CLAIMS

What is claimed is:

1. A method for destroying organic contaminants, the method comprising:

adding at least one oxidant to a contaminated fluid, thereby forming a mixture;

irradiating the mixture with ultraviolet radiation;

photolyzing the at least one oxidant;

measuring an amount of quality indicator remaining in the fluid; and

adjusting a process parameter to subsequently reduce the amount of organic contaminant remaining in the fluid to at or below a desired level.

2. The method of claim 1 wherein the at least one oxidant comprises a chlorine-based oxidant.

3. The method of claim 2 wherein the chlorine-based oxidant comprises hypochlorite, sodium hypochlorite, mixed oxidants, hypochlorous acid, or combinations thereof.

4. The method of claim 1 wherein the intensity of the ultraviolet radiation is greater than ~~approximately~~ 60 mJ/cm^2.

5. The method of claim 4 wherein the intensity of the ultraviolet radiation is greater than ~~approximately~~ 100 mJ/cm^2.

6. The method of claim 5 wherein the intensity of the ultraviolet radiation is greater than ~~approximately~~ 1000 mJ/cm^2.

7. The method of claim 1 wherein the ultraviolet radiation comprises a plurality of wavelengths.

16. The apparatus of claim 15 wherein said at least one oxidant comprises a chlorine-based oxidant and further comprising an on-site generator for generating said chlorine-based oxidant.

17. The apparatus of claim 16 wherein a brine input of said on-site generator is connected to a source of the contaminated fluid.

18. The apparatus of claim 15 wherein said source of ultraviolet radiation comprises a solar concentrator and/or a plurality of ultraviolet lamps.

19. The apparatus of claim 18 wherein said ultraviolet lamps emit ultraviolet radiation at different wavelengths, and said controller adjusts relative intensities of said lamps in response to data from said quality indicator sensor.

20. The apparatus of claim 15 wherein said source of ultraviolet radiation emits radiation having an intensity greater than ~~approximately~~ 100 mJ/cm^2.

21. The apparatus of claim 15 further comprising a pH sensor disposed upstream of said photoreactor.

22. The apparatus of claim 21 further comprising sources of an acidic chemical and an alkaline chemical for controllably adding one or more of said chemicals to a flow of the contaminated fluid prior to its entering said photoreactor in response to data from said quality indicator sensor and/or said pH sensor.

23. The apparatus of claim 15 further comprising a flow sensor for measuring a flow rate of the contaminated fluid and a pump for adjusting said flow rate in response to data from said quality indicator sensor.