



COLORADO

Department of Public
Health & Environment

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September 24, 2014

John B. Richardson, P.E.
WesTech Engineering, Inc.
3665 South West Temple
Salt Lake City, UT 84115

Subject: Acceptance of the WWETCO FlexFilter™ for Tertiary Filtration as an Alternative Technology for Use in Domestic Wastewater Treatment Works in Colorado

Dear Mr. Richardson:

The Water Quality Control Division (Division) has received and reviewed information for the WWETCO FlexFilter™ in accordance with section 1.8.0 of *Design Criteria for Domestic Wastewater Treatment Works Policy WPC-DR-1* (wastewater design criteria). The WWETCO FlexFilter™ design is accepted for use as an alternative technology subject to the design criteria in Table 1. This acceptance is not intended as a third-party certification of the technology.

This acceptance addresses the following item:

- WWETCO FlexFilter™ using polypropylene and polyester fibers (40% PP/60% PET) configured into balls - 2.8 grams, 2 inches in nominal diameter (tow length 3 inches, 15,000 fibers per tow), bound with stainless steel or aluminum clips, in a minimum uncompressed media depth of 30 inches, and contained within a flexible neoprene diaphragm with vulcanized seams which has been tested by the manufacturer for at least 10 years of continuous cycles.

This acceptance applies only to the WWETCO FlexFilter™ as indicated and does not constitute construction approval for installation in domestic wastewater treatment facilities. **Review and approval for the design of any domestic wastewater facility proposing to use this technology will be further reviewed on a site-specific basis by the Division as required by Section 22.11(1) of the *Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works 5CCR 1002-22* (Regulation 22) and the Colorado Water Quality Control Act (Act), Section 25-8-702, C.R.S. which states in part that: “No person shall commence the construction of any domestic wastewater treatment works or the enlargement of the capacity of an existing domestic wastewater treatment works, unless the site location and the design for the construction or expansion have been approved by the division.”**

Any modifications to the physical attributes or characteristics of this treatment technology must be submitted to this office for review and acceptance by the Division prior to sale in Colorado. This condition includes changes made to the WWETCO FlexFilter™ filter material or manufactured filter model (e.g., filter media, piping, mechanisms). For any changes to the process or equipment following the issuance of this letter, the Division will review any additional third party verification reports and issue a revised acceptance letter, or denial, as appropriate.



Table 1. WWETCO FlexFilter™ Design Criteria:

Design Criteria
<ol style="list-style-type: none">1. Design loading rate shall not exceed a maximum month average hydraulic loading rate of 11 gpm/ft² and an instantaneous hydraulic loading rate of 14 gpm/ft². Design loading shall be calculated without the installed redundant unit (see item 7). Flow equalization may be used to meet design loading rates. Backwash pumps shall have the capacity to provide flow of 5 gpm/ft² and blowers shall have the capacity to provide air flow of 10 scfm/ft².2. Acceptance of the fiber media filters is primarily intended for filtering secondary clarifier quality effluent. Pretreatment processes shall be incorporated into the site-specific process train, as required, to ensure that the turbidity of the influent to the fiber media filter is not intended to exceed 10 NTU, approximately 27 mg/L TSS, more than five percent of the time within a 24-hour period and never exceeds 15 NTU, approximately 40 mg/L TSS.3. Design for existing facilities shall include testing or analysis (e.g., filter influent TSS, particle size analysis, anticipated loading, lab tests, bench tests, and/or pilot testing) performed to evaluate filter effectiveness and the need for pretreatment for the expected wastewater characteristics. Design for new facilities shall include similar evaluation of anticipated performance of upstream processes to evaluate filter effectiveness and the need for pretreatment for the expected wastewater characteristics. Tank materials can be concrete, stainless steel, or epoxy-coated carbon steel as compatible with the expected wastewater characteristics.4. For facilities where ambient temperatures can be below freezing, the filter unit design shall include adequate cold weather provisions such as heat trace lines and/or installation in a temperature-controlled enclosure.5. The design must include alarm signals for high water, blower failure, and high effluent turbidity at a minimum. The design must identify how the WWETCO FlexFilter™ alarm signals will notify operators of high level alarm activations, when the facility is attended and unattended.6. The design must indicate where and how both the backwash water and the emergency bypass is directed (e.g., to headworks, clarifier, by pipe, channel, pump).7. Design Redundancy: Filter installations must have at least two installed fiber media filters, backwash pumps, and blowers. If filters are necessary to meet effluent limits, filter installations shall have at least one installed fiber media filter in addition to the filter(s) needed to meet the design capacity. Filter installations shall have at least one installed backwash pump and blower in addition to the pump(s) and blower(s) needed to meet the design capacity. Pumps and blowers shall be capable of being interconnected to each fiber media filter.8. If multiple filters are to be operated in parallel, adequate flow splitting and control devices must be provided to ensure appropriate flow to each unit.9. Maintenance Access. Design shall include provisions that allow the operator to access, operate, and maintain the treatment technology.10. Manufacturer Review. A review letter issued by the manufacturer indicating the installation was designed in accordance with manufacturer recommendations must be included with the site-specific design submittal. The manufacturer's review may not supersede criteria in this acceptance. The manufacturer's review may not be substituted for all required engineering documentation and calculations stamped and signed by a Colorado licensed Professional Engineer.

Additional Operations and Maintenance Criteria

1. An Operations and Maintenance (O&M) Manual shall be provided for all installations and be available for review by the Division during compliance inspections.
 - A. Individual operations plans shall establish backwash procedures and durations to ensure solids removal from both 'in' and 'on' the fiber media.
 - B. Individual operations plans shall include scheduled inspections and assessments of the condition of the fiber media and neoprene diaphragm as an operational safeguard. This plan for scheduled inspections and assessments should include a routine inspection at least annually.

Please be aware that any point source discharges of water from treatment facilities are potentially subject to a discharge permit under Colorado's State Discharge Permit System. Any point source discharges to state waters without a permit are subject to civil or criminal enforcement action.

As part of this review, the Division has evaluated the following documents:

- July 1, 2014 Submittal from WesTech Engineering, Inc. requesting alternative technology acceptance for WWETCO FlexFilter™.
- July 22, 2014 and August 25, 2014 submittals from WesTech Engineering, Inc. providing additional requested information for the alternative technology review for the WWETCO FlexFilter™.
- Various additional correspondences.

Please direct any further correspondence regarding this acceptance to:

David Kurz, P.E.
Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, CO 80246

If you have any questions or comments, please contact David Kurz at david.kurz@state.co.us or 303-692-3552.

Sincerely,

David Kurz, P.E.
Lead Wastewater Engineer
Engineering Section
Water Quality Control Division
Colorado Department of Public Health and Environment

cc: Josh Queen, Goble Sampson Associates [jqueen@goblesampson.com]
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