

STATE OF COLORADO

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

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Colorado Department
of Public Health
and Environment

July 4, 2011

To: Public Water Systems

Subject: Clarification about log removal credits granted to package plants with upflow clarification for meeting the removal requirements for *Giardia lamblia*, virus, and *Cryptosporidium*

To Whom It May Concern;

The Colorado Department of Public Health and Environment's Water Quality Control Division (the Division) has reviewed the conformance of 'package plants' with the Design Criteria for Potable Water Systems (DCPWS) and with Article 7 of the *Colorado Primary Drinking Water Regulations* (CPDWR), alternative filtration. For the purposes of this document, 'package plants' refers to complete surface water treatment plants which contain all or a portion of the major unit operations of surface water treatment: coagulation, flocculation, clarification, and filtration. The filtration in these 'package plants' typically is comprised of granular media filtration. The Division has traditionally and continues to maintain the position that if a 'package plant' is to be classified as a **conventional treatment plant**, it must conform with all applicable requirements of the DCPWS, specifically Parts 4 and 5 which specify specific design criteria for each unit operation.

'Package plants' that consist of sedimentation must at least meet the flocculation retention time and surface overflow rate requirements of the DCPWS. 'Package plants' that utilize dissolved air flotation (DAF) will be considered conventional treatment plants. 'Package plants' that consist of coagulation followed by an upflow bead clarifier where some flocculation and rough clarification takes place will **not** be given credit as conventional treatment and will be considered **direct filtration plants**. See Table 1 for a summary of credits granted.

As a direct filtration plant, such facilities with upflow bead clarifiers will not be given 2.5 log removal credit for *giardia* nor will it be given 2 log virus credit. Direct filtration plants receive **2 log giardia and 1 log virus** removal credit. This awarded credit is in keeping with previous decisions the Division has made. The Division is aware that other states, including California, may take an approach to allow facilities to attain conventional treatment status based on effluent turbidity results. The Division does not adjust a system's treatment removal credit based on effluent turbidity values, but rather classifies technologies and processes in order to be protective of public health and maintain the multiple-barrier approach to surface water treatment per EPA guidance.

This clarification applies only to the removal credits for these given treatment technologies and does not constitute construction approval for installation in public water systems. **Review and construction approval for the design of any public water system proposing to use this technology will be reviewed for approval on an individual basis by the Division as required by Article 1.11.2 of the Colorado Primary Drinking Water Regulations (CPDWR).**

Table 1. Package plants treatment credit:

Compliance Credit Granted to meet the requirements of the CPDWR *			
Type of Treatment Plant	Package plant with sedimentation⁺⁺	Package plant with DAF⁺⁺	Package plant with upflow bead clarifiers⁺⁺
<i>Giardia lamblia</i>	2.5 - Log	2.5 - Log	2.0 - Log
<i>Cryptosporidium</i>	3.0 - Log	3.0 - Log	2.5 - Log
Virus	2.0 - Log	2.0 - Log	1.0 - Log

*** NOTE:** Compliance credit awarded is simply for meeting minimum requirements of the CDPWR Article 7 (Surface Water Treatment Rules - SWTR).
⁺⁺ - Meeting the DCPWS

These types of package plants may be used as final compliance filters as part of a multiple treatment barrier approach to meeting SWTR requirements (Article 7, CPDWR).

In addition to the above treatment techniques, the water system **MUST** provide sufficient disinfection to achieve total treatment of **3.0-Log giardia and 4.0-Log virus**.

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:

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

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