CLAIMS

What is claimed is:

1. Low cost and sanitary efficient method for providing large water bodies suitable for direct contact recreational purposes, the large water body having a surface of at least 3,000 m^2, the method comprising:

    - designating a sedimentation zone 1 and a dissipation zone 2 in the large water body, both having different configurations and treatment methods, wherein:
        - the sedimentation zone 1 and dissipation zone 2 are located within the same water body 3, and are not separated by a physical barrier, wherein the ratio between the volume of water contained within the dissipation zone 2 and the volume contained within the sedimentation zone 1 is from 1:2 to 1:40;
        - the sedimentation zone 1 has an aesthetic purpose and is used mainly for secondary non-direct recreational contact purposes, wherein the sedimentation zone is designed to have a density of bathers lower than the dissipation zone 2, wherein as a daily average no more than 20% of the total number of bathers within the large water body 3 is present in the sedimentation zone 1;
        - the dissipation zone 2 is used for direct contact purposes, such as swimming and bathing, and is designed to have a high density of bathers, wherein as a daily average, at least 80% of the total number of bathers within the large water body 3 is present in the dissipation zone 2 with a maximum density of 1 bather per 2 m2;
    - applying a disinfection method based on a CT index into the sedimentation zone 1 water volume, wherein the CT index requires that the sedimentation zone 1 is treated by adding disinfectant agents to achieve a specific concentration "C" of the disinfectant during a minimum contact time of "T" in the water volume of the sedimentation zone 1, and wherein the disinfection method is performed such that the disinfectant agents are applied to the water volume contained in the sedimentation zone 1 to achieve a CT index of at least 42 every 72 hours;
    - applying an efficient amount of a flocculant composition into the sedimentation zone 1 that aids in the settling of different microorganisms and/or contaminants that are present in the sedimentation zone 1, and wherein water flows and water circulation within the sedimentation zone 1 are maintained to allow proper sedimentation;

- maintaining a permanent chlorine residual in the dissipation zone 2 water volume by adding an efficient amount of chlorine so that at least a 0.5 mg/L free chlorine level is maintained in the water volume contained within the dissipation zone 2;
- injecting water to the dissipation zone by means of one or more inlet nozzles 26 that along with the natural currents produced by winds and/or water temperature differences, has the capacity of generating a water dissipation pattern of the volume of water within the dissipation zone 2 into the sedimentation zone 1, and

wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 30 minutes.

2. Method according to Claim 1, wherein the sedimentation zone 1 and the dissipation zone 2 are delimited by delimitation means (4).

3. Method according to Claim 2, wherein the delimitation means (4) is selected from the group comprising: a visual delimitation, a flotation line, a delimitation line, overhead flags, buoys, a slope change, different depth and combinations thereof.

4. Method according to Claim 2, wherein the delimitation means (4) is established by means of a brochure, designations by signage or rules, a handbook, a user guideline and by written and/or verbal instructions, among others.

5. Method according to Claim 1, wherein the depth of the sedimentation zone 1 is at least 1.8 meters at its deepest point, wherein an efficient depth for settling of the microorganisms and contaminants is established and disturbance from bathers is minimized.

6. Method according to Claim 1, wherein the sedimentation zone 1 has a surface of at least 1,500 m^2, preferably at least 6,000 m^2 and even more preferably of at least 10,000 m^2.

7. Method according to Claim 1, wherein the flocculant composition comprises one or more flocculants agents selected from the group including synthetic polymers, quaternary ammonium cationic polymers, polycationic polymers, aluminum salts, calcium oxide, calcium hydroxide and mixtures thereof.

8. Method according to Claim 7, wherein the flocculant agents are selected from the group comprising a cationic or anionic polymeric flocculant and mixtures thereof.

9. Method according to Claim 1, wherein the flocculant composition is added to the sedimentation zone 1 at least once every 7 days at a rate of 0.03 g to 3.0 g per m^3 of water volume of the sedimentation zone 1.

10. Method according to Claim 1, wherein a periodic cleaning of a bottom surface of the sedimentation zone 1 is performed, ; whereby the sedimentation zone 1 will have a more natural aspect such as natural lakes and lagoons and daily cleaning is not required.

11. Method according to Claim 10, wherein the bottom surface of the sedimentation zone 1 is cleaned at least once every 7-days period.

12. Method according to Claim 1, wherein the sedimentation zone 1 is designed to discourage bathers from entering the sedimentation zone 1, whereby direct contact recreational purposes are minimized and the practice of aquatic sports with secondary contact purposes is encouraged.

13. Method according to Claim 1, wherein the dissipation zone 2 is designed so that it has a depth of up to 1.4 meters at its deepest point.

14. Method according to Claim 1, wherein the dissipation zone 2 is designed so that it has a depth of up to 1.6 meters at its deepest point.

15. Method according to Claim 1, wherein the dissipation zone 2 is designed so that it has a depth of up to 1.8 meters at its deepest point.

16. Method according to Claim 1, wherein the dissipation zone 2 comprises a downward slope from the periphery 12 to the bottom surface at an angle α that results in a slope of up to 15% to achieve a safe entry to the large water body 3.

17. Method according to Claim 1, wherein the dissipation zone 2 is designated so that as a daily average, at least 90% of the total number of bathers within the large water body 3 is present in the dissipation zone 2.

18. Method according to Claim 1, wherein the dissipation zone 2 is designed to have a maximum density of bathers of 1 bather per 2 m2.

19. Method according to Claim 1, wherein the dissipation zone 2 is designed to have a maximum density of bathers of 1 bather per 6 m2.

20. Method according to Claim 1, wherein the dissipation zone 2 is designed to have a maximum density of bathers of 1 bather per 8 m2.

21. Method according to Claim 1, wherein the water provided to the dissipation zone 2 through the one or more inlet nozzles 26 is treated with ultraviolet light (UV).

22. Method according to Claim 1, wherein the location, design and configuration of the one or more inlet nozzles 26 can vary to achieve different types of water renewal patterns within the dissipation zone 2.

23. Method according to Claim 1, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 25 minutes.

24. Method according to Claim 1, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 20 minutes.

25. Method according to Claim 1, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 15 minutes.

26. Method according to Claim 1, further comprising applying a periodic cleaning of a bottom surface of dissipation zone 2 in order to maintain the bottom surface of such dissipation zone 2 free of particles that may generate an aesthetic, safety, or sanitary impact in the water.

27. Method according to Claim 26, wherein the bottom surface of the dissipation zone 2 is cleaned at least once per every 72-hours period.

28. Method according to Claim 1, wherein the permanent chlorine residual is maintained in the dissipation zone 2 by the addition of chlorine tablets, by applying diluted chlorine through the one or more inlet nozzles 26 located in the dissipation zone 2, or by manually adding chlorine to such zone.

29. Method according to Claim 1, wherein the large water body 3 comprises a plurality of separate dissipation zones 2, preferably located in a periphery 12 of the water body 3.

30. Method according to Claim 1, wherein the large water body 3 has a volume of up to 50.000 m3 and comprises a centralized filtration system that can filter the complete water volume of the water body.

31. Method according to Claim 1, wherein the permanent disinfectant residual in the dissipation zone is maintained by adding disinfectant agents selected from the group comprising chlorine, bromine, ozone, its derivatives and mixtures thereof.

32. Method according to Claim 1, further comprising adding an efficient amount of a chlorine disinfectant in the sedimentation zone to maintain a permanent free chlorine level in the sedimentation zone, preferably of at least 0.5 mg/L.

~~33. A system for establishing a large water body 3 suitable for direct contact recreational purposes, the large water body 3 having a surface of least 3,000 m², and having a periphery 12 and a bottom, comprising:~~

~~a) a sedimentation zone 1 located within a portion of the large water body 3 and along a portion of the periphery;~~

~~b) a system for dosing chemicals 19 along the periphery within the sedimentation zone 1 arranged and configured to apply:~~

~~i) disinfectant agents in the water volume within the sedimentation zone 1 to achieve a CT index of at least 42 every 72 hours, where C is defined as the concentration and T is defined as the minimum contact time; and~~

ii) a flocculant composition into the sedimentation zone 1 that aids in the settling process of the different microorganisms, parasites, and protozoa that are present in the water body and inactivated by the CT cycle;

c) a dissipation zone 2 located within a portion of the large water body and along a portion of the periphery;

d) one or more inlet nozzles 26 within the dissipation zone 2 arranged and configured to inject water to the dissipation zone 2 to generate a diffusion pattern of the water volume within the dissipation zone,

e) a system for dosing chemicals 29 into the dissipation zone 2 configured to maintain a permanent chlorine residual in the water volume within the dissipation zone water, wherein at least a 0.5 mg/L free chlorine level is maintained in the water volume located within the dissipation zone.

34. The system of claim 33, wherein the sedimentation zone 1 and the dissipation zone 2 are delimited by delimitation means 4.

35. The system of claim 34, wherein the delimitation means 4 is selected from the group comprising: a visual delimitation, a flotation line, a delimitation line, overhead flags, buoys, a slope change, a different depth, designations by signage or rules, and combinations thereof.

36. The system of claim 33, wherein the depth of the sedimentation zone 1 is at least 1.8 meters at its deepest point, whereby an efficient depth for settling of the microorganisms and contaminants is established.

37. The system of claim 33, wherein the sedimentation zone 1 has a surface of at least 1,500 m^2, preferably at least 6,000 m^2 and even more preferably of at least 10,000 m^2.

38. The system of claim 33, wherein the flocculant composition comprises one or more flocculants agents selected from the group including synthetic polymers, quaternary ammonium cationic polymers, polycationic polymers, aluminum salts, calcium oxide, calcium hydroxide and mixtures thereof.

39. The system of 38, wherein the flocculant agents are selected from the group comprising a cationic or anionic polymeric flocculant and mixtures thereof.

~~40. The system of claim 33, wherein the flocculant composition is added to the sedimentation zone 1 at least once every 7 days at a rate of 0.03 g to 3.0 g per m^3 of water volume of the sedimentation zone 1.~~

~~41. The system of claim 33, further comprising a bottom surface cleaning device to periodically clean the sedimentation zone 1, whereby the sedimentation zone 1 will have a more natural aspect like a natural lake and daily cleaning is not required.~~

~~42. The system of claim 41, wherein the bottom surface of the sedimentation zone 1 is cleaned at least once every 7-days period.~~

~~43. The system of claim 33, wherein the system for dosing chemicals 19 into the sedimentation zone 1 comprises one or more inlet nozzles 18.~~

~~44. The system of claim 33, wherein the sedimentation zone 1 is arranged and configured to discourage bathers from entering the sedimentation zone 1, whereby direct contact recreational purposes are minimized and the practice of aquatic sports with secondary contact purposes is encouraged.~~

~~45. The system of claim 33, wherein the dissipation zone 2 is designed so that it has a depth of up to 1.4 meters at its deepest point, preferably up to 1.6 meters at its deepest point and even more preferably of up to 1.8 meters at its deepest point.~~

~~46. The system of claim 33, wherein the dissipation zone 2 comprises a downward slope from the periphery 12 to the bottom surface at an angle α that results in a slope of up to 15% to achieve a safe entry to the large water body 3.~~

~~47. The system of claim 33, wherein the dissipation zone 2 is designated so that as a daily average, at least 90% of the total number of bathers within the large water body 3 is present in the dissipation zone 2.~~

~~48. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to have a maximum density of bathers of 1 bather per 2 m2.~~

49. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to have a maximum density of bathers of 1 bather per 6 m2.

50. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to have a maximum density of bathers of 1 bather per 8 m2.

51. The system of claim 33, further comprising an ultraviolet light (UV) treatment device 28, wherein the water provided to the dissipation zone 2 through the one or more inlet nozzles 26 is treated with ultraviolet light (UV).

52. The system of claim 33, wherein the one or more inlet nozzles may be varied in number, direction and water flow to achieve different types of water renewal patterns within the dissipation zone 2.

53. The system of claim 33, wherein the system for dosing chemicals 29 into the dissipation zone 2 is configured to dose the chemicals through the one or more inlet nozzles 26 within the dissipation zone 2 .

54. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 25 minutes.

55. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 20 minutes.

56. The system of claim 33, wherein the dissipation zone 2 is arranged and configured to allow a Contamination Reduction Index (CRI) of up to 15 minutes.

57. The system of claim 33, further comprising a bottom surface cleaning device arranged and configured to clean a bottom surface of dissipation zone 2, whereby the bottom surface of the dissipation zone 2 is maintained free of particles that may generate an aesthetic, safety, or sanitary impact in the water.

58. The system of claim 57, wherein the bottom surface of the dissipation zone 2 is cleaned at least once per every 72-hours period.

59. The system of claim 33, wherein the permanent chlorine residual is maintained in the dissipation zone 2 by the addition of chlorine tablets, by applying diluted chlorine through the one or more inlet nozzles located in the dissipation zone 2, or by manually adding chlorine to such zone.

60. The system of claim 33, wherein the one or more inlet nozzles 26 are located throughout the surface of the dissipation zone and preferably along its periphery, center of along the delimitation means 4.

61. The system of claim 33, wherein the large water body 3 includes a plurality of separate dissipation zones 2, preferably located in the periphery 12 of the water body 3.

62. The system of claim 33, wherein the large water body 3 has a volume of up to 50.000 m3 and comprises a centralized filtration system that can filter the complete water volume of the water body.

63. The system of claim 33, wherein the system for dosing chemicals 19 is configured to apply a chlorine disinfectant into the sedimentation zone 1 in order to maintain a permanent free chlorine level in the sedimentation zone, preferably of at least 0.5 mg/L.

64. The system of claim 33, wherein the system for dosing chemicals 29 into the dissipation zone is configured to add disinfectant agents selected from the group comprising chlorine, bromine, ozone, its derivatives and mixtures thereof.