

**POLICY FOR DESIGN & INSTALLATION OF ULTRAVIOLET DISINFECTION UNITS**  
(Use for water supplies with groundwater sources only and no external distribution system)

This policy for Ultraviolet Disinfection (UV) shall not apply to surface water sources or groundwater sources that may be under the direct influence of surface water. Additionally, it must be mentioned that there is currently no UV unit that satisfies the 4-log removal of viruses required by the Ground Water Rule (GWR). You may still use UV for disinfection; however, you must comply with GWR monitoring and if at any time a confirmed presence of E. Coli is found in the raw water you will be required to comply with the 4-log removal/inactivation of viruses requirement (this will mean the installation of chlorine and contact tanks that supply the appropriate "CT").

UV units with a capacity of 30 gpm or less must be listed under NSF Standard 055 Disinfection Performance Class A. For UV units larger than 30 gpm, a copy of the bioassay performed by an independent laboratory for the specified UV unit must be submitted to validate the units ability to deliver 40,000 uW-s/cm<sup>2</sup> for the full operating range (e.g. 100%-70%). The unit selected shall not exceed the manufacturer's gpm rating at the expected peak flow rate. A flow control device shall be installed to ensure that the maximum flow rating of the unit is not exceeded, when appropriate. The water quality supplied to the UV disinfection system must be demonstrated to have a minimum UV transmittance at a wavelength of 254 nm of at least 70% or UV absorbance no greater than 0.155 cm<sup>-1</sup>. Additionally, the water quality reaching the UV must be in compliance with New York State Department of Health standards for physical parameters that could reduce the effectiveness of the UV treatment system. Additional design limits include: Iron- 0.3 mg/l, Manganese – 0.05 mg/l, Hardness: Total – 300 mg/l or Calcium – 120 mg/l, Hydrogen Sulfide – 1 mg/l, Turbidity – 1 NTU, Color – 15, and Suspended Solids – 10 mg/l. If any of these design limits are exceeded, a design for additional treatment to achieve acceptable levels must be included. The minimum pretreatment prior to the UV unit shall be a 5-micron sediment removal cartridge filter.

The UV unit shall be a closed vessel type designed for disinfection of potable water and shall be constructed of acceptable, durable materials such as 316L stainless steel with FDA grade materials for gaskets & O-rings. The unit shall provide ultraviolet radiation at a wavelength of 254 nm at a minimum dosage of 40,000 uW-s/cm<sup>2</sup> (40 mW-s/cm<sup>2</sup>) at all points throughout the disinfection chamber. Maximum water depth in the chamber, measured from the tube surface to the chamber wall shall not exceed three inches (3"). The UV lamp shall have a quartz or high silica glass sleeve, be of standard non-proprietary design, and be designed to withstand vibration and shock. The lamp shall also be instant start (minimal delay on start-up). The unit shall also include an automatic or manual cleaning device such as a wiper for cleaning the quartz sleeve without disassembly of the unit, or the unit shall be designed for quick disassembly for cleaning. An ultraviolet intensity meter shall be installed. The display for the UV system shall include a "power on" indicator and audible alarms for lamp out of service, low UV dosage (<70%), ballast high temperature, disinfection chamber high temperature, and power failure. Automatic shutdown of water flow shall be provided for alarm conditions.

The installation shall be designed to allow the UV unit a two-minute warm-up period prior to water flow. The unit shall also be designed to protect the operator against electrical shock or excessive radiation. The unit must be installed in a readily accessible location that is protected from extreme temperatures. The operator shall perform routine daily checks on the UV system.

A qualified water treatment specialist shall make the submission of the documentation necessary for approval by this office. The Orange County Health Department has the option of requiring that plans be prepared by a NYS licensed design professional depending on the complexity and/or cost of the system.

The following conditions shall be included on the approval:

1. Following completion of the installation of the treatment equipment, satisfactory water sample results for total coliform and heterotrophic plate count shall be provided.
2. Routine daily checks shall be performed on the treatment system to verify proper operation, including intensity meter reading of at least 70%. The intensity meter readings must be recorded on the monthly operation report form (DOH-360CUV) that must be submitted to the OCHD by the 10<sup>th</sup> day of the next month.
3. The treatment system shall be properly maintained, including cleaning on a regular basis, in accordance with the manufacturer's recommendations.
4. The UV lamp shall be replaced on an annual basis or as recommended by the manufacturer. A spare lamp shall be kept on the premises.
5. That following any repair work, the entire water system shall be thoroughly disinfected with chlorine.

**ORANGE COUNTY DEPARTMENT OF HEALTH  
124 Main Street, Goshen, NY 10924**

**Application for Approval of an Ultraviolet Disinfection System Installation**

(Use for water supplies with groundwater sources only and no external distribution system)

|   |  |
|---|--|
| FACILITY _____  | OWNER _____                            |
| ADDRESS _____   | ADDRESS _____                          |
| PHONE # (_____) _____   | PHONE # (_____) _____                  |
| ENGINEER OR PLUMBER (IF APPLICABLE) _____   |  |
| (NYS Licensed Engineer<br>required if cost of treatment<br>system exceeds \$5000) | PHONE # (_____) _____<br>ADDRESS _____ |

IS WATER SYSTEM METERED? \_\_\_\_\_ IF YES, MAXIMUM DAILY FLOW \_\_\_\_\_ gpd  
WELL PUMPING RATE \_\_\_\_\_ gpm  
# OF FAUCETS \_\_\_\_\_ MAX # USED SIMULTANEOUSLY \_\_\_\_\_  
# OF TOILETS \_\_\_\_\_ MAX # USED SIMULTANEOUSLY \_\_\_\_\_  
# OF SHOWERS \_\_\_\_\_ MAX # USED SIMULTANEOUSLY \_\_\_\_\_  
OTHER FIXTURES \_\_\_\_\_

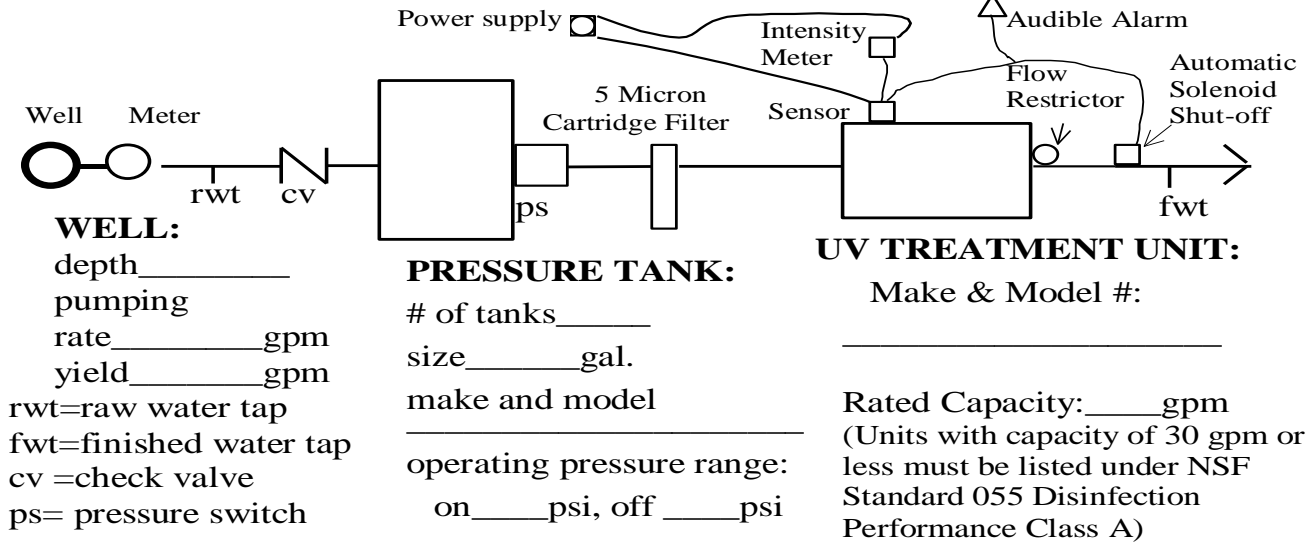
OWNER'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

An Ultraviolet Disinfection system (UV) may be used as an alternative to chlorination for Non-Community water supplies using groundwater sources (wells) that meet certain criteria. The well(s) must be properly constructed and not subject to the direct influence of surface water. Provide any available information on the construction of the well (e.g. well log) and a site plan showing the well location, including distances to any potential sources of contamination within 200 ft. The water quality reaching the UV system must be in compliance with New York State Department of Health standards for physical parameters that could reduce the effectiveness of the treatment process. Test results must be provided for:

- Total Coliform (quantitative analysis, not presence/absence)
- E. Coli (presence/absence)
- Heterotrophic plate count
- Turbidity
- Iron
- Manganese
- Hydrogen Sulfide (or undetectable Odor)
- Suspended Solids
- Total and/or Calcium Hardness
- Color
- UV Transmissivity or UV Absorbance

Pretreatment may also be provided to meet New York State Department of Health standards and/or to reduce maintenance for the UV system. Depending on the test results, or complexity of the water system, additional treatment including chlorination may be required. Fill out the diagram on the back of this sheet, and submit the completed application along with the required water test results from a New York State Department of Health certified laboratory. If a configuration other than that shown is proposed, attach an appropriate sketch. Provide any additional information as necessary to demonstrate compliance with the Orange County Department of Health Policy for Design & Installation of Ultraviolet Disinfection Units.

**TREATMENT SYSTEM SCHEMATIC (Attach additional info. if necessary)**



**APPROVAL AND CONDITIONS**

This application is approved under the provisions of Subsection 5-1.30 of the N.Y.S. Sanitary Code and the Orange County Dept. of Health Policy for the Design & Installation of Ultraviolet Disinfection Units, and is also subject to the following conditions:

1. THAT following completion of the installation of the treatment equipment in accordance with the approved WS-254, satisfactory finished water sample results for total coliform and heterotrophic plate count shall be submitted to the Orange County Health Dept. prior to supplying water for potable use.
2. THAT microbiological testing of the water supply shall be performed by the water supplier on a monthly/quarterly basis, and further, that a copy of the results of this analysis shall be submitted to the Orange County Health Department upon its receipt by the water supplier. The routine tests shall include Total Coliform and Heterotrophic Plate Count for both the raw and finished water. Unsatisfactory microbiological samples may result in the necessity of installing a secondary disinfection system such as chlorination.
3. THAT routine daily checks shall be performed on the treatment system to verify proper operation, including intensity meter reading of at least 70%. The intensity meter readings must be recorded on the monthly operation report form (DOH-360CUV) that must be submitted to the Orange County Health Department by the 10<sup>th</sup> day of the following month.
4. THAT the treatment system shall be properly maintained, including cleaning on a regular basis, in accordance with the manufacturer's recommendations.
5. THAT the UV lamp shall be replaced on an annual basis or as recommended by the manufacturer. A spare lamp shall be kept on the premises.
6. THAT this approval is based upon a peak flow of \_\_\_\_\_ gpm.
7. THAT any interruption in the treatment process or the drinking water supply, shall be reported to this office immediately. No change in the source or method of treatment shall be made without first notifying and obtaining approval from the Orange County Health Dept.
8. THAT following any repair work, the entire water system shall be properly disinfected with chlorine.

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 P.E.  
 Orange County Department of Health