

STATE OF COLORADO

John W. Hickenlooper, Governor
Larry Wolk, MD, MSPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
Located in Glendale, Colorado

www.colorado.gov/cdphe



Colorado Department
of Public Health
and Environment

May 23, 2014

Kevin Dufresne
GE Power and Water
3239 Dundas Street West
Oakville, ON, Canada
L6M 4B2

Subject: Acceptance of the GE Power and Water ZeeWeed® 1000 V4 Membrane Module as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* requirements for *Giardia lamblia* and *Cryptosporidium* Removal

Dear Mr. Dufresne;

The Colorado Department of Public Health and Environment's Water Quality Control Division ("the Department") has received and reviewed the information for the GE Power and Water ZeeWeed® 1000 V4 Membrane Module in accordance with Section 11.8(2)(b)(ii) and 11.10(5)(j) of the *Colorado Primary Drinking Water Regulations* (Regulation 11), 5 CCR 1002-11. The ZeeWeed 500D module meets or exceeds the requirements of the *State of Colorado Design Criteria for Potable Water Systems* (DCPWS) Sections 1.11, 4.3.8 and Regulation 11. The technology is conditionally accepted for use as an Alternative Filtration Technology and granted the removal credit in Table 4.1, Section 4.3.8.2 of the DCPWS. The technical specifications and conditions of acceptance for the ZeeWeed 1000 V4 modules are outlined in Table 1 as well as Section 4.3.8 of the DCPWS.

This acceptance supersedes the previous acceptance of the ZeeWeed 1000 V4 modules dated July 27, 2012.

This acceptance addresses the following items:

- ZeeWeed® 1000 V4 module

This acceptance applies only to the ZeeWeed 1000 V4 modules and does not constitute construction approval for installation at any public water system. Each individual submittal to the Department must demonstrate conformance with Section 4.3.8 of the DCPWS for each installation of the filters. **Review and approval for the design of any public water system proposing to use this technology will be handled on a case-by-case basis by the Department as required by Section 11.4 of Regulation 11.**

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

- California Department of Public Health Conditional Acceptance Testing For ZeeWeed 1000 V4 Membrane, December 2010
- NSF Website – GE ZeeWeed 1000 V4 module

Any addenda that will modify the modules must be submitted to the Department for review and acceptance prior to use in Colorado by a regulated public water system. This requirement includes any changes made to the ZeeWeed 1000 V4 materials of construction and associated interfaces with process piping. The Department will review any additional third party verification reports and issue a revised acceptance letter if appropriate.

Table 1: ZeeWeed 1000 V4 Technical Specifications and Conditions of Acceptance

| | |
|---|--|
| Filter Manufacturer | GE Water and Power |
| Filter Model | ZeeWeed 1000 V4 |
| Maximum Flux (gfd -gallons per sq. ft. per day) @ 20 °C | 60 |
| Maximum Flux (gfd) @ 1 °C | 34 |
| Max Transmembrane Pressure lbs per square inch differential (psid) | 13 |
| Alarm Transmembrane Pressure (psid) | 13 |
| Minimum direct integrity test (DIT) pressure to be exceeded throughout the DIT. | 12.1 psig |
| Direct integrity testing failure criteria NOTE: Each installation must calculate | Calculated Log Removal Value* (LRV) < Log Removal Credit (3.0 log removal <i>Giardia</i>) |
| Prefiltration | Not specified - pre-screening is typically required. |
| Additional Operations and Maintenance Criteria | |
| <ol style="list-style-type: none"> 1. If a filter fails an integrity test, the filter must be removed from service immediately and replaced with a functional filter or repaired prior to being returned to operation. 2. The public water system must keep records of the following operational parameters (available for Department review): <ol style="list-style-type: none"> a. Integrity test date, results (pass or fail), and initials of person performing the test b. Calculated LRV for each integrity test c. Clean in place (CIP) dates with clean water permeability and integrity test result. d. Filter maintenance and fiber repair results e. Filter replacement date and reason for replacement. 3. Public water systems must maintain an operation and maintenance manual for the micro/ultrafiltration system. All integrity tests and CIP procedures must follow manufacturer prescribed procedures. | |

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.

Kevin Dufresne
GE Water and Power
May 23, 2014
Page 3

Please direct any further correspondence regarding this acceptance to:

Tyson Ingels, 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 call Tyson Ingels at 303-692-3002.

Sincerely,

Tyson Ingels, P.E.
Lead Drinking Water Engineer
Engineering Section
Water Quality Control Division
Colorado Department of Public Health and Environment