

**COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DIVISION OF ADMINISTRATIVE LAW APPEALS**

**IN THE MATTER OF
DEPARTMENT OF CONSERVATION AND RECREATION
Docket No. DEP-04-919
DEP FILE #233-547
NATICK**

TESTIMONY OF RODNEY POLING, D.V.M.

I, Rodney Poling, do hereby swear and affirm the following:

1. I am a veterinarian with thirty two years experience studying animal disease. I completed my undergraduate work at the Ohio State University in 1969. I received my doctor of veterinary medicine degree in 1973 from the Ohio State University. I completed a medical, surgical and pathology internship from the Angell Memorial Animal Hospital in Boston in 1975.

2. From 1975 to 1999 I have worked as a practicing veterinarian specializing in companion animals. I have a special interest in veterinary surgery. From 1999 to 2005 I have been the Chief Medical Officer for Healthy Pet, which operates 31 veterinary hospitals in the United States.

3. I have been retained by the Petitioners in this matter to evaluate the potential for adverse effects on Lake Cochituate wildlife that may follow diquat administration as described in the Notice of Intent, as approved with conditions by the Natick Conservation Commission and the Massachusetts Department of Environmental Protection ("DEP"). I have undertaken this work on a *pro bono publico* basis. My opinions, as set forth herein, are stated to a reasonable degree of scientific certainty.

4. The materials I have reviewed in preparing this testimony include:

- Notice of Intent Application Aquatic Management Program, Lake Cochituate, Natick, MA prepared for the Commonwealth of Massachusetts Department of Environmental Management (now Department of Conservation and Recreation("DCR")) by Aquatic Control Technology ("ACT").
- Superseding Order of Conditions; DEP File number 233-547
- Natick Conservation Commission's Order of Conditions regarding plant management in Lake Cochituate, File #233-547
- Lake Cochituate Long Term Management Plan, prepared for the DCR by ACT

- Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report
- Testimony of Harlee Strauss, Ph.D., offered in this proceeding
- Testimony of Emily Monosson, Ph.D., offered in this proceeding
- Testimony of Debbie Ridings offered in this proceeding

5. My testimony is based on the review of the above materials, as well as my own clinical observations on toxicity in wild and domestic animals.

6. Lake Cochituate is a lake covering over 600 acres in the towns of Natick, Framingham, and Wayland, Massachusetts. The Lake is divided into several ponds, including South and Middle Ponds in Natick. A variety of wildlife has been observed on and around the Lake, including blue heron, geese, ducks, hawks, and many other birds, including a reported sighting of a bald eagle; muskrats; raccoons; red fox; deer; frogs; clams; snails; and many species of fish.

7. Under the NOI, as elaborated on by the Long Term Vegetation Management Plan, the Massachusetts Department of Conservation and Recreation proposes to treat some 50 acres along the shoreline and coves of South Pond with Reward (diquat dibromide, referred to as diquat in this testimony), 2 acres near the shoreline of Middle Pond with diquat and Aquathol K(endothall), and additional areas along the shoreline and coves in the north and south of Middle Pond with diquat. The purpose of these treatments is control of aquatic weeds in the Lake. As the most significant areas of application are to be treated with diquat, I limit my testimony to the potential for adverse impact of diquat on the wildlife using the Lake as habitat.

8. Diquat, without question, is teratogenic and embryotoxic to Mallard ducks and presumably to many other avian species at known levels of exposure. Teratogenic means that this chemical damages chromosomes and as such alters the genetic makeup of exposed animals. Embryotoxic indicates toxic damage to individuals after conception but prior to birth.


9. Diquat has also been demonstrated to produce effects of direct peroxidation of lipids and reduction of antioxidant activity. Peroxidation is a chemical reaction that alters the chemical makeup of fats that are vital building blocks of all body cells. Antioxidant activity protects the integrity of body cells and strengthens them against damage from any insult. It has been my observation that chemicals producing such effects have an adverse impact on all living creatures, be they avian, mammal, or fish. There will be significant variation in observed toxicity depending on species, age, sex and general health status of the individual animal. However, peroxidation and reduction of antioxidant activity at any level is clearly deleterious to the health and vitality of the exposed birds, mammals, or fish. Examples of how antioxidants support the immune system and neutralize cell trauma are common in the veterinary literature. Reports on the use of Roundup, which has effects on antioxidant activity similar to that of diquat, in

natural frog ponds show that when applied at recommended levels frog populations decrease by 70% and tadpole numbers are reduced 86%.

10. When diquat is carefully applied at typical rates of administration, water currents will create areas of higher and lower product concentration. In addition, the bottom vegetation feeding patterns of ducks and other waterfowl will re-circulate diquat in pond sediment indefinitely. It is therefore difficult to control how much diquat exposure will occur in animals present in the Lake Cochituate environment once the application of diquat has occurred. Although the DCR proposal is for application of diquat at slightly less than typical rates of administration (i.e., 1 - 1.5 gallons/acre rather than 2 gallons/acre, resulting in an anticipated surface water concentration of .19 - .30 ppm, rather than .37 ppm), this rate of application does not provide for a significant margin of safety, particularly when effects of water currents are taken into account. I am of the opinion that exposure to Diquat at any concentration is dangerous. I am even more concerned when water concentrations cannot be accurately predicted.

11. The published studies on diquat toxicity serve to highlight significant data gaps that prevent any definitive assurance of safety. For example, no work has been done on the concentration of diquat in the livers of fowl where it would be expected to be concentrated post-exposure. Furthermore, it can be expected that early stages of Lake Cochituate wildlife, such as ducks, geese, and frogs, will be present along the shoreline and shallows of Lake Cochituate in late May to mid-June, when the diquat application is proposed to occur. These stages are generally the most sensitive to substances producing the adverse health effects described above. In light of these facts, to minimize the potential for adverse effects on wildlife at Lake Cochituate, I recommend manual methods of plant removal and the utilization of natural plant inhibition as alternatives preferable to the use of diquat.

Signed under the pains and penalties of perjury this 4 day of May, 2005.


Rodney Poling D.V.M.