CLAIMS

1. A device for reducing biofouling in a water system, the device comprising:

a treatment unit comprising:

a reservoir for a volume of water;

at least one layer of a permeable fabric structure positioned within or defining a portion of a wall of the reservoir, in which the permeable fabric structure comprises an outer surface, an inner surface and a plurality of pores extending therebetween, the permeable fabric structure having a biocide on or in one or more of the outer surface or the inner surface and extending within at least a portion of at least one of a plurality of pores,

in which the treatment unit provides conditioned water downstream to the water system for reducing biofouling in the water system, in which at least a portion of the water passing through the water system passes through the treatment unit,

the conditioned water requiring an average dwell time to stay within the reservoir of the treatment unit before travelling into the water system,

in which the biocide contacts at least some of the water entering into or within the reservoir of the treatment unit so as to aid in forming the conditioned water prior to the conditioned water traveling into the water system such that biofouling is reduced in the water system downstream of the treatment unit.

2. A device according to Claim 1, in which the permeable fabric structure within the treatment unit has a permeability with the range of 0.1 millilitres of water per second per square centimetre to 100 millilitres of water per second per square centimetre.

3. A device according to Claim 1, in which the at least one layer of the permeable fabric structure comprises a 3-dimensional flexible material selected from the group consisting of natural and synthetic fabrics, natural and synthetic membranes, natural and synthetic sheets, and fabrics, membranes, films and sheets made from a combination of natural and synthetic materials.

4. A device according to Claim 1, in which a dissolved oxygen content of the water entering the reservoir of the treatment unit is similar to a dissolved oxygen content of the conditioned water travelling into the water system.

5. A device according to Claim 1, in which a dissolved oxygen content of the water entering the reservoir of the treatment unit is higher than a dissolved oxygen content of the conditioned water travelling into the water system.

6. A device according to Claim 1, in which the water system comprises a once-through system.

7. A device according to Claim 1, in which the water system comprises a recirculation system.

8. A device according to Claim 1, in which the water system comprises a make-up water circuit of a recirculation system.

9. A device according to Claim 1, in which the average dwell time is an average amount of time a molecule of the water spends within the reservoir between entering the reservoir and traveling into the water system.

10. A device according to Claim 1, in which the average dwell time is determined based on the volume of the reservoir divided by an average flow rate into the water system determined over a period of an hour during operation of the water system.

11. A device according to Claim 10, in which the average dwell time is within a range of 1 minute to 6 hours.

12. A device according to Claim 10, in which the average dwell time is 1 minute or less.

13. A device according to Claim 10, in which the average dwell time is greater than 6 hours.

14. A device according to Claim 1, in which at least a portion of the conditioned water does not necessarily pass through any of the plurality of pores of the permeable fabric structure.

15. A device according to Claim 1, in which the reservoir is positioned within a body of water and a water intake for the water system is configured to draw conditioned water from within the reservoir such that water from the body of water is pulled into the reservoir to fill the reservoir to replace the conditioned water taken through the water intake.

16. A device according to Claim 1, in which the reservoir is positioned within a body of water, in which the reservoir is or defines an inlet for the water from the body of water, in which the inlet comprises the at least one layer of the permeable fabric structure such that the

water from the body of water flows through the at least one layer of the permeable fabric structure into the reservoir.

17. A device according to Claim 16, in which the at least one layer of the permeable fabric structure forms the inlet of the reservoir and is replaceable.

18. A device according to Claim 1, in which the treatment unit further includes one or more preconditioning features that are configured to adjust water chemistry of the water within the reservoir.

19. A device according to Claim 1, in which the at least one layer of the permeable fabric structure comprises a plurality of permeable fabric structures positioned in a tortuous path leading to an outlet where the conditioned water is provided to the water system.

20. A device according to Claim 1, in which the reservoir is formed within a body of water, in which the permeable fabric structure is attached to a floatable device such that the permeable fabric structure extends downwardly from the floatable device into the body of water.

21. A device according to Claim 1, in which the treatment unit is an enclosure submerged completely within a body of water.

22. A device according to Claim 21, in which the treatment unit is anchored to a bottom surface of the body of water.

23. A device according to Claim 22, in which a water intake of the water system includes a pump configured to draw conditioned water from within the reservoir to provide to the water system via one or more pipes.

24. A device according to Claim 1, in which the reservoir is formed within a body of water, in which a first chemistry of the conditioned water is different than a second chemistry of water within the body of water.

25. A device according to Claim 1, in which the biocide is within a coating applied to the at least one layer of a permeable fabric structure.

26. A device according to Claim 1, in which the reservoir is formed within a body of water, in which the permeable fabric structure enables free flow of water from the body of water

without significant build-up occurring on either the outer surface or the inner surface of the permeable fabric structure for at least one month.

27. A device according to Claim 1, further comprising one or more strips or panels positioned in the reservoir, in which each of the one or more strips or panels is flexible and includes biocide thereon or therein that contacts the water in the reservoir to aid in forming the conditioned water.

28. A device according to Claim 27, further comprising an inner reservoir positioned within the reservoir, in which the inner reservoir includes the one or more strips or panels positioned therein.

29. A device according to Claim 1, further comprising an inner reservoir positioned within the reservoir, in which the inner reservoir includes one or more strips or panels positioned therein, in which each of the one or more strips or panels is flexible and includes biocide thereon or therein that contacts the water in the reservoir to aid in forming the conditioned water.

30. A device according to Claim 29, in which the one or more strips or panels are replaceable.

31. A method for reducing biofouling in a water system, the method comprising:

providing a treatment unit comprising:

a reservoir for a volume of water that is provided to the water system through a water intake; and

at least one layer of a permeable fabric structure positioned within or defining a portion of a wall of the reservoir, in which the permeable fabric structure comprises an outer surface, an inner surface and a plurality of pores extending therebetween, the permeable fabric structure having a biocide on or in one or more of the outer surface or the inner surface and extending within at least a portion of at least one of the plurality of pores;

in which the biocide contacts at least some of the water entering into or within the reservoir of the treatment unit so as to aid in forming conditioned water such that biofouling is reduced in the water system downstream of the treatment unit; and

causing conditioned water to travel downstream from the treatment unit and into a water intake of the water system for reducing biofouling in the water system, in which at least a portion of the water passing through the water system passes through the treatment unit.

32. A method according to Claim 31, in which causing conditioned water to travel into the water intake comprises pulling the conditioned water from the treatment unit.

33. A system comprising:

a treatment unit comprising:

a reservoir for a volume of water;

at least one layer of a permeable fabric structure positioned within or defining a portion of a wall of the reservoir, in which the permeable fabric structure comprises an outer surface, an inner surface and a plurality of pores extending therebetween, the permeable fabric structure having a coating on one or more of the outer surface or the inner surface and extending within at least a portion of at least one of a plurality of pores; and

an outlet for providing conditioned water downstream to a water intake of the water system for reducing biofouling in the water system, in which at least a portion of the water passing through the water system passes through the treatment unit,

the conditioned water requiring an average dwell time to stay within the reservoir of the treatment unit before traveling through the outlet and into the water system,

in which the coating contacts at least some of the water entering into or within the reservoir of the treatment unit so as to aid in forming the conditioned water prior to the conditioned water traveling through the outlet and into the water system such that biofouling is reduced in the water system downstream of the treatment unit.

34. A system according to Claim 33, in which the reservoir is formed within a body of water, in which the permeable fabric structure is attached to a floatable device such that the permeable fabric structure extends downwardly from the floatable device into the body of water.

35. A system according to Claim 33, in which the treatment unit is an enclosure submerged completely within a body of water.

36. A system according to Claim 35, in which the treatment unit is anchored to a bottom surface of the body of water.

37. A system according to Claim 36, in which the water intake of the water system includes a pump configured to draw conditioned water from within the reservoir to provide to the water system via one or more pipes.

38. A system according to Claim 33, in which the reservoir is formed within a body of water, in which a first chemistry of the conditioned water is different than a second chemistry of water within the body of water.

39. A system according to Claim 33, in which the coating includes biocide.

40. A system according to Claim 33, in which the reservoir is formed within a body of water, in which the permeable fabric structure enables free flow of water from the body of water without build-up occurring on either the outer surface or the inner surface of the permeable fabric structure that significantly adversely affects permeability of the permeable fabric structure for at least one month.

41. A system according to Claim 33, further comprising one or more strips or panels positioned in the reservoir, in which each of the one or more strips or panels is flexible and includes biocide thereon or therein that contacts the water in the reservoir to aid in forming the conditioned water.

42. A system according to Claim 33, further comprising an inner reservoir positioned within the reservoir, in which the inner reservoir includes one or more strips or panels positioned therein, in which each of the one or more strips or panels is flexible and includes biocide thereon or therein that contacts the water in the reservoir to aid in forming the conditioned water.

43. A system according to Claim 42, in which the one or more strips or panels are replaceable.

44. A system according to Claim 33, in which a first water chemistry of water within the reservoir is different than a second water chemistry of water entering the reservoir from an aqueous environment.

45. A system according to Claim 44, in which the first water chemistry is different than the second water chemistry by having at least one difference of a water chemistry characteristic, in which the water chemistry characteristic is one of dissolved oxygen, pH, total dissolved nitrogen, ammonium, nitrates, orthophosphates, total dissolved phosphates, silica, salinity, alkalinity, or chlorophyll.