MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

May 31, 2019

Ms. Karen McGuire
Office of Environmental Stewardship
U.S. EPA Region 1
5 Post Office Square, Suite 100
Mail Code OES04-5
Boston, MA 02109-3912

Ms. Susannah King
NPDES Program Manager
Division of Watershed Management
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

RE: Massachusetts Water Resources Authority
Permit Number MA 0103284
MWRA Contingency Plan Threshold Exceedance: Red Tide 2019

Dear Ms. McGuire and Ms. King:

In its outfall ambient monitoring program, MWRA monitors levels of the red-tide alga *Alexandrium catenella (Alexandrium)*, the cause of paralytic shellfish poisoning ("PSP"). Reporting on per-sample abundances of *Alexandrium* near MWRA's bay outfall (in the "nearfield") is part of MWRA's permit-attached Ambient Monitoring Plan[1] and Contingency Plan.[2] The Contingency Plan also specifies that MWRA conduct additional targeted monitoring for *Alexandrium* if any sample exceeds 100 cells per liter.

On May 16, 2019, MWRA conducted a routine water column monitoring survey. A measurement of 171 A*lexandrium* cells per liter in one sample from station F22 (Figure 1) did not constitute a threshold exceedance (F22 is not a nearfield station), but did trigger targeted *Alexandrium* monitoring surveys. On May 22, MWRA conducted such a survey.

On May 28, 2019, MWRA received results from the May 22 survey. One of the twelve samples collected from nearfield stations had *Alexandrium* in abundances exceeding the Contingency Plan threshold of 100 cells per liter. Station N07 (Figure 1) at the southeastern edge of the nearfield had an *Alexandrium* abundance of 413 cells per liter (Table 1) in a sample collected 10 meters deep. This exceedance for *Alexandrium* requires regulatory and public notification. This letter constitutes that notification.

[1] *Ambient Monitoring Plan for the Massachusetts Water Resources Authority Effluent Outfall Revision 2*. July 2010. Boston: Massachusetts Water Resources Authority. Report 2010-04. http://www.mwra.state.ma.us/harbor/enquad/trlist.html

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

There are no indications this exceedance is related to the Deer Island Treatment Plant outfall discharge. *Alexandrium* is frequently present in Massachusetts waters; it normally appears in late April or early May and peaks by the end of May, subsiding as summer begins. All current indications are that, as has been observed for previous blooms, the exceedance was caused by wind and current-driven transport into Massachusetts Bay of an *Alexandrium* population present in coastal waters off Maine and New Hampshire.

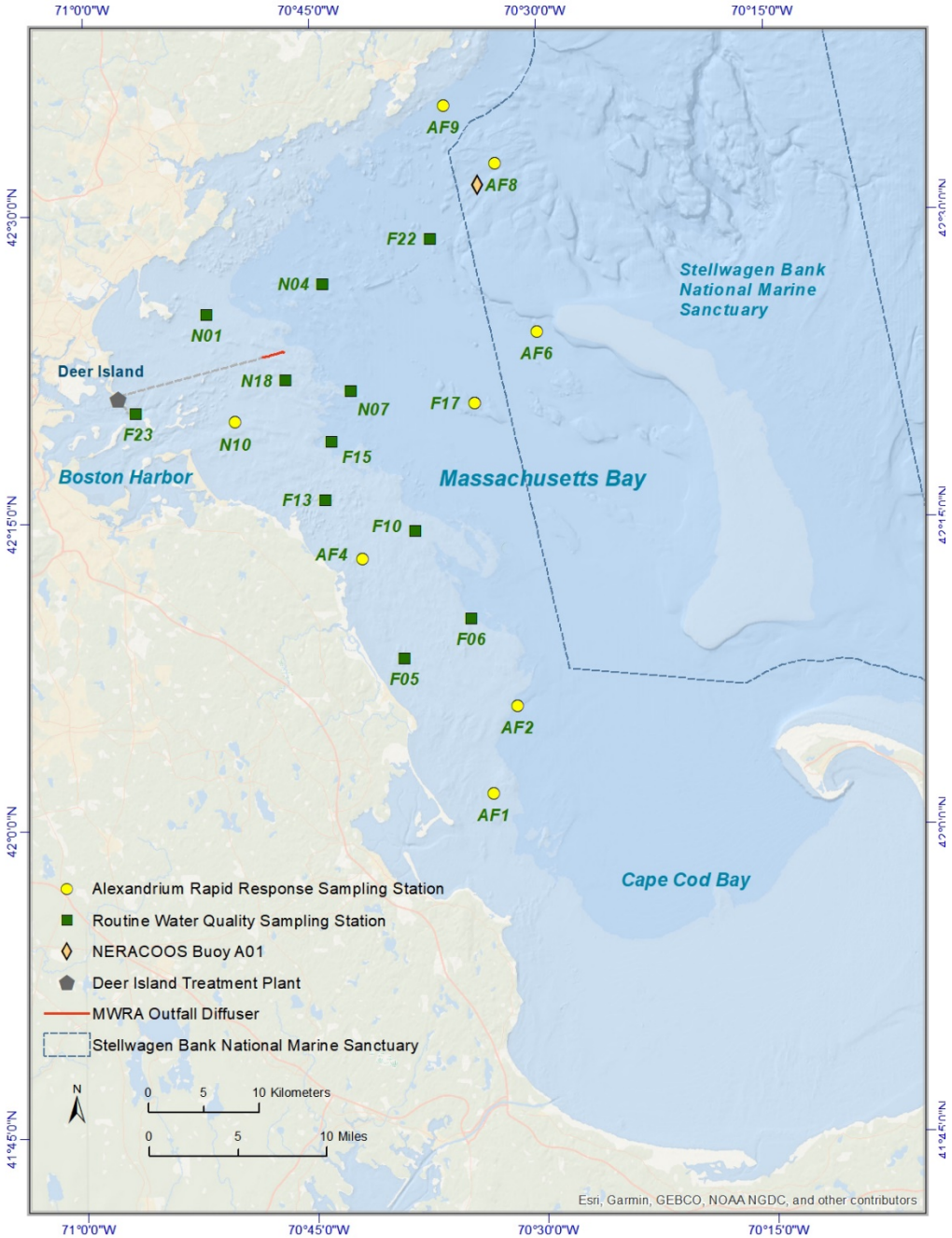


***Figure 1 Alexandrium catenella* monitoring stations. Routine sampling stations (squares) were monitored on May 16 and May 22. *Alexandrium* rapid response stations (circles) also were sampled on May 22.**

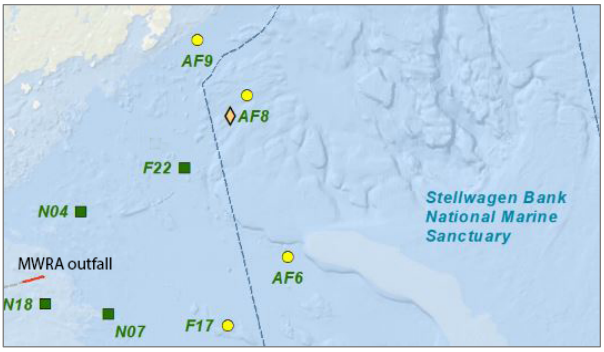
MWRA staff have been tracking the progress of this year's *Alexandrium* bloom since March. We have been receiving frequent updates from shellfish monitoring staff from Maine, New Hampshire, and Massachusetts, as well as updates from scientists at the Woods Hole Oceanographic Institution and the National Oceanic and Atmospheric Administration.

Thus far in 2019 the red tide season in Maine and New Hampshire waters has been relatively modest, though *Alexandrium* cells have been observed in New Hampshire for a few weeks and on May 9 PSP toxicity caused closure of New Hampshire's coastal shellfish beds.

Through Monday May 13, all PSP samples collected by the Massachusetts Division of Marine Fisheries in Massachusetts Bay and north of Cape Ann were non-detect for the toxin. Stormy weather accompanied by strong northeast winds then occurred between May 13 and 15. These winds had the potential to transport cells closer to shore near Cape Ann, and to transport cells into Massachusetts Bay.

Table 1. **Results of May 22, 2019 *Alexandrium* testing**. Stations are roughly ordered from north to south. All sample counts over 100 cells per liter are **bolded**. The nearfield sample count resulting in the exceedance is in bold **red** text.

Station	*Alexandrium* cells per liter		
	2 meters	10 meters	20 meters
AF9	**136**	41	-
AF8	**309**	65	-
F22	**247**	**287**	0
N04	51	82	1
N01	14	1	-
AF6	**155**	**262**	-
N18	56	1	0
N07	34	**413**	-
F17	**110**	**299**	-
F23	14	7	-
N10	9	2	-
F15	30	52	-
F13	18	25	2
F10	55	49	-
AF4	59	77	-
F06	48	72	-
F05	12	9	-
AF2	27	22	-
AF1	46	8	0



Massachusetts Division of Marine Fisheries detected low levels of PSP toxicity at some monitoring stations north of Cape Ann on May 20, 23, and 28. While the results are below the level at which shellfish beds are closed, they are consistent with transport of *Alexandrium* inshore by the northeast winds the previous week. Low levels of PSP toxicity, well below the levels at which beds are closed, were first observed in shellfish samples collected in Cohasset, Scituate, and Marshfield on May 28.

The results of MWRA's May 22 survey are similarly consistent with wind and current driven transport of cells that originated in Maine waters. *Alexandrium* cell counts over 100 cells per liter were observed only at offshore stations in the northern portions of Massachusetts Bay (Table 1). Samples collected closer to shore and in southern portions of Massachusetts Bay had lower *Alexandrium* counts.

These and other results available so far indicate that a portion of the coastal population of *Alexandrium* north of Cape Ann was transported into offshore waters of Massachusetts Bay by winds and currents, leading to the results observed. As described in its rapid response plan,[3] MWRA will carry out weekly *Alexandrium* surveys until the nearfield cell counts drop below the 100 cells/liter threshold. MWRA will report data from future surveys when they become available.

If you have any questions regarding this matter, please call Betsy Reilley at 617-788-4940.

Sincerely,

David Coppes
Chief Operating Officer

[3] Libby S, Rex AC, Keay KE, Mickelson MJ. 2013. *Alexandrium* Rapid Response Study Survey Plan. Revision 1. Boston: Massachusetts Water Resources Authority. Report 2013-06. 13 p. http://www.mwra.state.ma.us/harbor/enquad/pdf/2013-06.pdf

Cc:

Environmental Protection Agency, Region I
Karen McGuire (hard copy)
Matthew Liebman (hard copy)
Todd Borci

National Marine Fisheries Service
Daniel Morris

Stellwagen Bank National Marine Sanctuary
Peter DeCola

US Food and Drug Administration
Martin Dowgert

MA Executive Office of Energy and Environmental Affairs
Vandana M. Rao

MA Department of Environmental Protection
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Cape Cod Commission
Tom Cambareri

ME Dept of Marine Resources
Kohl Kanwit

Outfall Monitoring Science Advisory Panel
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