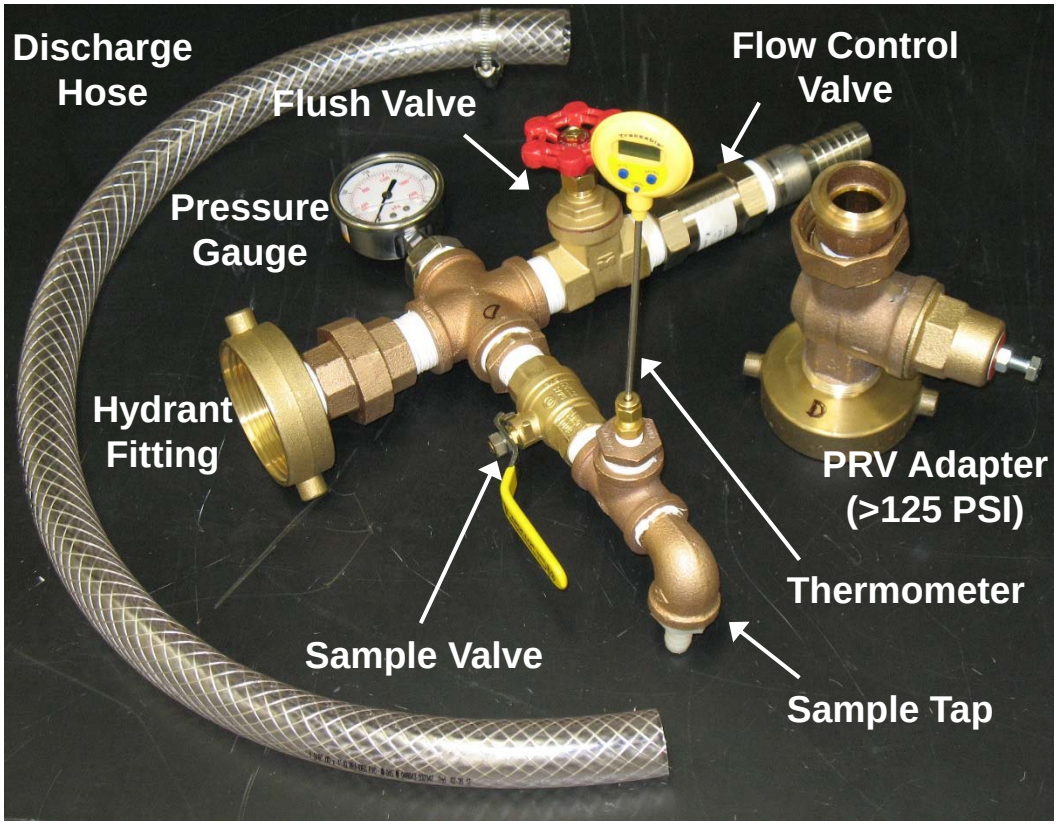
US EPA TSC “Falmouth” Hydrant Sampler

When collecting water quality samples, taps located at a residence or business are often not available or accessible in some areas of the system, so hydrants must be used. Dry barrel hydrants, the most common type of hydrant, are designed to be operated with their valves fully open. The “Falmouth” Hydrant Sampler was designed to allow the hydrant valve to be fully open, while collecting samples in a controlled, safe manner.



Hydrant Sampler Procedure

1. Determine the time needed to flush the sample line (i.e., rule of thumb or calculated flush time) using the procedure on the following page.
2. If system pressure is > 125 psi at sample location install PRV Adapter (ask operator, use best judgement).
3. Close all valves on the sampler, secure thermometer, and connect to hydrant;
4. Slowly open the hydrant until it is fully open (*system operator should operate the hydrant*).
5. Open the flush valve on sampler and start the timer. The flow control valve on the “Falmouth” Hydrant Sampler operates at a constant flow rate of 20 gpm.
6. Allow the sampler to flush for twice the CFT or time designated by the “rule of thumb.”
7. Open the sample valve to collect samples. Turn off the sample valve between samples.
8. Once all samples have been collected, open the sample valve and record the temperature after it has stabilized.
9. If the PRV Adapter is not being used, record the pressure reading when both the sample and flush valves are closed.
10. When sampling is complete, close all valves on the sampler and slowly close the hydrant valve. Open the flush valve slightly to release any remaining pressure and confirm the hydrant is completely closed. Remove the sampler.

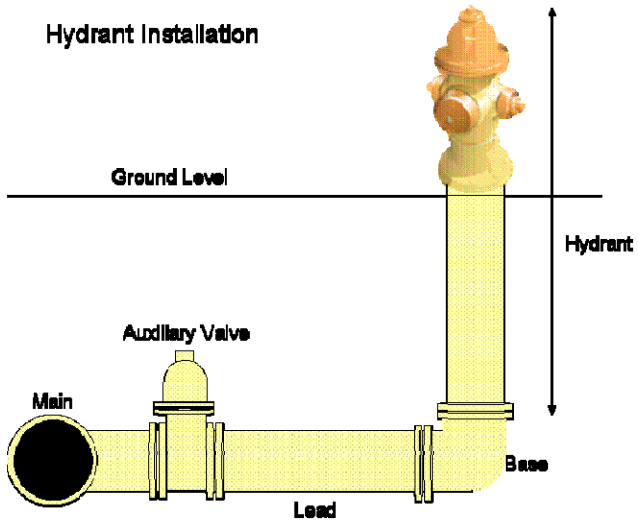
Hydrant Flush Time Approaches for Sampling (assumes flow rate of 20 gpm, regulated by hydrant sampler)

- ***Objective:*** assess water quality in the proximity of the sample location; under flushing may result in sampling from the service line; over flushing may pull water from another part of the system!
- ***Rule of Thumb*** approach is easiest (ok for one-time sampling): **3 minute total flush time before sampling** (assumes pipe diameter is 6 inches or less, and the pipe length is less than 20 feet)
- ***CFT*** approach should be determined if time allows: **Flush for two times the CFT before sampling;** the CFT is determined using the following steps:

1. Estimate the (total) length and diameter of hydrant piping (see figure, below); Utilize operator's knowledge of system, a system/site map, and/or design standards as needed

   Vertical length/diameter:
   - Assume hydrant diameter is 6 inches (unless indicated differently)
   - Assume hydrant length is 6 feet (based on design standards)

   Horizontal length/diameter:
   - Assume hydrant lead diameter is 6 inches
   - Measure/estimate the length of pipe between main and hydrant base; if location of main is not known, measure the horizontal distance between the auxiliary valve to the hydrant and add one foot to account for distance from the main to the auxiliary valve



2. Determine the necessary flush time (from matrix, on right) based on vertical and horizontal pipe lengths and diameters; assume 20 gpm flow rate due to the flow control valve on hydrant sampler.

Number of Minutes needed to Flush Hydrant at 20 gpm

Length of Pipe	Inside (Nominal) Diameter of Hydrant/ Pipe (inches)					
	2	4	6	8	12	16
1	0.0	0.0	0.1	0.1	0.3	0.5
5	0.0	0.2	0.4	0.7	1.5	2.6
10	0.1	0.3	0.7	1.3	2.9	5.2
15	0.1	0.5	1.1	2.0	4.4	7.8
20	0.2	0.7	1.5	2.6	5.9	10.4
25	0.2	0.8	1.8	3.3	7.3	13.1
30	0.2	1.0	2.2	3.9	8.8	15.7
35	0.3	1.1	2.6	4.6	10.3	18.3
40	0.3	1.3	2.9	5.2	11.8	20.9
45	0.4	1.5	3.3	5.9	13.2	23.5
50	0.4	1.6	3.7	6.5	14.7	26.1
55	0.4	1.8	4.0	7.2	16.2	28.7
60	0.5	2.0	4.4	7.8	17.6	31.3
65	0.5	2.1	4.8	8.5	19.1	33.9
70	0.6	2.3	5.1	9.1	20.6	36.6
75	0.6	2.4	5.5	9.8	22.0	39.2
80	0.7	2.6	5.9	10.4	23.5	41.8
85	0.7	2.8	6.2	11.1	25.0	44.4
90	0.7	2.9	6.6	11.8	26.4	47.0
95	0.8	3.1	7.0	12.4	27.9	49.6
100	0.8	3.3	7.3	13.1	29.4	52.2

1. Depending on the type of pipe material and degree of corrosion inside the pipe, the inner diameter will vary. These diameters are meant to be approximations.