EXHIBIT 31 (AR C.9)

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Dan Arsenault
U.S. Environmental Protection Agency
Office of Ecosystem Protection
5 Post Office Square, Mail Code – OEP06-1
Boston, MA 02109

15 December 2011

Dear Dan,

I write to you regarding the Lamprey River and the Newmarket Wastewater Treatment Plant discharge. I support the draft EPA permit including setting a monthly average total nitrogen concentration limit of 3.0 mg/L in discharge waters and a monthly average total nitrogen mass limit of 21 lb/day for the months of April through October.

The Lamprey River itself, Great Bay, and the estuary overall, need this limit if estuarine water quality and health are to be improved to support historic eelgrass distributions.

As you know, I am a research scientist and professor at the University of New Hampshire with nearly 40 years of work studying seagrasses and 28 years of research specifically on eelgrass in Great Bay. I have seen the deterioration of Great Bay over the long term and I understand the functioning and dynamics of the ecosystem. My work includes studies of eelgrass distribution with annual mapping of eelgrass throughout the estuary, studies of nitrogen effects, and comparison of the Great Bay Estuary to other locations along the east coast of the U.S. My work has been published in many scientific journals, all of which are peer reviewed in detail by internationally known scientists who work in the fields of seagrass research and estuarine ecology.

Eelgrass, as you are aware, is a crucial habitat and water filter in estuarine systems. It provides a nursery shelter area for young fish and shellfish and is part of the food web. The New Hampshire Department of Environmental Services' choice of eelgrass health as an indicator of estuarine conditions is well-founded. We have seen, time and again, that when eelgrass diminishes in an estuary, the system is on its way down – e.g., Chesapeake Bay, Waquoit Bay in Massachusetts, and Long Island Sound.

Here is what I know about eelgrass in the Lamprey River and Great Bay Estuary: it is declining, has been lost from Little Bay and the central Piscataqua River, and now has less than half its historical biomass in Great Bay itself. In the Lamprey River, as will all the river tributaries to the Great Bay Estuary, eelgrass is completely lost upstream of the mouth. For the Lamprey River specifically, the historic eelgrass distribution (see attached) is based on an eelgrass map from a 1948 UNH Master's Degree thesis. There was eelgrass extending well up the Lamprey historically, but now there is no eelgrass in the Lamprey River. Of the many times I have been in the Lamprey in the past decade, the water clarity has been poor.

Overall, in the Great Bay Estuary in the last six years particularly, I have seen the rapid decline of eelgrass in Little Bay and the Piscataqua River and the loss of water clarity in the Bay itself, in addition to an increase in nuisance seaweeds both large and small. *Ulva* sp. and *Gracilaria* sp., both considered eutrophication indicator seaweeds, have proliferated in Great Bay, often within the eelgrass beds, sometimes smothering the eelgrass.

Over the years I have examined the factors that may be contributing to eelgrass success and failure. My analysis of eelgrass tissue changes using the Nutrient Pollution Indicator (NPI, Lee et al. 2004) clearly showed an increase in nitrogen exposure in the late 1990s and early 2000s, indicating elevated concentrations of nitrogen entering the estuary (CICEET). Plain and simple, there is too much nitrogen entering the estuary. Although a large part of this nitrogen is non-point source, the greatest point source of nitrogen is the many wastewater treatment facilities in the Great Bay Estuary watershed. While I believe that all sources of nitrogen to the estuary must be reduced, the reduction of the point source inputs from wastewater facilities like that in Newmarket must be greatly reduced. To that end, the identification of 3.0 mg/L as a target concentration will have substantial impact on improving the Lamprey River and the Bay.

Questioning the science is the oldest stalling trick in the book. Unfortunately, the Lamprey and the estuary cannot afford to be stalled – water quality continues to degrade and the resources of the estuary are diminished season by season.

We must act soon to reverse nitrogen trends or we will be restoring the rivers and open waters of the Great Bay Estuary's watershed at great expense for decades to come, and with less than fully assured success. The EPA is right in attempting to reverse the nitrogen trends in New Hampshire's valuable Great Bay Estuary now, and the proposed nitrogen limit to the Newmarket Wastewater Treatment Plant effluent is a good first step.

Sincerely,

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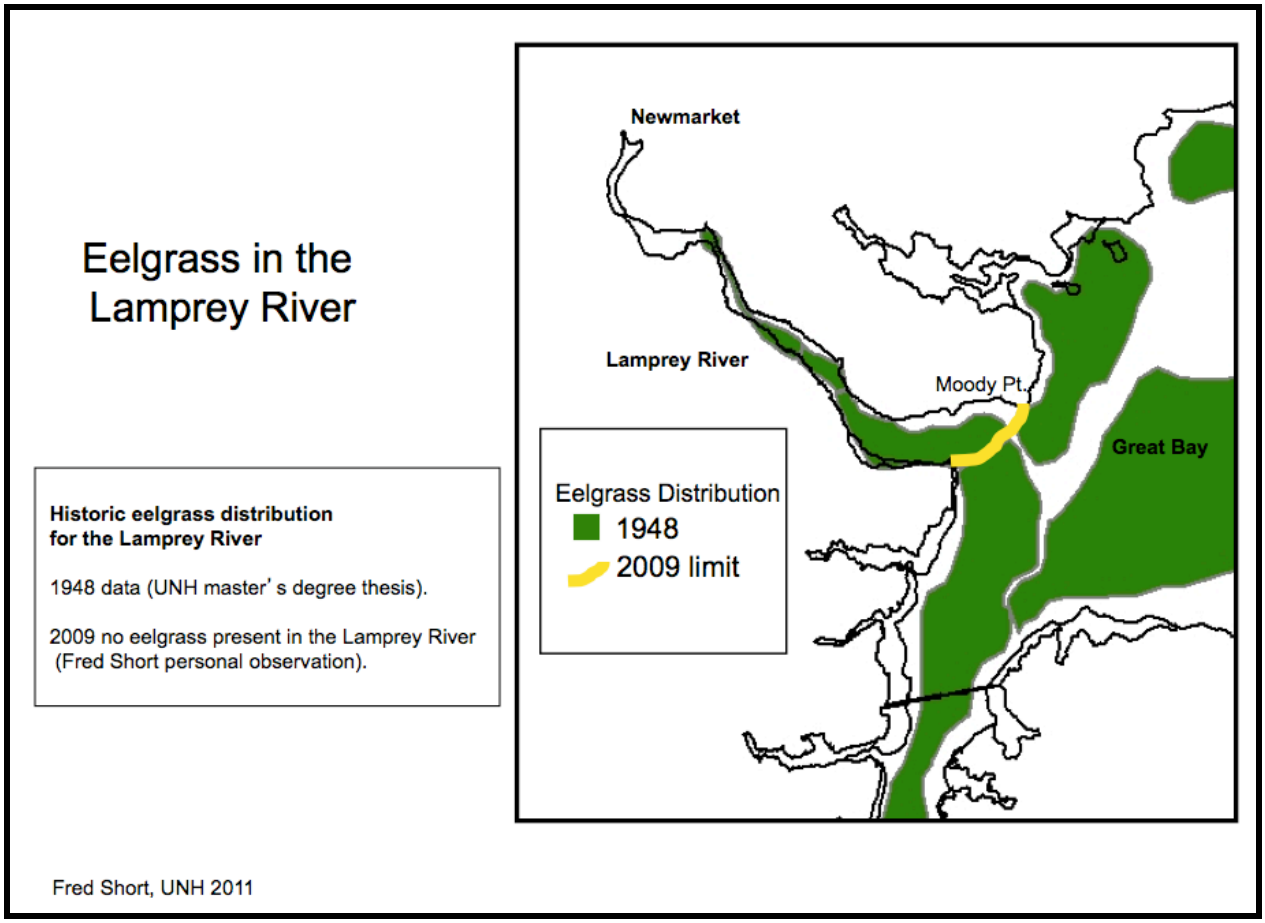

Lee, K.S., F.T. Short, D.M. Burdick. 2004. Development of a nutrient pollution indicator using the seagrass, *Zostera marina,* along nutrient gradients in three New England estuaries. Aquatic Botany, 78: 197–216.

CICEET Report: http://marine.unh.edu/jel/faculty/fred2/fredshort.htm