



# COMMONWEALTH of VIRGINIA

Department of Health

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May 6, 2016

## MEMORANDUM

**TO:** District Health Directors  
District Environmental Health Managers **GMP 2016-03**

**THROUGH:** Marissa J. Levine, MD, MPH, FAAFP  
State Health Commissioner 

**THROUGH:** Allen Knapp, Director, Office of Environmental Health Services

**FROM:** Dwayne Roadcap, Division Director 

**SUBJECT:** GUIDANCE MEMORANDUM AND POLICY (GMP) 2016-03:  
Implementation of 12VAC5-613-70, the Regulations for Alternative Onsite  
Sewage Systems (the AOSS Regulations).

### I. Definitions:

The following terms have the same meaning as found in the AOSS Regulations: BOD<sub>5</sub>, Division, general approval, small alternative onsite sewage system (AOSS), third party, TL-2, and TL-3. "Residential wastewater" has the same meaning found in Va. Code § 54.1-400. The following additional terms have the following meaning with respect to this policy:

"NSF/ANSI 40" means a standard promulgated by the National Sanitation Foundation and American National Standards Institute for residential wastewater treatment systems with rated capacities between 400 and 1,500 gallons per day. To achieve certification, treatment systems must produce an acceptable quality of effluent during a six-month (26-week) test. Class I systems must achieve a 30-day average effluent quality of 25 mg/l carbonaceous 5-day biochemical oxygen demand (CBOD<sub>5</sub>) and 30 mg/l total suspended solids (TSS) or less, and pH 6.0-9.0

"Quality Assurance and Quality Control (QA/QC) Plan" means a document developed by a third party to describe the proper collection, transport and handling of samples by properly trained and qualified persons.

## **II. Purpose:**

This policy implements 12VAC5-613-70, which requires the Division to develop a protocol to verify the performance of small AOSS treatment units. This policy establishes procedures and pass/fail criteria for field evaluation of TL-3 and how treatment units will be recognized as generally approved for TL-2 or TL-3. Requests for TL-2 or TL-3 general approval after the effective date of this policy are subject to 12VAC5-613-70 and the requirements herein.

GMP #147 is rescinded and replaced with this policy. GMP #147 included design requirements for pad, trench, and drip dispersal systems. Although promulgation of the AOSS Regulations negated the need for design specifications found in GMP #147, nothing precludes a designer from using prior design guidance since it complies with the AOSS Regulations.

Any manufacturer with a prior agreement (that has not expired) may update the old agreement upon request in conformance with this policy; however, the manufacturer can also choose to follow the prior agreement.

## **III. Scope:**

The evaluation procedure described herein only applies to a small AOSS treating residential wastewater. A manufacturer is not required to have any treatment unit evaluated pursuant to this policy, nor is a designer required to use a generally approved treatment unit. Until a manufacturer's product line is generally approved, it is not generally approved, which means a non-generally approved treatment unit must adhere to the reporting schedule of 12VAC5-613-100.E.

The protocol outlined herein is a method to evaluate treatment efficacy for a specific manufacturer's product line that is designed to treat residential wastewater from a single family home. The evaluation protocol does not predict the performance or statistical mean of any particular treatment unit from an individual home. VDH does not rely solely on the results of an individual grab sample to establish the factual basis for a violation of the AOSS Regulations.<sup>1</sup>

## **IV. Background:**

VDH historically evaluated nascent and emerging technologies using "experimental" or "provisional" protocols in 12VAC5-610 by coupling treatment with dispersal, requiring fecal coliform measurements after effluent dispersed through the soil. From 1996 through 2009, three manufacturers--Bord na Móna (Anua), Orenco, and Premiere Tech--collected "end-of-pipe" effluent data from units installed in Virginia during their experimental and provisional

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<sup>1</sup> 12VAC5-613-50.1 states, "[except] when there is additional evidence that an AOSS has failed to achieve one or more of the performance requirements of this chapter or when a licensed operator has filed a report indicating that an AOSS cannot be returned to normal function via routine maintenance, the department shall not rely solely on the results of an individual grab sample to establish the factual basis for a violation of this chapter."

evaluation. These evaluations demonstrated higher-quality effluent could be dispersed at higher soil loading rates and with reduced vertical separation to soil limiting features. Additional manufacturers subsequently provided end of pipe data for their units (Bio-Microbics, Clearstream, Ecological Tanks, Inc., EZ Treat, and Quanics). Five of these manufacturers received general approval for TL-3 before the effective date of the AOSS Regulations; the others received general approval afterwards.

#### **V. Procedures for TL-2 general approval:**

All treatment units with NSF/ANSI Standard 40 Class I (NSF/ANSI 40) approval are generally approved for TL-2 without further evaluation and approval. Field sampling is only required in accordance with 12VAC5-613-100 to verify individual system performance. NSF's listing of Standard 40 Class I approved treatment units is available at <http://www.nsf.org/Certified/Wastewater/Listings.asp?TradeName=&Standard=040>. The Division may request an installation and design manual. Otherwise, a manufacturer of a treatment unit without NSF/ANSI 40 approval may request general approval for TL-2 by submitting the application found in Appendix A1.

#### **VI. Procedures for TL-3 general approval:**

A manufacturer can obtain general approval by submitting a complete application (Appendix A2), signing a memorandum of understanding and agreement (Appendix B), and then successfully executing and completing the agreement.<sup>2</sup> A manufacturer with a product recognized for TL-3 general approval prior to December 7, 2011 shall retain such status until December 7, 2016.<sup>3</sup> The following is necessary for processing the application:

- i. The proprietary treatment unit must be recognized by VDH as generally approved for TL-2 treatment.
- ii. A professional engineer licensed to practice in Virginia must certify in writing that in his professional opinion the treatment unit can be expected to consistently produce "end-of-pipe" effluent meeting TL-3.
- iii. The manufacturer must submit an operation and maintenance (O&M) manual that is acceptable to the Division. The O&M manual is for listing purposes only and must contain the following minimum elements:<sup>4</sup>
  - a. A list of any control functions for the treatment unit and how to use them.
  - b. A recommended schedule for periodic monitoring and inspection of the treatment unit and the actions recommended at each inspection interval.
  - c. The expected use and the design criteria for the treatment unit.

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<sup>2</sup> The manufacturer can provide the application electronically to [Marcia.Degen@vdh.virginia.gov](mailto:Marcia.Degen@vdh.virginia.gov).

<sup>3</sup> See 12VAC5-613-30.L and M for more information.

<sup>4</sup> Depending on the specific and individualized design, additional or different O&M instructions may be necessary for a unique system installation.

- iv. The professional engineer must certify in writing that he has reviewed the manufacturer's O&M manual and that, in his professional opinion, the manufacturer's maintenance schedule appears to accurately reflect the servicing and maintenance needs of the proprietary treatment unit.
- v. The Division Director and the manufacturer must execute the Memorandum of Understanding and Agreement to evaluate the treatment unit's efficacy.

The AOSS Regulations, at 12VAC5-613-70, describes the process for field testing. Treatment unit models that are identical in function and vary only in design flow may comprise the test population. For example, the test population may be Model X-500, Model X-600, and Model X-750 with design flows of 500, 600, and 750 gallons per day, respectively.

If a non-generally approved TL-3 unit is installed, then sampling requirements follow 12VAC5-613-100.E. Data collected may fulfill sampling requirements for 12VAC5-613-100.E and this policy.

The memorandum of agreement may be amended by mutual consent of the parties, and may be terminated by either party with notice. The State Health Commissioner specifically delegates responsibility of signing the contract to the Division Director, Division of Onsite Sewage, Water Supplies, Environmental Engineering and Marina Programs. By executing the Agreement, the Manufacturer and Division agree that within three years of the date the agreement is executed, the manufacturer will complete an evaluation of a minimum of 20 treatment units located and installed in the Commonwealth of Virginia, which will be jointly agreed upon by the manufacturer and the Division. The Division and manufacturer also agree to the following:

- i. Each of the 20 treatment units selected for evaluation must be designed and used for a single-family residential dwelling with a design flow less than or equal to 1,000 gallons per day (GPD), used as expected for a permanently occupied home. Residential design flows shall be calculated using the rate of 150 gallons per day (GPD)/bedroom.
- ii. The manufacturer will not evaluate any unit associated with seasonal occupancy or seasonal rental use.
- iii. The manufacturer will contact the Division when a viable treatment unit has been installed or identified. Upon notice, the Division will confirm whether the treatment unit is suitable for testing.
- iv. The manufacturer will maintain an electronic database of treatment units selected for evaluation and report that database to the Division. On a quarterly basis, the manufacturer will provide influent and effluent results as described in section v (below). The manufacturer will retain copies of the Chain of Custody forms for sample collection, transport, and measurement and provide them to the Division within five days of submitting the quarterly database report.

- v. The manufacturer will hire and use a third party accepted by the Division to oversee and administer the testing and evaluation protocol. At a minimum, four consecutive quarterly influent and effluent samples must be collected for 12 months from each of the 20 treatment units. Quarters run from January 1 to March 31, April 1 to June 30, July 1 to September 30, and October 1 to December 31. Treatment units must be in operation for at least 3 months before sampling begins.

All procedures to collect, transport, and measure samples, with proper chains of custody, must be conducted under the supervision of an independent third party.

- vi. Failure of the manufacturer to report in accordance with section iv (above), or failure of the manufacturer to make progress toward the goal as evidenced by the installation and monitoring of the treatment units, may result in the termination of the agreement.
- vii. All units must be operated and maintained in accordance with the site specific O&M manual required by 12VAC5-613-170. A manufacturer may ensure that a unit is in proper working order at the start of the study; however, O&M during the course of the study must be conducted by an independent, properly licensed operator in accordance with the approved O&M manual. The third party must assess impacts from additional O&M performed on the treatment unit to maintain its function. The third party must also submit O&M logs for each site with the final report.
- viii. The third party must provide an acceptable Quality Assurance and Quality Control (QA/QC) plan that includes information on the collection, transport, and handling of samples.

The manufacturer must provide the Division with a copy of its contract with the third party that specifies the third party's duties, including the need to have properly trained persons and/or licensees to collect, transport, or test samples from the treatment units. The contract between the manufacturer and third party becomes an addendum to the agreement. If requested by the Division, the manufacturer will have the third party provide at least 72 hours notice before collecting samples to allow for joint collection with the Division upon request.

The manufacturer must ensure that at least two inspection and sampling ports are available on each treatment unit to allow the third party to adequately sample influent and effluent. Each inspection and sampling port must be located in a manner to accurately characterize the influent and effluent. The manufacturer must have the third party report influent results for pH, BOD<sub>5</sub> and TSS. The third party may estimate flow based on water meter readings, pump run time meters, pump run counters, number of persons in the household, or another method detailed in the QA/QC plan.

If the influent does not reflect the average or normal values for residential wastewater, then the Division may require additional testing or eliminate that specific residence from the evaluation. Influent testing is required to verify that the treatment unit is receiving residential strength wastewater. If influent data is not practical to collect, then the manufacturer may report effluent from the primary settling tank (septic tank or trash tank) as influent, or request that influent sampling be waived. The Division may consider and agree to other influent sampling

points on a case by case basis. Flow may be induced through the unit to obtain an effluent sample in accordance with the QA/QC plan. Induced flow must not exceed 5 GPM or extend beyond the time needed to collect a suitable sample. The third party must keep and maintain chain of custody documentation in accordance with the QA/QC plan for each sampling event and provide that documentation with the quarterly report.

The sample collection, preservation, holding times, and analytical methods for all required parameters must comply with 40 CFR 136. Composite or grab samples for TSS and BOD<sub>5</sub> may be used. The use of a laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP) is recommended; a list of Virginia Environmental Laboratory Accreditation Program (VELAP) accredited laboratories is available at <http://www.dgs.state.va.us/DivisionofConsolidatedLaboratoryServices/Services/EnvironmentalLaboratoryCertification2/tabid/1503/Default.aspx>.

The manufacturer must maintain an electronic database or spreadsheet of all system installations, and report the database to the Division Director by the 15<sup>th</sup> day of January, April, July, and October of each year the evaluation continues. The spreadsheet report will include sample results for influent and effluent; interim observations about the treatment unit's performance with respect to the pass/fail criteria; and the level of effluent treatment required for each installation (TL2 or TL3).

The pass/fail criteria for effluent will be as follows:

Effluent Parameter	Upper 99% Confidence Interval of Log-Transformed Data Converted Back to Native Units
BOD <sub>5</sub> (mg/l)	Less than or equal to 10 mg/l
TSS (mg/l)	Less than or equal to 10 mg/l

Each of the four quarterly samples for each treatment unit shall be log transformed and then averaged before applying the statistical manipulation. A one tailed t-test shall be applied with n-1 degrees of freedom, where "n" is equal to the number of test sites/units. The method detection level must be reported for the required parameter analyses. For the purposes of data manipulation, values below the method detection level will be treated as one-half of the method detection level.

At the conclusion of its evaluation in accordance with the Agreement, the identified third party must prepare a final report with the following minimum information:

- i. Description of sites selected and typical installation, including how sites were selected;
- ii. Geographic locations of systems tested;
- iii. O&M logs and an assessment of any O&M performed, including effects O&M might have had on the outcome of test results;
- iv. Chain of custody forms;
- v. List of key participants;

- vi. Description of sampling and analytical methods;
- vii. All testing results, including sample data, statistical analyses, or other evaluations;
- viii. Rationale for exclusion of data or removal of a system from the statistical analysis, if necessary; and
- ix. An overall evaluation or assessment of the study data.

The report must include an electronic copy of the data in Excel format for statistical analysis or as otherwise agreed by the Division. The Division will review the final report and determine whether the treatment unit can be listed as generally approved for TL-3 treatment. Upon submission of the third party report, the Division will evaluate results and determine whether the treatment unit passed the evaluation within 90 days of receipt.

The final effluent result for BOD<sub>5</sub> and TSS will be determined as the upper 99th-percent confidence interval of the log-transformed effluent data, converted back to “native” units (i.e., the antilogarithm of the upper 99th-percent confidence interval of the log-transformed effluent data). Each of the four quarterly samples for each evaluated treatment unit shall be log transformed and then averaged before applying the statistical manipulation. A one-tailed “t” distribution shall be used with n-1 degrees of freedom, where “n” is equal to the number of test units.

If the above statistical analysis indicates that the treatment unit produces 10 mg/l or less BOD<sub>5</sub> and TSS, then the treatment unit will be generally approved for TL-3 treatment, and listed (Appendix E). The manufacturer of a treatment unit that fails its evaluation may, with sufficient justification, petition VDH to execute a new agreement to repeat field testing. Examples of sufficient justification include modification of the treatment unit to improve performance and/or the discovery of errors in the initial testing, including laboratory errors, which are sufficient to invalidate the original test’s data and conclusions. A manufacturer failing to complete the testing within the three year time period may request a new agreement with adequate justification.

A treatment unit may be removed from general approval when the design of the treatment unit has substantially changed from the design that was tested and evaluated. In such case, the Division will notify the manufacturer and provide due process in accordance with the Administrative Process Act.



**Application Checklist**

**WASTEWATER TREATMENT TECHNOLOGY LISTING for TL-2**

Please supply all requested information (form will expand as information is entered). Incomplete applications will be returned to the applicant.

Product Identification (name and model designation(s)):	
Application Request (Check One): <input type="checkbox"/> Information Listing (Approval via NSF 40) <input type="checkbox"/> Approval via Other	
<b>APPLICANT CONTACT INFORMATION</b>	<b>CERTIFYING ENGINEER INFORMATION</b>
Name and Title:	Name:
Signature and Date: _____	Company Name:
Address:	Address:
Telephone:	Telephone:
Email:	Email:

***If you checked 'Information Listing (Approval via NSF 40)' above, please supply the following information in electronic format. (Note: units with current NSF 40 approvals are automatically considered generally approved for TL-2. However, the manufacturer may request that the following information be posted on the VDH website for their unit. VDH may require the installation manual for units that directly disperse to the soil from the treatment unit.)***

- Technical plans and specifications for each unit (model) proposed for TL-2 listing.
- Installation manual
- Operation and Maintenance (O&M) Manual. ***Electronic submittal (PDF or Word format) is required.***

***If you checked 'Approval via Other' above, please supply the following information in electronic format.***

- Technical plans and specifications for each unit (model) proposed for TL-2 listing.
- Copy of third party testing report that documents TL-2 treatment level. Supply test data in excel spreadsheet format
- Installation manual
- Operation and Maintenance (O&M) Manual.

See GMP 2015-3 for additional information.

Submit completed form with all attachments to: Marcia J. Degen, Ph.D., P.E. ([Marcia.Degen@vdh.virginia.gov](mailto:Marcia.Degen@vdh.virginia.gov))  
Onsite Water and Sewage, Marina, and Engineering Programs  
Virginia Department of Health  
109 Governor Street, 5th Floor  
Richmond, Virginia 23219

**Application Checklist****WASTEWATER TREATMENT TECHNOLOGY LISTING for TL-3**

Please supply all requested information (form will expand as information is entered). Incomplete applications will be returned to the applicant.

Product Identification (name and model designation(s)):	
Is the unit generally approved for Secondary (TL-2) Treatment in Virginia?: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Application Request (Check One): <input type="checkbox"/> Evaluation Completed – Required data set included (see GMP 2015-3 for details) <input type="checkbox"/> Evaluation Requested – Required data set not included	
<b>APPLICANT CONTACT INFORMATION</b>	<b>CERTIFYING ENGINEER INFORMATION</b>
Name and Title:	Name:
Signature and Date: _____	Company Name:
Address:	Address:
Telephone:	Telephone:
Email:	Email:

**If you checked 'Evaluation Completed' above, please supply the following information.**

**(If a variance to 12VAC5-613-70 is desired, please attach the variance request. See GMP 2015-3 for details.)**

- Technical plans and specifications for each unit (model) proposed for TL-3 listing.
- Data set with completed statistics (minimum of 20 units sampled quarterly for one year). **Electronic submittal (Excel format) is required. All data must be from units serving Virginia residences with year-round occupancy. All data must be submitted. Review GMP 2015-3 for more information.**
- Discussion of data set validity, including data source(s), verification of independent 3<sup>rd</sup> party sample collection, sampling protocol, sample analytical methods, unit maintenance, justification for data exclusion, etc.
- Virginia-licensed P.E. certification that the unit is expected to comply with TL-3 treatment standards.
- Operation and Maintenance (O&M) Manual. **Electronic submittal (PDF or Word format) is required.**
- Virginia-licensed P.E. certification that the O&M Manual accurately reflects the service and maintenance requirements of the product.

**If you checked 'Evaluation Requested' above, please supply the following information.**

- Technical plans and specifications for each unit (model) proposed for TL-3 listing.
- Completed and signed "Memorandum of Understanding and Agreement"
- Copy of 3<sup>rd</sup> party contract and QA/QC Plan for sample collection and analysis with required submittals.
- If a partial data set is included, discussion of data set validity, including data source(s), verification of 3<sup>rd</sup> party sample collection, sampling protocol, sample analytical methods, unit maintenance, justification for data exclusion, etc. **All data must be from units serving Virginia residences with year-round occupancy.**
- Operation and Maintenance (O&M) Manual. **Electronic submittal (PDF or Word format) is required.**
- Virginia-licensed P.E. certification that the O&M Manual accurately reflects the service and maintenance requirements of the product.
- Virginia-licensed P.E. certification that the unit is expected to comply with TL-3 treatment standards.

**Submit completed form with all attachments to:** Marcia J. Degen, Ph.D., P.E. ([Marcia.Degen@vdh.virginia.gov](mailto:Marcia.Degen@vdh.virginia.gov))  
Onsite Water and Sewage, Marina, and Engineering Programs  
Virginia Department of Health  
109 Governor Street, 5th Floor  
Richmond, Virginia 23219

**Electronic submittals via email are encouraged; electronic data and O&M Manual submittals are required.**

Appendix B:

**Memorandum of Understanding and Agreement**

This Memorandum of Understanding and Agreement, made this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, is by and between the Commissioner of Health, with delegated authority to the Director of the Division of Onsite Sewage, Water Services, Environmental Engineering, and Marina Programs (the Division or Division Director) and \_\_\_\_\_, the “Manufacturer.”

The Manufacturer agrees to test and evaluate the efficacy of \_\_\_\_\_, also known as the “Treatment Unit”, in accordance with the evaluation protocol set forth below and in Guidance, Memoranda and Policy 2015-03 or successor policy. The Manufacturer and the Division agree to:

1. As described in this Agreement, GMP 2016-3 or its successor, or as outlined in an approved variance, within three years of the date this Agreement is executed, complete an evaluation of a minimum of 20 Treatment Units located and installed in the Commonwealth of Virginia. The Manufacturer must conclude the evaluation on or before \_\_\_\_\_. The Treatment Units will be jointly agreed upon by the Manufacturer and Division.
  - i. Each of the 20 Treatment Units selected for evaluation must be designed and used for a single-family residential dwelling with a design flow less than or equal to 1,000 GPD, used as expected for a permanently occupied home for 12 months. Residential design flows shall be calculated using the rate of 150 GPD/bedroom. For existing data sets, the manufacturer must demonstrate the appropriateness of the Treatment Unit population represented by the data.
  - ii. No evaluation or testing will be accepted for seasonal occupancy or seasonal rental use.
  - iii. When new performance data is to be collected for evaluation, the Manufacturer will contact the Division when a viable Treatment Unit for that evaluation is installed or identified. Upon notice by the Manufacturer, the Division will confirm whether the Treatment Unit is suitable for testing
  - iv. The Manufacturer will maintain an electronic database of Treatment Units selected for evaluation and report that database to the Division on a quarterly basis, along with the results of influent and effluent sampling conducted as described in section v (below). The Manufacturer will retain copies of the Chain of Custody forms for sample collection, transport, and measurement and provide them to the Division within five days of submitting the quarterly database report.
  - v. The Manufacturer will hire and use a third party, as described in this section and accepted by the Division, to oversee and administer the testing and evaluation protocol. At a minimum, four consecutive quarterly influent and effluent samples are to be collected for 12 months from each of the 20 Treatment Units. Quarters shall run from January 1 to

March 31, April 1 to June 30, July 1 to September 30, and October 1 to December 31. Treatment Units must be in operation for at least 3 months before sampling begins.

All procedures to collect, transport, and measure samples, with proper chain of custody, must be conducted under the supervision of a suitable third party such as a faculty member in an appropriate program of an accredited college or university, a licensed professional engineer experienced in the field of environmental engineering, or by a testing firm acceptable to and pre-approved by the Division.

- vi. Failure of the Manufacturer to report in accordance with section iv (above), or failure of the Manufacturer to make progress toward the goal as evidenced by the installation and monitoring of the Treatment Units, may result in the termination of this Agreement.
  - vii. All units must be operated and maintained in accordance with the site specific Operation and Maintenance (O&M) manual required by 12VAC 5-613-170. A manufacturer may ensure that a unit is in proper working order at the start of the study; however O&M during the course of the study must be conducted by an independent, properly licensed operator identified to the Division. O&M must be conducted in accordance with the approved O&M manual. The impact of any additional O&M on the final results must be assessed in the final report. The O&M must be submitted for each site with the final report.
2. The Manufacturer will provide a copy of the contract with the third party overseeing the project to the Division, which becomes an addendum to the Agreement. The contract describes the duties to be performed by both the third party and the Manufacturer. A Quality Assurance and Quality Control (QA/QC) plan, drafted jointly by the Manufacturer and the third party, is also provided and is an addendum to the Agreement. The QA/QC plan includes information on the collection, transport, and handling of samples.
- i. The third party is: \_\_\_\_\_  
Contact information: \_\_\_\_\_
  - ii. If requested by the Division, the Manufacturer agrees the third party will provide at least 72 hours notice before collecting samples and allow for joint collection with the Division upon request.
  - iii. The Manufacturer agrees to place and assure that at least two inspection and sampling ports are available on each Treatment Unit to allow the third party to adequately sample influent and effluent. Each inspection and sampling port must be located to accurately characterize the influent and effluent generated during expected residential use.
  - iv. The Manufacturer agrees to test and report influent results for pH, BOD<sub>5</sub>, and TSS. The Manufacturer agrees to test and report effluent results for flow, pH, BOD<sub>5</sub>, and TSS. Flow may be estimated from water meter readings, pump run time meters, pump run counters, number of persons in the household, or other method detailed in the QA/QC plan.

Influent testing is required to verify that the treatment unit is receiving residential strength wastewater. If influent data is not practical to collect, then the Manufacturer may report effluent from the primary settling tank (septic tank or trash tank) as influent or another point acceptable to the Division. Flow may be induced through the unit to obtain an effluent sample, provided the induced flow rate does not exceed 5 gallons per minute and shall only extend until a suitable sample volume is collected. The Division can waive influent sampling if it is not practical to obtain valid samples.

3. Hire and use a lab accepted by the Division to perform measurements using the *Standard Methods for the Examination of Water and Wastewater* for influent and effluent, in accordance with 40 CFR 136. Composite or grab samples for TSS and BOD<sub>5</sub> may be used. The Manufacturer will ensure the third party provides proper chain of custody for each sampling event, which will be provided with the quarterly report.

The certified lab: \_\_\_\_\_

Contact information: \_\_\_\_\_

4. Maintain an electronic database or spreadsheet of all system installations, and report the database to the Division Director by the 15<sup>th</sup> day of January, April, July, and October of each year the evaluation continues. The report will include the following information:
  - i. Sample results for influent and effluent.
  - ii. Interim observations about the Treatment Unit's performance with respect to the pass/fail criteria.
  - iii. For each Treatment Unit, the level of effluent treatment required for installation.
5. The pass/fail criteria for effluent will be as follows:

Effluent Parameter	Upper 99% Confidence Interval of Log-Transformed Data Converted Back to Native Units
BOD <sub>5</sub> (mg/l)	Less than or equal to 10 mg/l
TSS (mg/l)	Less than or equal to 10 mg/l

Each of the four quarterly samples for each Treatment Unit shall be log transformed and then averaged before applying the statistical manipulation. A one tailed t-test shall be applied with n-1 degrees of freedom where "n" is equal to the number of test sites/units. The method detection level must be reported for the required parameter analyses. For the purposes of data manipulation, values below the method detection level will be treated as one-half of the method detection level.

6. At the conclusion of its evaluation in accordance with the Agreement, the Manufacturer will have the third party submit a final report with the following minimum information:
  - i. Description of each site selected, typical installation, and how each site was selected;
  - ii. Geographic locations of systems tested;

- iii. O&M logs and an assessment of O&M performed;
- iv. Chain of Custody forms;
- v. List of key participants;
- vi. Description of sampling and analytical methods;
- vii. All testing results, including sample data, statistical analyses or other evaluations;
- viii. Rationale for exclusion of data or removal of a system from the statistical analysis, if necessary; and
- ix. An overall evaluation and assessment of the study data in relation to the pass/fail criteria.

The report must include an electronic copy of the data in Excel format in the provided spreadsheet for statistical analysis or as otherwise agreed to by the Division.

- 7. In return for the above considerations, the Division agrees to maintain a list of Treatment Units installed in Virginia and their sampling results. Upon conclusion of the testing and evaluation in accordance with this Agreement, the Division will render a case decision regarding whether the Treatment Unit has met the effluent performance expectations.
- 8. This Agreement may be amended by mutual consent of the parties and may be terminated by either party.
- 8. The undersigned agree to the conditions of this Agreement.

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Dwayne Roadcap  
Division Director

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Manufacturer