Biofilter is approved as an advanced treatment system producing a Class I effluent as defined in the Department's Manual for On Site Sewage Management Systems.

II. Siting Criteria

The Puraflo series Biofilters may be utilized on sites determined to be suitable as specified in the DHR Rules and Regulations for On Site Sewage Management Systems and the Department's Manual for On Site Sewage Management Systems with the following exception(s):

1. The Puraflo series Biofilter may not be used on sites that exceed a maximum percolation rate of 90 minutes per inch when used with an absorption bed. The Puraflo series Biofilter may not be used on sites that exceed a maximum percolation rate of 120 minutes per inch when used with an absorption trench.
2. A minimum vertical separation of 12 inches of naturally occurring soil must be present between the bed bottom or trench bottom infiltrative surface and any impervious or limiting soil horizon.

III. Installation Criteria

The Puraflo Peat Biofilters shall be installed in accordance with the DHR Rules and Regulations for On Site Sewage Management Systems, the Department's Manual for On Site Sewage Management Systems and the manufacturer's installation guidelines including:

1. Prior to installation of the Puraflo Biofilter, a septic contractor must hold a valid septic tank contractors certification for the Department of Human Resources and be an authorized representative of the manufacturer approved to install the referenced products.
2. The septic tank and Puraflo Peat Biofilter must be installed on a site that is not subject to flooding or prone to receiving vehicle traffic.
3. The modules may not be buried or covered with soil or any heavy objects.
4. Two or more units are allowed to be utilized with a manufacturer approved distribution device as site and soil conditions allow. The Puraflo modules must be installed with equal distribution to each unit.
5. Time dosing is required for equal distribution. This includes a State of Georgia approved pump tank (1000 gallon minimum per manufacturer's recommendation) and audio/visual alarms. The amount of water released to each Puraflo module shall not exceed 5 to 15 gallons/dose/module with a minimum 0.8 to 2.4 hour resting period after each cycle.
6. A DHR approved effluent filter must be installed on the outlet end of the septic tank used before a Puraflo Peat Biofilter configuration.
7. Absorption trenches or beds shall be constructed in accordance with the DHR Rules and Regulations for On Site Sewage Management Systems, the Department's Manual for On Site Sewage Management Systems and the manufacturer's installation guidelines. Geo-textile fabric or equivalent must be placed over the exposed gravel (outside the footprint of the unit) in the absorption bed or trenches.
8. The use of a garbage disposal unit is not recommended for use with a Puraflow Peat Biofilter, per manufacturer's recommendations.

IV. Design Criteria

Bord Na Mona Puraflo Peat Biofilters required:

Number of Bedrooms	1	2	3	4	5	6	7	8	9	10	11	12
GPD	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800
Modules required	1	2	3	4	5	6	7	8	9	10	11	12

*Any Puraflo Peat Biofilter system proposed over 2000 gallons per day must be designed by a professional engineer.

1. Site-specific plans and specifications shall be submitted for review and approval by the local health department prior to issuance of an On-site Sewage Management System construction permit. Only individuals authorized in writing by the manufacturer or by a professional engineer shall prepare these plans.
2. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon in contact with the infiltrative surface of the bed/trench side-wall and bottom, and extending for a distance one (1') foot below the absorption bed/trench bottom.

3. Treatment sizing shall be determined based on 150 gallons per module.
4. Absorption field sizing shall be determined by the current sizing chart for Class I effluent in the Department's Manual for On Site Sewage Management Systems (see Addendum A).
5. All absorption field configurations must be time-dosed to ensure that the expected 24-hour flow is applied in a 24-hour period and ensure equal distribution.
6. The absorption bed shall consist of twelve (12") inches, eight (8") inches or six (6") inches of washed gravel, ½" to 2" in diameter. When using eight (8") inches or six (6") inches of gravel in an absorption bed, the square feet of absorption bed required, as established by the Class I effluent sizing chart, must be multiplied by an equivalency factor of 1.08 and 1.12 respectively.

Example: Four Bedroom home with Percolation Rate of 20 minutes/inch and 2 feet of separation from water table, bed configuration. 150 GPD/bedroom.

(4 BR * 150 GPD/BR) = 600 gallons per day
20 minute/inch percolation rate = 1.0 Gal/Day/ft² (Class I chart)
600 GPD / 1.0 GPD/Day/ft² = 600 ft^2 of absorption field bottom area with 12" gravel

Or

600 ft^2 * 1.08 (8" gravel bed equivalency factor) = 648 ft^2 absorption field bottom area with 8" gravel

Or

600 ft^2 * 1.12 (6" gravel bed equivalency factor) = 672 ft^2 absorption field bottom area with 6" gravel

7. The gravel base typically covers a 320 ft^2 area, yet can be configured for varying site and soil conditions. A combination of a bed and absorption trenches may be used to make up additional square footages as dictated by site conditions.
8. A Puraflo system is typically not installed on sites that contain slopes of greater than 35% unless the results of a special investigation by a soil classifier demonstrates the slope limitation can be overcome by design or by site modification.
9. The manufacturer shall review designs for systems that have a waste stream in excess of 350 mg/L total suspended solids and/or 300 mg/L carbonaceous biochemical oxygen demand (domestic strength waste). A letter from the manufacturer stating that the designs for such a system meet manufacturer specifications shall accompany applications to the local health department for permitting.

V. Service Related Obligations

1. The manufacturer or the authorized representative must furnish a three-year initial service policy to the owner; the cost of the initial service policy must be included in the original purchase price. The initial service policy must contain provisions for annual service visits (a minimum of one service visit/year) during which electrical, mechanical, and other applicable components are inspected, adjusted and serviced.
2. The initial service policy must contain a clause that states that the owner will be notified in writing, about improper operations that cannot be remedied at the time of inspection and that written notification must include an estimated date of correction; if the malfunction is expected to cause a sewage backup into the dwelling or a

surface discharge of effluent, then a copy must be furnished to the local health authority.

3. Service providers must maintain accurate records of their service contracts, customers and time lines for renewal of service contracts.
4. The manufacturer or licensed distributor shall submit to the Department and county health authority by March 15th reports of maintenance/service visits conducted during the previous year.
5. The manufacturer or authorized representative must make available, for purchase by the owner, an extended service policy with services equal to or greater than those provided by the initial service policy. The owner must obtain such a service policy or insure that equivalent maintenance is provided. Maintenance and periodic reporting must continue for the life of the system.
6. A manufacturer prepared owner's manual must accompany each Puraflo Peat Biofilter. The authorized representative must provide copies of the manual to the system owner at the time of installation.

By: _____ Date: _____

Scott A. Uhlich, Program Manager
Land Use Program, Environmental Health Sect.

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: Ecoflo Biofilters – ST-500, STB-500, ST-650, STB-650

Issued To:

Premier Tech Environment
1 Avenue Premier
Riviere Du Loup, Quebec, Canada G5R61

Premier Tech Environment
1099 Lakewood Lane
Versailles, KY 40383

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Ecoflo ST and STB series Biofilter are approved for use with on-site sewage management systems for domestic wastewater treatment under the following conditions:

I. System Description

The Ecoflo ST series Biofilter is an integrated on-site wastewater treatment system consisting of a small fiberglass shell with a filter bed made from specially treated sphagnum peat moss. The Ecoflo ST series fiberglass shell has an open bottom and is utilized with an absorption bed. Wastewater from the septic tank is pumped from a state-approved dosing tank to the distribution system of the biofilter unit. The wastewater is dispersed via the "tipping bucket" onto the dispersion plates. Wastewater flows through the peat filter medium and is discharged by infiltration into the ground through the absorption bed.

The Ecoflo STB series Biofilter differs from the ST series in that a collection bottom is attached to the fiberglass shell. The Ecoflo STB series may be used in conjunction with an absorption trench or with pressure dosed subsurface absorption fields.

When used for the secondary treatment of domestic wastewater, the Ecoflo Series Biofilter is approved as an advanced treatment system producing a Class I effluent as defined in the Department's Manual for On Site Sewage Management Systems.

II. Siting Criteria

The Ecoflow ST and STB series Biofilters may be utilized on sites determined to be suitable as specified in the DHR Rules and Regulations for On Site Sewage Management Systems and the Department's Manual for On Site Sewage Management Systems with the following exception(s):

1. The Ecoflow ST series Biofilter may not be used on sites that exceed a maximum percolation rate of 90 minutes per inch when used with an absorption bed. The Ecoflow STB series Biofilter may not be used on sites that exceed a maximum percolation rate of 120 minutes per inch when used with an absorption trench.
2. A minimum vertical separation of 12 inches of naturally occurring soil must be present between the bed bottom or trench bottom infiltrative surface and any impervious or limiting soil horizon.

III. Installation Criteria

The Ecoflow ST and STB Biofilters shall be installed in accordance with the DHR Rules and Regulations for On Site Sewage Management Systems, the Department's Manual for On Site Sewage Management Systems and the manufacturer's installation guidelines including:

1. Prior to installation of the Ecoflow Biofilter, a septic contractor must hold a valid septic tank contractors certification for the Department of Human Resources and be an authorized representative of the manufacturer approved to install the referenced products.
2. The septic tank and Ecoflow Biofilter must be installed on a site that is not subject to flooding or prone to receiving vehicle traffic.
3. The manufacturer's startup procedure must be used, including filling the septic tank to two-thirds (2/3) capacity with water, allowing the remainder of the tank to be filled with domestic strength waste (350 mg/L total suspended solids, 300 mg/L $CBOD_5$).
4. The lid of the Ecoflow Biofilter must be at least 2" above ground level without the use of risers after final landscaping.
5. Two or more units are allowed to be utilized with a manufacturer/state approved distribution device as site and soil conditions allow. Ecoflow Biofilters must be installed "in parallel" to one another with equal distribution to each unit.
6. Time dosing is required for equal distribution. The amount of water released to each Ecoflo Biofilter shall not exceed 10 gallons/dose with a minimum 2-minute resting period after each cycle. This is determined by a site specific soil investigation. A pressure-equalizing pipe, as required by the manufacturer, must connect the pumping station and the Ecoflow Biofilter.
7. An approved effluent filter must be installed on the outlet end of the septic tank used before an Ecoflow Biofilter.
8. Absorption trenches or beds shall be constructed in accordance with the DHR Rules and Regulations for On Site Sewage Management Systems, the Department's Manual for On Site Sewage Management Systems and the manufacturer's installation guidelines. Geo-textile fabric or equivalent must be placed over the exposed gravel (outside the footprint of the unit) in the absorption bed or trenches.
9. The absorption trench or bed bottom infiltrative surface shall be no deeper than 48 inches below the original soil surface, as required by the manufacturer.

IV. Design Criteria

Number of Ecoflo Modules required.

Number of Bedrooms	ST – 500 and STB – 500 Ecoflo Modules (420 GPD)	ST – 650 and STB – 650 Ecoflo Modules (600 GPD)
1 to 2	1	1
3 to 4	2	1
5	2	2
6	3	2
7+	*	*

*Any Ecoflo Peat Biofilter system proposed over 1000 gallons per day must be designed by a professional engineer.

1. Site-specific plans and specifications shall be submitted for review and approval by the local health department prior to issuance of an On-site Sewage Management

System construction permit. Only individuals authorized in writing by the manufacturer or by a professional engineer shall prepare these plans.

2. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon in contact with the infiltrative surface of the bed/trench side-wall and bottom, and extending for a distance one (1') foot below the absorption bed/trench bottom.
3. Absorption field sizing shall be determined by the current sizing chart for Class I effluent in the Department's Manual for On Site Sewage Management Systems (see Addendum A).
4. All bed absorption field configurations must be time-dosed to ensure that the expected 24-hour flow is applied in a 24-hour period and ensure equal distribution.
5. The absorption bed shall consist of twelve (12") inches or eight (8") inches of washed gravel, ½" to 2" in diameter. When using eight (8") inches of gravel in an absorption bed, the square feet of absorption bed required, as established by the Class I effluent sizing chart, must be multiplied by an equivalency factor of 1.08 .

Example: Four Bedroom home with Percolation Rate of 20 minutes/inch and 2 feet of separation from water table, bed configuration. 150 GPD/bedroom.

(4 BR * 150 GPD/BR) = 600 gallons per day
20 minute/inch percolation rate = 1.0 Gal/Day/ft² (Class I chart)
600 GPD / 1.0 GPD/Day/ft² = 600 ft^2 of absorption field bottom area with 12" gravel

Or

600 ft^2 * 1.08 (8" gravel bed equivalency factor) = 648 ft^2 absorption field bottom area with 8" gravel

6. For absorption fields exceeding 300 sq. ft., it is recommended that absorption trenches be added to a 300 sq. ft. bed to obtain the total absorption field area required.
7. The manufacturer shall review designs for systems other than single-family residences. A letter from the manufacturer stating that these designs meet manufacturer specifications shall accompany applications to the local health department for permitting.

V. Service Related Obligations

1. The manufacturer or the authorized representative must furnish a three-year initial service policy to the owner; the cost of the initial service policy must be included in the original purchase price. The initial service policy must contain provisions for annual service visits (a minimum of one service visit/year) during which electrical, mechanical, and other applicable components are inspected, adjusted and serviced.
2. The initial service policy must contain a clause that states that the owner will be notified in writing, about improper operations that cannot be remedied at the time of inspection and that written notification must include an estimated date of correction; if the malfunction is expected to cause a sewage backup into the dwelling or a surface discharge of effluent, then a copy must be furnished to the local health authority.
3. Service providers must maintain accurate records of their service contracts, customers and time lines for renewal of service contracts.

4. The manufacturer or licensed distributor shall submit to the Department and county health authority by March 15th reports of maintenance/service visits conducted during the previous year.
5. The manufacturer or authorized representative must make available, for purchase by the owner, an extended service policy with services equal to or greater than those provided by the initial service policy. The owner must obtain such a service policy or insure that equivalent maintenance is provided. Maintenance and periodic reporting must continue for the life of the system.
6. A manufacturer prepared owner's manual must accompany each Ecoflow Biofilter. The authorized representative must provide copies of the manual to the system owner at the time of installation.

By: _____ Date: 4/27/06

Scott A. Uhlich, Program Manager
Land Use Program, Environmental Health Sect.

Georgia Department of Human Resources
Division of Public Health
Environmental Health Section

Alternative System Approval

For: Eljen GSF Geotextile Sand Filter System

Issued To: Eljen Corporation
10 North Main Street, Suite 216
West Hartford, CT 06107

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Eljen GSF Geotextile Sand Filter System is approved, for use with on-site sewage management systems for domestic wastewater treatment under the following conditions:

I. System Description

The Eljen GSF Geotextile Sand Filter System utilizes a two stage treatment process for the dispersion of effluent into the soil. The GSF is made up of a light-weight, recycled cuspated plastic core, a geotextile membrane sized for filtration of septic effluent, and a 6-inch (minimum) layer of approved ASTM C33 or equivalent sand. The plastic core is designed into an "S-curve configuration" to provide separation of the Bio-Matt™ Fabric (geotextile membrane) layers, to maintain structural integrity, and to aid in oxygen transfer from the soil to the effluent. The geotextile membrane filters the effluent and protects the sand from fines. This geotextile membrane and approved sand combine to provide secondary treatment to the effluent.

The GSF unit measures 4-feet long, 2-feet wide, and 7-inches tall. This unit (A42 module) is surrounded by 6-inches of approved sand. Each A42 module contains corrugated plastic and 16 square feet of geotextile membrane per running foot of the unit. A perforated pipe (Schedule 40) is centered above the modules to distribute the effluent over and into the geotextile corrugations. The pipe is secured with provided wire clamps. Wastewater then flows through the module and is discharged into the ground through the absorption bed, trench or mound.

The Eljen GSF Geotextile Sand Filter System is approved for use for the treatment and dispersal of wastewater having the consistency and strength of typical domestic influent. When used for the secondary treatment of domestic wastewater, the Eljen Geotextile Sand Filter System is approved as an advanced treatment system producing a Class I equivalent effluent as defined in the Department's Manual for On-Site Sewage Management Systems.

II. Siting Criteria

The Eljen GSF Geotextile Sand Filter System may be utilized on sites determined to be suitable as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems with the following exception(s):

1. The Eljen GSF Geotextile Sand Filter System may not be used on sites that exceed a maximum percolation rate of 90 minutes per inch when used with an absorption bed.

The Eljen GSF may not be used on sites that exceed a maximum percolation rate of 120 minutes per inch when used with an absorption trench.

2. A minimum vertical separation of 12 inches of naturally occurring soil must be present between the bottom of the sand of the bed bottom or trench bottom infiltrative surface and any impervious or limiting soil horizon.

Site plans are required in GA; however it is not always required to be done by a Professional Engineer.

III. Installation Criteria

The Eljen GSF modules shall be installed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and this approval document including:

1. Prior to installation of an Eljen GSF system, a septic contractor must hold a valid septic tank contractors certification for the Department and be an authorized representative of the manufacturer approved to install the referenced products. The system components and boundaries should be carefully laid out with the location and elevations of trenches or beds following the Georgia DHR Manual for On-site Sewage Management Systems. Site plans are required; however, it is not always required to be done by a professional engineer.

2. The septic tank and Eljen GSF modules must be installed on a site that is not subject to flooding or prone to receiving vehicle traffic.

3. Heavy machinery must be kept off of clay soils used for absorption and installations must not be conducted under wet conditions. The receiving layer of natural soil must be scarified or plowed to eliminate smearing and to maximize soil contact area. This area should not be raked and walking in the trench or bed should be minimized.

4. Add a 6-inch layer of ASTM C33 sand or equivalent. Compact and rake the media to grade. A hand tamper is sufficient to stabilize the sand below the GSF modules. Check for zero grade at the top of the sand before placing the modules.

5. The GSF modules must be placed on grade with the stripe in the upward position equally spaced but may angle to follow the natural contour.

6. The 2 - 4 inch, Sch 40, distribution pipe must be secured to the top of each GSF module with the provided wire clamps. The perforated pipe must be positioned over the modules with the ½ inch orifices staggered every 6 inches at the 5:00 and 7:00 positions. Perforations at the 6:00 position may be allowed when placed on a dispersion pad. Use solid pipe between modules.

7. Geotextile fabric must cover the top and sides of all GSF modules for the entire length of each row or module and ASTM C33 sand or equivalent shall be placed along the sides and bottom (6-inches minimum) of each GSF module to ensure adequate aeration of the filter media.

8. Where the total soil cover exceeds 18 inches above the geotextile media, a vent pipe shall be connected to the end of the distribution pipe(s).

9. The system should be backfilled with clean native soil with a minimum of 6 to 12 inches of cover over the pipe. Make sure that the final grade is crowned to allow for any natural settlement and to ensure diversion of surface water.

10. Seeding and stabilizing the soil cover is required to protect the system from soil erosion. Landscape timbers may be used to help stabilize the grass cover when slopes exceed that of the natural grade.

11. The individual GSF modules may be installed in a trench, bed or mound configuration as dictated by the site conditions. Absorption beds and four foot trenches must be dosed to a distribution box in a manner that uniformly distributes the effluent across the entire drainfield at a volume of 3.5 gallons or less per A42 modules.

12. Absorption trenches, beds, or mounds shall be constructed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and the manufacturer's installation guidelines. Trench width of 4 feet, including module and sand, is allowed for GSF A42 module.

IV. Absorption Field Sizing

The sizing of the Eljen GSF Geotextile Sand Filter System installed in bed, trench or mound configuration shall be based on the anticipated peak daily volume of wastewater and the characteristics of the soil in which the absorption field system is to be located. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes into contact with the infiltrative surface of the sidewall, trench/bed bottom and for a distance one (1') foot below the absorption trench/bed bottom.

Trench installation

1. Determine the design application rate by using the GSF Trench Application Rate Chart below. The design application rate is based on the percolation rate of the most hydraulically limiting soil horizon that comes into contact with the sidewall, trench bottom and for a distance of one foot below the absorption trench bottom.

2. Determine the linear length of the Eljen GSF absorption trench required by first dividing the gallons per day by the Trench Application Rate from the charts. For single family home application, the peak daily flow is based on 150 gallons per bedroom. For commercial (non-residential) systems peak flow is based on Table JT-1 found in the Department's Manual for Onsite Sewage Management Systems. Then divide the square footage by three foot (3') or four foot (4') based on the trench width of the design. Four foot (4') trenches must be demand dosed and meet the requirements for GSF bed installation requirements.

3. Determine the number of Eljen GSF modules required from the charts below.

4. Equally space the Eljen GSF modules within the trench. Slower percolating soils will space modules farther apart.

5. Demand dosing shall be required where more than five hundred linear feet (500') Eljen GSF trench is required. When more than 500' and less than one thousand liner feet (1000') are required a single pump or siphon shall be used. When more than 1000' linear feet of absorption trench are required alternating siphons or pumps shall be used.

TABLE 1 RESIDENTIAL 3′ TRENCH APPLICATION RATE CHART WITH 1 FOOT SEPERATION TO LIMITING CONDITION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom 2	3	4	5	Add
Group I	5	1.200	21	21	28	35	7
	10	0.909	21	21	28	35	7
	15	0.789	21	21	28	35	7
	20	0.714	21	21	28	35	7
	25	0.652	21	21	28	35	7
Group II	30	0.600	21	21	28	35	7
	35	0.566	21	21	28	35	7
	40	0.536	21	21	28	35	7
	45	0.500	21	21	28	35	7
	50	0.484	21	21	28	35	7
	55	0.462	21	21	28	35	7
Group III	60	0.448	21	24	32	40	8
	65	0.435	21	24	32	40	8
	70	0.423	21	27	36	45	9
	75	0.411	21	27	36	45	9
	80	0.405	21	27	36	45	9
	85	0.400	21	30	40	50	10
	90	0.395	21	30	40	50	10
Group IV	95	0.390	21	30	40	50	10
	100	0.385	21	30	40	50	10
	105	0.380	21	30	40	50	10
	110	0.375	21	30	40	50	10
	115	0.370	21	30	40	50	10
	120	0.366	21	30	40	50	10

TABLE 2 RESIDENTIAL 4′ TRENCH APPLICATION RATE CHART WITH 1 FOOT SEPERATION TO LIMITING CONDITION AND DOSED EQUAL DISTRIBUTION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom 2	3	4	5	Add
Group I	5	1.200	21	21	28	35	7
	10	0.909	21	21	28	35	7
	15	0.789	21	21	28	35	7
	20	0.714	21	21	28	35	7
	25	0.652	21	21	28	35	7
Group II	30	0.600	21	21	28	35	7
	35	0.566	21	21	28	35	7
	40	0.536	21	21	28	35	7
	45	0.500	21	21	28	35	7
	50	0.484	21	21	28	35	7
	55	0.462	21	21	28	35	7
Group III	60	0.448	21	24	32	40	8
	65	0.435	21	24	32	40	8
	70	0.423	21	27	36	45	9
	75	0.411	21	27	36	45	9
	80	0.405	21	27	36	45	9
	85	0.400	21	30	40	50	10
	90	0.395	21	30	40	50	10
Group IV	95	0.390	21	30	40	50	10
	100	0.385	21	30	40	50	10
	105	0.380	21	30	40	50	10
	110	0.375	21	30	40	50	10
	115	0.370	21	30	40	50	10
	120	0.366	21	30	40	50	10

TABLE 3 RESIDENTIAL 3' TRENCH APPLICATION RATE CHART WITH 2 FOOT SEPERATION TO LIMITING CONDITION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom				
			2	3	4	5	Add
Group I	5	2.400	21	21	28	35	7
	10	1.818	21	21	28	35	7
	15	1.579	21	21	28	35	7
	20	1.429	21	21	28	35	7
	25	1.304	21	21	28	35	7
Group II	30	1.200	21	21	28	35	7
	35	1.132	21	21	28	35	7
	40	1.071	21	21	28	35	7
	45	1.000	21	21	28	35	7
	50	0.968	21	21	28	35	7
	55	0.923	21	21	28	35	7
Group III	60	0.896	21	24	32	40	8
	65	0.725	21	24	32	40	8
	70	0.704	21	27	36	45	9
	75	0.685	21	27	36	45	9
	80	0.676	21	27	36	45	9
	85	0.667	21	30	40	50	10
	90	0.658	21	30	40	50	10
Group IV	95	0.649	21	30	40	50	10
	100	0.641	21	30	40	50	10
	105	0.633	21	30	40	50	10
	110	0.625	21	30	40	50	10
	115	0.617	21	30	40	50	10
	120	0.610	21	30	40	50	10

TABLE 4 RESIDENTIAL 4' TRENCH APPLICATION RATE CHART WITH 2 FOOT SEPERATION TO LIMITING CONDITIONAND DOSED EQUAL DISTRIBUTION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom				
			2	3	4	5	Add
Group I	5	2.400	21	21	28	35	7
	10	1.818	21	21	28	35	7
	15	1.579	21	21	28	35	7
	20	1.429	21	21	28	35	7
	25	1.304	21	21	28	35	7
Group II	30	1.200	21	21	28	35	7
	35	1.132	21	21	28	35	7
	40	1.071	21	21	28	35	7
	45	1.000	21	21	28	35	7
	50	0.968	21	21	28	35	7
	55	0.923	21	21	28	35	7
Group III	60	0.896	21	24	32	40	8
	65	0.725	21	24	32	40	8
	70	0.704	21	27	36	45	9
	75	0.685	21	27	36	45	9
	80	0.676	21	27	36	45	9
	85	0.667	21	30	40	50	10
	90	0.658	21	30	40	50	10
Group IV	95	0.649	21	30	40	50	10
	100	0.641	21	30	40	50	10
	105	0.633	21	30	40	50	10
	110	0.625	21	30	40	50	10
	115	0.617	21	30	40	50	10
	120	0.610	21	30	40	50	10

TABLE 5 COMMERCIAL 3' TRENCH APPLICATION RATE CHART

Soil Type	PercRate (min/in)	1-2 ft Separation Application Rate (GPD/Ft2)	>2 ft Separation Application Rate (GPD/Ft2)	Non-Residential Use (< 200 mg/l BOD+TSS) Gallons/GSF A42 Module
Group I	5	1.200	1.50	18
	10	0.909	1.50	18
	15	0.789	1.50	18
	20	0.714	1.43	18
	25	0.652	1.30	18
Group II	30	0.600	1.20	18
	35	0.566	1.13	16
	40	0.536	1.07	16
	45	0.500	1.00	16
	50	0.484	0.97	16
	55	0.462	0.92	16
Group III	60	0.448	0.90	16
	65	0.435	0.72	15
	70	0.423	0.70	15
	75	0.411	0.68	15
	80	0.405	0.68	15
	85	0.400	0.67	15
	90	0.395	0.66	15
Group IV	95	0.390	0.65	13
	100	0.385	0.64	13
	105	0.380	0.63	13
	110	0.375	0.63	13
	115	0.370	0.62	13
	120	0.366	0.61	13

TABLE 6 COMMERCIAL 4' TRENCH WITH DOSED EQUAL DISTRIBUTION APPLICATION RATE CHART

Soil Type	PercRate (min/in)	1-2 ft Separation Application Rate (GPD/Ft2)	>2 ft Separation Application Rate (GPD/Ft2)	Non-Residential Use (< 200 mg/l BOD+TSS) Gallons/GSF A42 Module
Group I	5	1.200	1.50	18
	10	0.909	1.50	18
	15	0.789	1.50	18
	20	0.714	1.43	18
	25	0.652	1.30	18
Group II	30	0.600	1.20	18
	35	0.566	1.13	16
	40	0.536	1.07	16
	45	0.500	1.00	16
	50	0.484	0.97	16
	55	0.462	0.92	16
Group III	60	0.448	0.90	16
	65	0.435	0.72	15
	70	0.423	0.70	15
	75	0.411	0.68	15
	80	0.405	0.68	15
	85	0.400	0.67	15
	90	0.395	0.66	15
Group IV	95	0.390	0.65	13
	100	0.385	0.64	13
	105	0.380	0.63	13
	110	0.375	0.63	13
	115	0.370	0.62	13
	120	0.366	0.61	13

Bed Installation

1. When an absorption field bed design is used, demand dosing of the effluent shall be utilized to apply the effluent to the absorption field. The frequency of dosing shall be based on the soils hydraulic conductivity and the design flow. The absorption field bed shall be dosed to a distribution box in a manner that uniformly distributes the effluent across the entire bed. GSF A42 shall be dosed at 3.5 gallons or less per module. The absorption field shall be dosed in a manner to ensure the entire expected 24 hour effluent flow is applied in a 24 hour period.

2. Determine the design application rate by using the GSF Bed Application Rate Chart below. The design application rate is based on the percolation rate of the most hydraulically limiting soil horizon in contact with the side wall, bed bottom and for a distance one foot below the absorption bed bottom.

3. Determine the Eljen GSF bed absorption field area by dividing the gallons per day by the bed application rate. For single family home application, the peak daily flow is based on 150 gallons per bedroom. For commercial (non-residential) systems peak flow is based on Table JT-1 found in the Department's Manual for Onsite Sewage Management Systems.

4. Determine the number of Eljen GSF modules required from the charts below. Beds designed for systems with peak flows greater than 600 gals per day must use pressure distribution.

TABLE 7 RESIDENTIAL BED APPLICATION RATE CHART WITH 1 FOOT SEPERATION TO LIMTING CONDITION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom				
			2	3	4	5	Each Add.
Group I	5	0.97	21	21	28	35	7
	10	0.71	21	21	28	35	7
	15	0.61	21	21	28	35	7
	20	0.59	21	21	28	35	7
	25	0.54	21	21	28	35	7
Group II	30	0.50	21	21	28	35	7
	35	0.47	21	21	28	35	7
	40	0.45	21	21	28	35	7
	45	0.42	21	21	28	35	7
	50	0.37	21	21	28	35	7
	55	0.35	21	21	28	35	7
Group III	60	0.34	21	24	32	40	8
	65	0.33	21	24	32	40	8
	70	0.32	21	27	36	45	9
	75	0.31	21	27	36	45	9
	80	0.31	21	27	36	45	9
	85	0.30	21	30	40	50	10
	90	0.30	21	30	40	50	10

TABLE 8 RESIDENTIAL BED APPLICATION RATE CHART WITH 2 FOOT SEPERATION TO LIMITING CONDITION

Soil Type	PercRate (min/in)	Application Rate (GPD/Ft2)	GSF A42 Modules / Bedroom				
			2	3	4	5	Each Add.
Group I	5	1.94	21	21	28	35	7
	10	1.42	21	21	28	35	7
	15	1.22	21	21	28	35	7
	20	1.18	21	21	28	35	7
	25	1.08	21	21	28	35	7
Group II	30	1.00	21	21	28	35	7
	35	0.94	21	21	28	35	7
	40	0.90	21	21	28	35	7
	45	0.84	21	21	28	35	7
	50	0.74	21	21	28	35	7
	55	0.70	21	21	28	35	7
Group III	60	0.68	21	24	32	40	8
	65	0.55	21	24	32	40	8
	70	0.53	21	27	36	45	9
	75	0.52	21	27	36	45	9
	80	0.52	21	27	36	45	9
	85	0.50	21	30	40	50	10
	90	0.50	21	30	40	50	10

TABLE 9 COMMERCIAL BED APPLICATION RATE CHART

Soil Type	PercRate (min/in)	1-2 ft Separation Application Rate (GPD/Ft2)	>2 ft Separation Application Rate (GPD/Ft2)	Non-Residential Use (< 200 mg/l BOD+TSS) Gallons/GSF A42 Module
Group I	5	0.97	1.94	18
	10	0.71	1.42	18
	15	0.61	1.22	18
	20	0.59	1.18	18
	25	0.54	1.08	18
Group II	30	0.50	1.00	18
	35	0.47	0.94	16
	40	0.45	0.90	16
	45	0.42	0.84	16
	50	0.37	0.74	16
	55	0.35	0.70	16
Group III	60	0.34	0.68	16
	65	0.33	0.55	15
	70	0.32	0.53	15
	75	0.31	0.52	15
	80	0.31	0.52	15
	85	0.30	0.50	15
	90	0.30	0.50	13

Mound Installation

The individual GSF modules may be installed in a mound configuration and must be sized and configured based on the criteria for Wisconsin Mounds found in the Department's Manual for Onsite sewage management systems and the manufacture's Georgia Design and Installation Manual. The site plan shall bear the signature of the designer and the following statement: I certify this sewage system design meets the minimum design requirements by the DHR Manual for On-Site Sewage Management Systems.

V. Service Related Obligations

1. The manufacturer or the authorized representative must furnish a three-year initial technical assistance service policy to the owner; the cost of the initial service policy must be included in the original purchase price. The initial technical assistance service policy must contain the name and telephone number of an appropriate service representative to be contacted in reference to the system in the event that a problem arises, service is required, or to obtain information.

2. A manufacturer prepared owner's manual must accompany each Eljen GSF Geotextile Sand Filter System. The authorized representative must provide copies of the manual to the system owner at the time of installation.

By: _____ Date: January 4, 2012

Chris G. Kumnick,
Program Director; Land Use
Environmental Health Branch

Georgia Department of Public Health
Environmental Health Section

Alternative System Approval

For: **Advanced Enviro-Septic® Treatment System**

Issued To: Presby Environmental, Inc.
143 Airport Road
Whitefield, NH 030598

In accordance with provisions established in the Department of Human Resources (DHR) Rules and Regulations for On-Site Sewage Management Systems, Chapter 290-5-26, the Presby Environmental, Inc. Advanced Enviro-Septic® Treatment System is approved for use in Georgia for domestic wastewater treatment and dispersal. All systems using the Advanced Enviro-Septic Treatment™ System must be designed and installed in compliance with the procedures and specifications described in the Manufacturer's *Georgia Design and Installation Manual (August, 2012)* and the Department's *Manual for On-Site Sewage Management Systems*

I. System Description

The Presby Environmental, Inc. (PEI) Advanced Enviro-Septic® (AES) Treatment System utilizes a two stage treatment process for the dispersion of effluent into the soil. AES Treatment System is an innovative onsite wastewater treatment system that is passive, non-mechanical and does not use pressure distribution. The primary component is a large diameter perforated, multi-layer fabric-wrapped pipe that is installed in a bed of specified system sand. The Advanced Enviro-Septic® System is designed to purify wastewater that has received primary treatment in a septic tank and to disperse the treated wastewater into the underlying soils. This geotextile membrane and approved system sand combine to provide secondary treatment.

The Presby Environmental, Inc. Advanced Enviro-Septic® (AES) Treatment System is approved for use for the treatment and dispersal of wastewater having the consistency and strength of typical domestic influent. When used for the secondary treatment of domestic wastewater, the Advanced Enviro-Septic® (AES) Treatment System is approved as an advanced treatment system producing a Class I equivalent effluent as defined in the Department's Manual for On-Site Sewage Management Systems.

The AES Treatment System is a piped unit which measures 10-feet long (can be cut to any length), with an exterior diameter of 12 inches. The AES unit is ridged and perforated corrugated plastic pipe with skimmer tabs on the interior. The unit has an aligned Bio-Accelerator™ layer at the bottom of pipe's exterior and is covered with a mat of randomly-oriented plastic fibers. The fibers are surrounded by a non-woven geo-textile fabric stitched in place. An AES unit is described in United States Patent No. *US 6,461,078 B1 (Oct 8, 2002)* and *5,954,451 (Sep. 21, 1999).* Each 10 ft. unit has a liquid holding capacity of approximately 58 gallons and is flexible enough to bend up to 90°. This AES unit is surrounded by 6-inches of approved system sand. The overall height of an Advanced Enviro-Septic® System measures 24 in. including system sand (not including fill or cover material): 6 in. of system sand below the Advanced Enviro-Septic® pipe; 12 in. diameter of the Advanced Enviro-Septic® pipe; and 6 in. of system sand

above the Advanced Enviro-Septic® pipe. The pre-treated wastewater flows through the units and is discharged into the ground through an absorption bed, trench or mound.

The system sand that surrounds the Advanced Enviro-Septic® units is an essential component of the system. It is critical that the correct type and amount of system sand is used when constructing the system. System sand must be coarse to very coarse, clean, granular sand, free of organic matter. It must adhere to all of the requirements in the PEI *Georgia Design and Installation Manual (August 2012).*

System Sand Specifications for AES in Georgia (% by weight) (# Refers to Standard US Sieve Sizes. Fines determined by washing)		
ORIGINAL SYSTEM SAND	**ASTM-C33 Modified for SYSTEM SAND**	**ALTERNATIVE SYSTEM SAND**
0% larger than ¾ in.	100% passing 3/8 in.	100% passing 3/8 in.
0-35 % retained by #10	95-100% passing #4	95-100 % passing #4
40-90% retained by #35	80-100% passing #8	70-90% passing #8
2% max. passing #200	50-85% passing #16	45-80% passing #16
	25-60% passing #30	0-40% passing #30
	5-30% passing #50	0-20% passing #50
Comment: System Sand is coarse to very coarse clean, granular sand, free of all organic matter. The correct sand provides pore space for gas transfer and encourages efficient dispersal into soil below.	0-10% passing #100	0-8% passing #100
	0-2% passing #200	0-5% passing #200
	Comment: This specification was derived in order to provide reference to a readily available, standardized sand product. The added restriction on fines content (2% max.) makes ASTM C-33 appropriate material for System Sand.	***Comment:*** This specification allows for slightly more fines content by incorporating a higher percentage of coarse content.

When an AES Treatment System is installed at or above grade, in area fill or a mound, the AES pipe and System Sand must be installed in certified fill meeting ASTM C-33 or equivalent requirements found in the *Georgia Manual for Onsite Sewage Management.*

II. Siting Criteria

The Presby Environmental, Inc. Advanced Enviro-Septic® (AES) Treatment System may be utilized on sites determined to be suitable as specified in the DHR Rules and Regulations for On-Site Sewage Management Systems and the Department's Manual for On-Site Sewage Management Systems with the following exception(s):

1. The Advanced Enviro-Septic® Treatment System may not be used on sites that exceed a maximum percolation rate of 90 minutes per inch when used with an absorption bed. The AES Treatment System may not be used on sites that exceed a maximum percolation rate of 120 minutes per inch when used with an absorption trench.

2. A minimum vertical separation of 12 inches of naturally occurring soil must be present between the bottom of the system sand infiltrative surface and any impervious or limiting soil horizon.

3. Minimum horizontal separation distances, or setbacks, are measured from the outer most edge of the system sand with in ground AES Treatment Systems. With systems installed at or above grade the setbacks are measured from the toe of the side slope.

III. Installation Criteria

The Presby Environmental, Inc. Advanced Enviro-Septic® (AES) Treatment System shall be installed in accordance with the DHR Rules and Regulations for On-Site Sewage Management Systems, the Department's Manual for On-Site Sewage Management Systems and this approval document including:

1. Installation must comply to the Presby Environmental, Inc. Advanced Enviro-Septic® (AES) Treatment System *Georgia Design and Installation Manual* (August 2012). In the event of contradictions between this Manual and Georgia rules, PEI should be contacted for technical assistance.

2. Prior to installation of an AES Treatment System, a septic contractor must hold a valid septic installer certification from the Department and be trained and certified in the use of AES to install or design AES Treatment Systems. Certification is obtained by successfully completing the Advanced Enviro-Septic Certification Course provided by PEI or its authorized representative(s).

3. The system materials, components and boundaries should be carefully laid out in a site plan with the location and elevations of trenches, beds or mounds following the Georgia Manual for On-site Sewage Management Systems. Site plans are required in GA; however it is not always required to be drawn by a professional engineer.

4. The septic tank and AES Treatment System must be installed on a site that is not subject to frequent flooding or prone to receiving vehicle traffic.

5. Minimum daily design flow for any system is 300 gpd (2 bedrooms) or 140 feet of AES Pipe. The maximum daily design flow for any system is 10,000 gpd.

6. The Advanced Enviro-Septic® rows are to be installed horizontally over the system sand. Parallel rows within a 3.5 foot trench, bed or mound require 6 inches of separation (or greater) filled with system sand. Rows are to be level within 1 in. end-to-end and side-to-side.

7. In certain soils, the required trench length will exceed the AES pipe required. In order to distribute and ensure balanced hydraulic loading across the entire length of the trench, segmented rows are used to extend the AES pipe row length as needed to "fill" the trench length, taking full advantage of greater infiltrative surface area without the expenditure for more AES pipe than is required for treatment. The maximum length of a PVC connector is 20 ft. At least 50% of the segmented row's overall length must be provided by AES pipe. PVC connectors must extend 2 to 4 in. into the Double Offset Adapter.

8. Connections and conveyance within the AES Treatment System consists of the manufacturer's offset adapters, double offset adapters, and couplings. Raised connections are used to connect multiple trenches in serial distribution. All conveyance and sewer pipe must be four inch (4") Schedule 40 PVC.

9. All AES Treatment Systems installed in a bed require a mechanical dosing device. AES pipe in a bed must utilize D-Box distribution. Pressure distribution may not be used with AES pipe. The minimum center to center spacing between the rows of AES pipe 1.5 feet. In bed systems, with percolation rates greater than 60 mpi the minimum width:length ratio is 1:6.

10. Adequate ventilation is essential to the proper functioning of the AES Treatment System. Vent openings must be located to ensure the unobstructed flow of air through the entire Advanced Enviro-Septic® System. An effluent filter is required. The effluent filter selected must be sized and designed such that it allows the free passage or air to ensure the proper functioning of the system. The low vent inlet must be a minimum of 1 ft. above final grade. High and low vents are required for all systems. A minimum of a 10 ft. differential between high and low vents must be maintained.

    For gravity systems, a low vent through an offset adapter is installed at the end of each row or bed. A vent manifold may be used to connect the ends of multiple rows. The house (roof) vent functions as the high vent as long as there are no restrictions or other vents between the low vent and the house (roof) vent.

    For pumped systems and some systems using a dosing device, a low vent is installed through an offset adapter at the end of each row or bed. A high vent is installed through an unused D-box outlet. Alternatively, the low vent may be attached to the D-box and the high vent may be attached to the end of the last Advanced Enviro-Septic® row.

11. The system should be backfilled with a minimum of 4 inches of cover. Suitable earth cover, similar to the naturally occurring soil at the site and capable of sustaining plant growth, is required as the uppermost layer over the entire system (and side-slope tapering). The topsoil layer should be a minimum of 4 in. deep and should be immediately seeded or mulched in order to prevent erosion. The final grade should be crowned to allow for any natural settlement and to ensure diversion of surface water.

12. The Advanced Enviro-Septic® System may be installed in a trench, bed or mound configuration as dictated by the site conditions. Absorption beds and trenches greater than 3.5 feet wide must be dosed to a distribution box in a manner that uniformly distributes to parallel rows across the system at a volume of 1 gallon per linear foot of the total AES units.

IV. Absorption Field Sizing

The sizing of Advanced Enviro-Septic® System installed in bed, trench or mound configuration shall be based on the anticipated peak daily volume of wastewater and the characteristics of the soil in which the absorption system is to be located. All design criteria in this approval assumes typical domestic wastewater effluent strength of 200 mg/l (BOD or TSS) and 25mg/l fats, oil, grease or less from the septic tank. The design absorption rate shall be based on the most hydraulically limiting naturally occurring soil horizon that comes into contact with the infiltrative surface of the sidewall, trench/bed bottom and for a distance one (1') foot below the absorption trench/bed bottom. Systems in soils with a perc rate greater than 60 mpi are subject to a bed loading limit of 900 gallons per day and a bed width-to-length ratio of 1:6.

BED AND TRENCH SYSTEM SIZING TABLES

TABLE A: BED SIZING, SYSTEM LOADING RATES

TABLE A, AES System Sand Bed Sizing/ System Loading Rate ("SLR")			
Soil Group	Perc Rate (mpi)	One Foot Vertical Separation (gpd/sq.ft.)	Two Foot Vertical Separation (gpd/sq.ft.)
I	1-5	0.97	1.94
	6-10	0.71	1.42
	11-15	0.61	1.22
	16-20	0.59	1.18
	21-25	0.54	1.08
II	26-30	0.50	1.00
	31-35	0.47	0.94
	36-40	0.45	0.90
	41-45	0.42	0.84
	46-50	0.37	0.74
	51-55	0.35	0.70
	56-60	0.34	0.68
III	61-65**	0.33	0.55
	66-70**	0.32	0.53
	71-75**	0.31	0.52
	76-80**	0.31	0.52
	81-85**	0.30	0.50
	86-90**	0.30	0.50
**1:6 Minimum Width:Length Ratio and 900 gpd bed loading limit in 61-90 mpi soils			

TABLE B: TRENCH SIZING, 3.5 FT. FIXED LENGTH; 2 FOOT SEPERATION

Table B – Fixed Total Length Trenches – Limited to use in Soil Perc Rates 1 – 20 mpi **Trench Area calculated to meet Georgia's System Loading Rates (SLRs)** 2 ft. Vertical Separation Distance – 3.5 ft. Wide Trench*, 2 Pipe Rows per Trench (35 ft. trench length and 70 ft. AES pipe per bedroom/150 gpd daily design flow)				
Number of Bedrooms	Hydraulic Capacity (Gallons per Day)	Total AES pipe required (2 rows per Trench)	Total Length of Trenches Req'd. (Number of Trenches Varies)	Actual Trench Length
2	300	140 ft.	70 ft.	Add 1 ft. of length per trench to allow for 6 in. System Sand beyond each end of pipe rows.
3	450	210 ft.	105 ft.	
4	600	280 ft.	140 ft.	
5	750	350 ft.	175 ft.	
* Actual Trench width is 3.5 ft. to allow for 6 in. System Sand in all directions around AES pipe. Sizing calculations above are based on GA's 3 ft. maximum trench width credit; Dosing Device is not required unless sizing takes credit for full 3.5 ft. of trench width.				

TABLE C: TENCH SIZING, FIXED WIDTH 3 AND 3.5 FT, 1 FT SEPERATION

TABLE C – Fixed-Width Trenches with 1 ft. Vertical Separation Distance Perc Rates 1-15, 3.5 ft. Wide Trench with 2 Rows of AES Pipe Perc Rates 16-120, 3 ft. Wide Trench with 1 Row of AES Pipe						
Soil Type	Perc Rate (mpi)	System Loading Rate (SLR) (gpd/sq.ft.)	System Sand Trench Length (ft.) minimum			
			(2) bedrooms	(3) bedrooms	(4) bedrooms	(5) bedrooms*
Group I	**3.5 ft. Wide Trench with 2 Rows of AES Pipe: (Note: Sizing Credit Calculated based on 3 ft. width, no dosing device required)**					
	1-5	1.200	84	125	167	209
	6-10	0.909	111	166	221	276
	11-15	0.789	127	191	254	317
	3 ft. Wide Trench with 1 Row of AES Pipe:					
	16-20	0.714	141	211	281	351
	21-25	0.652	154	231	307	384
Group II	26-30	0.600	167	250	334	417
	31-35	0.566	177	266	354	442
	36-40	0.536	187	280	374	467
	41-45	0.500	200	300	400	500
	46-50	0.484	207	310	414	517
	51-55	0.462	217	325	433	542
Group III	56-60	0.448	224	335	447	559
	61-65	0.435	230	345	460	575
	66-70	0.423	237	355	473	592
	71-75	0.411	244	365	487	609
	76-80	0.405	247	371	494	618
	81-85	0.400	250	375	500	625
	86-90	0.395	254	380	507	633
Group IV	91-95	0.390	257	385	513	642
	96-100	0.385	260	390	520	650
	101-105	0.380	264	395	527	658
	106-110	0.375	267	400	534	667
	111-115	0.370	271	406	541	676
	116-120	0.366	274	410	547	684
*See p. 9, "6 or More Bedrooms" for instructions for using Tables for sizing systems larger than 750 gpd.						

TABLE D: TRENCH SIZING, 3 AND 3.5 FIXED WIDTH; 2 FOOT SEPERATION

TABLE D – Fixed-Width Trenches - 2 ft. Vertical Separation Distance Perc Rates 1-65 mpi, 3.5 ft. Wide Trench with 2 Rows of AES Pipe Perc Rates 66-120 mpi, 3 ft. Wide Trench with 1 Row of AES Pipe						
Soil Type	Perc Rate (mpi)	System Loading Rate (SLR) (gpd/sq.ft.)	Sand Trench Length (ft.) minimum			
			(2) bedrooms	(3) bedrooms	(4) bedrooms	(5) bedrooms
Group I	**3.5 ft. Wide Trench with 2 Rows of AES pipe per trench (Note: Sizing Credit calculated based on 3 ft. width, no dosing device required)**					
	1-5	2.400	70	105	140	175
	6-10	1.818	70	105	140	175
	11-15	1.579	70	105	140	175
	16-20	1.429	70	105	140	175
	21-25	1.304	77	116	154	192
Group II	26-30	1.200	84	125	167	209
	31-35	1.132	89	133	177	221
	36-40	1.071	94	141	187	234
	41-45	1.000	100	150	200	250
	46-50	0.968	104	155	207	259
	51-55	0.923	109	163	217	271
Group III	56-60	0.896	112	168	224	280
	61-65	0.725	138	207	276	345
	3 ft. Wide Trench with 1 Row of AES pipe per trench					
	66-70	0.704	143	214	285	356
	71-75	0.685	146	219	292	365
	76-80	0.676	148	222	296	370
	81-85	0.667	150	225	300	375
	86-90	0.658	152	228	304	380
Group IV	91-95	0.649	155	232	309	386
	96-100	0.641	157	235	313	391
	101-105	0.633	158	237	316	395
	106-110	0.625	160	240	320	400
	111-115	0.617	163	244	325	406
	116-120	0.610	164	246	328	410
*See p. 9, "6 or More Bedrooms," for instructions for using Tables for sizing systems larger than 750 gpd.						

V. Dosing

Dosing is required where more than five hundred feet (500') of AES Treatment System trench is required. When more than 500' and less than one thousand feet (1000') of trench length is required a single pump, siphon or dosing device shall be used. When more than 1000 linear feet of trench are required, alternating siphons or pumps shall be used. The volume per dose for all systems (trench or bed method) must be no greater than 1 gallon times the total length of all AES pipe. Dosing must be a minimum of 4 times per day; 6-8 cycles per day are recommended. The dosing cycle should provide at least one hour between doses. Pump dose volume is limited to 20 gallon per minute per flow equalizer.

VI. AES Treatment System for Wisconsin Mound Installation

The ASE Treatment System may be installed in a Wisconsin mound configuration and must be sized and configured based on the criteria for Wisconsin Mounds found in the Department's *Manual for Onsite Sewage Management Systems.*

VII. Sizing Calculations for Non Bedroom Facilities -Commercial

When determining the required bed area or trench length for a commercial system (non-bedroom calculation) with residential strength effluent, divide Daily Design Flow (gal/day) by the Soil Loading Rate (SLR) based on the soil's perc rate. Sizing is the same for residential and commercial systems. Refer to Tables A, C, and D. Non-residential Systems will use 1 ft. of AES pipe for every 2 gpd of daily design flow:

Daily Design Flow (gal/day) ÷ 2 = Minimum AES pipe (ft.)

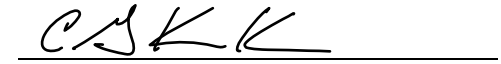
VIII. Replacement Area

There shall be sufficient unobstructed land area, meeting all requirements for installation of an onsite sewage management system, equal in size for a conventional system or larger, to provide the complete replacement of the absorption field.

IV. Service Related Obligations

1. The manufacturer or the authorized representative must furnish a three-year initial technical assistance service policy to the owner; the cost of the initial service policy must be included in the original purchase price. The initial technical assistance service policy must contain the name and telephone number of an appropriate service representative to be contacted in reference to the system in the event that a problem arises, service is required, or to obtain information.

2. A Presby Environmental, Inc., owner's manual must accompany each Advanced Enviro-Septic® System. The authorized representative must provide copies of the manual to the system owner at the time of installation. A copy is available from the manufacturer's website, www.PresbyEnvironmental.com.

By:  Date: August 16, 2012

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