ANDREW M. CUOMO
GOVERNOR

JOE MARTENS
COMMISSIONER

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK 12233-1010

February 21, 2012

Honorable Lisa P. Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Suite 3000
Washington, DC 20460

Re: New York's Comments on EPA's Proposed 2013 Vessel General Permit
Docket ID No. EPA–HQ–OW– 2011–0141, Federal Register Vol. 76 No. 236

Dear Administrator Jackson:

Thank you for the opportunity to provide comments on the Environmental Protection Agency's (EPA) proposed 2013 Draft Vessel General Permit (VGP). New York fully appreciates the difficulty of regulating the discharge of ballast water in a manner that prevents the spread of aquatic invasive species (AIS). Although EPA's proposed VGP makes significant strides toward this goal, we believe a stronger national standard can be implemented that is cost effective, achievable and better controls the spread of AIS. The draft VGP acknowledges that numerous aquatic invasive species, a pollutant as defined by the Clean Water Act (CWA), have been introduced into waters of the United States through the discharge of ballast water. The volume of water moved via ships' ballast tanks makes ballast discharges a major source for the introduction and spread of AIS.

The Nation's waters have been dramatically damaged by AIS. By way of example, a recent scientific report[1] estimated that zebra mussels, a ship-borne invasive species first discovered near Detroit 20 years ago, now comprise half the consumer biomass, by weight, of the Hudson River. Over 180 such invaders – species that infest, overwhelm and destroy native habitat – already plague the Great Lakes, at an estimated annual cost of $5.7 billion[2] to that system's economy and environment. Ballast water released from ocean vessels is the recognized vector for 65% of all invasions recorded in the Great Lakes since the opening of the St. Lawrence Seaway in 1959.[3]

---

[1] Strayer, D.L., J. Powell, P. Ambrose, L.C. Smith, M.L. Pace, and D.T. Fischer. 1996. Arrival, spread, and early dynamics of a zebra mussel (Dreissena polymorpha) population in the Hudson River estuary. Canadian Journal of Fisheries and Aquatic Sciences 53: 1143-1149.

[2] Pimentel, D. et. al. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. Ecological Economics 52:273-288.

[3] Anthony Ricciardi. 2006. Patterns of invasion in the Laurentian Great Lakes in relation to changes in vector activity. Diversity and Distribution 12: 425-433.

For a detailed recitation of the damage caused by invasive species in the Great Lakes due to ship ballast water, and an analysis of the Canadian and United States Governments' inaction, see J. Alexander, Pandora's Locks (2009). Clearly, if the threat posed by AIS is to be effectively addressed, ballast water must be properly managed.

DEC applauds EPA for incorporating many technically sound provisions into the draft VGP. DEC is pleased with the improvements made regarding grey water discharge effluent limitations, the retention of the requirement that vessels exchange and flush ballast water for certain vessels entering the Great Lakes, the inclusion of pathogen monitoring requirements for vessels using ballast water treatment systems, and requirements to address "hull fouling," a significant pathway for the introduction of AIS.

In general we do not believe that the IMO D2 Discharge Standards proposed by EPA provide an effective or adequate standard to address the known risks of AIS nor does it reflect best available control technology. Moreover, we believe other aspects of your proposal can and should be strengthened to provide needed protection of the marine environment. In sum, we propose the following:

- A technology based discharge standard which is based on demonstrated best available technology (BAT);
- A national standard requiring ballast water exchange and flushing, in addition to any required treatment system;
- A numeric water quality based effluent limitation (WQBEL) to meet state water quality standards;
- A requirement that all bulk carrier vessels (a/k/a/Lakers) adopt ballast water treatment systems; and
- A ban on bilge water discharges.

The rationale for these recommendations is set forth below.

1. The proposed IMO D2 standard is insufficient to treat AIS

The VGP requires compliance with effluent standards for ballast water discharges known as the IMO D2 standards. The IMO D-2 Discharge Standards are a removal or sanitation rate for organisms or size classes of organisms as follows:

- Organisms greater than 50 microns in minimum dimension:
  <10 viable organisms per cubic meter;
- Organisms 10-50 microns in minimum dimension:
  <10 viable organisms per ml;
- Escherichia coli:
  <250 colony forming units (cfu)/100 ml;
- Intestinal Enterococci:
  < 100 cfu/100 ml; and
- Toxicogenic *Vibrio cholerae* (O1 & O139):
  <1 cfu/100 ml.

While DEC supports a strong national standard that will adequately address AIS, the IMO D2 standard is not sufficient to address the hundreds, and maybe thousands, of potential AIS that are transported in vessel ballast water tanks. For example, it has been found that "even with the IMO standards, per-ship discharges in excess of 10^6 total zooplankton remain possible."[4] This would result in a strong likelihood that ballast water discharges subject only to the IMO D2 standard, would have the potential to discharge AIS under EPA's proposed VGP.

Studies indicate that the IMO D2 standard is only a marginal improvement on the current management practice of ballast water/salt water exchange for the largest organisms (>50 um), and is similar to the non-treatment of ballast water for smaller organisms (<50 um).[5] For example, the IMO Study Group on Ballast Water and Other Ship Vectors (IMO Study Group) found that the median concentration of the largest organisms (>50 um, generally equivalent to zooplankton) in unmanaged ballast water was 0.4 per liter, or 400 per cubic meter. Based on that data, the IMO Study Group recommended a discharge standard three orders of magnitude more stringent i.e., 0.4 per cubic meter.[6] Despite this recommendation, the standard ultimately adopted by the International Maritime Organization for organisms of this size was 10 per cubic meter, which falls between the concentration in unmanaged ballast water and the IMO Study Group's recommendation. Therefore, the IMO D2 standard represents only a limited improvement for larger organisms.

The IMO Study Group also found that the median concentration of the smaller organisms <50 um (generally equivalent to phytoplankton) in unmanaged ballast water is 13.3 per milliliter. Therefore, the IMO Study Group recommended a discharge standard three orders of magnitude lower, i.e., 0.0133 per milliliter. However, the standard ultimately adopted by IMO for organisms of this size was 10 per milliliter, which is essentially the same as the concentration in unmanaged ballast water. Given this analysis that the IMO D2 standard is not adequately protective (as it leaves many potential AIS unmanaged) EPA should improve the protections in the proposed VGP to provide adequate protection against further invasive species introductions via this known vector.

2. The technology based effluent limitations for ballast water discharges should be based on best available technologies.

It is appropriate that "technology based effluent limitations" (TBELs) be based upon "best available technologies" (BAT). The draft VGP indicates that the IMO D2 standard is achievable by the current BAT. As will be discussed below, however, the data also shows that there are existing "Type-Approved" systems capable of treating ballast water to a more stringent standard. Since there is documented data that the IMO D2 standard is ineffective in dealing with

---

[4] Minton, M.S., et. al. 2005. Reducing propagule supply and coastal invasions via ships: Effects of emerging strategies. Front. Ecol. Environ. 2005 3(6) 304-308.

[5] M. Falkner, et al. "California State Lands Commission Report on Performance Standards for Ballast Water Discharges in California Waters," California State Lands Commission, Marine Facilities Division, January 2006, at 19.

[6] IMO Marine Environmental Protection Committee, Study Group on Ballast Water and Other Ship Vectors, Harmful Aquatic Organisms in Ballast Water: Comments on Draft Regulation E-2, MEPC 49/2/21 (2003), Annex I, Sections 8 and 15(a).

significant potential AIS transported in ballast tanks, EPA should adopt a more stringent technology-based standard that can be met by existing systems.

The California State Lands Commission issued a Report: 2011 Update: Ballast Water Treatment Systems for use in California Waters, September 1, 2011 (Enclosed) (CSLC Report) that evaluated 60 treatment technologies. The CSLC Report found that there are at least 10 ballast water treatment systems currently available that have demonstrated the "potential" to meet California's statutory standard of no detectable living organisms in the discharge. Several of these systems are presently able to meet a standard that is significantly greater than the IMO D2 standard.

DEC conducted its own evaluation of test data from seven of the ballast water treatment systems that were deemed by the CSLC Report as 'potentially' able to meet California's "no detectable living organisms" discharge standard. Of the seven systems evaluated by DEC, three systems (Ecochlor, JFE Engineering and NK Company Ltd) have been found by DEC staff to be able to meet at least a 10x IMO standard with a 99% confidence level, and two of the systems (Ecochlor and NK Company Ltd) were shown to be capable of meeting a 100x IMO standard with a 58% confidence level given existing data that is available. Furthermore, all of these systems have already received Type Approval[7] for general installation (see Enclosure). This information shows that several proven technologies are available to meet a standard at least one order of magnitude more protective than the IMO D2 standard.

To address these concerns and to appropriately move the state of treatment technology forward, New York respectfully requests that EPA work collaboratively with affected states and adopt the following standards and requirements in the VGP:

- a 100x IMO discharge standard implemented by June 1, 2016, with provision for a different compliance schedule if justified based on unavailability of technology;
- a voluntary discharge standard of 10x IMO by June 1, 2014;
- grandfather until 2024 those vessels deploying 10x IMO systems prior to June 1, 2014;
- continue to require ballast water ocean exchange and flushing nationally;
- a prohibition against the discharge of bilge water; and
- require use of other reasonable and effective management practices to limit aquatic invasive introductions prior to implementation of the 100x IMO discharge standards.

These standards and requirements provide flexibility to the industry by authorizing vessels to install any of the current technologies that demonstrated the ability to meet and exceed a 10x IMO level of treatment. By grandfathering until 2024 those vessels that implement technology early, technologies would be brought to market earlier, reduced in cost through mass production and otherwise scaled-up for implementation at an accelerated rate. Such an approach fosters the more immediate installation of ballast water treatment technology to greatly abate the

[7] "Type-Approved" means that a credible nation has reviewed and approved a particular technology as being safe for installation on a ship (e.g., that it achieves appropriate safety criteria). The United States does not currently have a process for issuing type approvals. A reference is set forth in Enclosure A to the nation that Type-Approved each of the three technologies focused on in that Enclosure.

introduction and spread of AIS. Considering the threats posed by AIS, the benefits of a stronger national standard would be significant.

Ballast water treatment technologies are rapidly advancing to combat AIS transported in ballast water. As more of these technologies become commercially available, the cost of retrofitting treatment systems on a vessel will decrease.

While DEC supports EPA's efforts to review the status of ballast water treatment technology, the report issued by EPA's Science Advisory Board (SAB Report) does not account for the current capability of existing ballast water treatment technologies. This is in part due to the fact that only nine data sets were reviewed in detail, one of which was for a system no longer available in the commercial market. The SAB Report did not adequately address the need for a formal test protocol that is more stringent than the IMO D2 standard. The SAB Report did not recognize the documented progress already achieved by certain treatment systems and lacks a consistent and straightforward statistical approach. The SAB Report draws overly broad conclusions for the limited scope of the analysis that was undertaken. In combination, these issues prevent the SAB Report from being a valid assessment of the current, or future, capabilities of ballast water treatment systems to surpass the IMO D2 standard.

The data supports the conclusion that there are commercially available systems which can currently meet a 10x IMO standard, three of which are Type-Approved by major shipping nations. Furthermore, two of the Type-Approved systems may already be capable of achieving a 100x IMO standard. For these reasons, the IMO D2 standard proposed in the VGP does not appear to represent an appropriate TBEL for achieving BAT requirements

3. The VGP should include a numeric water quality based effluent limitation (WQBEL) for ballast water discharge to meet state water quality standards

In the VGP, EPA has proposed to adopt the IMO D2 standard as the numeric technology based effluent limitation (TBEL) for AIS in ballast water discharges. EPA should also issue water quality based effluent limitations (WQBELs) that would not cause a contravention of any state's water quality standards. Based on this, DEC urges EPA to "generate a set of water quality-based ballast water discharge limitations that are protective of the environment under most situations by making conservative assumptions, using safety factors similar to those used in ecological risk assessments for pollutants, and/or by setting ballast water discharge limitations based on the upper confidence limits of predictions of invasions."[8] DEC believes, consistent with recent discussions with other Great Lakes states, that a WQBEL of at least 100 x the IMO D2 standard is needed to protect water quality, and this WQBEL should be included as a goal in the VGP

One of the most important issues to address before finalizing the VGP is the lack of numeric WQBELs. For example, New York's water quality standards, set forth in 6 NYCRR Section 703.2, require that no "deleterious substances" can be discharged to New York's waters, which violate the best usage of those waters. Biological pollutants, such as AIS, qualify as such

[8] Lee II, H., et. al., 2010. Density Matters: Review of Approaches to Setting Organism-Based Ballast Water Discharge Standards. U.S. EPA, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Western Ecological Division.

substances, and have already significantly impacted the biological integrity of New York's waters.

WQBELs are necessary to control pollutants which EPA "determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State's water quality standard." 40 C.F.R. § 122.44(d)(1)(i). WQBELs are not based on available control technology, but on what is necessary to achieve water quality standards, 40 C.F.R. § 122.44(d)(1). EPA should ensure that water quality standards are protected in any permit that it issues, including the VGP. This water quality obligation extends to ensuring that the VGP is consistent with the CWA's anti-degradation policy and provides full protection of existing and designated uses such as the protection and propagation of fish, shellfish, and wildlife, as well as recreation, from aquatic invasive species. *See* 40 C.F.R. §131.12(a) (anti-degradation); *id.* § 131.6 (designated uses).

Establishing a specific WQBEL in the VGP is consistent with longstanding procedures for developing a NPDES permit. In addition to the TBELs, EPA, or a State or Tribe, must evaluate the discharge to determine compliance with Sections 101 and 301(b)(1)(C) of the CWA, and 40 CFR 122.44(d)(1). These require that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. Therefore, any limits must be stringent enough to ensure that water quality standards are attained.

The EPA proposed 'narrative' WQBEL in the VGP incorporates the general requirement that the vessel owner/operator must control the discharge(s) such that states' water quality standards are not violated. However, since the IMO D2 standard does not adequately treat all AIS; any discharge of ballast water has the potential to violate state water quality standards, and thus, violate the VGP. For this reason, DEC urges EPA to develop an effective numerical WQBEL for the VGP.

4. <u>Ballast water exchange should be required nationally at all times, in addition to any treatment systems that is ultimately required</u>

The VGP requires ballast water exchange and flushing for all coastal vessels traveling on the west coast of the United States, and most vessels traveling into the Great Lakes. This requirement terminates when technology is installed on those vessels to meet the IMO D2 standard, at which time only a limited number of vessels entering the Great Lakes will still be required to exchange and flush ballast water. Ballast water exchange in addition to ship-board treatment is far more environmentally protective than just a treatment system. Canada has conducted a research study and proposed to the IMO Sub-committee on Bulk Liquids and Gases, that a combination of a ballast water treatment system and exchange and flushing will lower the AIS invasion risk by "at least 10 times" compared to using the ballast water treatment alone. This research study indicates that some ballast water treatment systems operate more effectively and reliably when coupled with mid-ocean ballast water exchange.[9] DEC strongly recommends

[9] Government of Canada submission to the International Maritime Organization's Sub-Committee on Bulk Liquids and Gases, Proposal to utilize ballast water exchange in combination with a ballast water management system to achieve an enhanced level of protection, December 10, 2010 at Pars 18 and 20. (Enclosed)

that all vessels entering waters of the United States be required to conduct ballast water exchange and flushing at 200 nautical miles from shore in addition to treatment. For all vessels, mid-ocean exchange and flushing is known to reduce the number of live organisms in ballast tanks, thus increasing the likelihood that treatment technologies will meet or exceed the discharge standards.

DEC is especially concerned that vessels operating along the east coast have the potential to transport and introduce AIS, such as the golden mussel which has become established in South America and has even greater potential for ecological and economic impacts than the zebra mussel due to its larger size and ability to thrive in low calcium waters. Therefore, DEC requests that all vessels operating along the east coast of the U.S. be required to conduct exchange and flushing at least 50 nautical miles from shore in waters at least 200 meters in depth.

The Great Lakes account for a small fraction of global shipping yet they are closely connected to all other ports, and the species in them, by the shipping network. Most global ports, and thus the species in them, are separated from the Great Lakes by approximately two ship voyages.[10] For most vessels entering the Great Lakes from outside the Exclusive Economic Zone (EEZ), there is a significant benefit of exchange/flushing, in that it will provide stronger protection than the IMO D2 standards when coupled with any standards that EPA ultimately adopts.

5. EPA should not exempt bulk carrier vessels (Lakers) from the ballast water treatment system requirements

The VGP excludes bulk carrier vessels built before 2009 from the proposed discharge standards if they are confined to the Great Lakes upstream of the Welland Canal. While DEC understands the rationale for treating bulk carriers differently, these vessels are still capable of spreading AIS around the Great Lakes. Domestic ballast water transfers "may contribute to non-indigenous species introductions and are likely the most important ballast-mediated pathway of secondary spread within the Great Lakes."[11] Given the number of bulk carrier vessels transiting the Great Lakes every year, it is imperative to address this pathway for invasive species.

EPA's exclusion of existing bulk carrier vessels (Lakers) confined to the Great Lakes from the numeric discharge standards acknowledges the unique challenges facing this sector of the industry, but unfortunately will prolong the time-frame for the development and installation of suitable technology. Lakers have the capacity to spread existing invasive species within the Great Lakes due to the very large quantity of ballast water transported between Great Lakes ports by these vessels. The fact that Lakers do not travel outside the Great Lakes does not mean that their ballast water discharges do not contain AIS that can be spread throughout the various Great Lakes.

While land-based and ship-board test data for treatment systems operating in freshwater are limited, it is DEC's understanding there are several commercially available technologies already type approved that are suitable for operating in such conditions. A Report of Lloyd's Register

---

[10] Keller, R.P. et. al., 2010. Linking environmental conditions and ship movements to estimate invasive species transport across the global shipping network. Diversity and Distributions (2010) 1-10.

[11] Rup, M. et. al., 2010. Domestic ballast operations on the Great Lakes: Potential importance of Lakers as a vector for introduction and spread of nonindigenous species. Can. J. Fish. Aquatic. Sci. 67:256-268 (2010).

Ballast Water Treatment Technology: Current Status (June 2011) indicated 28 of 59 systems reviewed are suitable for use in fresh water to treat AIS. DEC recommends that EPA require vessels operating exclusively within the Great Lakes to install appropriate ballast water treatment technology, consistent to that which is required for ocean going vessels. If engineering constraints or availability of appropriate systems prevents vessel operators from meeting established compliance deadlines, options for extending the compliance deadline for these vessels should be considered.

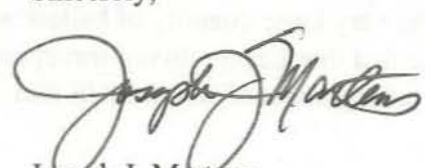
6. The VGP relies on insufficient BMPs to mitigate the environmental impacts of bilge water discharges. These discharges should be prohibited.

The VGP proposes a suite of BMPs for vessel bilge water discharges. These practices include prohibitions from releasing chemicals such as dispersants, detergents, emulsifiers, chemicals, or other substances that remove the appearance of a visible sheen in their bilge water discharges. DEC recommends an outright prohibition of the discharge of bilge water in all waters of the United States. Bilge water is waste water accumulated in the bottom part of a vessel from the engine room and other mechanical parts of the vessel. It is typically contaminated with petroleum including volatile and semi-volatile organic compounds like benzene and polycyclic aromatic hydrocarbons. Even with the BMPs in the VGP, bilge water could contain elevated level of hazardous chemicals that could be harmful to the ecosystem. The discharge of bilge water qualifies as a pollutant discharge from a point source, pursuant to the Clean Water Act and State law, and should be properly regulated to protect the waters of the United States.

* * * * *

DEC encourages EPA to take decisive action to protect the waters of the United States from AIS. DEC urges EPA to issue the next VGP with an adequate and protective WQBEL for ballast water discharges, and adopt a TBEL that is representative of the best available technology. DEC respectfully requests that EPA adopt DEC's recommended alternative approach to ballast water discharge standards when finalizing the VGP. Thank you for considering DEC's comments which, if implemented, would provide a strong national approach to controlling the spread of aquatic invasive species.

Sincerely,



Joseph J. Martens

Enclosures

ENCLOSURE A

Statistical analysis of the three Type-Approved ballast water treatment systems that DEC found to be capable of at least 10x IMO standards.

	Ecochlor (US system, German type approval)	JFE Engineering (Japanese system, Japanese type approval)	NK Company Ltd (Korean system, Korean type approval)
Technology	Chemical and filtration	Chemical and filtration	Ozonation
10x IMO Statistics	99% Confidence	99% Confidence	99 % Confidence
100x IMO Statistics	58% Confidence	0% Confidence (failed)	59% Confidence

Confidence level calculations are based on a Poisson distribution (see Lee et al., *Density Matters,* EPA/600/R-10/031, 2010) and based on the assumption that living organisms are randomly distributed in the ballast water tank.

Statistical confidence that Ecochlor's system meets the 1 per m^3 (10x IMO) living organism limit for organisms >50 µm (corresponding generally to zooplankton) is 99% or better, based on 10 run test results (see Final Report issued February 2009 by NIOZ) in which 2 living organisms were counted in a total sample volume of 30 m^3.

Statistical confidence that JFE's system meets the 1 per m^3 (10x IMO) living organism limit for organisms >50 µm is 99.4%, based on runs (see Final Report issued June 2009 by NIVA) for testing that took place after 5 days after exposure to treatment via biocide, in a combination of high and low salinity water tests, where 19 living organisms were counted in a total volume of 33 m^3. In the high-salinity tests alone, 4 living organisms were counted in a total volume of 15 m^3, indicating a 99.9% statistical confidence, and in the low-salinity tests alone, 15 living organisms were counted in a total volume of 18 m^3, indicating a 71.3% statistical confidence

Statistical confidence that NK3's system meets the 1 per m^3 (10x IMO) living organism limit for organisms >50 µm is 99.99%, based on 9 run test results (see Final Report issued April 2011 by KOMERI) in which 0 living organisms were counted in a total sample volume of 9 m^3.