Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

PILOTING APPROVAL RENEWAL
Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Bio-Microbics, Inc.
8450 Cole Parkway
Shawnee, KS 66227

Trade name of technology and model: BioBarrier® MBR® models 0.5-N, 1.0-N, 1.5-N, 2.0-N, BioBarrier® HSMBR® models 1.5-SN, 1.5-DN, 3.0-SN, 3.0-DN, 4.5-SN, 4.5-DN, 6.0-SN, 6.0-DN, 9.0-SN, 9.0-DN (hereinafter the 'System', 'Alternative System' or 'Technology'). Schematic drawings of the models, the manuals for Design, Installation, O&M and Owner and a technology inspection checklist are part of this Approval.

Transmittal Number:	X271033
Date of Issuance:	July 11, 2016 Renewed on August 04, 2021
Date of Expiration:	August 04, 2026

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Approval to: Bio-Microbics, Inc., 8450 Cole Parkway, Shawnee, KS 66227 (hereinafter 'the Company'), to Pilot in the Commonwealth of Massachusetts the System described herein. Sale and use of the System are conditioned on and subject to compliance by the Company, the Designer, the Installer, the Service Contractor, and the System Owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

/s/ *Marybeth Chubb* August 04, 2021

Marybeth Chubb, Date
Wastewater Section Chief
Bureau of Water Resources

I. Purpose

1. The purpose of Piloting Approval ('the Approval') is to allow installation and use of no more than 15 on-site sewage disposal systems utilizing the Technology in Massachusetts in order to provide field testing and a technical demonstration that a particular alternative system can or cannot function effectively under relevant physical and climatological conditions (310 CMR 15.285).

2. The Approval requires that sufficient performance testing be completed so that the Department may determine if the System can or cannot consistently provide secondary treatment, Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS) in the effluent to 30 mg/L or less, and function to effectively reduce total nitrogen (TN) to less than or equal to 19 mg/L, and provide a level of environmental protection at least equivalent to that of a system designed and constructed in accordance with 310 CMR 15.100 through 15.293. *TN is equal to TKN (total Kjedahl Nitrogen) plus NO2 (Nitrite) plus NO3 (Nitrate).*

3. The Approval authorizes the installation and use of a System to serve a facility with design flows less than 10,000 gallons per day, including new construction, an increase in flow at an existing facility, or an upgrade or replacement of an existing failed or nonconforming system. The facility must meet the specific siting conditions for piloting an Alternative System (310 CMR 15. 285(2)), and the facility must meet the siting requirements of this Approval.

4. With the other applicable permits or approvals that may be required by Title 5, the Approval authorizes the installation and use of the Alternative System in Massachusetts. All the provisions of Title 5, including the General Conditions for all Alternative Systems (310 CMR 15.287), apply to the sale, design, installation, and use of the System, except those provisions that specifically have been varied by the Approval.

5. The Approval shall only apply to model units with the same model designations specified in this Approval and meet the same specifications, operating requirements, and plans, as provided by the Company at the time of the application. Any proposed modifications of the approved units or the addition of new units shall be subject to the review of the Department for coverage under the Approval.

II. System Description

The System is a Secondary Treatment Unit (STU) that includes a circuitous flow train through a primary sedimentation compartment, anaerobic treatment compartment, and aerobic contact/ filtration compartment all within the treatment tank.

The Bio-Microbics BioBarrier® MBR and HSMBR are membrane bioreactor (MBR System), designed to remove BOD, TSS, nitrogen and Fecal Coliform. The system is installed before the soil absorption system (SAS), designed and constructed in accordance with 310 CMR 15.100 - 15.279. The HSMBR® models can be used in a Single Train -SN or a Dual Train - DN.

The System is in a three-compartment tank. The membrane module always in the last compartment and the anoxic zone connected to the aeration zone via a baffle wall. The wastewater from a facility enters the system's settling zone in the first compartment for

primary sedimentation and floatable retention. On the outlet side in this first compartment is a SaniTEE® screen, to provide screening. The second compartment serves as the anoxic zone and contains a mixing pump. The third compartment is the aeration zone containing the membrane module, a permeate pump and an air supply from the System's remote installed blower unit. The membrane module consists of flat sheet membranes arranged in a cartridge. A high mixed liquor suspended solids concentration in the aeration zone provides biological treatment and nitrification. A portion of the nitrified wastewater is returned to the anoxic chamber for denitrification by the mixing pump action via patent pending ports in the baffle wall separating the two zones. The final effluent or permeate is pulled out by the permeate pump through the MBR membranes leaving behind large organic and inorganic particles for further digestion or wasting.

The MBR is cleaned in place according to instructions in Service Manual.

The System may be equipped with chemical feed to provide a carbon source for anoxic denitrification when required by the wastewater constituents. The aeration system runs when the permeate pump is activated by a float system. The aeration system provides scouring for the membranes and oxygen to the biological process. When the permeate pump is not running the aeration system runs on a timer that activates the blower based on a pre-determined time. The off time provides a resting period for the MBR unit. The rest periods allow the membranes to relax which helps in membrane filtration capability. When the aeration operates the solids are broken up by turbulence.

All pumps, timers, and aeration equipment are controlled at the control panel. Final effluent disposal at the SAS is by either pressure distribution or gravity.

Approved System models and associated flow rates are as follows:

System Models	Flow Rate (gal/day)
BioBarrier MBR 0.5-N	500
BioBarrier MBR 1.0-N	1,000
BioBarrier MBR 1.5-N	1,500
BioBarrier MBR 2.0-N	2,000
BioBarrier HSMBR 1.5-SN or 1.5-DN	1,500
BioBarrier HSMBR 3.0-SN or 3.0-DN	3,000
BioBarrier HSMBR 4.5-SN or 4.5-DN	4,500
BioBarrier HSMBR 6.0-SN or 6.0-DN	6,000
BioBarrier HSMBR 9.0-SN or 9.0-DN	9,000

III. Site Application, Design and Installation Requirements

1. Each proposed site-specific use of the System to be piloted must be reviewed by the Department prior to installation of the System. The Owner shall submit to the Department the written approval of the Local Approving Authority (LAA or BOH), together with a copy of the completed Department application BRP WP 64b and obtain Department written approval as required by 310 CMR 15.285(2).

2. The Designer shall be a Massachusetts Registered Professional Engineer or a Massachusetts Registered Sanitarian, provided that such Sanitarian shall not design a system with a discharge greater than 2,000 gallons per day.

3. Design and installation of the System shall be in strict conformance with the approved plans and specifications, 310 CMR 15.000, except as otherwise stated in this Approval, and this Approval.

4. For new construction or increases in flow, the Alternative System may only be installed provided that:

   a) A site evaluation, in compliance with 310 CMR 15.100 through 15.107, has been approved by the Approving Authority;

   b) The Designer shows on the plans:

      i. an existing conforming conventional system on-site that is sized for the proposed design flow and is approved with a separate reserve area in accordance with the design standards for new construction 310 CMR 15.100 through 15.255; or

      ii. a primary area for a conventional system that could be built on-site with a separate reserve area in accordance with the design standards for new construction of 310 CMR 15.100 through 15.255; and

   c) The LAA approves the reserve area for a conventional system designed in accordance with the standards for new construction;

   d) The record drawings, on file with the LAA, clearly indicate the full-sized primary area and the full-sized reserve SAS are for the sole purpose of on-site sewage disposal system;

   e) The installation shall not disturb the site in any manner that prevents the future installation of a conventional primary SAS without encroaching on the approved conventional reserve area; and

   f) The System Owner shall not construct any permanent buildings or structures or disturb the site in any manner that prevents the future installation of a conventional primary SAS without encroaching on the approved reserve area.

5. To upgrade or replace an existing failed or nonconforming system, an Alternative System approved pursuant to 310 CMR 15.285 (Piloting) may only be installed where a conventional system could be feasibly built on-site, with the exception of providing a reserve area (15.248), provided that:

   a) The Designer shows on the plans the area for an approvable conventional system designed in accordance with the standards of 310 CMR 15.100 through 15.255;

   b) The record drawings, on file with the LAA, clearly indicate the area for the conventional system is reserved for the sole purpose of upgrading the on-site sewage disposal system;

   c) The installation of the Alternative System and any changes to the site by the System Owner shall not render the site unusable for the future installation of a conventional system; and

d) The installation of the Alternative System is in accordance with the siting requirements of the Approval.

6. To upgrade or replace an existing failed or nonconforming system, an Alternative System approved pursuant to 15.285 (piloting) may be installed where a conventional system designed in accordance with the standards of 310 CMR 15.100 through 15.255 cannot be feasibly built on-site, provided that:

   a) There is no increase in the actual or proposed design flow;

   b) The Designer demonstrates that the impact of the proposed Alternative System has been considered and the design requirements of 310 CMR 15.000 have been varied to the least degree necessary so as to allow for both the best feasible upgrade within the borders of the lot and the least effect on public health, safety, welfare and the environment;

   c) The Designer shows on the plans an area for the best feasible conventional upgrade without the use of any Alternative System, in the event that the System fails or is not capable of providing equivalent environmental protection;

   d) The installation of the System, including all components and the SAS system, shall not disturb the site in any manner that would render it unusable for the future installation of the best feasible conventional upgrade;

   e) The record drawings, on file with the LAA, shall clearly indicate the area reserved for the best feasible conventional upgrade;

   f) The System Owner shall not construct any permanent buildings or structures in an area for the best feasible conventional upgrade or disturb the site in any manner that would render the area unusable for the future installation of the best feasible conventional upgrade; and

   g) The installation of the System is in accordance with the siting requirements of the Approval.

7. When the System is used for new construction in areas subject to the nitrogen loading limitations of 310 CMR 15.214, an increase in calculated allowable nitrogen loading per acre is allowed for facilities with a design flow of less than 2,000 gallons per day (gpd) as provided in 310 CMR 15.217(2). When used in such areas:

   a) For any facility, an increase in the flow rate per acre is allowed up to a design flow up to 550 gpd/acre provided that the facility meets a TN effluent limit of 25 mg/l or less, or

   b) For any residential facility, an increase in the flow rate per acre is allowed up to a design flow up to 660 gpd/acre provided that the facility meets a TN effluent limit of 19 mg/l or less.

   If a System(s) needs replacement, there must be an approved technology that can be installed on-site to meet the nitrogen loading limitations.

8. Frames and covers of all access manholes and ports of the System components shall be watertight, made of durable material, and shall be installed and maintained at grade, to allow for necessary inspection, operation, sampling, and maintenance access. Manholes brought to final grade shall be secured to prevent unauthorized access. No structures which could

interfere with performance, access, inspection, pumping, or repair shall be located directly upon or above the access locations.

9. Access to all System tanks and to the septic tank shall be in accordance with 310 CMR 15.228 (2). The septic tank shall have at least three manholes, with the two over the inlet and outlet having a minimum opening of 20 inches. All access ports and manhole covers shall be secure removable impermeable covers of durable material installed and maintained at or above finish grade to allow for maintenance of the System (except septic tank covers which are not required to be at finish grade).

10. The System shall use appropriate H-20 loading capable tanks and covers for areas subject to traffic loads.

11. For any System that does not flow by gravity to the SAS, the System shall be equipped with sensors and high-level alarms to protect against high water due to pump failure, pump control failure, loss of power, or system freeze up. The control panel including alarms and controls shall be mounted in a location always accessible to the System Operator (or Service Contractor). Emergency storage capacity for wastewater above the high-level alarm shall be provided equal to the daily design flow of the System and the storage capacity shall include an additional allowance for the volume of all drainage which may flow back into the System when pumping has ceased.

12. Emergency 24-hour storage capacity or an independent standby power source may be provided for operation during an interruption in power. With any interruption of the power supply the source must be capable of automatically activating in addition to manual start-up capability. The standby power must be sufficient to handle peak flows for at least 24 hours and sufficient to meet all power needs of the System including, but not limited to, pumping, ventilation, and controls. Standby power installations must be inspected and exercised at least annually and all automatic and manual start up controls must be tested. Standby power installations must comply with all applicable state and local code requirements. Provided that a standby power installation complies with these requirements, no variance is required to the provisions of 310 CMR 15.231(2).

13. System unit malfunction and high-water alarms shall be visible and audible for facility occupants and the Service Contractor. Circuit(s) for alarms shall be connected separate from the circuits to the operating equipment and pumps.

14. All System control units, valve boxes, conveyance lines and other System appurtenances shall be designed and installed to prevent freezing per the Company's recommendations.

15. Any System structures with exterior piping connections located within 12 inches or below the Estimated Seasonal High Groundwater elevation shall have the connections made watertight with neoprene seals or equivalent.

16. In compliance with 310 CMR 15.240(13), a minimum of one (1) inspection port shall be provided within the SAS consisting of a perforated four-inch pipe placed vertically down into the stone to the naturally occurring soil or sand fill below the stone. The pipe shall be capped with a screw type cap and accessible to within three inches of finish grade.

17. Upon submission of an application for a Disposal System Construction Permit (DSCP), the Company shall provide to the LAA:

    a) Certification by the Designer that the design conforms to the Approval and Title 5; and,

    b) Certification by the Company or its authorized agent that the design conforms to the Approval and that the proposed use of the System is consistent with the unit's capabilities and all Company requirements;

    c) If any training is required by the Company, proof that the Designer has satisfactorily completed the training for the design and installation of the Technology; and

    d) A certification, signed by the Owner of record for the property to be served by the Technology, stating that the property Owner:

        1. Has been provided a copy of the Approval, the Owner's Manual, and the Operation and Maintenance Manual and the Owner agrees to comply with all terms and conditions;

        2. Has been informed of all the Owner's costs associated with the operation including, when applicable: power consumption, maintenance, sampling, recordkeeping, reporting, and equipment replacement;

        3. Understands the requirement for a service contract;

        4. Agrees to fulfill his responsibilities to provide a Deed Notice as required by 310 CMR 15.287(10) and this Approval);

        5. Agrees to fulfill his responsibilities to provide written notification of the Approval to any new Owner, as required by 310 CMR 15.287(5);

        6. If the design does not provide for the use of garbage grinders, the restriction is understood and accepted; and

        7. Whether or not covered by a warranty, the System Owner understands the requirement to repair, replace, modify, or take any other action as required by the Department or the LAA, if the Department or the LAA determines that the Alternative System is not capable of meeting the performance standards required by Title 5.

18. The System Owner and the Designer shall not submit to the LAA a DSCP application for the use of the Technology under the Approval if the Approval has expired or has been revised, reissued, suspended, or revoked by the Department prior to the date of application.

19. The System Owner shall not authorize or allow the installation of the System other than by a locally approved System Installer who, if required by the Company, has received the necessary training by the Company.

20. Prior to the commencement of construction, the System Installer must certify in writing to the Designer, the LAA, and the System Owner that (s)he is a locally approved System Installer and, if required by the Company, has received any necessary training.

21. The Installer shall maintain on-site, at all times during construction, a copy of the approved plans, the Owner's manual, the O&M manual, and a copy of the Approval.

22. The System shall be installed in a manner which neither intrudes on, replaces any component of, or adversely affects the operation of any component of the subsurface sewage disposal system designed and constructed in accordance with the standards of 310 CMR 15.200 – 15.279.

23. Prior to certifying the conformance of the installation of the System, the Company shall confirm that the System Owner has recorded the required Deed Notice.

24. Prior to the issuance of a Certificate of Compliance by the LAA, the System Installer and Designer must provide, in addition to the certifications required by Title 5, certifications in writing to the LAA that the System has been constructed in compliance with the terms of the Approval.

25. Prior to the issuance of a Certificate of Compliance by the LAA, the Company or its authorized agent shall submit to the Approving Authority, with a copy to the Designer and the System Owner, a certification that the installation conforms to the Approval. The authorized agent of the Company responsible for the inspection of the installation shall have received technical training in the Company's products.

26. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sanitary sewer system. Accordingly, no System shall be installed if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004. When a sanitary sewer connection becomes feasible after an Alternative System has been installed, the System Owner shall connect the facility served by the System to the sewer within 60 days of such feasibility and the System shall be abandoned in compliance with 310 CMR 15.354, unless a later time is allowed in writing by the Department or the LAA.

IV. Operation and Maintenance, Monitoring, and Inspection

1. As stated in 310 CMR 15.285(3), the Company shall implement a system monitoring and reporting plan as described in this Approval, covering no less than 18 months of operation at each facility to be piloted.

2. For all Systems installed under the Approval, the Company or its authorized agent shall be responsible for oversight, monitoring, data collection, and submissions to the LAA and the Department.

3. For the duration of the performance evaluation, the System Owner and the Company shall enter into an O&M Agreement. The Company shall be responsible for providing a qualified Service Contractor to service the System during this period. Prior to commencement of construction of a System installation, the Company shall provide to the LAA a copy of a signed O&M Agreement with the System Owner. For the duration of the performance evaluation, the Company shall maintain a copy of the current O&M Agreement.

4. At a minimum any O&M Agreement shall include the following provisions:

    a) The name of the qualified Service Contractor that appears on the Company's current list of Service Contractors;

b) In the case of a System failure, equipment failure, alarm event, components not functioning as designed, or violations of the Approval, procedures and responsibilities of the Company, the Service Contractor, and the System Owner shall be clearly defined for corrective measures to be taken immediately;

c) The Service Contractor shall agree to provide written notification within five days, describing corrective measures taken, to the System Owner, the local board of health, and the Company; and

d) Procedures and responsibilities for recording wastewater flows and power consumption during the performance evaluation must be defined. If direct metering of power consumption is not feasible, equipment run times shall be recorded for the Company to provide recorded estimates of power consumption of the facility.

5. No System shall be used until an O&M plan is submitted to the local approving authority which:

a) provides for the contracting of a person or firm competent in providing services consistent with the System's specifications and the operation and maintenance requirements specified by the Designer and any specified by the Department;

b) contains routine O&M activities specified by the Company necessary for proper operation of the System;

c) contains procedures and responsibilities for recording monthly wastewater flow or water meter readings;

d) contains procedures for notification to the Company and the local approving authority within five days of a System failure or alarm event and for corrective measures to be taken immediately;

e) provides the name of an Operator, which must be a Massachusetts certified operator, minimum Grade IV, as required by 257 CMR 2.00, that will operate and maintain the System at the frequency specified in the approval as applicable, and anytime there is an alarm event; and,

f) shall require submittal of sampling or monitoring data and Operator inspection results within 45 days of each sampling date and each inspection date, to the local approving authority and to the Department. Submittal to the Department will be through the Barnstable County Septic Management Program's IA Tracking Database: https://septic.barnstablecountyhealth.org/
The inspection results reported must include the information recorded/required on a DEP approved inspection form (https://www.mass.gov/lists/title-5-septic-system-forms#title-5-inspections-&-pumping-forms-) and the Company's technology inspection checklist.

6. The Company shall provide written notification to the Department within seven days of any cancellation or expiration of the O&M Agreement required for the duration of the performance evaluation.

7. Upon the Company's completion of a System performance evaluation (PE) report and the Department's acceptance of the System being in compliance with Title 5, effluent limits, and the performance goals and conditions of this Approval for at least the previous 12 months, the System Owner and Service Contractor shall be responsible thereafter until the conditions of the Approval are modified, terminated, or superseded by a new Approval. The System Owner

and the Service Contractor shall enter into an O&M Agreement and the Agreement shall be at least for one year.

8. The System shall be inspected, monitored, operated, and maintained by a Service Contractor under an O&M Agreement in accordance with this Approval and in accordance with any Company, Designer, or LAA requirements. The Service Contractor must be trained by the Company, must be on the Company's current list of Service Contractors, and must be certified at Grade Level IV (four) by the Board of Registration of Operators of Wastewater Treatment Facilities, in accordance with Massachusetts regulations 257 CMR 2.00.

9. The System Owner and the Service Contractor shall maintain on-site, at all times, a copy of the approved plans, the Owner's Manual, the O&M Manual, a copy of the Approval, and a copy of the current O&M Agreement.

10. The System Owner and the Service Contractor shall provide written notification to the LAA within seven days of any cancellation, expiration or other change in the terms and/or conditions of the required O&M Agreement.

11. At a minimum, the Service Contractor shall inspect, properly operate, and properly maintain the System:
    a) Any time there is System failure, equipment failure, or an alarm event;
    b) In accordance with the O&M manual and Designer requirements;
    c) In accordance with the requirements of the LAA;
    d) In accordance with the Approval; and
    e) For seasonal use, the Service Contractor shall be on-site and responsible for the proper start-up and shut down of the Alternative System.

12. Each time a Pilot Alternative System is visited by a Service Contractor the following shall be recorded, at a minimum:
    a) Date, time, air temperature, and weather conditions;
    b) Observations for objectionable odors;
    c) Observations for signs of breakout of sanitary sewage in the vicinity of the Alternative System, which indicate a failure of the Alternative System;
    d) Identification of any apparent violations of the Approval;
    e) Since the last inspection, whether the system had been pumped with date(s) and volume(s) pumped;
    f) Sludge depth and scum layer thickness, if measured;
    g) When responding to alarm events, the cause of the alarm and any remedial steps taken to address the alarm and to prevent or reduce the likelihood of future similar alarm events;
    h) Field testing results, if any;
    i) List of samples taken for laboratory analysis, if any;
    j) Any cleaning and lubrication performed;
    k) Any adjustments of control settings, as recommended or deemed necessary;

l) Any testing of pumps, switches, alarms, as recommended or deemed necessary;

m) Identification of any equipment failure or components not functioning as designed;

n) Parts replacements and reason for replacement, whether routine or for repair; and

o) Further corrective actions recommended, if any.

13. For the duration of the performance evaluation (or PE), the required O&M Agreement shall include the following monitoring schedule at a minimum:

Parameter	Monitoring Frequency	Sample Type	Location	Effluent Limits
wastewater temperature	each inspection	Measure	effluent to SAS	Measure and record
flow	each inspection	Measure	See Paragraph IV.16	Measure and record
pH	See frequency specified below	Grab	Influent as specified & Effluent to SAS	6 to 9
Total Nitrogen	See frequency specified below	Grab	Influent as specified & Effluent to SAS	25 mg/l at 550 gpd/acre & 19 mg/l at 660 gpd/acre Residential only
BOD_5	See frequency specified below	**Grab**	Influent as specified & Effluent to SAS	30 mg/l
TSS	See frequency specified below	Grab	Influent as specified & Effluent to SAS	30 mg/l
turbidity	See frequency specified below	Measure	Effluent to SAS	≤ 40 NTU
settleable solids	See frequency specified below	Measure	Effluent to SAS	Measure and record ml/l only
color	See frequency specified below	visual observation	Effluent to SAS	Record observation only
Depth of Ponding Within SAS	once every year	Measure	Inspection port to bottom of SAS	See Paragraph IV.19(d)

System Monitoring Responsibility

14. For at least the first 18 months of operation and until a System's Performance Evaluation (PE) has been completed by the Company, and approved by DEP, the Company shall be responsible for the following minimum monitoring requirements and effluent limits:

a.) For year-round properties:

1) The facility shall be inspected monthly for the first 12 months then quarterly thereafter:
2) The influent and effluent shall be monitored for pH, BOD5, TSS and total nitrogen (TN) monthly for the first 3 months, then quarterly for effluent only.
3) After at least 6 quarterly samples, the effluent shall be sampled quarterly for TN and field tested for pH, turbidity, settleable solids and color.
4) Non-residential facilities shall also monitor influent quarterly for wastewater temperature, pH, BOD5, TSS and TN for a minimum of 4 quarters; and,

b) For Seasonal properties:

1) The facility shall be inspected, and the influent and effluent sampled for pH, BOD5, TSS and TN at least twice per year, once 30 to 60 days after occupancy and the second sample must be taken no less than 2 months after the first sample or just prior to the seasonal end-of-use.
2) After at least 6 samples, the effluent shall be analyzed for just TN and field tested for pH, turbidity, settleable solids, and color.

15. After a minimum of 18 months and completion of the PE of a System that shows the System was in compliance with Title 5, effluent limits, and the performance goals and conditions of this Approval for at least the previous 12 months, the System Owner and the Service Contractor shall be responsible for the following monitoring requirements:

a) For Systems designed to receive or receiving more than 440 gallons per day per acre that were installed to serve new construction or an increase in flow in an area subject to the Nitrogen Loading Limitations of 310 CMR 15.214 and subject to a total nitrogen concentration limit, the following applies until the Approval is modified, terminated, or superseded:

1) Year-round properties shall be inspected when sampled and effluent samples shall be taken twice per year at least 5 months apart and analyzed for TN. At least one sample will be taken between December 1 and March 1 of each year.
2) Seasonal properties shall be inspected when sampled and effluent samples shall be taken for TN a minimum of twice per year. At least one annual sample must be taken 30 to 60 days after occupancy. A second sample must be taken no less than 2 months after the first sample or just prior to the seasonal end-of-use.

16. Flow Metering – Flow shall be recorded each time the system is inspected and sampled by the System Operator and may be based on either actual metering data of System wastewater flow, or water meter data for the total facility adjusted during summer months if necessary using winter season water use data. If facility contains more than one water meter, all meters shall be reported with a summary of water use.

17. All analysis shall be performed at a US EPA or Department certified laboratory using accredited methods approved in the latest update of 40CFR Part 136. All sampling shall be performed in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater. It is a violation of this Approval to falsify any data collected

pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.

18. Within 45 days of each site visit, all monitoring data shall be submitted to the System Owner and the LAA with the O&M report and inspection checklist, and to the Department. Submittal to the Department will be through the Barnstable County Septic Management Program's IA Tracking Database: https://septic.barnstablecountyhealth.org/
The inspection results reported must include the information recorded/required on a DEP approved inspection form (https://www.mass.gov/lists/title-5-septic-system-forms#title-5-inspections-&-pumping-forms-) and the Company's technology inspection checklist.

Compliance Requirements

19. The System shall be subject to the following performance requirements:

a) For areas subject to the Nitrogen Loading Limitations of 310 CMR 15.214, whenever two consecutive monitoring rounds exceed the required TN limit, a written evaluation with recommendations for changes in the design, operation, and/or maintenance of the System shall be submitted to the LAA, within 90 days of the second exceedance of the limit. The written evaluation with recommendations shall be prepared by the Service Contractor or a qualified Designer and the submission shall include all monitoring data, inspection reports, and laboratory analyses since the last annual report to the LAA;

b) Whenever field testing indicates a pH outside the of 6 to 9 or an exceedance of the turbidity limit of 40 NTU, the Service Contractor shall collect an effluent sample from the treatment unit for laboratory analysis for BOD5 and TSS, and make any adjustments and/or repairs to the System deemed necessary during the inspection;

c) Whenever two consecutive monitoring rounds include at least one exceedance of the limits for BOD5 or TSS, a written evaluation with recommendations for changes in the design, operation, and/or maintenance of the System shall be submitted to the LAA, within 90 days of the second exceedance of the limits. The written evaluation with recommendations shall be prepared by the Service Contractor or a qualified Designer and the submission shall include all monitoring data, inspection reports, and laboratory analyses since the last annual report to the LAA;

d) Whenever an SAS inspection port measurement indicates the ponding level within the SAS is above the invert of the distribution system, an additional measurement shall be made 30 days later. If the subsequent reading indicates the elevation of ponding within the SAS is above the invert of the distribution system, within 60 days of the follow up inspection, a written evaluation with recommendations for changes in the design, operation, and/or maintenance of the System shall be submitted to the LAA. The written evaluation with recommendations shall be prepared by the Service Contractor or a Designer and the submission shall include all monitoring data, inspection reports, and laboratory analyses for the previous year; and

e) Recommendations for any changes to the System shall be implemented, as approved by the LAA, in accordance with an approved schedule, provided that all corrective measures are implemented consistent with the limitations described in Paragraph V.8.

Responsibility for completing these compliance requirements is same as is assigned in the above Paragraphs IV.15 and 16 for monitoring requirements.

20. For Systems failing to comply with any other terms of the Approval not included in Paragraph 15, and until the Company submits a Performance Evaluation report to the System Owner and the LAA showing the System was in compliance with Title 5, effluent limits, and the performance goals and conditions of this Approval for at least the previous 12 months, the Company or its authorized agent shall determine the cause(s) of the noncompliance. The Company shall provide written recommendations for corrective actions to the System Owner and the LAA. Corrective actions may include but are not limited to design changes, installation changes, operation or maintenance changes including sampling modifications, and/or changes in roles and responsibilities for the manufacturer, vendors, designers, installers, service contractors and owners. Any recommended changes which are not consistent with this Approval shall first be submitted to the Department with an application for an Approval modification.

    The Company shall be responsible for implementation of recommended changes, as approved by the LAA, in accordance with an approved schedule. All corrective measures implemented shall be consistent with the Approval and the other limitations described in Paragraph V.8.

21. Unless directed by the LAA to take other action, the System Owner shall immediately cease discharges or have wastewater hauled off-site, if at any time during the operation of the Alternative System the system is in failure as described in 310 CMR 15.303(1)(a)1 or 2, backing up into facilities or breaking out to the surface.

V. Additional System Owner and Service Contractor Requirements

1. Prior to issuance of a Certificate of Compliance for a System installation, the System Owner shall record and/or register the Deed Notice required by 310 CMR 15.287(10) and provide a copy to the LAA. The Deed Notice shall be completed as follows:

    a. Certified Registry copy of the Deed Notice bearing the book and page/or document number; and,

    b. If the property is unregistered land, a copy of the System Owner's deed to the property as recorded at the Registry, bearing a marginal reference on the System Owner's deed to the property.

2. Prior to signing any agreement to transfer any or all interest in the property served by the System, or any portion of the property, including any possessory interest, the System Owner shall provide written notice, as required by 310 CMR 15.287(5) of all conditions contained in the Approval to the transferee(s). Any and all instruments of transfer and any leases or rental agreements shall include as an exhibit attached thereto and made a part of thereof a copy of the Approval for the System. The System Owner shall send a copy of such written notification(s) to the LAA within 10 days of giving such notice to the transferee(s).

3. The System Owner shall provide access to the site for the Company and the Service Contractor to perform inspections, maintenance, repairs, responding to alarm events and field testing as may be required by the Approval, including sampling the System in accordance with the Approval.

4. The System Owner and the Service Contractor shall maintain copies of the Service Contractor's O&M reports, inspection checklists, and all reports and notifications to the LAA for a minimum of three years.

5. The System Owner shall not install, modify, upgrade, or replace the System except in accordance with a valid DSCP issued by the LAA which covers the proposed work.

6. Upon determining that the System is in violation of the Approval or the System has failed, as defined in 310 CMR 15.303, the Service Contractor shall notify the System Owner immediately.

7. Upon determining that the System has failed, as defined in 310 CMR 15.303, the System Owner and the Service Contractor shall be responsible for the notification of the LAA within 24 hours of such determination.

8. In the case of a System failure, an equipment failure, alarm event, components not functioning as designed, components not functioning in accordance with manufacturer's specifications, or violations of the Approval, the Service Contractor shall provide written notification within five days describing corrective measures to the System Owner, the local board of health, and the Company and may only propose or take corrective measures provided that:

   a) All emergency repairs, including pumping, shall be in accordance with the limitations and permitting requirements of 310 CMR 15.353;

   b) The design of any repairs or upgrades are consistent with the Alternative System Approval;

   c) The design of any repairs or upgrades requiring a DSCP shall be performed by an individual who is a Massachusetts Registered Professional Engineer or a Massachusetts Registered Sanitarian, provided that such Sanitarian shall not design a system with a discharge greater than 2,000 gallons per day.

   d) The installation shall be done by an Installer with a currently valid Disposal System Installers Permit (310 CMR 15.019)

   The System Owner shall also be responsible for ensuring written notification is provided within five days to the local Board of Health.

9. The Service Contractor shall provide written notification to the Company within seven days of any cancellation, expiration or other change in the terms and/or conditions of a required O&M Agreement.

10. By September 30th of each year, the System Owner and the Service Contractor shall be responsible for submitting to the LAA all O&M reports, all monitoring results, and inspection checklists completed by the Service Contractor during the previous 12 months.

11. By September 30th of each year, the Service Contractor shall be responsible for submitting to the Company copies of all O&M reports including alarm event responses, all monitoring results, violations of the Approval, inspection checklists completed by the Service Contractor, notifications of system failures, and reports of equipment replacements with reasons during the previous 12 months.

12. The Service Contractor shall notify the System Owner of any changes to the terms and conditions of the Approval within 30 days of any changes.

13. Within one year of any changes to the terms and conditions of the Approval, the System Owner shall amend, as necessary, the O&M Agreement to reflect the changes to the terms and conditions of the Approval.

14. The System Owner shall furnish the Department any information that the Department requests regarding the System, within 21 days of the date of receipt of that request.

15. The Approval shall be binding on the System Owner and on its agents, contractors, successors, and assigns, including but not limited to the Designer, Installer, and Service Contractor. Violation of the terms and conditions of the Approval by any of the foregoing persons or entities, respectively, shall constitute violation of the Approval by the System Owner unless the Department determines otherwise.

VI. Company Requirements

1. The Approval shall be binding on the Company and its officers, employees, agents, contractors, successors, and assigns, including but not limited to dealers, distributors, and resellers. Violation of the terms and conditions of the Approval by any of the foregoing persons or entities, respectively, shall constitute violation of the Approval by the Company unless the Department determines otherwise.

2. The Company shall be responsible for verification of the appropriate model unit as part of the review of proposed installations under the Approval.

3. The Company shall notify the Director of the Wastewater Management Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval is issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.

4. The Company shall make available to owners, operators, and installers of the System, in printed and electronic format: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System; a protocol for collecting samples for laboratory analysis; a maintenance checklist; a list of trained Operators and a recommended schedule for maintenance of the System. It is recommended the Company have a Massachusetts page on their web site to include these items.

5. For each system installation, the Company shall provide, in printed or electronic format, the System design plan, installation, O&M, and Owner’s manuals, and any updates associated with this technology Approval, to the System Owners, Designers, Installers, Service Contractors, vendors, resellers, and distributors of the System.

6. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.

7. The Company shall institute programs of training and continuing education for Service Contractors. Training shall be provided at least annually. If the Company requires trained Designers and Installers, the Company shall institute programs of training and continuing education that is separate from or combined with the training for Service Contractors. The Company shall maintain, annually update, and make available by March 15th of each year, lists of approved Service Contractors and, if training is required, Designers and Installers. The Company shall certify that any approved Service Contractors, Designers, and Installers have taken the appropriate training and passed the Company's training qualifications. The Company shall not re-certify a Service Contractor if the Service Contractor has not complied with the reporting requirements for the previous year.

8. If Installer training is required by the Company, the Company shall not sell the Technology to an Installer unless the Installer is trained. The Company shall also require, by contract, the distributors and resellers of the Technology shall not sell the Technology to an Installer unless the Installer is trained.

9. As part of any training programs for Designers, Installers, and Service Contractors, the Company shall provide each trainee with a copy of this alternative technology Piloting Approval with any design, installation, O&M, and owner's manuals that were submitted as part of the Approval.

10. The Company shall furnish the Department any information that the Department requests regarding the Technology within 21 days of the date of receipt of that request.

11. For at least the first 18 months of operation, the Company shall be responsible for operating, maintaining, and monitoring the Systems in accordance with this Approval. The Company shall ensure that the monitoring data and O & M inspection results are submitted within 45 days of each sampling date and each inspection date to the local approving authority and to the Department. Submittal to the Department will be through the Barnstable County Septic Management Program's IA Tracking Database: https://septic.barnstablecountyhealth.org/
The inspection results reported must include the information recorded/required on a DEP approved inspection form (https://www.mass.gov/lists/title-5-septic-system-forms#title-5-inspections-&-pumping-forms-) and the Company's technology inspection checklist. Accurate completion of the forms shall be the responsibility of the Company. The Company shall maintain copies of all data and inspections results for all Systems installed under the Approval.

12. The Company shall submit to the Department for approval any proposed updates or changes to the Technology schematics, O&M manual, inspection checklist, etc. The Company shall request Department approval for any substantive changes which may require a modification of the Approval.

13. The Company shall provide notification of any changes to this Approval within 60 days of issuance by the Department to all System Owners with existing systems utilizing the Technology, to all Service Contractors/Operators servicing existing installations of the Technology, and to all distributors and resellers of the Technology.

14. The Company must offer to the System Owner a two-year initial service policy with the purchase of the Technology that includes eight (8) site visits (every 3 months). The Company must make available, for a fee, an extended service policy for a minimum of 5 years beyond the two-year initial service policy.

15. Prior to its sale of any System that may be used in Massachusetts, the Company shall provide the purchaser with a copy of the Approval with the System design, installation, O&M, and Owner's manuals. In any contract for distribution or sale of the System, the Company shall require the distributor or seller to provide the purchaser of a System for use in Massachusetts with copies of these documents, prior to any sale of the System.

16. Prior to submission of an application for a DSCP, the Company shall provide to the Designer and the System Owner:
    a) All design and installation specifications and requirements;
    b) An operation and maintenance manual, including:
        1. An inspection checklist;
        2. Recommended inspection and maintenance schedule;
        3. Monitoring (i.e. water use and power consumption) and sampling procedures, if any;
        4. Alarm response procedures, if any, and troubleshooting procedures;
    c) An owner's manual, including proper system use and alarm response procedures, if any;
    d) Estimates of the Owner's costs associated with System operation including, when applicable: power consumption, maintenance, sampling, recordkeeping, reporting, and equipment replacement;
    e) A copy of the Company's warranty, and
    f) Lists of Designers, Installers, and Service Contractors.

17. Upon submission of an application for a DSCP to the Approving Authority, the Company shall submit to the Approving Authority, with a copy to the Designer and the System Owner, a certification by the Company or its authorized agent that the design conforms to the Approval and that the proposed use of the System is consistent with the unit's capabilities and all Company requirements. The review shall include evaluation of the need for installation of water meter(s) at each facility. An authorized agent of the Company responsible for the design review shall have received technical training in the Company's products.

18. The Company shall maintain records of:
    a) The Approval;
    b) Any design and installation manuals;
    c) An owner's manual, including alarm response procedures, if any;

d) An operation and maintenance manual, including:

1. An inspection checklist;
2. Recommended inspection and maintenance schedule;
3. Monitoring requirements, if any (including water use and power consumption when required) and sampling procedures, and
4. Alarm response procedures, if any, and troubleshooting procedures.

e) Estimates of the operating costs provided to the Owner, including, when applicable: power consumption, maintenance, sampling, recordkeeping, reporting, and equipment replacement;

f) A copy of the Company's warranty, and

g) Lists of any approved Designers, Installers, and trained Service Contractors.

19. The Company shall maintain the following information for the Systems installed in Massachusetts:

a) The address of each facility where the Technology was installed, the Owner's name and address (if different), the type of use (e.g. residential, commercial, institutional, etc.), the design flow, the model installed;

b) The installation date, start-up date, current operational status;

c) The name of the Service Contractor, noting any cancellations or changes to any Service Contracts;

d) A summary of System failures, System malfunctions, and violations of the Approval with the date of each event and corrective actions taken to reach compliance, including but not `monitoring changes; and/or changes in roles and Piloting Approval;

e) Copies of all Service Contractor records submitted to the Company, including all O&M reports with alarm event responses, all monitoring results, completed inspection checklists, notifications of system failures and reports of equipment replacements with reasons, and

f) Copies of any completed PE reports.

20. By March 15th of each year the Company shall submit to the Department an annual report that contains the following information for all installed Systems:

a) A table of the information required by the preceding Paragraph (Section VI, paragraph (19) a, b, c, d, e and f).

b) A table of monitoring data collected for all Systems installed to-date;

c) A list of pending applications for System installations which have been submitted to local approving authorities.

d) Identification of each System failure to comply with any performance criteria of the Approval or the system monitoring and reporting plan, including but not limited to, effluent quality limits. Include the date of each event, the date that the System was returned to compliance, and the reasons for the noncompliance and the corrective actions that were taken, including but not limited to any design changes, installation changes, operation or maintenance changes including sampling, and/or changes in roles

and responsibilities for the manufacturer, vendors, designers, installers, service contractors and owners;

e) For any System in violation of the Approval or not in compliance with any performance criteria at the time of the annual report, the reasons for the noncompliance and the status of any corrective actions that are needed;

f) Any general recommendations and requests for changes to the system monitoring and reporting plan or the performance criteria of the Approval; and

The report shall be signed by a corporate officer, general partner or the Company owner. (Service Contractor records submitted to the Company should not be included with the annual report but shall be made available to the Department within 30 days of a request by the Department.)

21. Upon completion of the Performance Evaluation (PE) of a System after a minimum of 18 months of operation, the Company shall submit to the Department, the System Owner and the LAA a PE report on the System describing and summarizing the operations of the System, any changes in operation or design that were made during the piloting performance evaluation period and the results of the piloting program for that System. The report shall also include whether the System was in compliance with Title 5, the effluent limits, and the performance goals and conditions of this Approval for at least the previous 12 months of operation. That report shall also include either recommendations for approving and ending the piloting program for that System or recommendations for continuing piloting for any System that has not performed as planned and/or required.

    a) For System's either not in compliance with Title 5 and/or not meeting performance goals of the Approval, the report shall provide recommendations for either continuing the pilot evaluation of the System or removal of the piloted unit as well as if necessary, the upgrade or replacement of the System with a fully complying Title 5 I/A or conventional system.

    b) Systems in compliance with Title 5 and meeting the performance goals and conditions of this Approval, the report shall provide recommendations for approving and ending the piloting program for that System. The Company may turn the responsibility for operation and monitoring of the System over to the System Owner and Service Contractor in accordance with this Approval.

22. The Department will review the submitted report and determine if additional Piloting of that System is required. The Company shall either continue the Piloting program for that system as required by the Department or remove the System(s) or replace it with fully complying Title 5 system(s). If the Department determines that the System has performed at the relevant level for at least 12 months, the Company can turn the responsibility for operation and monitoring of the system over to the System owner in accordance with Section IV, item 7 of this Approval.

23. If the Company wishes to continue the Approval after its expiration date, the Company shall apply for and obtain a renewal of the Approval. The Company shall submit a renewal application at least 180 days before the expiration date of the Approval, unless written permission for a later date has been granted in writing by the Department. Upon receipt of a

timely and complete renewal application, the Approval shall continue in force until the Department has acted on the renewal application.

VII. General Requirements

1. Any Alternative System for which a complete DSCP application is submitted while the Approval is in effect, may be permitted, installed, and used in accordance with the Approval, unless and until:

   a) The Department issues modifications or amendments to the Approval which specifically affect the installation or use of an Alternative System installed under the Approval for the Technology; or

   b) The Department, the local approval authority, or a court requires the Alternative System to be modified or removed or requires discharges to the System to cease.

2. Unless otherwise stated in this approval, all notices and documents required to be submitted to the Department by the Approval shall be submitted to:

   Director
   Wastewater Management Program
   Department of Environmental Protection
   One Winter Street - 5th floor
   Boston, Massachusetts 02108

Rights of the Department

The Department may suspend, modify or revoke the Approval for cause, including, but not limited to, non-compliance with the terms of the Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to the Approval and/or the System against the Company, a System Owner, a Designer, an Installer, and/or Service Contractor.