

ADDENDUM NO. 2

Spectacle Pond Water Treatment Plant Filter Media Replacement  
Project No. 24DPW07  
Ayer DPW

This addendum amends and/or supplements the bid documents as indicated below. Only these items alter the Bid Documents; any verbal discussions or responses are hereby declared null and void.

**Bidder shall acknowledge receipt of this addendum on the Form for General Bid.**

BID OPENING

1. Bid Opening has been changed from 2:00 PM on Thursday November 30, 2023 to 2:00 PM Friday, December 8, 2023.

SPECIFICATIONS

2. Section 11225 Pressure Filter Media Replacement –
  - a) Part 3 Execution
    - a. 3.01 E. a-d. should be removed in its entirety as no media has been observed in the filtered water effluent pipe at Spectacle Pond Water Treatment Plant.

ATTACHMENT

3. O&M Procedures for Media Loading and Startup/Shutdown

Attached to this addendum is the Hydro-Pure Systems Company, Inc. O&M Media Loading and Filtration Startup/Shutdown Procedures. This attachment is added to the bid document as Appendix C.

Attachments:

O&M Procedures for Media Loading and Startup/Shutdown

# ATTACHMENT C - PROCEDURES FROM O&M PLAN

## Media Loading

### HYDRO-PURE SYSTEMS COMPANY, INC. - O&M MANUAL

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#### 3.2 MEDIA LOADING: GREENSAND FILTERS

The following is the procedure to follow for loading and conditioning greensand filters for service.

##### 1. INSTRUCTIONS FOR INSTALLING MANGANESE GREENSAND

Manganese greensand should be installed under water. With water available to the unit, allow clean water to enter the tank slowly until it stands some 12 to 18 inches deep above the supporting bed. If water is not available at the present time, hoses may be used to place the required water in the filter.

The manganese greensand may be placed in the filter tank by pouring it through the tank opening until the required volume of manganese greensand is installed in place. Manganese greensand is normally shipped in 1-cu. ft. bags.

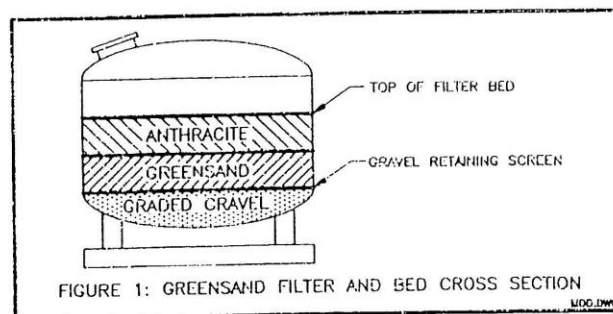
After the required manganese greensand has been placed in the tank and leveled, the filter must be given a conditioning backwash with the fines skimmed from the bed surface before it is placed in service or anthracite (if used, see Figure 1 below) is placed in the tank.

**CAUTION:** THE MANGANESE GREENSAND BED MUST BE BACKWASHED AND THE FINES SKIMMED FROM THE BED SURFACE BEFORE ANY ADDITIONAL STEPS ARE TAKEN.

The manganese greensand filter should be backwashed at the required flow rate. Following the backwash, the filter should be given a short down-flow rinse; then the filter should be backwashed again.

Following this second backwashing, the filter should be completely drained. An inspection should show a layer of fine material on the bed surface from 1/2 to 3/4 inch thick. This surface material must be removed and discarded. This material must be removed with a flat trowel or flat shovel and discarded. Do not rake or scrape this material across the bed surface as this will only push the fines down into the bed.

The manganese greensand bed is now ready for conditioning and, following conditioning, the addition of anthracite (if used, see Figure 1 below).



**3.2 MEDIA LOADING: GREENSAND FILTERS.....(continued)****2. CONDITIONING & DISINFECTING MANGANESE GREENSAND**

Before the manganese greensand is placed in service, it MUST be conditioned by regenerating it with potassium permanganate. The manganese greensand MUST be given a backwash and the fines removed from the bed surface before the manganese greensand is conditioned. The following procedure should be used to properly condition the manganese greensand after the greensand has been loaded, with the fines removed and before placing the filter in service:

1. Depressurize the vessel by opening the Rinse outlet or Waste Valve. Partially drain and remove the top manhole cover after all the pressure is removed from the tank.
2. Drain the water from the tank until the water level is 2-3 inches above the manganese greensand bed.
3. Dissolve the appropriate amount of permanganate in a sufficient quantity of water (see paragraph 3.4). Permanganate is slow dissolving, so constant stirring may be required.
4. Add the potassium permanganate solution through the tank manhole opening by any convenient means available, such as a portable sump pump or by buckets. If any undissolved, permanganate remains in the mixing container, add more water until all the permanganate is dissolved and the solution is placed in the filter. Try to avoid getting undissolved potassium permanganate into the filter, this will take a very long time to dissolve and rinse out.
5. Place water in the filter tank until the water level is 2-3 inches below the manhole opening.
- \*6. If air is part of your filtering system, turn on the air-wash and allow the permanganate solution to mix completely with the water added for a period of 2-3 minutes. If air-wash is not part of your filter system, omit this step.
7. Open the Rinse Outlet or Drain Valve to a flow rate which is approximately on-half of the normal service rate. Allow the permanganate solution to drain slowly through the manganese greensand bed. If the level of permanganate solution drops below the manganese greensand bed surface, add more water to the top of the bed to prevent the manganese greensand from going dry.

\*OPTIONAL

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**3.2 MEDIA LOADING: GREENSAND FILTERS.....(continued)**

8. When the first indication of colored water, which will be pink or reddish in appearance, is observed in the water draining from the tank, close the Rinse or Drain Valve.
- \*9. If air is part of your filtering system, introduce the air and allow the manganese greensand and permanganate solution to intermix for a period of 5-10 minutes. If air wash is not part of your system, proceed directly to Step #10.
10. Allow the filter to sit with the permanganate solution in contact with the manganese greensand for 4 hours, or, if practical, overnight. If no colored water appears in the waste water after the permanganate solution has been drained through the manganese greensand bed, repeat steps 2 through 7 using one-half the permanganate called for originally.
11. Replace the manhole cover and slowly refill the tank through the inlet. The air should be exhausted through the Air Vent Valve. After the tank is re-pressurized, open the Rinse outlet Valve to the normal rinse flow rate. Allow the filter to rinse until the water passing to waste is clear, iron and manganese-free. The rinse should be stopped at this point.

**\*OPTIONAL**

**3. ADDITIONAL INFORMATION**

- 3.1 The manganese greensand filter should not rinse without the permanganate feeder in operation and adjusted to the "just pink" color entering the filter. The pre-pH correction feeder, if required, should also be adjusted and running during this rinse.
- 3.2 Sometimes, although rarely, it is impractical to add potassium permanganate in solution. It is not very desirable to add dry permanganate as it dissolves extremely slowly, but if necessary permanganate may be added to 12 inches of water over the bed. The time required for rinsing may be extended considerably by taking this action.
- 3.3 Conditioning is done after removing the fine manganese greensand and before the anthracite (if used) is loaded.

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## 3. ADDITIONAL INFORMATION.....(continued)

## 3.4 Amount of chemical and rinse water required for conditioning:

A. Conditioning of manganese greensand requires 2.0 ounces of potassium permanganate for every cubic foot of manganese greensand to be conditioned.

B. The permanganate is dissolved by using 4.0 ounces of potassium permanganate per gallon of water.

C. The rinse flow rate should be no greater than 0.5 gpm/ft<sup>3</sup> of manganese greensand being treated ( 100 gpm).

D. Potassium Permanganate required for conditioning:

$$\text{a. } \frac{198 \text{ cu. ft/Filter} \times 2.0 \text{ oz.}}{16 \text{ oz/lb}} = \frac{25 \text{ lbs./Filter}}{16 \text{ oz/lb}}$$

b. Dilute Volume Required (4.0 oz/gal).

$$\frac{25 \text{ lbs/Filter} \times 16 \text{ oz/lbs}}{4 \text{ oz/gal}} = \frac{100 \text{ gal/Filter}}{4 \text{ oz/gal}}$$

c. Hydro-Pure suggests a quantity twice the amount for one conditioning ( 350 lbs.), plus the amount for injection, be available for start-up.

\* - As required based upon the operating volume of greensand in each filter.

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# 1.1 Filtration - Shutdown Procedures

## 3.3 FILTRATION - SHUTDOWN PROCEDURES

<u>General Procedure</u>	<u>Step Sequence</u>	<u>Additional Information</u>
1. TOTAL FILTER SHUTDOWN	1.1 Filtration can be stopped by shutting down the well pump.	
	1.2 Pressure of approximately 80 lbs. will be present in the filters due to the distribution system.	
2. SINGLE FILTER SHUTDOWN	2.1 Close the raw water intake valve by setting the OPEN-CLOSE-AUTO valve control selector switch to the CLOSE position.	The plant flow will then be divided between the remaining five filters in operation. Care must be taken not to overload any one filter.
3. FILTER DRAINING	3.1 Close the raw water intake, discharge, and waste isolation valves by setting the OPEN-AUTO-CLOSE valve control selector switch to the CLOSE position.	The filter is now isolated from the system.
	3.2 Open the filter scouring drain valve.	
	3.3 The backwash flow rate control unit must be manually opened to allow drain water to discharge to the wet well.  CAUTION: The filter must be gradually refilled prior to filtration to prevent any damage to the unit.	Neither the inlet or the discharge pressure gauges should indicate any pressure.  Refer to Section <b>3.4</b> Filtration Startup Procedures.

## 1.2 Filtration - Startup Procedures

### 3.4 FILTRATION - STARTUP PROCEDURES

<u>General Procedure</u>	<u>Step Sequence</u>	<u>Additional Information</u>
1. GENERAL PROCEDURES AND CHECKS	1.1 Complete a general inspection of the filters, piping, valving and equipment.	Normal filtering operation is shown on Figure 3-1.
	1.2 Check that the hydropneumatic system is operating properly.	The hydropneumatic tank should have approximately 150 psi pressure and the HOA switch at the unit should be in the A (Auto) position.
	1.3 Insure that the raw water piping, valving and surge control equipment is ready for operation.	
	1.4 Insure that the discharge valve is open for treated water discharge to the distribution system.	Operating the treatment plant with no place for the water to discharge can cause major problems.
	1.5 Insure the raw water bypass valve of the filtration plant is closed.	Operating the treatment plant with the bypass valve open will render the treatment process useless with the result of poor quality water entering the system.
2. FILL THE FILTERS	2.1 Each filter must be filled and pressurized before startup.	Water from the distribution system is recommended for this purpose.

### 3.4 FILTRATION - STARTUP PROCEDURES

<u>General Procedure</u>	<u>Step Sequence</u>	<u>Additional Information</u>
	2.2 Close the filter drain valves and air feed valves.	
	2.3 Open the finished water manual isolation valve and allow the filter to fill slowly.	When the filter pressure gauges show approximately 80 psi, the filter is filled.
	2.4 Open all of the filter manual isolation valves.	
3. START THE FILTERS	3.1 Switch on the circuit breaker to provide power to the filter control panel.	There is a circuit breaker at the MCC (Motor Control Center) and a circuit breaker in the filter control panel.
	3.2 Set all the OPEN-CLOSE-AUTO valve control selector switches to the AUTO position.	
	3.3 Check the OPEN-CLOSE indicator on each automatic valve to insure proper position. When the pin is up and visible, the valve is open. When the indicator pin is down, the valve is closed.	<u>Valve Positions for Filtration</u> Inlet Valve - Open (large green valve) Outlet/Backwash Valve - Open (large blue valve) Waste Valve - Closed (large beige valve) Rinse Valve - Closed (smaller beige valve)



### 3.4 FILTRATION - STARTUP PROCEDURES

<u>General Procedure</u>	<u>Step Sequence</u>	<u>Additional Information</u>
	3.4 The green service light should be ON for each filter to operate.	
	3.5 Start the well pump and chemical systems, filtration will begin.	Refer to Chapter 2, Section 2.5 for detailed procedures.
	3.6 Check the differential pressure at each filter. If this differential is above 6 to 8 lbs, the filter should be backwashed.	Differential pressure is the difference in pressure between the filter inlet pressure gauge and the filter outlet gauge.
	3.7 Check filter inlet and outlet water quality and adjust chemical dosages accordingly.	Filter inlet (or raw) water should have a slight brownish-pink tint.  Filter outlet (or finish) water should be crystal clear with <u>no</u> pink tint.