

**STANDARD OPERATING PROCEDURE  
STAN MAYFIELD BIOREFINERY PILOT PLANT**

**TITLE: UV Sterilizing Water System**

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**APPROVALS: Process Change Committee**

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**A. Scope**

This SOP describes the procedure to operate the UV Sterilizing Water System in order to supply sterilized water for use in the Liquefaction, Prep Tank, CIP Rinse, Fermenters, and Propagators.

**B. Safety and Training Requirements**

Refer to UF lab safety policies regarding equipment listed in section D below before starting any process work.

Review the location of fire extinguishers, fire blankets, safety showers, spill cleanup equipment and protective gear before beginning any process work.

During operations in the plant, the following safety gear will be utilized at all times:

- Safety Goggles or Face Shield
- Protective Gloves
- Hard Hat

**C. Related Documents and SOPs**

1. UV Water Pump manual XXXX
2. UV Sterilizer Manual (Safeguard UV Systems CLS Operators Manual – 029302)
3. Biomass Liquefaction SOP-2305
4. Process Water System Operation SOP-9505
5. CIP System SOP-8205
6. Fermentation Tank A SOP-3230
7. Fermentation Tank B SOP-3235
8. Fermentation Tank C SOP-3240
9. Primary Propagator 1 SOP-3210
10. Primary Propagator 2 SOP-3215
11. Secondary Propagator 1 SOP-3220
12. Secondary Propagator 2 SOP-3225

**D. Preparation/Materials/Equipment**

1. UV Water Pump (PC-9503)
2. UV Water Tank (TS-9503)
3. UV Sterilizer 1 (X-9501)

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4. UV Sterilizer 2 (X-9502)

**E. Detailed Procedure**

**E.1. Startup Procedure**

- Initial valve positions settings are given in the table below

UV Water System				
Line	Line Number	Valve	Position	Check
Process Water to UV Water Tank	RCW-9501-16-SS10	9503-V-01	Close	
		9501-V-20	Close	
Process Water to UV Water Pump	RCW-9503-03-SS10	9503-V-05	Close	
		Drain	9503-V-06	Close
			9503-V-25	Close
Process Water to UV Sterilizer	RCW-9503-02-SS10	9503-V-08		
	Pressure Indicator	9503-V-26	Open	
UV Water to Downstream Process	UVW-9503-04-SS10	9503-V-04	Close	
to CIP	UVW-9503-15-SS98	9503-V-09	Close	
to Prep Tank	UVW-9503-15-SS98	9503-V-10	Close	
to Fermenter C	UVW-9503-14-SS98	9503-V-12	Close	
to Fermenter B	UVW-9503-13-SS98	9503-V-13	Close	
to Fermenter A	UVW-9503-12-SS98	9503-V-14	Close	
to Liquefaction Cooler	UVW-9503-07-SS98	9503-V-15	Close	
to Propagator 2B	UVW-9503-10-SS98	9503-V-17	Close	
<del>to Propagator 1B</del>	<del>UVW-9503-09-SS98</del>	<del>9503-V-19</del>	<del>Close</del>	
to Propagator 3A	UVW-9503-08-SS98	9503-V-20	Close	
to Propagator 2A	UVW-9503-11-SS98	9503-V-21	Close	
<del>to Propagator 1A</del>	<del>UVW-9503-06-SS98</del>	<del>9503-V-22</del>	<del>Close</del>	
to Propagator 3B	UVW-9503-05-SS98	9503-V-24	Close	
Spare Valves		9503-V-11	Close	
<del>to C5 Screw Feeder</del>		9503-V-16	Close	
<del>to Hot Water Tank</del>		9503-V-18	Close	
<del>to Cooling Water Tank</del>		9503-V-23	Close	
Level Indicator		9503-V-02	Open	
Drain		9503-V-03	Close	

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2. Assure the process water supply is ready according to the Process Water System Operation SOP-9505.
  3. Assure valve 9503-V-03 is closed.
  4. At HMI, set the UV Water Tank (TS-9503) level to 80% in LIC-9503-01.
    - a. ~~LIC 9503-01 modulates LV 9503-01 which controls flow rate of the process water, maintaining the water level at the set point.~~
    - b. LIC-9503-01 trigger Low-Low alarm at 10%, High alarm 90% and High-High alarm at 95%.
  5. ~~Open valves 9501 V-20 and 9503 V-01~~ to start filling the UV Water Tank (TS-9503) with process water.
  6. ~~Open valves 9503 V-05, 08, 04 to open the UV water recirculation loop.~~
  7. Assure UV Sterilizer 1 (X-9501) and 2 (X-9502) are turned on ~~according to manual XXXX.~~
  8. Once the tank volume has reached 30%, turn on the UV Water Pump (PC-9503) at HMI to recirculate UV water to the UV Water Tank..
  9. UV water supplies sterilized water to the CIP system (PID-8201), Liquefaction Cooler (HP-2301), Propagators (VS-3201A, VS-3201B, VS-3202A, VS-3202B, VS-3203A, VS-3203B) and Fermenters (VS-3204A, VS-3204B, VS-3204C). Refer to the respective SOP for the corresponding valve operation.

**E.2 Shut Down Procedure**

**~~E.2.a. Short Term~~**

- ~~1. At HMI, turn off the UV Water Pump (PC-9503).~~
- ~~2. Turn off the UV Sterilizer 1 (X-9501) and 2 (X-9502).~~

**~~E.2.b. Long Term~~**

1. At HMI, turn off the UV Water Pump (PC-9503).
2. Turn off the UV Sterilizer 1 (X-9501) and 2 (X-9502).
3. Restore all valves to the initial positions according to the initial valve configuration table.