PROCESS TO OBTAIN (IMPLEMENT AND MAINTAIN) WATER BODIES LARGER THAN 15,000 M^3 FOR RECREATIONAL USE WITH COLOR, TRANSPARENCY AND CLEANNESS CHARACTERISTICS SIMILAR TO SWIMMING POOLS OR TROPICAL SEAS AT LOW COST

FIELD OF THE INVENTION

This invention discloses a process to obtain (i.e., to implement and maintain) large water bodies or volumes for recreational use, such as lakes or ponds with excellent color, high transparency and cleanness characteristics similar to swimming pools or tropical seas at low cost, in particular for water bodies larger than 15,000 m^3. The invention also comprises a device to extract a particulate material decanted from the water by using the aforementioned process. Furthermore, the present invention discloses a structure to contain large water bodies or volumes, which is specially designed to carry out said process. The decantation process together with the device to extract a decanted material from the water, plus the arrangement of the large volume structure with its functional characteristics of water surface displacement, allow replacing traditional filtration as used in conventional swimming pools that would be very onerous and inefficient in systems having large bodies or volumes.

BACKGROUND OF THE INVENTION

When a nutrient enters into water, aerobic organisms consume dissolved oxygen as a result of the induced metabolic activity. Thus, the nutrient exerts a demand on dissolved oxygen availability, which is called biological oxygen demand (BOD). If the amount of organic material in the medium is very high, it can lead to a decrease in dissolved oxygen concentration. At low oxygen levels, aquatic environment promote the growth of anaerobic species.

Anaerobic metabolism is much slower than aerobic processes (typically more than one order of magnitude) have lower efficiency, and generates various intermediate organic compounds (e.g. organic acids, alcohols, methane). As a result of the lower rate of dissolved organic matter consumption, this will accumulate in the aquatic environment.

CLAIMS

1. A structure to contain a large water body, including a water body larger than 15,000 m^3, for recreational use with color, transparency and cleanness characteristics similar to swimming pools or tropical seas, wherein the structure includes a bottom and walls covered with a plastic liner made of a non-porous material able to be thoroughly cleaned; wherein the depth of the structure to the bottom is about 0.5 meters or higher; wherein the structure includes a system of skimmers for the removal of impurities and surface oils, and a fresh water feeding pipe system that allows entrance of fresh water and results in water removal by displacement of surface water through the skimmer system.

2. The structure according to claim 1, wherein the non-porous material is a membrane made of a material selected from the group consisting of linear low-density polyethylene and high density polyethylene.

3. The structure according to claim 2, wherein the color of the non-porous material is light blue, white or yellow.

4. The structure according to claim 1, wherein the structure has a depth between 2 and 5 meters.

5. The structure according to claim 1, wherein the structure has a recycling system that uses pipes with injectors which allow maintaining water homogeneity by avoiding stagnating zones and allow the application of chemicals.

6. The structure according to claim 1, wherein said structure has a water inlet line and water inlet chambers through which water is extracted to feed the fresh water feeding pipe system of the structure.

7. The structure according to claim 1, wherein the walls define a border, and wherein the system of skimmers is positioned along the border.

8. A structure to contain a large water body, including a water body larger than 15,000 m^3, for recreational use with color, transparency and cleanness characteristics similar to swimming pools or tropical seas, wherein the structure has a border and includes: a bottom and walls along the border built with a low-permeability material, wherein the bottom and walls are lined with a non-porous plastic membrane material able to be cleaned; wherein the depth of the structure to the bottom is at least about 0.5 meters, and up to about 5 meters; a system of skimmers disposed along the border for the removal of impurities and surface oils; a recycling piping system installed around the border of the structure and including a plurality of water injectors distributed along the border for injecting water into the water body to maintain homogeneity; and a fresh water feeding pipe system that allows entrance of fresh water and results in water removal by displacement of surface water through the skimmer system.

9. The structure according to claim 8, wherein the low-permeability material of the wall is selected from the group consisting of clay, bentonite and cement.

10. The structure according to claim 8, wherein the non-porous plastic membrane material is a material selected from the group consisting of linear low-density polyethylene and high density polyethylene.

11. The structure according to claim 10, wherein the color of the non-porous material is light blue, white, or yellow.

12. The structure according to claim 8, wherein the structure has a depth between 2 and 5 meters.

13. The structure according to claim 8, wherein said structure has a water inlet line and water inlet chambers through which fresh water is extracted to feed the fresh water feeding pipe system of the structure.

14. The structure according to claim 13, wherein the water inlet chambers are constructed at a depth of more than 6 meters below the sea surface.

STRUCTURE TO CONTAIN A LARGE WATER BODY, FOR RECREATIONAL USE WITH COLOR, TRANSPARENCY AND CLEANNESS CHARACTERISTICS SIMILAR TO SWIMMING POOLS OR TROPICAL SEAS AT LOW COST

FIELD OF THE INVENTION

This invention discloses a process to obtain (i.e., to implement and maintain) large water bodies or volumes for recreational use, such as lakes or ponds with excellent color, high transparency and cleanness characteristics similar to swimming pools or tropical seas at low cost, in particular for water bodies larger than 15,000 m^3. The invention also comprises a device to extract a particulate material decanted from the water by using the aforementioned process. Furthermore, the present invention discloses a structure to contain large water bodies or volumes, which is specially designed to carry out said process. The decantation process together with the device to extract a decanted material from the water, plus the arrangement of the large volume structure with its functional characteristics of water surface displacement, allow replacing traditional filtration as used in conventional swimming pools that would be very onerous and inefficient in systems having large bodies or volumes.

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CLAIMS

1. A structure to contain a large water body, including a water body larger than 15,000 m^3, for recreational use with color, transparency and cleanness characteristics similar to swimming pools or tropical seas, wherein the structure includes a bottom and walls covered with a plastic liner made of a non-porous material able to be thoroughly cleaned; wherein the depth of the structure to the bottom is about 0.5 meters or higher; wherein the structure includes a system of skimmers for the removal of impurities and surface oils, a fresh water feeding pipe system that allows entrance of fresh water and results in water removal by displacement of surface water through the skimmer system, and a pumping system including a coupling means connected to a moveable suction device for cleaning the plastic liner.

2. The structure according to claim 1, wherein the nonporous material is a membrane made of a material selected from the group consisting of linear low-density polyethylene and high density polyethylene.

3. The structure according to claim 2, wherein the color of the non-porous material is light blue, white, or yellow.

4. The structure according to claim 1, wherein the structure has a depth between 2 and 5 meters.

5. The structure according to claim 1, wherein the structure has a recycling system that uses pipes with injectors which allow maintaining water homogeneity by avoiding stagnating zones and allow the application of chemicals.

6. The structure according to claim 1, wherein said structure has a water inlet line and water inlet chambers through which water is extracted to feed the fresh water feeding pipe system of the structure.

7. The structure according to claim 1, wherein the walls define a border, and wherein the system of skimmers is positioned along the border.

8. A structure to contain a large water body, including a water body larger than 15,000 m^3, for recreational use with color, transparency and cleanness characteristics similar to swimming pools or tropical seas, wherein the structure has a border and includes: a bottom and walls along the border built with a low-permeability material, wherein the bottom and walls are lined with a non-porous plastic membrane material able to be cleaned; wherein the depth of the structure to the bottom is at least about 0.5 meters, and up to about 5 meters; a system of skimmers disposed along the border for the removal of impurities and surface oils; a recycling

piping system installed around the border of the structure and including a plurality of water injectors distributed along the border for injecting water into the water body to maintain homogeneity; a fresh water feeding pipe system that allows entrance of fresh water and results in water removal by displacement of surface water through the skimmer system; and a pumping system including a coupling means connected to a moveable suction device for cleaning the plastic liner.

9. The structure according to claim 8, wherein the low permeability material of the wall is selected from the group consisting of clay, bentonite and cement.

10. The structure according to claim 8, wherein the nonporous plastic membrane material is a material selected from the group consisting of polyvinyl chloride, linear low-density polyethylene and high density polyethylene.

11. The structure according to claim 10, wherein the color of the non-porous material light blue, white, or yellow.

12. The structure according to claim 8, wherein the structure has a depth between 2 and 5 meters.

13. The structure according to claim 8, wherein said structure has a water inlet line and water inlet chambers through which fresh water is extracted to feed the fresh water feeding pipe system of the structure.

14. The structure according to claim 13, wherein the water inlet chambers are constructed at a depth of more than 6 meters below the sea surface.