

# Pond Remediation

Lakes, ponds and canals in and around golf courses, home developments, businesses and industrial areas pose unique environmental problems that affect the aesthetic characteristics of the water, especially in terms of its visual and parameters. Continual nutrient runoff from fertilizing, decaying plant material, and sewage and/or septic tank contamination accumulates in these waters, causing algal blooms, blue green algae and foul odors.

Algae grow in water that is rich in nitrogen and phosphorous. During the day, algae use carbon dioxide as a carbon source and sunlight as an energy source. Since both of these are considered "free," it is not possible to reduce or control these factors. When the area around a pond is fertilized, a large volume of the fertilizer is washed into the lagoon and an algal bloom quickly follows this spike in nutrients. The algae continue to grow until the available nutrients have been exhausted. When the nutrients are reduced, the algae begin to die. This natural process leads to the creation of a eutrophic pond. The algae produce oxygen during the day, then at night, they use this oxygen. This cycle leads to the extinction of fish and other organisms and also contributes to the accumulation of sludge (dead algae and dead plant material such as grass clippings) at the bottom of the lake. The decomposing organic material consumes the dissolved oxygen that is necessary for fish and microorganisms, and the anaerobic digestion of the decomposing organic material causes extreme odor.

The pond remediation bacteria in EmTec FM, however, can effectively utilize the available nutrients faster than the algae and therefore stabilize the pond. Instead of an algal bloom, the pond will undergo a bacteria growth surge which will also reduce the decaying algae accumulation at the pond bottom. Reduction of this sludge also will reduce the odors from the pond. In most cases, the algae bloom can be stopped or prevented and the ammonia reduced overnight. Through the use of maintenance dosages of EmTec FM every month, or at the end of each fertilization application, the algae blooms can be controlled and the existing algae sludge reduced.

The standard nitrogen cycle is a biological cycle that changes the form of nitrogen back and forth between ammonia, nitrite, nitrate, organic nitrogen and nitrogen gas. Since it is an element, Nitrogen cannot be degraded. However, it can be utilized and controlled in the compound that is preferred.

At the surface of the pond, the bacteria will convert the ammonia and nitrate into amino acids and protein, producing more bacteria. This process is aerobic, and since the surface area of the pond has unlimited oxygen, aeration is not required. If your ornamental pond has an aeration device, such as a fountain, please continue to use it.

At the bottom of the pond, the bacteria will use the oxygen that is available to degrade the organic material, such as dead algae and grass clippings. The bacteria will also degrade this material anaerobically when the oxygen level is reduced. This anaerobic condition allows the bacteria to convert nitrate into nitrogen gas (denitrification). As a result, sludge levels in the pond will be reduced within the first season and will not accumulate as rapidly as before. The EmTec Pond Kit is a biological treatment, specifically designed to successfully

- Digest organic matter and sludge in ponds, lakes and canals
- Digest Hydrocarbons
- Digest PIH (Pesticide, Insecticide, Herbicide)
- Reduce Nutrient levels - especially nitrate and ammonia
- Reduce the cause of algal blooms and blue green algae
- Reduce or eliminate foul odors
- Reduce Sludge removal and/or Sludge maintenance
- Improve water clarity

## GLOSSARY

**Algae** - Any of various chiefly aquatic, eukaryotic, photosynthetic organisms, ranging in size from single-celled forms to the giant kelp. Algae were once considered to be plants but are now classified separately because they lack true roots, stems, leaves, and embryos.

**Cyanobacteria** - A photosynthetic bacterium, generally blue-green in color and in some species capable of nitrogen fixation. Cyanobacteria were once thought to be algae, also called blue-green algae.

**Eutrophic** - Having waters rich in minerals and organic nutrients that promote the proliferation of plant life, especially algae, which reduces the dissolved oxygen content and often causes the extinction of other organisms. Used of a lake or pond.

**Nitrogen** - A nonmetallic element that constitutes nearly four-fifths of the air by volume, occurring as a colorless, almost inert diatomic gas (N<sub>2</sub>), in various minerals and in all proteins and used in a wide variety of important products, including ammonia, nitric acid, TNT, and fertilizers.

**Nitrogen Cycle** - The circulation of nitrogen in nature, consisting of the cycle of chemical reactions in which atmospheric nitrogen is compounded, dissolved in rain, and deposited in the soil, where it is assimilated and metabolized by bacteria and plants, eventually returning to the atmosphere by bacterial decomposition of organic matter.

**Nitrification** - The oxidation, by bacterial action, of ammonium salts into nitrites and the further oxidation of nitrites into nitrates.

**Denitrification** - The loss or removal, by bacterial action, of nitrites and nitrates to nitrogen gas.

**Phosphate** - A salt of a phosphoric acid. A fertilizer containing phosphorus compounds. Found in DNA, RNA and bacterial phospholipid membranes.

This information sheet was downloaded from:  
<http://www.emtec.co.th/pond-remediation.html>