What is claimed is:

1. A method for treating large water bodies, including large artificial excavated or floating structures with bottoms comprising flexible membranes, wherein the method comprises:

   (a) Applying an effective amount of a flocculant to water in the water body to maintain turbidity of the water below 2 NTU, wherein the flocculant flocculates suspended solids in the water into particles that settle to the bottom of the water body.

   (b) operating a mobile suctioning device to maintain an increase in the black component of the bottom's color below 30% based on the CMYK scale, wherein the mobile suction device suctions a portion of water from the bottom of the water body containing settled particles, and wherein the device is capable of cleaning at a surface cleaning rate of 10,000 m^2 per 24 hours;

   (c) filtering the water suctioned by the mobile suction device and returning the filtered water to the water body, wherein the water suctioned by the mobile suction device does not exceed 10% of the total water volume of the water body in a 24 hour interval; and

   (d) operating a degreasing system to maintain a surface water layer having less than about 20 mg/L of floating greases, wherein greases from a surface water flow into the degreasing system are removed by a separation unit comprising a degreaser and the treated water is returned to the water body.

2. The method of claim 1, further comprising adding a chlorine-based additive to maintain at least a minimum free residual chlorine level in the water, where the minimum free residual chlorine level is at least the value resulting from the following equation:

$$Minimum\ Free\ Residual\ Chlorine\ Level = (0.3 - 0.002(WQI - 100))ppm$$

3. The method of claim 1, wherein the water body has a surface area of at least 7,000 m^3.

4. The method of claim 1, wherein the flexible membrane has a thickness between about 0.1 mm and about 5 mm.

5. The method of claim 1, wherein the flexible membrane comprises rubber, plastic, Teflon, low density polyethylene, high density polyethylene, polypropylene, nylon, polystyrene, polycarbonate, polyethylene terephthalate, polyamides, PVC, acrylics, or a combination thereof.

6. The method of claim 1, wherein the suctioning device is operated to avoid re-suspension of less than 30% of the settled materials and debris that are found on the bottom.

7. The method of claim 1, wherein the suctioning device is supported over brushes to avoid damaging the bottom of the artificially constructed structures.

8. The method of claim 1, wherein the suctioning device is a self-propelled device.

9. The method of claim 1, wherein the suctioning device allows concentration of suctioning power at suction points distributed along the bottom of the device, therefore providing higher suctioning efficiency and avoiding re-suspending the settled materials and debris found on the bottom.

10. The method of claim 1, further comprising receiving information regarding the turbidity of the water and applying flocculants to adjust the turbidity below a set limit.

11. The method of claim 1, wherein the turbidity is determined by empirical methods, analytical methods, or algorithms based on experience.

12. The method of claim 1, wherein a control system activates the application of additives, the operation of the suctioning device, and the operation of the degreaser system.

13. The method of claim 12, wherein the control system is an automated system that processes information.

14. The method of claim 12, wherein the control system may be operated on site.

15. The method of claim 12, wherein the control system may be operated remotely through an internet connection or other information-exchange system.

16. The method of claim 1, wherein the control system receives information regarding the turbidity of the water and activates the flocculant application to adjust the turbidity within a set limit.

17. The method of claim 1, wherein flocculant comprises synthetic polymers such as quaternary ammonium-containing polymers and polycationic , multivalent cations (e.g., quats and polyquats); aluminum salts; calcium oxide; calcium hydroxide; ferrous sulphate; ferric chloride; polyacrylamide; sodium aluminate; sodium silicate; and some natural agents such as chitosan, gelatin, guar gum, alginates, moringa seeds; starch derivatives; and combinations thereof.

18. The method of claim 1, wherein flocculant comprises algaecide properties.

19. The method of claim 1, wherein the flocculant is dispensed into the water by a chemical application system comprising at least one selected from the group consisting of injectors, sprinklers, dispensers, manual application, and piping.

20. The method of claim 2, further comprising receiving information regarding the free residual chlorine level in the water.

21. The method of claim 2, wherein the minimum free residual chlorine level is determined by empirical methods, analytical methods, or algorithms based on experience.

22. The method of claim 2, wherein a control system activates the chlorine-based additive application.

23. The method of claim 2, wherein the chlorine-based additive is dispensed into the water by a chemical application system comprising at least one selected from the group consisting of injectors, sprinklers, dispensers, manual application, and piping.

24. The method of claim 1, wherein the chemical application system is disposed to provide homogeneity to the water body, wherein water quality between two different locations differs less than 20 % for periods of time longer than 4 hours.

25. The method of claim 1, further comprising receiving information regarding the color of the bottom of the water body and activating the mobile suctioning device to adjust the color within a set limit by suctioning settled particles from the bottom of the water body.

26. The method of claim 1, further comprising determining the color of the bottom of the structure, wherein the color is determined by an empirical methods, sensorial methods, analytical methods, or algorithms based on experience.

27. The method of claim 1, wherein the color of the bottom of the structure is determined using a colorimeter.

28. The method of claim 1, wherein operation of the mobile suctioning device is activated based on an amount of impurities that have settled onto the bottom of the water body and affect the color of the bottom, the amount of settled impurities corresponding to an amount of turbidity removed from the water.

29. The method of claim 12, wherein the control system receives information regarding the color of the bottom of the water body and activates the operation of a suctioning device to adjust the color within a set limit.

30. The method of claim 12, wherein the control system receives information regarding amount of floating greases and activates the operation of the degreasing system to adjust the amount of floating greases within a set limit.

31. The method of claim 1, wherein the degreasing system comprises skimmers to provide the surface water flow into the separation unit.

32. The method of claim 1, wherein the degreaser comprises an overflow apparatus for separating oils and greases from the water.

33. The method of claim 1, wherein the degreasing system comprises one or more screens for retaining large debris and a degreaser for separating water from oils and greases through overflow.

34. The method of claim 1, wherein the degreasing system comprises a filter.

35. The method of claim 1, wherein the method is applied to a bathing zone within the water body.

36. The method of claim 1, wherein the minimum residual chlorine level is maintained continuously within the water body.

37. The method of claim 2, wherein the minimum residual chlorine level is maintained for a period of time within the water body.

38. The method of claim 2, wherein the minimum residual chlorine level is maintained when the water body is in use.

39. The method of claim 1, wherein the impurities comprise suspended solids, organic matter, inorganic matter, bacteria, or algae.

40. The method of claim 1, wherein the water body comprises an excavated structure having a bottom and walls to contain the water and a non-permeable flexible membrane covering the bottom of the water body, the bottom having a slope that is about 20% or less and the walls having a slope that is greater than about 45%;

41. The method of claim 1, wherein soil forming the bottom of the excavated structure is compacted soil, the soil being compacted to at least 80 % of its relative density (RD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is less than 12%.

42. The method of claim 1, wherein soil forming the bottom of the excavated structure is compacted soil, the soil being compacted to at least 85 % of its maximum dry density (MDD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is greater than 12%.

43. A system for maintaining water quality in a large water body, comprising:

a chemical application system for dosing a flocculant into the water, wherein the chemical application system applies a flocculant to the water in the water body to maintain turbidity of the water below 2 NTU;

a mobile suctioning device capable of moving along the bottom of the water body and suctioning a portion of water from the bottom containing settled solids, wherein the mobile suctioning device is activated before the increase in the bottom's color black component exceeds 30% on a CMYK scale;

a filtration unit in fluid communication with the mobile suctioning unit, wherein the filtration unit receives the portion of water suctioned by the mobile suction unit; and

a degreasing system comprising a separation unit comprising a degreaser and skimmers for providing a surface water flow from the water body to the separation unit, wherein the degreasing system is activated to maintain a surface water layer having less than about 20 mg/L greases; and

one or more return lines for returning filtered water from the filtration unit and the degreasing system to the water body;

44. The system of claim 43, wherein the water body has a surface area of at least 7,000 m3.

45. The system of claim 43, wherein the water body comprises an excavated structure having a bottom and walls to contain the water and a non-permeable flexible membrane covering the bottom of the water body, the bottom having a slope that is about 20% or less and the walls having a slope that is greater than about 45%.

46. The system of claim 43, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 80 % of its relative density (RD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is less than 12%.

47. The system of claim 43, wherein soil forming the bottom of the excavated structure is compacted soil, the soil compacted to at least 85 % of its maximum dry density (MDD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is greater than 12%.

48. The system of claim 43, wherein the removed top layer of soil is at least 5 cm.

49. The system of claim 43, further comprising a control system that activates the application of additives, the operation of the suctioning device, and the operation of the degreaser system.

50. The system of claim 49, wherein the control system is arranged and configured to receive information regarding water quality parameters, process the information, and activate the chemical activation system, mobile suctioning device, and/or degreasing system to adjust the water quality parameters within their limits.

51. The system of claim 49, wherein the control system is an automated system that processes information.

52. The system of claim 49, wherein the control system may be operated on site.

53. The system of claim 49, wherein the control system may be operated remotely through an internet connection or other information-exchange system.

54. The system of claim 43, wherein the control system receives information regarding the turbidity of the water and activates the flocculant application to adjust the turbidity within a set limit.

55. The system of claim 43, wherein the bottom of the water body has a color that provides a specific coloration to water in the water body.

56. The system of claim 43, wherein the bottom has a white, yellow, or light blue color.

57. The system of claim 43, wherein the degreaser comprises an overflow apparatus for separating oils and greases from the water.

58. The system of claim 43, wherein the degreasing system comprises one or more screens for retaining large debris and a degreaser for separating water from oils and greases through overflow.

59. The system of claim 43, wherein the non-permeable flexible material comprises rubber, plastic, Teflon, low density polyethylene, high density polyethylene, polypropylene, nylon, polystyrene, polycarbonate, polyethylene terephthalate, polyamides, PVC, acrylics, or a combination thereof.

60. The system of claim 43, wherein the non-permeable flexible material has a thickness between about 0.1 mm and about 5 mm.

61. The system of claim 43, wherein the walls are covered with the non-permeable flexible material.

62. The system of claim 43, wherein the suctioning device is supported over brushes to avoid damaging the bottom of the artificially constructed structures.

63. The system of claim 43, wherein the suctioning device is a self-propelled device.

64. The system of claim 43, wherein the suctioning device allows concentration of suctioning power at suction points distributed along the bottom of the device, therefore providing higher suctioning efficiency and avoiding re-suspending the settled materials and debris found on the bottom.

What is claimed is:

1. A method for treating large water bodies for recreational uses, including large artificial excavated or floating structures with bottoms comprising flexible membranes, wherein the method comprises:

(a) applying an effective amount of a flocculant to water in the water body to maintain turbidity of the water below 2 NTU, wherein the flocculant flocculates suspended solids in the water into particles that settle to the bottom of the water body;

(b) monitoring to determine the color of the bottom of the water body, receiving information regarding the color of the bottom and activating a mobile suctioning device to adjust the color within a set limit by suctioning settled particles from the bottom of the water body;

(c) operating the mobile suctioning device to maintain an increase in a black component of the color of the bottom below 30% based on the CMYK scale, wherein the mobile suction device moves on the bottom of the water body and suctions a portion of water from the bottom of the water body containing settled particles, wherein the device is capable of moving and cleaning at a rate of 10,000 m^2 per 24 hours, and wherein operating the mobile suctioning device does not re-suspend more than 30% of the settled particles in the area on the bottom of the water body cleaned by the mobile suction device;

(d) filtering the water suctioned by the mobile suction device and returning the filtered water to the water body, wherein the water suctioned by the mobile suction device does not exceed 10% of the total water volume of the water body in a 24 hour interval; and

(e) operating a degreasing system to maintain a surface water layer having less than about 20 mg/L of floating greases within a top-most 1 cm of the surface water layer, wherein greases from the surface water layer flow into the degreasing system and are removed by a

separation unit comprising a degreaser, and the water that has passed through the degreaser is returned to the water body.

2. The method of claim **1**, further comprising adding a chlorine-based additive to maintain at least a minimum free residual chlorine level in the water, where the minimum free residual chlorine level is at least the value resulting from the following equation:

$$\text{Minimum Free Residual Chlorine Level} = (0.3 - 0.002(WQI - 100))\text{ppm}.$$

3. The method of claim **1**, wherein the water body has a surface area of at least 7,000 m^3.

4. The method of claim **1**, wherein the flexible membrane has a thickness between about 0.1 mm and about 5 mm.

5. The method of claim **1**, wherein the flexible membrane comprises rubber, plastic, Teflon, low density polyethylene, high density polyethylene, polypropylene, nylon, polystyrene, polycarbonate, polyethylene terephthalate, polyamides, PVC, acrylics, or a combination thereof.

6. The method of claim 1, wherein the suctioning device is supported over brushes to avoid damaging the bottom of the artificially constructed structures.

7. The method of claim 1, wherein the suctioning device is a self-propelled device.

8. The method of claim 1, wherein the suctioning device allows concentration of suctioning power at suction points distributed along the bottom of the device, therefore providing higher suctioning efficiency and avoiding re-suspending the settled materials and debris found on the bottom.

9. The method of claim **1**, further comprising receiving information regarding the turbidity of the water and applying flocculants to adjust the turbidity below a set limit.

10. The method of claim **1**, wherein the turbidity is determined by empirical methods, analytical methods, or algorithms based on experience.

11. The method of claim **1**, wherein a control system activates the application of additives, the operation of the suctioning device, and the operation of the degreaser system.

12. The method of claim **11**, wherein the control system is an automated system that processes information.

13. The method of claim 11, wherein the control system may be operated on site.

14. The method of claim 11, wherein the control system may be operated remotely through an internet connection or other information-exchange system.

15. The method of claim 11, wherein the control system receives information regarding the turbidity of the water and activates the flocculant application to adjust the turbidity within a set limit.

16. The method of claim 1, wherein the flocculant comprises synthetic polymers comprising quaternary ammonium-containing polymers or polycationic multivalent cations; aluminum salts; calcium oxide; calcium hydroxide; ferrous sulphate; ferric chloride; polyacrylamide; sodium aluminate; sodium silicate; natural agents comprising chitosan, gelatin, guar gum, alginates, or moringa seeds; starch derivatives; or combinations thereof.

17. The method of claim 1, wherein flocculant comprises algaecide properties.

18. The method of claim 1, wherein the flocculant is dispensed into the water by a chemical application system comprising at least one selected from the group consisting of injectors, sprinklers, dispensers, manual application, and piping.

19. The method of claim **2**, further comprising receiving information regarding the free residual chlorine level in the water.

20. The method of claim **2**, wherein the minimum free residual chlorine level is determined by empirical methods, analytical methods, or algorithms based on experience.

21. The method of claim **2**, wherein a control system activates the chlorine-based additive application.

22. The method of claim **2**, wherein the chlorine-based additive is dispensed into the water by a chemical application system comprising at least one selected from the group consisting of injectors, sprinklers, dispensers, manual application, and piping.

23. The method of claim **18**, wherein the chemical application system is disposed to provide homogeneity to the water body, wherein water quality between two different locations differs less than 20% for periods of time longer than 4 hours.

24. The method of claim **1**, further comprising receiving information regarding the color of the bottom of the water body and activating the mobile suctioning device to adjust the color within a set limit by suctioning settled particles from the bottom of the water body.

25. The method of claim **1**, wherein the color is determined by an empirical methods, sensory methods, analytical methods, or algorithms based on experience.

26. The method of claim **1**, wherein the color of the bottom of the structure is determined using a colorimeter.

27. The method of claim **1**, wherein operation of the mobile suctioning device is activated based on an amount of impurities that have settled onto the bottom of the water body and affect the color of the bottom, the amount of settled impurities corresponding to an amount of turbidity removed from the water.

28. The method of claim **11**, wherein the control system receives information regarding the color of the bottom of the water body and activates the operation of a suctioning device to adjust the color within a set limit.

29. The method of claim **11**, wherein the control system receives information regarding amount of floating greases and activates the operation of the degreasing system to adjust the amount of floating greases within a set limit.

30. The method of claim **1**, wherein the degreasing system comprises skimmers to provide the surface water flow into the separation unit.

31. The method of claim **1**, wherein the degreaser comprises an overflow apparatus for separating oils and greases from the water.

32. The method of claim **1**, wherein the degreasing system comprises one or more screens for retaining large debris and a degreaser for separating water from oils and greases through overflow.

33. The method of claim **1**, wherein the degreasing system comprises a filter.

34. The method of claim **1**, wherein the method is applied to a bathing zone within the water body.

35. The method of claim **2**, wherein the minimum residual chlorine level is maintained continuously within the water body.

36. The method of claim **2**, wherein the minimum residual chlorine level is maintained for a period of time within the water body.

37. The method of claim **2**, wherein the minimum residual chlorine level is maintained when the water body is in use.

38. The method of claim **1**, wherein the impurities comprise suspended solids, organic matter, inorganic matter, bacteria, or algae.

39. The method of claim **1**, wherein the water body comprises an excavated structure having a bottom and walls to contain the water and a non-permeable flexible membrane covering the bottom of the water body, the bottom having a slope that is about 20% or less and the walls having a slope that is greater than about 45%.

40. The method of claim **39**, wherein soil forming the bottom of the excavated structure is compacted soil, the soil being compacted to at least 80% of its relative density (RD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is less than 12%.

41. The method of claim **39**, wherein soil forming the bottom of the excavated structure is compacted soil, the soil being compacted to at least 85% of its maximum dry density (MDD) if a passage rate of the soil forming the bottom of the excavated structure through N°200 mesh is greater than 12%.

42. The method of claim **1**, wherein the bottom comprises a colored material with a white, yellow, or blue color.