PWS Name _____ PWS ID _____

CHECKLIST: NOTIFICATION TO EPA REGION 8 OF NEW TREATMENT AT SURFACE WATER/GWUDISW PUBLIC WATER SYSTEM

This checklist includes all materials which should be completed and submitted to EPA Region 8 when a Public Water System using Surface Water or GWUDI SW (a Subpart H System) is making a change to the Treatment Plant:

Please submit this completed checklist and all applicable attachments (marked up schematics, manufacturer's documentation, diagrams, etc.) ***at least 90 days BEFORE the change is to be made, so that EPA can confirm treatment requirements, and notify you of any changes to your monitoring or regulatory requirements.***

You can submit this checklist via e-mail to r8dwu@epa.gov or by mail to:

EPA Region 8
Mailcode: 8WD-SDB
1595 Wynkoop Street
Denver, CO 80202-1129
Attn: SWTR Manager

Submit the following with this Checklist:

- ☐ Completed **Changes to Public Water Systems form** (notification form, available on the EPA Region 8 Drinking Water Online Website) – use this form to describe the treatment plant changes, expected startup date, etc.
- ☐ Marked-up copies of **Overall and Treatment Plant Schematics** – current copies are available for your PWS when you log onto Drinking Water Watch and go to the link for Water System Facilities. Please show all new processes on the Treatment plant page, including pretreatment, filters (show # and if in parallel or series), disinfection, locations for monitoring turbidity and chlorine residuals, etc.
- ☐ For new, alternative filtration (e.g. **bags, cartridges, membranes**) – information on manufacturer and model # of the filter (for bags/cartridges describe both the housing and the filter elements), maximum flow rates (gpm) and available LTSWTR-compliant Challenge Testing manufacturer report, Quality Control Release Value certification (for membrane modules) and Direct Integrity testing calculations (for membrane units), and any other information from the manufacturer. **
- ☐ For **UV disinfection**, include information on the manufacturer, model # and flow rates (gpm), validated dosage (mJ/cm2), and available validation testing information from the manufacturer **
- ☐ **Giardia and Virus Inactivation (CT) calculations for chemical disinfectant,** during proposed (most conservative) conditions in winter and summer (lowest finished water temperature, highest pH, peak hourly flow, lowest free chlorine residual). Diagrams should be provided (hand-drawn acceptable) which clearly show dimensions, location of inlet/outlet/baffles, operating water level, and other information to document volume

calculations and baffling factor for each inactivation segment. (Baffling table and inactivation calculation questions shown on following pages.) Completed spreadsheet for logs inactivation (disinfection profiling spreadsheet) may be submitted as long as the supporting documentation is also provided for volumes, baffling factors, etc.

** For public water systems which were determined to be Bin 2, 3 or 4 under the Long Term 2 Enhanced SWTR and thus must install additional treatment for Cryptosporidium, the LT2 regulatory requirements related to bags, cartridges, membranes and UV disinfection must be met. These include specific requirements for the Challenge Testing and Direct Integrity testing of membranes and bags/cartridges, Quality Control Release Value calculation and certification of the as-sold membrane modules, and the validation testing and monitoring of UV. Please see 40 CFR §§141.715 – 722 for these and consult with EPA Region 8. All water systems (Bin 1 or those installing membranes or UV for additional treatment credit) must operate and monitor the treatment in accordance with EPA Region 8 policies. See monthly reporting forms/guidance for these technologies for more information.

PWS Name _____ PWS ID _____

DOCUMENTATION THAT NEW TREATMENT ACHIEVES COMPLIANCE WITH LT2SWTR *CRYPTOSPORIDIUM, and* 3-LOG *GIARDIA* AND 4-LOG VIRUS REDUCTION REQUIREMENTS (must be achieved before or at 1st customer/user)

Identify location of 1st user: _____

1. Treatment technique **chemical inactivation** determination

WINTER : For each segment where inactivation credit is to be given, prior to 1st user:

Lowest disinfectant residual and where measured:

Water temperature (lowest):

Water pH (highest):

Maximum flow through segment:

Describe the segment (tank; clearwell; pipe; etc.) and appropriate baffling factor (see attached table)

Calculate volume of this segment using minimum operating height of tanks, and do CT calculation for logs *Giardia* and virus inactivation:

****

Total logs *Giardia* inactivation from all chemical disinfection segments: _____
Total logs virus inactivation from all chemical disinfection segments: _____

SUMMER : For each segment where inactivation credit is to be given, prior to 1st user:

Lowest disinfectant residual and where measured:

Water temperature (lowest):

Water pH (highest):

Maximum flow through segment:

Describe the segment (tank; clearwell; pipe; etc.) and appropriate baffling factor (see attached table):

Calculate volume of this segment using minimum operating height of tanks, and do CT calculation for logs *Giardia* and virus inactivation:
****

Total logs *Giardia* inactivation from all chemical disinfection segments:

Total logs virus inactivation from all chemical disinfection segments:

PWS Name _____ PWS ID _____

Treatment Technique **UV Disinfection Inactivation**: based upon validated dosage, use table below to determine logs inactivation:

Table 1. UV Dose Requirements in
Millijoules per Square Centimeter (mJ/cm^2)

Target Pathogen	Log Inactivation							
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Cryptosporidium	1.6	2.5	3.9	5.8	8.5	12	15	22
Giardia	1.5	2.1	3.0	5.2	7.7	11	15	22
Viruses	**	**	**	**	**	**	**	**

Source: 40 CFR 141.720(d)

** UV not credited with virus inactivation by EPA R8 for SW/GU systems

PWS Name _____ PWS ID _____

Fill out the following table for each treatment plant. Filtration removal credits are found on the following pages, for the specific type of filtration.

Treatment Plant Name _____

SWTR	***Giardia lamblia***	
IESWTR/LT1ESWTR	Filtration Type: _____	Logs Removal:
	Chemical Inactivation (from CT calculations, lowest during the year):	Logs:
	UV Disinfection (based on validated dosage):	Logs:
	Other removal or inactivation (describe): _____	Logs:
	TOTAL LOGS *Giardia* Treatment	=
	≥ 3 ?	(Y/N)
	Viruses	
	Filtration Type: _____	Logs Removal:
	Chemical Inactivation (from CT calculations, lowest during the year):	Logs:
	Other removal or inactivation (describe): _____	Logs:
	TOTAL LOGS Virus Treatment	=
	≥ 4 ?	(Y/N)

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Baffling Condition	T10/T*	Baffling Description
Unbaffled	0.1	None, agitated basin, very low length to width ratio, high inlet and outlet flow velocities, unbaffled, inlet and outlet at the same levels.
Poor	0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles, vertical perforated pipe for an inlet and/or outlet.
Average	0.5	Baffled inlet or outlet, vertical perforated pipe for an inlet or outlet, with some intra-basin baffles.
Superior	0.7	Perforated inlet baffle, perforated intra-basin baffles, outlet weirs or perforated launders.
Excellent	0.9	Serpentine Baffling throughout
Perfect	1.0	Pipeline flow

*T10 = detention time at which 90% of the water passing through the unit is retained

PWS ID _____

PWS Name _____

FILTRATION CREDITS FOR MICROBIAL REMOVAL, TO MEET SWTR, IESWTR and LT1ESWTR**

(systems consistently meeting the CFE turbidity limits in the table below, and the operational and design requirements outlined in this policy, are granted the Logs removal credit in the table below.)

FILTRATION TREATMENT TECHNOLOGY	COMBINED FILTER EFFLUENT (CFE) TURBIDITY (95% MNTHLY/MAX) ntu	MAXIMUM LOGS OF CREDIT FOR PHYSICAL REMOVAL			MINIMUM LOGS OF INACTIVATION NEEDED BY DISINFECTION	
		Cryptosporidium	*Giardia*	Viruses	*Giardia*	Viruses
Conventional	*** 0.3/1	>2	2.5	2.0	0.5	2.0
Direct	***0.3/1	>2	2.0	1.0	1.0	3.0
Slow Sand	1/5	>2	2.0	2.0	1.0	2.0
Diatomaceous Earth	1/5	>2	2.0	1.0	1.0	3.0
Reverse Osmosis	0.3/1	>2	>3.0	3.0	0	1.0
Nanofiltration	0.3/1	>2	>3.0	3.0	0	1.0
Ultrafiltration	0.3/1	>2	>3.0	0	0	4.0
Microfiltration	0.3/1	>2	>3.0	0	0	4.0
Pretreatment plus Bag or Cartridge (B/C) *	1/5	2	2.0	0	1.0	4.0
Conventional Filtration followed by (B/C)	0.5/5	2	2.5	2.0	0.5	2.0

*** See policy for description of adequate pretreatment for SW and for GWUDISW using B/C Filtration**

**** Additional types of alternative filtration should be evaluated on a case-specific basis. 95th percentile and maximum turbidity values will be no more than 1 NTU and 5 NTU, respectively, for all alternative filtration technologies, unless different site specific values are assigned. All NTU rounding shall be in accordance with EPA established policy. Also, these filtration credits do not apply to point-of-use devices.**

***** Conventional and direct filtration also have requirements for monitoring of individual filter effluent turbidity(IFE). See IESWTR and LT1ESWTR.**