



November 9, 2018

Jack Barker
Innovative Water Technologies, Inc.
29625 Industrial Park Road
Rocky Ford, CO 81067

Subject: Acceptance of the Innovative Water Technologies, Inc. IWT 275 membrane module as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* (CPDWR) requirements for *Giardia lamblia* and *Cryptosporidium* Removal

Dear Mr. Barker;

The Colorado Department of Public Health and Environment's Water Quality Control Division ("the Department") has received and reviewed the information for the Innovative Water Technologies, Inc. IWT 275 membrane modules 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 IWT 275 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 IWT 275 modules are outlined in Table 1 as well as Section 4.3.8 of the DCPWS.

This acceptance addresses the following items:

- Innovative Water Technologies IWT 275 ultrafiltration modules
- IWT UF 5, 10, 20, 30, 40, 50 prepackaged filtration skids
- IWT Sunspring SS24 and SS36 skids

This acceptance applies only to the IWT 275 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 and filtration skids. **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:

- Membrane filtration review document (July 23, 2016) - Submittal provided to the Department by Innovative Water Technologies, Inc.
- <http://www.nsf.org> - SUEZ Water Technologies and Solutions materials certification for membrane components
- Acceptance of Pentair Homespring Model UF211 Module as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* (CPDWR) requirements for *Giardia Lamblia* and *Cryptosporidium* Removal letter from the Department dated May 23, 2014.
- Revised Acceptance of GE Power and Water ZeeWeed 1500-550 and 1500-600 Membrane Modules as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* (CPDWR) requirements for *Giardia Lamblia* and *Cryptosporidium* Removal letter from the Department dated July 31, 2013.



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 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: IWT 275 Technical Specifications and Conditions of Acceptance

Filter Manufacturer	Innovative Water Technologies
Filter Model	IWT 275
Maximum Flux (gfd -gallons per sq. ft. per day) @ 20 °C	90
Maximum Flux (gfd) @ 1 °C	50
Surface area of each module (sqft)	275
Max Transmembrane Pressure lbs per square inch differential (psid)	40
Alarm Transmembrane Pressure (psid)	40
Maximum Inlet Pressure - lbs per square inch gauge (psig)	55
Minimum direct integrity test pressure (starting pressure)	11.4 psig
Direct integrity testing failure criteria	Greater than 1 psi decay over 5 minutes
Prefiltration	500 micron pre-screen
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. Maintenance clean, and Clean-In-Place dates with clean water permeability and integrity test result. c. Filter maintenance. d. Filter replacement date and reason for replacement. 3. Public water systems must maintain an operation and maintenance manual for the ultrafiltration system. All integrity tests and CIP procedures must follow manufacturer prescribed procedures. 	

Table 2: Pre-Accepted IWT Skids Conditions of Acceptance:

Skid Type	IWT						Sunspring	
	UF5 - 1 filter	UF10 - 2 filters	UF20 - 4 filters	UF30 - 6 filters	UF40 - 8 filters	UF50 - 10 filters	SS24 - 1 filter	SS36 - 2 filters
Maximum Daily Production (gallons)	13,750	27,500	55,000	82,500	110,000	137,500	13,750	27,500
Cross Connection Control (DCPWS 4.3.8.8(b)(vii))	Verified. Membrane integrity test must be performed immediately before and after Clean-In-Place and Disinfect-In-Place procedures to verify operation of downstream ball valve.							
Effluent Turbidity (DCPWS 4.3.8.10(a) and (b))	Verified.							

Flow Control (DCPWA 4.3.8.10(c))	Verified. Flow restrictor on effluent.
Additional Appurtenances Required	Verified. Influent solenoid valve and effluent check valve.

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.

Please direct any further correspondence regarding this acceptance to:

Emily Wong, 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 Emily Wong at 303-692-3566.

Sincerely,

Emily Wong, P.E.
Senior Review Engineer
Engineering Section | Water Quality Control Division
Colorado Department of Public Health and Environment