# MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Telephone: (617) 242-6000
Fax: (617) 241-6070
TTY: 617 788-4971

Frederick A. Laskey
Executive Director


August 17, 2007

Mr. Glenn Haas, Director
Division of Watershed Management
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Mr. Stephen Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Water Technical Unit "SEW"
P.O. BOX 8127
Boston, MA 02114

Re: Massachusetts Water Resources Authority, Permit Number MA0103284
Notification Pursuant to Part I.8. Contingency Plan: *Phaeocystis*

Dear Mr. Haas and Mr. Perkins:

One of the nuisance algae that the Massachusetts Water Resources Authority ("MWRA") monitors in its outfall ambient monitoring program is *Phaeocystis*. Reporting on seasonal abundances of *Phaeocystis* in the outfall nearfield area is part of the Contingency Plan.[1] MWRA has received *Phaeocystis* results from samples from the 2007 Winter/Spring season, which were collected from February 12, 2007 through April 22, 2007. The nearfield average was 2,150,964 cells/L, which is slightly higher than the Caution Level threshold of 2,020,000 cells/L, triggering a notification under the Contingency Plan. This letter constitutes the notification for the threshold exceedance. Average 2007 *Phaeocystis* data from February through April are summarized in the table below.

**Contingency Plan threshold results for *Phaeocystis* for winter/spring, 2007.**

| Parameter | Specific Parameter | Baseline | Caution Level Threshold | Warning Level Threshold | 2007 Results |
|---|---|---|---|---|---|
| ***Phaeocystis pouchetii*** | Winter/spring | 470,000 cells/L | 2,020,000 cells/L | None | 2,150,964 cells/L |

No adverse aesthetic or other impacts were observed from this year's spring *Phaeocystis* bloom Such impacts could include persistent foam on the sea surface and/or unpleasant, acrid odors reminiscent of burning plastic. Figure 1 shows that the temporal pattern of the bloom was fairly typical, with the bloom first detected in mid-March, counts peaking in mid-April, and disappearing by late May. Peak nearfield abundances were slightly lower than those observed during the *Phaeocystis* bloom in spring 2004. One minor difference in this year's bloom is that,

1 *Massachusetts Water Resources Authority Contingency Plan Revision 1*. 2001. Report ENQUAD ms-071. http://www.mwra.state.ma.us/harbor/enquad/trlist.html

contrary to our observations in recent years, no *Phaeocystis* were detected in the May nearfield survey.

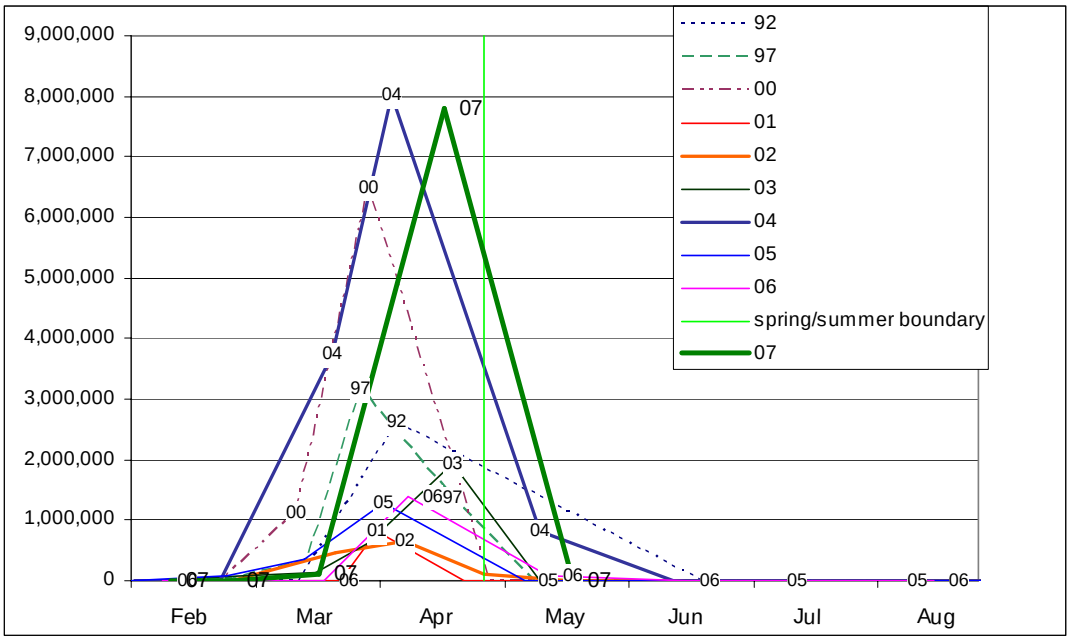


**Figure 1 Seasonal survey abundances of *Phaeocystis*, 2000-2007. The 2007 bloom is indicated as a heavy green line.**

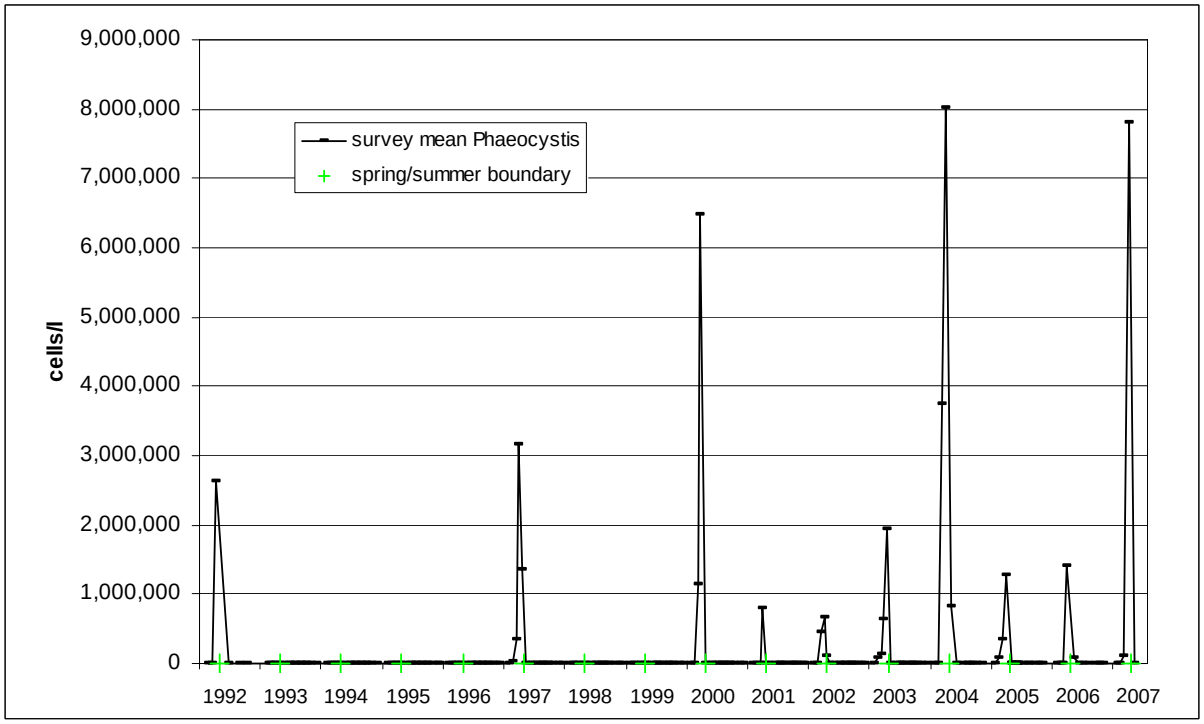


**Figure 2. Annual patterns of nearfield mean *Phaeocystis* abundances, 1992-2007. Outfall start-up was in fall, 2000.**

Figure 3 shows the winter-spring seasonal means plotted against the corresponding threshold.

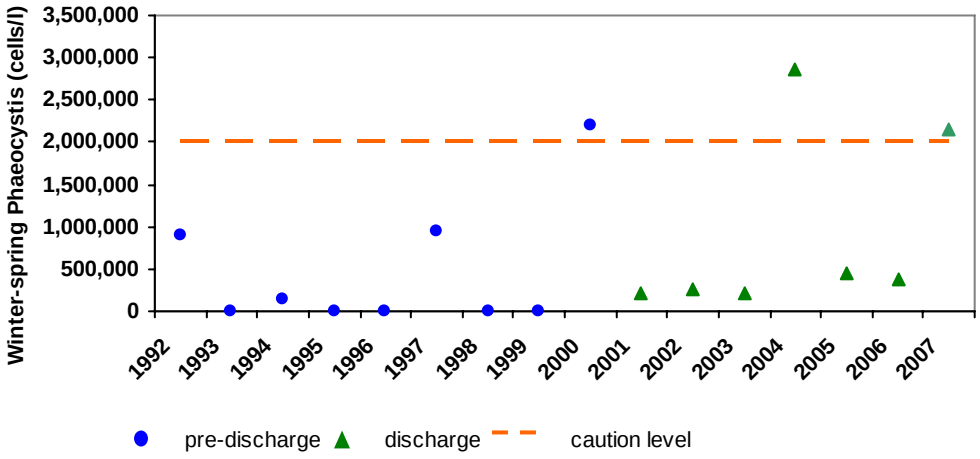


**Figure 3. Winter-spring nearfield seasonal mean *Phaeocystis* counts 1992-2007**

There is no obvious association with MWRA's outfall, as the bloom appeared to be region-wide, with high counts at stations near Cape Ann, in the outfall nearfield, in Stellwagen Basin, and at coastal stations. The highest count observed during the winter-spring *Phaeocystis* bloom was 9.2 million cells/liter, at F24, a farfield station between Boston Harbor and the nearfield. Figure 4 shows satellite images of chlorophyll in Massachusetts Bay when MWRA's spring surveys were taking place. In Massachusetts Bay during *Phaeocystis* blooms, *Phaeocystis* is the dominant algal species.

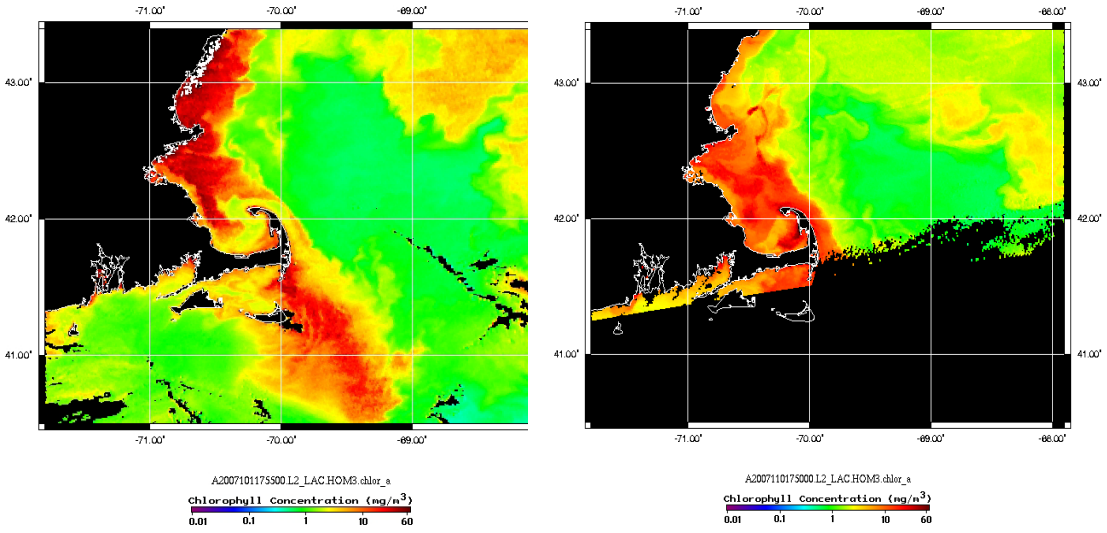


**Figure 4 MODIS satellite images of chlorophyll in Massachusetts Bay on April 11 (left) and April 20, 2007 (right) during MWRA spring sampling.**

MWRA evaluated possible causes for local *Phaeocystis* blooms in a recent report.[2] While the reasons behind the change from the pattern of blooms occurring every 2-3 years during the 1990s to the annual *Phaeocystis* blooms observed since 2000 remain elusive, the evaluations in this report do not suggest a strong linkage between MWRA's effluent discharge and the blooms of this alga.

MWRA also monitored for two other nuisance algae during this time period: *Alexandrium* (responsible for red tide) and *Pseudonitzschia*. Neither of these algae were at abundances that exceeded the thresholds, although *Alexandrium* was present in Massachusetts Bay this spring.

Please let me know if any of MWRA's staff can give you additional assistance regarding this notification.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

[2] See Chapter 4 of Libby PS, Borkman DG, Hunt CD and Brawley JW, 2006. **2005 Nutrient Issues Review**. Boston: Massachusetts Water Resources Authority. Report 2006-02. 65 p.

Cc:

**Environmental Protection Agency, Region I**
Matthew Liebman
Todd Borci
Roger Janson

**MA Department of Environmental Protection**
Cathy Vakalopoulos

**Outfall Monitoring Science Advisory Panel**
Andrew Solow
Robert Beardsley
Norb Jaworski
Scott Nixon
Judy Pederson
Michael Shiaris
James Shine
Juanita Urban-Rich
Robert Kenney

**National Marine Fisheries Service**
Chris Mantzaris

**Stellwagen Bank National Marine Sanctuary**
Craig MacDonald

**EOEA**
Kathy Baskin

**Hyannis Library**
Ann-Louise Harries

**MWRA Library**
Mary Lydon

**Cape Cod Commission**
Steve Tucker