Alliance for the Great Lakes * Great Lakes United * National Wildlife Federation * Natural Resources Defense Council * Northwest Environmental Advocates

Water Docket
U.S. Environmental Protection Agency
Mail Code 4101T
1200 Pennsylvania Ave. N.W.
Washington, D.C. 20460

Dear Environmental Protection Agency,

I. Introduction

Invasive species have already caused massive harm to the Nation's waters and the uses dependent on those waters, from Chesapeake Bay to San Francisco Bay, from the Great Lakes to the inland waters of Florida. [1] They cost the United States billions of dollars annually.[2] Ship-borne invasive species cost the Great Lakes Region alone at least $200 million dollars every year.[3] The Zebra mussel – introduced to the United States through ballast water discharges and first discovered in Lake St. Clair, which connects Lakes Huron and Erie – now infests waters across the United States and has significantly altered the Great Lakes ecosystem.[4] Non-indigenous species also significantly affect endangered species populations in the United States.[5]

The Clean Water Act requires EPA to place limits on ballast water discharges that eliminate the unique threat of invasive species as living and reproducing pollutants. EPA's Draft 2013 Vessel General Permit proposes revisions to the limits included in the agency's 2008 permit, but nevertheless does not live up to the Clean Water Act's mandate that the agency establish technology- and water quality-based effluent limitations in this permit that will fully protect our Great Lakes and coastal waters from further harm due to the introduction and spread of aquatic invasive species in vessels' ballast water. Neither the International Maritime Organization's D-2 standards that EPA proposes as technology-based effluent limitations, nor the feckless water quality-based effluent limitations it includes, would assure that states' water quality standards are protected by requiring vessels to take steps to fully and effectively prevent their ballast water discharges from causing further species invasions. Research has shown that the IMO standards are not sufficient to prevent new non-indigenous species from invading United States waters. Moreover, the risk of invasive species is driven by many factors in addition to the concentration of organisms discharged.

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[1] Nat'l Aquatic Nuisance Species Task Force, *Aquatic Nuisance Species Impacts*, ANS TASK FORCE.GOV (last visited Jan. 31, 2012), http://www.anstaskforce.gov/more_impacts.php.
[2] *Id*.
[3] U.S. Dep't of Agric., *Annual Losses to Great Lakes Region by Ship-borne Invasive Species at least $200 Million*, NATIONAL INVASIVE SPECIES INFORMATION CENTER (July 2008), http://www.glu.org/sites/default/files/lodge_factsheet.pdf.
[4] *Aquatic Nuisance Species Impacts*, *supra* note 1.
[5] *Aquatic Nuisance Species Impacts*, *supra* note 1 (noting that 42% of listed endangered species are significantly impacted by non-indigenous species).

To comply with the Clean Water Act, EPA must establish technology-based effluent limitations at least as stringent as those currently required by California and New York, as well as enforceable water quality-based effluent limitations that will prevent the introduction and spread of new invasive species in vessels' ballast water discharges. Further, EPA should compress the compliance schedule for these effluent limitations and eliminate unjustified delays based on the unsupported assumption that a more rapid implementation schedule than the IMO is requiring (including an unjustified allowance for vessels to wait until their next drydocking after the compliance deadline before installing a ballast water treatment system) is not achievable. In addition, EPA must evaluate onshore treatment and any relevant pilot projects in its BAT determination for lakers and require the most stringent effluent limitation achievable. EPA should also require vessels entering the Great Lakes or other freshwater environments, as a technology-based effluent limitation, to continue mid-ocean ballast water exchange in combination with ballast water treatment, but EPA cannot characterize this as an effective water quality-based effluent limitation that will assure compliance with water quality standards. Finally, EPA must comply with the Endangered Species Act to ensure that the permit does not jeopardize threatened or endangered native species.

II. The Invasive Species Problem

All regulations and actions pursuant to the Clean Water Act must support the statute's objective to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[6] Furthermore, such regulations must prohibit the discharge of "toxic pollutants in toxic amounts" and achieve, where attainable, "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water."[7] The CWA defines "pollutant" and "toxic pollutant" to include the introduction of invasive species.[8]

Aquatic Invasive Species ("AIS") are a persistent and unique problem in U.S. coastal and inland waters, and make up an injurious portion of the approximately 50,000 plant, animal, and microbe invasive species that have successfully established reproducing populations in United States territory.[9] Ship-borne AIS may be introduced through a variety of vectors, including ballast water and sediment from ballast tanks, chain lockers, anchor chains, and vessel hulls. Additional vectors include research and education facilities, the aquarium and pet industry, and the live-food trade.[10] Though no reliable and comprehensive estimates of total AIS introductions

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[6] CWA § 101(a), (33 U.S.C. 1251(a)).

[7] *Id.*

[8] The CWA defines "pollutant" to include "biological materials" (33 U.S.C. 1362(6)) and toxic pollutants as "those pollutants, or combinations of pollutants, *including disease-causing agents*, which after discharge and upon exposure, ingestion, inhalation or assimilation into *any organism*, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring" (33 U.S.C. 1362(13) (emphasis added)). Thus, the CWA narrative standards also are applicable to organisms and disease agents that may exist in ballast discharge.

[9] David Pimental et al, *Biological Invasions: Plant, Animal, and Microbe Invasive Species in the United States and World*, Ecological Studies, Volume 193-6, 315-330 (2007).

[10] U.S. Environmental Protection Agency, 2008 Proposed Issuance of NPDES VGP for Discharges Incidental to the Normal Operation of Commercial and Large Recreational Vessels, Fact Sheet at 16. *See also* David Reid et al, *Identifying and Establishing Options for Best Management Practices for NOBOB Vessels*, NOAA Great Lakes

nationwide exist, case studies of several major bodies of water across the country do provide a sense of the rates of species introduction.[11] AIS establishment is not only directly related to how often—and in what concentration—members of that species are introduced. Additional variables that influence survival, reproduction, and establishment include—but are not limited to—genetic species traits; reproductive techniques; mobility; the abiotic characteristics of the landscape; and biological interactions with resident species.[12]

AIS pose several dangers to aquatic ecosystems, including: outcompeting native species, threatening endangered species, damaging habitat, changing food webs, and altering the chemical and physical aquatic environment. Furthermore, AIS have caused substantial damage to recreational and commercial fisheries, infrastructure, and water based recreation and tourism.

A. Invasive Species Threaten Biodiversity and Ecosystems

AIS can affect the "composition, density, and interactions of native species" and cause "significant changes to the ecosystem, such as alterations to the food webs, nutrient dynamics and biodiversity."[13] "Without co-evolved parasites and predators, some non-indigenous aquatic species can out-compete and even displace native populations."[14] Invasive species are thought to have been involved in 70% of this century's extinctions of native aquatic species, and 42% of current endangered species are impacted significantly by invasive species.[15]

In the Great Lakes Region, invasive Zebra mussels—native to the Caspian Sea—have achieved densities as high as 700,000 per square meter.[16] This has led to a much greater filtration rate of particulate matter and algae, resulting in lower turbidity in the water column.[17] The greater filtration of light through the water column affects plant viability, and the removal of

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Environmental Research Laboratory *available at* http://www.glerl.noaa.gov/res/Task_rpts/2004/aisreid04-1.html (2007) (studies found that a majority of ships and a near-majority of tanks surveyed contained non-indigenous strains of pathogens known to cause human health impacts).

[11] *See, e.g.*, A. Ricciardi, *Patterns of invasion in the Laurentian Great Lakes in relation to changes in vector activity*, 12 Diversity and Distributions 425-433 (2006) (estimating that there have been approximately 182 invasions to date within the Great Lakes Region, and subsequent invasions are occurring at least once every 28 weeks); USCG, *U.S. Coast Guard Draft Programmatic Environmental Impact Statement for Standards for Living Organisms in Ship's Ballast Water Discharged in U.S. Waters*. Retrieved from www.regulations.gov (Docket ID: USCG- 2001-10486-0139.1) (2009) (estimating that there have been approximately 234 invasions to date within the San Francisco Bay Region, and subsequent invasions are occurring at least once every 14 weeks); M. Sytsma et al, *Lower Columbia River Aquatic Non-indigenous Species Survey 2001-2004: Final Technical Report*. Prepared for the U.S. Coast Guard and U.S. Fish and Wildlife Service. Retrieved from http://www.clr.pdx.edu/docs/LCRANSFinalReport.pdf (2004) (estimating that there have been approximately 81 invasions to date within the Lower Columbia River Basin, and subsequent invasions are occurring at least once every 22 weeks).

[12] National Academy of Sciences, *Assessing the Relationship between Propagule Pressure and Invasion Risk in Ballast Water*, Fig. 3-1 (p. 57) (2011).

[13] Michigan Dept. of Environmental Quality *available at* http://www.michigan.gov/deq/0,4561,7-135-3313_3677_8314-18366--,00.html.

[14] *Id.*

[15] U.S. EPA, Invasive Non-Native Species *available at* http://www.epa.gov/owow/watershed/wacademy/acad2000/invasive.html

[16] David K. Britton, *Zebra and Quagga Mussels*, ANS Task Force, http://www.anstaskforce.gov/spoc/zebra_mussels.php (last visited Feb. 21, 2012).

[17] United States Dept. of the Interior: Geological Survey (2009) *available at* http://nas.er.usgs.gov/queries/factsheet.aspx?speciesid=5.

algae that other native species depend on as a food source allow Zebra and quagga mussels to outcompete and extirpate native filter feeder populations.[18] The effects continue through the food web to fish, potentially causing increased competition, decreased survival, and decreased biomass of native fish species.[19] For example, fish biomass has decreased by about 95% in Lake Huron and significantly in Lake Michigan due to zebra and quagga mussels filtering out plankton at the base of the food chain.[20] Another disturbing example is the invasive snowflake coral, which is threatening the ecologically sensitive Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve through its ability to out-compete native species for space on the reef.[21]

B. Invasive Species Threaten Economic Infrastructure

AIS pose a serious risk to commercial and recreational fisheries. For example, the annual estimated economic damages from European green crab predation to commercial and recreational shellfisheries and eelgrass restoration efforts range from $18.6 to $22.6 million per year in the United States.[22] There are also many examples of AIS, such as the hydrilla plant and water lettuce, which have had adverse impacts on recreation and tourism nationwide by damaging water quality. Floating plants clog the water's surface, blocking boating and swimming, impeding water flow, and disrupting plant and animal communities.[23] Invasive mollusks such as zebra mussels can also cause boat engines to overheat, and can cover shorelines with sharp-edged shells and rotting mussel flesh, which can diminish interest in visiting infested beaches.[24]

Industrial facilities, such as those that purify water, generate electricity, and manufacture

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[18] *Id. See also* David K. Britton, *Zebra and Quagga Mussels,* ANS Task Force, http://www.anstaskforce.gov/spoc/zebra_mussels.php (last visited Feb. 21, 2012).

[19] *Id.*

[20] Janet Pelley, "Musseling Out Algae: Water Quality: Invasive mussels may turn the Great Lakes into a biological desert," *Chemical & Engineering News* (Mar. 30, 2011); *see also* Scott Fields, "Great Lakes Resource at Risk," *Environmental Health Perspectives,* 113 (Mar. 2005): A164–A173.

[21] R. Toonen, *Reproduction and developmental characteristics of an alien soft coral in Hawaii* (2005) *available at* http://www.hawaii.edu/ssri/hcri/research/projects/threats/inv_spec-invert-bio-01.shtml. In the Great Lakes Region, the round goby takes over prime spawning sites of native species such as the logperch and mottled sculpin, and is changing the balance of the ecosystem. In Ohio, the round goby's presence in Lake Erie led the state to shut down the smallmouth bass fishery to help prevent predation on smallmouth eggs. *See* U.S. Geological Survey Nonindigenous Aquatic Species Database, *Round Goby* (2011) *available at* http://nas.er.usgs.gov/queries/factsheet.aspx?SpeciesID=713

[22] *See* Ecological and Economic Impacts and Invasion Management Strategies for the European Green Crab, U.S. EPA: National Center of Environmental Economics (2008) (illustrating effects of green crab introduction along the east and west coasts, including the decimation of soft-shell clam fisheries in New England). The sea lamprey caused a massive collapse of the trout fisheries in the Great Lakes, and current U.S. and Canadian control costs total more than $15 million annually to allow recovery, ANS Task Force *available at* http://www.anstaskforce.gov/spoc/sealamprey.php (last visited 1/23/12).

[23] *See, e.g.*, Mark Mossler, Florida Crop/Pest Management Profile: Aquatic Weeds, University of Florida (Reviewed 2009) *available at* http://edis.ifas.ufl.edu/pi175 (approximately $22.5 million was spent in 2005 for aquatic plant control in Florida's public waters).

[24] *See, e.g.*, *The Zebra Mussel Invasion*, NOAA: U.S. Dept. of Commerce *available at* http://www.noaa.gov/features/earthobs_0508/zebra.html; *Zebra Mussels*, National Atlas *available at* http://nationalatlas.gov/articles/biology/a_zm.html. Similarly, the fishhook water flea can "achieve high population densities, forming 'clumps' that can entangle the fishing lines of anglers. Indiana Department of Natural Resources, *Spiny and Fishhook Water Flea*, *available at* http://www.in.gov/dnr/files/spiny_and_fishhook_water_flea.pdf.

goods, depend on water intake structures to perform their services. These structures can often be adversely affected by AIS. Bivalves such as the zebra mussel, the brown mussel, and the green mussel attach to surfaces of water intake structures, navigation dams, pumping stations, and gears, often making them inoperable, which inconveniences the public and results in significant industry costs.[25] Similarly, invasive plant species such as hydrilla and water hyacinth can disrupt water flow in irrigation canals and in utility cooling reservoirs.[26]

C. Invasive Species Threaten Human Health

While the exact nature of the link between human health impacts and AIS invasions through ballast water is poorly understood, studies have established that pathogenic invasive species can be transported in ballast water.[27] Emphasizing the serious nature of the potential threat, the presence of non-native strains of epidemic cholera have previously been confirmed in U.S. waters.[28] Additional pathogenic bacteria identified in ballast water known to be associated with adverse human health impacts include *E. coli*, enterococci, *Vibrio cholerae*, *Clostridium perfingens*, *Salmonella spp*. *Cryptosporidium spp*., and *Giardia spp.*, as well as a variety of viruses.[29]

D. Need to Prevent Future AIS Introductions

The EPA estimates that approximately 58 non-indigenous species currently "pose high or medium risk for becoming established in the Great Lakes and for causing ecological harm."[30] Many studies have analyzed the potential for species invasion, and while methodologies differ,

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[25] The U.S. Geological Survey has estimated potential economic impact at $5 billion from 2000 to 2010 to U.S. and Canadian water users within the Great Lakes region alone, USGS, Dept. of the Interior (2011) *available at* http://www.glsc.usgs.gov/_files/factsheets/2000-6%20Zebra%20Mussels.pdf. Maintenance of pipes clogged with zebra mussels costs the power industry up to $60 million per year while temporary shutdowns caused by reduced water flow can cost over $5,000 an hour. It is estimated that the cost of the zebra mussel invasion to the US will be $3.1 billion over the next ten years. Lynn Jackson, *Marine Biofouling: Ann Assessment of Risks and Management Initiatives*, Global Invasive Species Programme (2008) *available at* http://www.gisp.org/publications/toolkit/BiofoulingGuidelines.pdf.

[26] David Pimental et al, Update on the environmental and economic costs associated with non-indigenous species in the United States. 52 *Ecological Economics* 273 (2004) ((annual expenditures on aquatic weed control in the United States, much of which is spent on AIS weeds specifically, are estimated at $100 million).

[27] Lisa A. Drake et al, Potential Microbial Bio-invasions via Ships' Ballast Water, Sediment, and Biofilm, 55 *Marine Pollution Bulletin* 333-341(2007).

[28] Centers for Disease Control (CDC). *Isolation of Vibrio Cholera 01 from Oysters – Mobile Bay, 1991, 1992.* Morbidity and Mortality Weekly Report, Feb. 12, 1993, Vol. 42(05); 91-93.

[29] *Economic and Benefits Analysis of the Final Vessel General Permit (VGP)*, Developed For: Office of Wastewater Management, U.S. EPA (p. 114) (Dec. 18, 2008), *available online* http://www.klgates.com/FCWSite/ballast_water/Final_Rule/Final_Economic_Analysis.pdf. Ballast water is also a vector for the microorganisms associated with the "red tide" or harmful algal bloom phenomenon. This phenomenon occurs when certain species of algae release toxins into an aquatic environment, which adversely impacts aquatic life and can also impact human health if fish contaminated with the toxin are consumed. *See* Hallegraeff, G. M., and C. J. Bolch, Transport of diatom and dinoflagellate resting spores via ship's ballast water: implications for plankton biogeography and aquaculture. *Journal of Plankton Research* 14:1067-1084 (1992).

[30] U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Predicting Future Introductions of Nonindigenous Species to the Great Lakes, at 1 (Nov. 2008). Modeling fourteen of the 58 potential invasive species showed that the shallower portions of the Great Lakes appear to be most vulnerable to invasion. *Id*. at 2.

species identifying criteria often overlap. Researchers often ask whether a transport vector exists that could introduce a species; whether a species is likely to survive transport in the identified vector; if the species has a probability of being introduced multiple times or in large numbers; if the species will be able to successfully reproduce; and whether the species has been known to invade other areas.[31]

The discussion above on potential threats to ecosystems, economic infrastructure, and human health, emphasizes the need to prevent the introduction of these risk-posing species. Often such species have successfully invaded elsewhere,[32] or are regarded as particularly likely to outcompete native species.[33] The complexity of analyzing AIS introduction probabilities, and the wide range and varied nature of AIS impacts, clearly demonstrate a need to prevent the introduction of AIS through ballast water discharges.

III. The Clean Water Act requires NPDES permits that assure compliance with water quality standards

Congress enacted amendments to the Clean Water Act ("CWA" or "the Act") in 1972 to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water."[34] To achieve the Act's goal of eliminating the discharge of pollutants into navigable waters, each state must establish ambient water quality standards for intrastate waters at levels necessary to protect the "public health or welfare, enhance the quality of water and serve the purposes of" the Act.[35] A water quality standard consists of three components: (1) designated uses of the water, (2) criteria necessary to protect the designated uses, and (3) a policy limiting the degradation of water quality to protect water quality ("the antidegradation policy").[36]

To further achieve the Act's goal of eliminating the discharge of pollutants into navigable waters, Congress created the National Pollutant Discharge Elimination System ("NPDES"), prohibiting the discharge of any pollutant from a point source into navigable waters unless that point source receives a permit under § 402 of the Act.[37] NPDES permits such as the Draft 2013

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[31] *See, e.g.*, E. Baker et al, *Watchlist of Potential Great Lakes Aquatic Invasive Species*, NOAA: Great Lakes Aquatic Non-indigenous Species Information System [Hereinafter: *GLANIS Report*] *available at* http://www.glerl.noaa.gov/res/Programs/glansis/watchlist.html.

[32] A. Adebayo et al, *Water hyacinth and water lettuce in the Great Lakes: playing with fire?* Aquatic Invasions 6: 91-96. (2011) (South American aquatic plant identified as having extensive invasion history and described as one of the worst aquatic weeds in the world).

[33] *See supra Glanis Report* note 22, at 97 (Table B-1) (Northern Snakehead fish identified as having high probability of invasion in the Great Lakes based on previous devastation to freshwater ecosystems of the U.S. because of its predacious nature, lack of natural predators, high fertility, and adaptability to a wide range of environmental conditions).

[34] 33 U.S.C. § 1251(a).

[35] 33 U.S.C. § 1313(c)(2)(A).

[36] 33 U.S.C. § 1313(c)(2)(A); *PUD No. 1 of Jefferson Co. v. Wash. Dept. of Ecology*, 511 US 700, 714 (1994); 40 C.F.R. § 131.3(e); 40 C.F.R. § 131.6; EPA, *Water Quality Standards Handbook* ("*EPA Handbook*") § 1.2 , *available at* http://water.epa.gov/scitech/swguidance/standards/handbook/chapter01.cfm (last visitedFeb. 10, 2012).

[37] 33 U.S.C. §§ 1311, 1342.

Vessel General Permit ("VGP") must contain technology-based effluent limitations ("TBELs"), which are based on available control technologies.[38]

NPDES permits must also contain more stringent limits, known as water quality-based effluent limitations ("WQBELs"), where technology-based effluent limitations alone are insufficient to ensure that dischargers do not violate water quality standards.[39] WQBELs are necessary to control pollutants which the permitting agency "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 water quality standard."[40]

One component of water quality standards with particular resonance in the AIS context is antidegradation. The antidegradation policy requires the maintenance and protection of existing uses and the water quality necessary to protect existing uses.[41] "Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards."[42] "No activity is allowable under the antidegradation policy which would partially or completely eliminate any existing use."[43]

A. EPA's obligations in selecting BAT when setting TBELs

Because EPA has not yet promulgated national effluent guidelines for ballast water discharges pursuant to Section 304 of the Clean Water Act, the Agency's own regulations require it to use "best professional judgment" to incorporate, as a "minimum level of control that must be imposed in a permit issued under the Act," effluent limitations for invasive species based on Best Available Technology ("BAT"). 40 C.F.R. § 125.3(a)(2)(v); *see also* 33 U.S.C. § 1311(b)(2)(A). BAT is a stringent treatment standard that has been held to represent "a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges," *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 74 (1980), including requiring the elimination of discharges of all pollutants" if "such elimination is technologically and economically achievable," 33 U.S.C. § 1311(b)(2)(A).[44]

TBELs established pursuant to the BAT standard are intended to be technology-forcing, *i.e.*, to "result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants." 33 U.S.C. § 1311(b)(2)(A); *see also NRDC v. EPA*, 822 F.2d 104, 123 (D.C. Cir. 1987) (stating that "the most salient characteristic of this [CWA] statutory scheme,

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[38] 33 U.S.C. § 1311(b)(1)(A); 40 C.F.R. § 122.44(a)(1).

[39] 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d); *see also Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 492 (2d Cir. 2005).

[40] 40 C.F.R. § 122.44(d)(1)(i).

[41] *See* 40 C.F.R. § 131.12(a)(1).

[42] 40 C.F.R. § 131.3(e).

[43] *EPA Handbook* § 4.4.2, *available at* http://water.epa.gov/scitech/swguidance/standards/handbook/chapter04.cfm (last visited Feb. 10, 2012). Thus, EPA must protect existing uses (including existing uses which are also designated uses) against degradation, not just elimination. *See PUD No. 1*, 511 U.S. at 718-19.

[44] Technology-based effluent limitations are a necessary minimum requirement for a permit "regardless of a discharge's effect on water quality." *Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 344 (5th Cir. 1981); *see also PUD No. 1*, 511 U.S. at 704 (state water quality standards are "supplementary" to required individual technology-based limitations) (citing *EPA v. Calif.* ex. rel. *Water Res. Control Bd.*, 426 U.S. 200, 205 n.12 (1976)); *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620, 623 (2d Cir. 1976) (CWA "predicate[s] pollution control on the application of control technology on the plants themselves rather than on the measurement of water quality.").

articulated time and again by its architects and embedded in the statutory language, is that it is technology-forcing"). Courts have thus recognized that Congress intended for EPA to look to the best operating facilities in the relevant class in determining technological availability. *NRDC v. EPA*, 863 D.2d 1420, 1426 (9th Cir. 1988); *Kennecott v. EPA*, 780 F.2d 445, 448 (4th Cir. 1985) (stating that "[i]n setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible").

In determining BAT, EPA may deem a technology available if it is used at only one facility in the industry class. *Ass'n of Pac. Fisheries v. EPA*, 615 F.2d 794, 816 (9th Cir. 1980) (quoting the House Report accompanying the 1983 amendments, which stated that "[i]t will be sufficient for the purposes of setting the level of control under available technology, that there be one operating facility which demonstrates that the level can be achieved"); *FMC Corp. v. Train*, 539 F.2d 973, 983-84 (4th Cir. 1976); *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1058 (3d Cir. 1975).

EPA may also conclude that a technology is available if it is only in use in another industry class, so long as it shows that that technology is transferable to the industry class for which it is establishing BAT. *Kennecott*, 780 F.2d at 453 (giving the rationale for allowing BAT to be based on technology in use outside the industry class that "[p]rogress would be slowed if EPA were invariably limited to treatment schemes already in force at the plants which are the subject of the rulemaking."); *see also Reynolds Metals Co. v. EPA*, 760 F.2d 549, 562 (4th Cir. 1985). In order to determine technological availability based on a technology's use outside the industry class, however, EPA must also determine that the technology is transferable to the industry and make a reasonable prediction that, if used in the industry, the technology will achieve effluent standards. *Tanner's Council of America, Inc. v. Train*, 540 F.2d 1188, 1192 (4th Cir. 1976).

Finally, EPA may determine that a technology is available even if it is not in use in any industry. *Am. Petroleum Inst. v. EPA*, 858 F.2d 261, 265 (5th Cir. 1988) (stating that under BAT, "a process is deemed 'available' even if it is not in use at all"); *FMC Corp.*, 539 F.2d at 983-84 (finding EPA justified in setting BAT for chemical oxygen demand based on performance data from a single pilot plant).

B. EPA's obligations in setting WQBELs

EPA must set WQBELs based on what is necessary to achieve water quality standards, without regard either to cost or to whether control technology is already available to meet those requirements.[45] Moreover, EPA must set WQBELs that "assure compliance" with water quality standards.[46]

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[45] *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1163 (9th Cir. 1999); *see also Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346, 350 (D.C. Cir. 1993); *In re City of Moscow, Idaho*, 10 E.A.D. 135, NPDES Appeal 00-10, 2001 WL 988721, at *24 (E.A.B. July 27, 2001); 40 C.F.R. § 122.44(d)(1); S.Rep. No. 414, *reprinted in* 1972 U.S. Code Cong. & Admin. News 3668, 3710 (EPA "is under a specific obligation to require that level of effluent control which is needed to implement existing water quality standards without regard to the limits of practicability.").

[46] 33 U.S.C. § 1342(a)(2) (EPA "shall prescribe conditions for . . . [NPDES] permits to *assure compliance* with the requirements of" CWA § 402(a)(1).) (emphasis added). One of the requirements of § 402(a)(1) is that permitted discharges must comply with CWA § 301. Section 301, in turn, requires WQBELs.

EPA's regulations reinforce the necessity to assure compliance with water quality standards. One regulation in particular requires permitting authorities to "ensure" that WQBELs are developed to achieve a level of water quality that "complies with all applicable water quality standards."[47]

In *Arkansas v. Oklahoma*, the Supreme Court acknowledged that "'unless there is some method for measuring compliance, there is no way to ensure compliance.'"[48] Measuring compliance presupposes effluent limitations specific enough to be measurable. EPA itself recognizes as much: "Each permit must be written clearly and unambiguously so that compliance can be tracked effectively and the permit can be enforced if violations occur."[49]

Taken together, the provisions of the Act, as well as EPA's regulations and interpretation of the Act, establish a requirement that WQBELs be written with sufficient specificity to enable compliance with them to be verifiable. Only then will such limitations be enforceable as a practical matter.

C. EPA's obligations to require monitoring and reporting

CWA § 402 requires "conditions on data and information collection, reporting, and such other requirements as [EPA] deems appropriate."[50] EPA regulations expand on this, requiring permits to contain monitoring requirements, specifying that their purpose is "[t]o *assure compliance* with permit limitations."[51] In addition, permits must contain requirements to report monitoring results."[52]

In other words, permits must contain conditions requiring both monitoring and reports of monitoring results showing whether discharges comply with effluent limitations. Such conditions are necessary to verify compliance with water quality standards,[53] and to facilitate enforcement if compliance is lacking.[54]

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[47] 40 C.F.R. § 122.44(d)(1)(vii)(A). Another regulation prohibits the issuance of an NPDES permit "when imposition of conditions cannot *ensure compliance* with the applicable water quality requirements of all affected states." 40 C F.R § 122.4(d) (emphasis added). "Affected states" necessarily include the water quality standards of the state issuing the permit.

[48] 503 U.S. 91, 111 (1992) (internal citation omitted).

[49] U.S. Environmental Protection Agency, *NPDES Permit Writers' Manual*, 11-21 (EPA-833-K-10-001, 2010) [hereinafter "*NPDES Permit Writers' Manual*"].

[50] 33 U.S.C. § 1342(a)(2).

[51] 40 C.F.R. § 122.44(i)(1) (emphasis added); *see also NPDES Permit Writers' Manual* at 8-2 ("Monitoring is performed to determine compliance with effluent limitations established in NPDES permits . . . [and] establish a basis for enforcement actions.").

[52] *Id*. § 122.44(i)(2).

[53] *NPDES Permit Writers' Manual* at 11-22 ("A primary function of the compliance monitoring program is to verify compliance with permit conditions, including effluent limitations and compliance schedules.").

[54] *Id*. at 8-1 ("Periodic monitoring and reporting establish an ongoing record of the permittee's compliance status and, where violations are detected, create a basis for any necessary enforcement actions.").

The critical role of enforcement in effectuating the purposes of the Clean Water Act is reflected in Congress's enactment and successive amendments of the law.[55] Beginning with the 1972 amendments, Congress strengthened the enforcement authority of the federal government and enabled private citizens to bring an action in federal court against anyone violating effluent limitations.[56]

IV. EPA's selection of BAT was flawed

A. Technology capable of achieving IMO standards is not BAT

Our first major area of concern is with EPA's contemplated Best Available Technology ("BAT") determination that numeric technology-based effluent limitations ("TBELs") for invasive species in ballast water should be based on the International Maritime Organization's ("IMO") proposed D-2 standards. We do not believe that EPA possesses a sound factual basis for this determination, in the EPA Science Advisory Board report ("SAB Report") or otherwise.

1. The EPA Science Advisory Board's ("SAB's") assessment of ballast water management systems ("BWMSs") was flawed

a) The SAB analyzed data from only a fraction of commercially available BWMSs

The SAB panel concluded that "none of the assessed BWMS can meet a standard that is 100 or 1000 times more stringent" than the U.S. Coast Guard's proposed Phase 1 standard, which is comparable to the IMO D-2 standard.[57] The key word in this conclusion is the word "assessed." The panel reviewed only a small subset of treatment technologies (in data packages provided by EPA to the panel[58]) and did not review other information that might have been obtained independently, including whole categories of treatment systems under development:

> For this assessment, 51 individual BWMS were identified from prior reports (Albert et al. 2010; CSLC 2010; Lloyds Register 2010) to show the breadth and diversity of treatment approaches. However, it is important to note that of the 51 BWMS listed, a large proportion are at early conceptual/development stages (only approximately 15 to 20 have been tested onboard an active vessel) and a few have recently been discounted because of logistic or performance challenges. The Panel received information packages on 15 individual BWMS, but just nine BWMS were considered to have reliable data for an assessment of performance.[59]

As a result, the Panel's analysis ignored at least 42 BWMS and numerous different approaches to treating ballast water. In contrast to the Panel, the California State Lands Commission has

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[55] *Black Warrior Riverkeeper, Inc. v. Cherokee Mining, LLC*, 548 F.3d 986, 987-88 (11th Cir. 2008).
[56] *Id*. at 988.
[57] Letter from Dr. Deborah L. Swackhammer, Chair, Science Advisory Board, and Dr. Judith L. Meyer, Chair, SAB Ballast Water Advisory Panel, to Lisa P. Jackson, Administrator, U.S. Environmental Protection Agency at 2 (Jul. 12, 2011).
[58] SAB Report at 30.
[59] *Id*. at 36.

reviewed 60 BWMS and determined 18 systems had sufficient data to test for potential compliance with California's more stringent ballast water quality standards.[60]

As a result of the limited scope of the panel's review, its conclusion about the inability of BWMS to meet a standard that is 100 or 1000 times more stringent than the Phase 1 standard deserves little credence, as does its conclusion that "wholly new systems need to be developed to meet proposed standards that are 100 or 1000 times more stringent than Phase 1."[61] The panel's failure to gather data resulted in a failure to produce a comprehensive evaluation ballast water treatment technology.

b) The SAB's criteria for determining whether a BWMS can meet standards more stringent than the IMO standards were unduly restrictive

In adopting the conclusions of the SAB panel, EPA appears to be committing two fundamental errors as it assessed whether ballast water treatment systems are capable of meeting discharge standards more stringent than the IMO standards. First, EPA seems to be conflating the ability to measure performance from ballast water treatment systems (e.g., detection limits) with the actual ability of those systems to eliminate invasive species in ballast water effluent. Second, EPA seems to have rejected without sufficient analysis the statistical method offered by Dr. Raymond Vaughan of the New York State Attorney General's Office for testing ballast water treatment system compliance with standards that are orders of magnitude more stringent than the IMO D-2 standards (i.e., 10x or 100x more stringent). The SAB Report does not directly address Dr. Vaughan's proposed method, although it does – in Appendix C of its report – dismiss (without analysis) testing to more stringent standards on the ground that it would be "impracticable at this point," because "test facilities in the U.S. typically analyze ~5 m^3 of water per test" rather than larger volumes that would be required to test to standards more stringent than IMO.[62] This purported "typical" behavior of current testing facilities is not sufficient justification for assuming that existing ballast water treatment technologies cannot be tested for compliance with the more stringent standards. Even if it is true that ballast water test facilities are not currently configured to test more than five cubic meters of water at a time, the "summed Poisson method" described by Miller, et al. (2011) – a paper relied on by EPA – describes an approach for sampling ballast water from the same source in batches, then summing the results in order to reach the appropriate level of statistical confidence that a particular concentration standard is being met.[63]

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[60] California State Lands Commission, "2011 Update: Ballast Water Treatment Systems For Use In California Waters," at 33, *available at* http://www.slc.ca.gov/spec_pub/mfd/ballast_water/Documents/2011TechUpdateFinal_1Sep2011.pdf (last visited Feb. 5, 2012).

[61] Letter from Dr. Deborah L. Swackhammer, Chair, Science Advisory Board, and Dr. Judith L. Meyer, Chair, SAB Ballast Water Advisory Panel, to Lisa P. Jackson, Administrator, U.S. Environmental Protection Agency at 2 (Jul. 12, 2011).

[62] SAB Report at C-4.

[63] A. Whitman Miller, et al., "Enumerating Sparse Organisms in Ships' Ballast Water: Why Counting to 10 Is Not So Easy," 45 *Envtl. Sci. & Tech.* 3539, 3539-3546 (2011).

Although Miller et al. applies this method to test for compliance to the IMO D-2 standards, as Dr. Vaughan points out, there are no limitations inherent in the method that would prevent it from being applied to test ballast water for compliance with more stringent standards. In New York's comments to the SAB, Dr. Vaughan notes that

> New York has stated that the minimum total sample volume needed to demonstrate compliance at 95% confidence with a 100x IMO standard is 30 m^3 for organisms >50 µm and 30 ml for organisms 10-50 µm. New York recognizes that larger volumes may be preferable [for testing compliance with a 100x IMO standard] but finds that these are the minimum sample volumes needed under a Poisson distribution. The SAB report neither disagrees nor clearly acknowledges these minimum sample volumes [for engaging in such testing] . . . .[64]

In February 2011, the New York State Department of Environmental Conservation, using the same methods described by Dr. Vaughan, found that the performance of at least one treatment system, made by Ecochlor, was "at or near the confidence level needed to demonstrate compliance" with New York's Clean Water Act Section 401 water quality based requirements that vessels meet standards equivalent to 100x IMO.[65] The New York DEC has since referred to an additional ten treatment systems that have demonstrated the "potential" to comply with discharge standards that are 100x more stringent than IMO.[66]

Nothing in the SAB Report directly addresses the validity of New York's determination, which appears to us to be soundly reasoned. In selecting an "available" technology for BAT purposes, EPA is not limited to those that are contemporaneously in use by the regulated industry.[67] Data from a "relevant pilot plant," or from just one operational source, could supply the requisite support for the availability of a BAT standard.[68] Accordingly, in the absence of a more persuasive explanation from EPA, any BAT determination finding that existing ballast water treatment technologies cannot out-perform the IMO D-2 standards would be arbitrary and capricious.[69] Although EPA claims that it does not have adequate data showing that ballast water treatment systems are capable of meeting these more stringent standards, EPA has not done a sufficient analysis of whether testing methods are available that would allow for confirmation that existing technologies can out-perform the IMO D-2 standards. Based on the information developed by New York State and submitted to the SAB panel, EPA should instead

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[64] New York Comments to SAB, March 15, 2011.

[65] Letter from James M. Tierney, Assistant Commissioner, Office of Water Resources, New York State Department of Environmental Conservation (Feb. 7, 2011).

[66] Letter from Joseph J. Martens, Commissioner, New York State Department of Environmental Conservation, to Lisa Jackson, Administrator, U.S. Environmental Protection Agency (Oct. 20, 2011).

[67] *Am. Petroleum Inst. v. EPA*, 858 F.2d 261, 264 (5th Cir. 1988); *Am. Paper Inst. v. Train*, 543 F.2d 328, 353 (D.C. Cir. 1976).

[68] *Ass'n of Pac. Fisheries v. EPA*, 615 F.2d 794, 816 (9th Cir. 1980); *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1058 (3d Cir. 1975).

[69] *See, e.g.*, *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (holding that an agency decision that "entirely failed to consider an important aspect of the problem" was arbitrary and capricious); *NRDC v. EPA*, 822 F.2d 104, 111 (D.C. Cir. 1987) ("[A]n agency rule is arbitrary and capricious if the agency relies upon improper factors, ignores important arguments or evidence, fails to articulate a reasoned basis for the rule, or produces an explanation that is 'so implausible that it could not be ascribed to a difference in view or the product of agency expertise.'").

determine that BAT for ballast water treatment systems requires establishment of a TBEL at least 100x more stringent than the IMO D-2 standards.

B. Technology capable of achieving better than IMO standards is available and economically achievable

The States of California and New York have invested considerable resources and analysis in justifying numeric concentration-based effluent limits for ballast water two to three orders of magnitude more stringent than IMO standards.[70] As noted above, in February 2011, the New York State Department of Environmental Conservation found that at least one treatment system was "at or near the confidence level needed to demonstrate compliance" with New York's Clean Water Act Section 401 water quality based requirements that vessels meet standards equivalent to 100x IMO.[71] In addition, in a recent report, the California State Lands Commission found that there are now at least ten (10) commercially available treatment systems that have the potential to meet California's standards, and that the technology continues to develop rapidly.[72] According to the report, the Commission staff believes that developing detailed compliance protocols will allow for verification that these treatment systems are able to meet California's standards, and the Commission intends to engage in a rulemaking in the near future to establish these protocols.[73]

We urge EPA to take advantage of the efforts of New York and California and use their discharge standards and technology assessments as the starting point for developing technology-based effluent limits for the next VGP. We believe that EPA should not propose or adopt any technology-based effluent limitations for ship-board ballast water treatment systems that are less stringent than the stringent discharge standards that New York and California have already found to be achievable.

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[70] The standards being implemented by California under its state law, and by New York for new vessels under its Section 401 certification of the VGP, are:

- Organisms 50 or more micrometers in dimension – no detectable living organisms
- Organisms less than 50 and more than 10 micrometers in dimension – less than 0.01 living organism per milliliter
- Indicator microbes – all ballast water discharges shall contain:
    - Less than 1 colony forming unit of toxicogenic *Vibrio cholera* per 100 milliliters or less than 1 colony forming unit of than microbe per gram of wet weight of zoological samples;
    - Less than 126 colony forming units of *Escherichia coli* per 100 milliliters; and
    - Less than 33 colony forming units of intestinal entercocci per 100 milliliters.
- Any ballast water discharge shall contain less than 1,000 bacteria per 100 milliliters and less than 10,000 viruses per 100 milliliters.

[71] Letter from James M. Tierney, Assistant Commissioner, Office of Water Resources, New York State Department of Environmental Conservation (Feb. 7, 2011).

[72] California State Lands Commission, "2011 Update: Ballast Water Treatment Systems For Use In California Waters," at 33, *available at* http://www.slc.ca.gov/spec_pub/mfd/ballast_water/Documents/2011TechUpdateFinal_1Sep2011.pdf (last visited Feb. 5, 2012).

[73] *Id.* at 4.

C. EPA should have considered onshore treatment

While proposing TBELs for ballast water in the draft VGP based on what shipboard ballast water treatment systems can achieve (i.e., the IMO D-2 ballast water discharge standards), EPA states that "[n]ot all vessels will use onboard treatment systems to comply with discharge requirements."[74] The draft VGP allows for three other methods by which vessels can comply with the permit's ballast water TBELs: onshore treatment of ballast water, use of drinking water ("public water supply water" or "PWS") as ballast water, or by not discharging ballast water.[75]

Although each of these three alternatives represents a different technology-based approach to reducing or eliminating invasive species in ballast water discharges, EPA does not appear to have independently evaluated any of the three approaches in making its BAT determination that TBELs for ballast water should be based on the IMO D-2 discharge standards. Rather, EPA appears to have considered only shipboard ballast water treatment systems in its BAT determination. With respect to onshore treatment, EPA specifically finds that it is not "available" within the meaning of the CWA.[76] With respect to use of PWS or ability to avoid discharging ballast water at all, EPA appears to make no specific findings quantifying the class, category, or number of vessels for which such an alternative approach is "available" within the meaning of the statute, nor does it discuss whether or how the availability of such alternative approaches bears on its BAT determination.[77] Nevertheless, despite EPA's either finding that these alternative approaches are not "available" or declining to make any specific findings, the agency simultaneously finds that some vessels will in fact use one or more of those approaches to comply with the draft VGP's proposed ballast water TBELs.[78]

To the extent that alternative technology-based approaches are in fact "available" within the meaning of the CWA for specific categories or classes of vessels, EPA must evaluate them in its BAT determination for those vessels and require the most stringent effluent limitation achievable – regardless of whether that effluent limitation is achievable through use of a shipboard treatment system or through an alternative approach. Specifically, EPA does not appear to have independently evaluated whether there are any vessels that could achieve greater or faster reductions (or even elimination) of invasive species in their ballast water effluent using an alternative approach instead of shipboard treatment, but that would not do so unless required to do so in the VGP. This is true not only in terms of ultimate compliance with TBELs – i.e., whether any vessels that would eventually be required by the VGP to comply with IMO discharge standards could achieve a lower effluent limitation for invasive species using an alternative approach – but also in terms of the timing of compliance with TBELs – i.e., whether any vessels that under the current draft VGP would not be required to comply with IMO discharge standards until their first drydocking after 2014 or 2016 could more quickly achieve an

[74] Draft VGP Fact Sheet at 76.
[75] Draft VGP §§ 2.2.3.1.5.2-4.
[76] Draft VGP Fact Sheet at 103.
[77] Draft VGP Fact Sheet at 104-105.
[78] *See* Draft VGP Fact Sheet at 76 ("Estimates developed by King et al. (2010) suggest that *less than half of the vessels with ballast water discharge are likely to install onboard ballast water treatment systems. Some vessels are more likely to use an alternative ballast water management approach*, including not discharging ballast water while in waters subject to this permit, using onshore facilities, or using freshwater as ballast.") (emphasis added).

equivalent or better reduction of invasive species in their ballast water discharges using an alternative approach.

EPA's failure to fully and independently evaluate in its BAT determination the availability of alternative approaches to reducing or eliminating invasive species in ballast water is arbitrary and capricious, and EPA must correct this important omission from its analysis before the VGP can be lawfully reissued.[79]

This is especially true for onshore treatment of ballast water, which EPA appears to have rejected out of hand with minimal independent analysis on the ground that it is not "available" as a treatment option.[80] Not only is this finding inconsistent with EPA's own findings elsewhere in the Fact Sheet that some vessels will in fact choose to comply with the VGP's TBELs for ballast water using onshore treatment,[81] but it is also inconsistent with the EPA SAB panel's findings on onshore treatment:

> Use of reception facilities for the treatment of ballast water appears to be technically feasible (given generations of successful water treatment and sewage treatment technologies), and is likely to be more reliable and more readily adaptable than shipboard treatment. Existing regional economic studies suggest that treating ballast water in reception facilities would be at least as economically feasible as shipboard treatment.[82]

The SAB panel also conducted an extensive review of the literature on onshore treatment and found five previous studies that compared the effectiveness or costs of onshore and shipboard treatment, noting that "in each of these comparative studies, [onshore treatment] was judged to be as effective or more effective, and generally cheaper, than shipboard treatment."[83] Indeed, conventional water treatment (such as filtration followed by disinfection) can result in concentration reductions of bacteria and viruses of up to log 8 (or 100,000,000 times reduction).[84] The SAB Report also cites to a 2002 U.S. Coast Guard review of costs that finds that onshore treatment was generally less expensive than shipboard treatment.[85]

In addition to this favorable cost comparison, the SAB panel also identified a number of other "potential advantages" of onshore treatment:

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[79] *See, e.g.*, *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (holding that an agency decision that "entirely failed to consider an important aspect of the problem" was arbitrary and capricious); *NRDC v. EPA*, 822 F.2d 104, 111 (D.C. Cir. 1987) ("[A]n agency rule is arbitrary and capricious if the agency relies upon improper factors, ignores important arguments or evidence, fails to articulate a reasoned basis for the rule, or produces an explanation that is 'so implausible that it could not be ascribed to a difference in view or the product of agency expertise.'").

[80] Draft VGP Fact Sheet at 103.

[81] *See* Draft VGP Fact Sheet at 76, quoted *supra*.

[82] SAB Report at 96.

[83] SAB Report, App. B, at B-3.

[84] SAB Report at 83.

[85] SAB Report, App. B, at B-3.

> [F]ewer reception facilities than shipboard systems would be needed; smaller total treatment capacity would be needed; and reception facilities would be subject to fewer physical restrictions, and would therefore be able to use more effective technologies and processes such as those commonly used in water treatment. A shift from shipboard treatment to reception facilities is in some ways analogous to a shift from household septic tanks to centralized wastewater treatment plants.[86]

Although EPA identifies a number of logistical "challenges" that vessels may need to overcome in order to discharge their ballast water to onshore treatment facilities – i.e., that onshore facilities would likely not be available at all ports of call, that vessels would need to be able to "move ballast water up from tanks and off the ship at a rate fast enough that the vessel can perform cargo operations without significant and costly delays," and that "some vessels may need to discharge part of their ballast water before arriving at berth"[87] – EPA makes no effort to quantify these "challenges" or analyze whether some vessels would be able to overcome them, if not everywhere then at least in some regions of the country. In the absence of analysis by EPA, it is not clear that these logistical challenges are any greater or more costly to overcome than the challenges faced by vessels in installing shipboard treatment systems.

Given the clear potential advantages of onshore treatment, and in particular that "there are methods available for [onshore] reception facilities that cannot be used on vessels" to treat ballast water[88] and that onshore facilities would be less likely to rely on biocides that have potential adverse collateral impacts on human health and the environment,[89] EPA must fully and independently evaluate the availability of onshore treatment facilities as part of its BAT determination for invasive species in ballast water discharges prior to finalizing the VGP, including whether any existing onshore facilities could be adapted to accept ballast water from any categories or classes of vessels.[90]

V. EPA's phased compliance schedule is flawed

As a general rule, the CWA requires that dischargers comply immediately with all TBELs based on BAT, in furtherance of the statute's goal that all discharges of pollution ultimately be eliminated.[91] Under EPA regulations, EPA may not use compliance schedules to extend this statutory deadline.[92]

In the draft VGP, EPA attempts to circumvent this prohibition on compliance schedules for TBELs on invasive species in ballast water based on a novel theory of phased BAT compliance: i.e., that ballast water treatment systems are not yet "available" within the meaning of the statute – despite the fact that many systems are in fact commercially available today – but

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[86] SAB Report at 81.
[87] Draft VGP Fact Sheet at 104.
[88] SAB Report at 82.
[89] *Id*. at 84.
[90] *See, e.g., Kennecott v. EPA*, 780 F.2d 445, 453 (4th Cir. 1985); *Reynolds Metals Co. v. EPA*, 760 F.2d 549, 562 (4th Cir. 1985); *Tanner's Council*, 540 F.2d at 1192.
[91] *See* 33 U.S.C. § 1311(b) (requiring compliance with BAT effluent limitations no later than March 31, 1989).
[92] *See* 40 C.F.R. § 122.47 ("Any schedules of compliance under this section shall require compliance as soon as possible, but not later than the applicable statutory deadline under the CWA.").

that they will become "available" for statutory compliance purposes according to the schedule that has already been proposed by the IMO and the U.S. Coast Guard for compliance with IMO D-2 standards.[93] This proposed schedule contemplates that the smallest category of vessels (less than 1500 cubic meters) and the largest category of vessels (greater than 5000 cubic meters) will be required to install ballast water treatment systems by the time of their first drydocking after 2016, and that the middle category of vessels (between 1500 and 5000 cubic meters) will be required to install ballast water treatment systems by the time of their first drydocking after 2014.[94] EPA states in the Fact Sheet that it "has determined that it is not possible for all vessels equipped with ballast water tanks to install ballast water treatment systems by December 19, 2013 due to worldwide limitations in drydock capacity and ballast water treatment capacity to manufacture sufficient numbers of systems for all vessels to install within a two year period."[95]

EPA's purported "determination" that a more rapid implementation schedule than that proposed by the IMO and the Coast Guard is not "economically achievable" does not appear to be based on an independent analysis that is well supported within the permit record. As noted above, BAT is a stringent treatment standard that has been held to represent "a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges."[96]

In establishing the BAT implementation schedule for the draft VGP, EPA does not appear to have made its own findings as to how quickly vessels could install ballast water treatment systems if they devoted "the maximum resources economically possible" to that goal. Rather, EPA seems to have simply taken the industry's word for it that a more rapid implementation schedule would not be achievable, stating in the Fact Sheet that it "did consider accelerating" its compliance schedule for ballast water TBELs in the draft VGP but "decided against doing so, based on concerns that altering the anticipated [IMO compliance] schedule at this late a date could disrupt the industry's prior planning and perhaps even result in further delays."[97] Such uncritical deference to the shipping industry's "prior planning" is not consistent with the CWA's mandate that, after 1989, BAT be implemented immediately to reduce and ultimately eliminate pollution as rapidly as is economically possible. Nor is EPA's sole reliance on two PowerPoint presentations from the same industry-sponsored conference in the Netherlands – one from a shipping industry consultant and the other from the Marine Director of the German Shipowners' Association – to conclude that "additional challenges associated with retrofitting the large number of vessels that will need to install treatment technologies" justify adoption of the IMO's implementation schedule.[98] It is also worth noting that EPA did not even attempt to analyze any more rapid implementation scenarios in its Economic and Benefits

[93] Draft VGP Fact Sheet at 81, 106-108.
[94] Draft VGP § 2.2.3.5.2.
[95] Draft VGP Fact Sheet at 81.
[96] *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 74 (1980).
[97] Draft VGP Fact Sheet at 106.
[98] PowerPoint presentation by Henrik Bacher, Elomatic Consulting & Engineering, "How to Choose and Integrate Best System that Fulfills Your Requirements," 4th Ballast Water Management Summit, Amsterdam, The Netherlands (2011), Docket No. EPA-HQ-OW-2011-0141-0037; PowerPoint presentation by Capt. Wolfgang Hintzsche, Marine Director, German Shipowners' Association, "Addressing Retrofit and Operational Challenges of BWT-Systems," 4th Ballast Water Management Summit, Amsterdam, The Netherlands (2011), Docket No. EPA-HQ-OW-2011-0141-0127.

Analysis for the draft VGP; instead, "EPA assumed that no additional vessels will install a [ballast water treatment system] to comply specifically with the VGP discharge standards."[99]

In particular, the draft VGP's allowance for vessels to comply with IMO ballast water discharge standards only after their first drydocking after a given compliance deadline is a significant and unjustified delay. As EPA notes in the Fact Sheet, most vessels typically drydock on a three to five year cycle.[100] Thus, EPA has proposed to allow vessels an additional three to five year period before having to comply with IMO ballast water discharge standards, based on the assumption that any shipboard ballast water management system would have to be installed during the vessel's scheduled drydocking. [101]

There does not appear to be adequate support for this assumption in the permit record, however. On the contrary, when the Coast Guard evaluated this issue in 2009, it stated in its Preliminary Regulatory Analysis and Initial Regulatory Flexibility Analysis that "[n]one of the proposed systems" for ballast water treatment analyzed by the Coast Guard "requires the vessel to be drydocked."[102] The same document states that "[o]nce the regulatory regime is articulated and actual production and installation have begun, we [*i.e.*, the Coast Guard] consider it relatively easy to install a treatment system."[103] Moreover, the American Bureau of Shipping has found that, although "most systems will require some out of service time for the ship in order to complete the installation[,] . . . none of those currently on the market is likely to require drydocking."[104]

Additionally, Hyde Marine, one of the leading ballast water treatment technology suppliers, asserts in its vendor literature that the Hyde GUARDIAN system has the advantages of "small space and ease of installation…Interface with the existing ballast system is simple and many installations are completed without requiring drydock and even while the vessel is in commercial operation."[105] Another manufacturer, Marenco Technology Group Inc., also states that its ballast water treatment system requires "[n]o vessel down time to install and minimal modification."[106] EPA must evaluate these and other ballast water treatment systems, prior to finalizing the draft VGP, to determine whether any systems can be installed on vessels without drydocking. If there are in fact available ballast water treatment systems whose installation does not require drydocking, then EPA must revise its BAT determination and compliance schedule accordingly.

More broadly, EPA should not allow for unjustified delays in requiring compliance with the TBELs that it has established for invasive species in ballast water discharges. Before

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[99] Economic and Benefits Analysis at 68.
[100] Draft VGP Fact Sheet at 107.
[101] *See* Draft VGP Fact Sheet at 107 ("EPA expects that most existing vessels will need to enter a drydock to install a ballast water management system. . . .").
[102] U.S. Coast Guard Office of Standards Evaluation and Development, *Preliminary Regulatory Analysis and Initial Regulatory Flexibility Analysis* (June 2008), Doc. No. USCG-2001-10486-0140.1, at 49.
[103] *Id.* at 59.
[104] American Bureau of Shipping, "Eagle – Ballast Water Treatment Advisory," 27 (2010).
[105] Hyde GUARDIAN Ballast Water Treatment System, at 2, *available at* http://www.hydemarine.com/ballast_water/documents/HydeMarine225Brochure.pdf (last visited Feb. 6, 2012).
[106] Marenco Technology Group, Why Choose Marenco, *available at* http://www.marencogroup.com/about.html.

finalizing the draft VGP, EPA must evaluate whether its proposed implementation schedule for ballast water TBELs is consistent with the CWA's mandate that, after 1989, BAT be implemented immediately to reduce and ultimately eliminate pollution as rapidly as is economically possible. Specifically, EPA must make a finding that its BAT implementation schedule represents "a commitment of the maximum resources economically possible" to reducing or eliminating invasive species in ballast water, rather than (as it seems to have done here) a schedule that will minimize burdens on the shipping industry. If EPA is unable to make such a finding based on independent analysis, then EPA should compress the implementation timeline and require that technology-based effluent limitations be met on the date that the new permit goes into effect.

VI. EPA's "Narrative WQBEL" is flawed

EPA appropriately "determined that, after application of the required TBELs, reasonable potential to cause or contribute to an exceedance of water quality standards exists." [107] EPA's subsequent determination, however, "that calculation of a numeric WQBEL is infeasible at this time,"[108] is flawed. Moreover, EPA's so-called narrative WQBEL for ballast water discharges is illegal, because it is not practically enforceable.

It is already well-established that EPA's TBELs – the IMO D-2 standards – were not designed to achieve complete prevention of new invasive species introductions and thus fully protect water quality standards. Although negotiations over the IMO Ballast Water Convention resulted in a consensus on a set of numeric standards for live organism concentration in ballast water discharges, the standards agreed upon were not based purely on a scientific assessment of the level of protection needed to prevent significant risk of ballast-mediated species invasions, but also incorporated "inputs from experts in other disciplines, such as shipping and engineering, risk managers, as well as state, national, non-governmental organization[s] (NGO[s]), and industry representatives."[109] During the negotiations, the U.S. delegation (led by the Coast Guard) proposed a concentration-based discharge standard 1000 times more stringent than that which was ultimately agreed upon in the negotiations, "based on the large number of organisms that would be discharged even at these low concentrations and the additive densities from multiple ship discharges."[110] Other countries urged that substantially weaker standards be adopted, however, and "the numbers ultimately adopted reflect a negotiated outcome among the many countries with differing views," which "makes it extremely difficult, or impossible, to parse exactly how a decision was made" or to determine "whether the IMO standards are

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[107] U.S. EPA, *2011 Proposed Issuance of National Pollutant Discharge Elimination System (NPDES) Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Vessels: Draft Fact Sheet*, at 120, 125.
[108] *Id*. This determination is inconsistent with, and renders irrational, EPA's simultaneous statement that it "generally expects that vessels that achieve the permit's technology-based limits through the careful implementation of effective pollution control measures and BMPs are likely to already be controlling their vessel discharges to a degree that would make additional water quality-based controls unnecessary." *Id*. at 149. *See also* VGP § 2.3.1 ("EPA generally expects that compliance with the other conditions in this permit, including Parts 2.1, 2.2, and 5, will control discharges as necessary to meet applicable water quality standards.")
[109] Henry Lee II, et al., Density Matters: Review of Approaches to Setting Organism-Based Ballast Water Discharge Standards, ix, 12 (2010) (U.S. EPA, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Western Ecology Division, EPA/600/R-10/031), *available at* http://www.epa.gov/npdes/pubs/vessels_densitymatters_final.pdf.
[110] *Id.* at 15.

sufficiently protective."[111] Nevertheless, a further analysis of the IMO's own data by the California Advisory Panel on Ballast Water Performance Standards found that nearly half of all commercial vessels that discharge ballast water would meet the IMO standards without conducting any treatment or ballast water exchange whatsoever, indicating that the IMO standards do not represent a substantial improvement in protection over the status quo.[112]

EPA's purported WQBEL only incorporates the general requirement that "discharge[s] must be controlled as necessary to meet applicable water quality standards in the receiving waterbody or another waterbody impacted by . . . discharges."[113] This is not specific enough to be measurable or practically enforceable, either by the agency or citizens. Moreover, if EPA itself cannot determine a numeric discharge limit that will protect existing and designated uses or meet water quality criteria,[114] it is completely unreasonable for the agency to expect States, let alone ship captains, to know what concentration of organisms in ballast water discharges will assure compliance with water quality standards.

Significantly, EPA nowhere finds or determines, as it must, that the "WQBEL" will assure compliance with water quality standards; the agency only "expects" it "to be as stringent as necessary to achieve water quality standards."[115] Furthermore, this expectation is entirely unsupported by any reasoned analysis demonstrating that the "WQBEL" will protect designated or existing uses.

Although different States' water quality standards may vary in minor respects with respect to invasive species, if EPA chooses to continue regulating vessels by means of a CWA nationwide general permit, then EPA has the legal responsibility to establish a strong federal regulatory floor that protects core CWA antidegradation policy interests and designated uses that are common across all the States. To the extent that technologies are not commercially available that would enable vessels to comply immediately with any WQBELS that are more stringent than applicable TBELs, the CWA allows for EPA to incorporate a compliance schedule into a permit.[116]

What the CWA does not allow, however, is for EPA to postpone compliance with the law indefinitely based on a thin promise that it may require it in the future, as it does in the draft VGP by asserting that numeric WQBELs are "infeasible."[117] Because theoretically a reproducing population of non-indigenous organisms can be established by the introduction of a

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[111] *Id.* at 15-16.
[112] California State Lands Commission, *Report on Performance Standards for Ballast Water Discharges in California Waters*, 4, app. 2 & 4 (2006), *available at* http://www.slc.ca.gov/spec_pub/mfd/ballast_water/Documents/CSLCPerformanceStndRpt_2006.pdf.
[113] VGP § 2.3.1.
[114] EPA acknowledges that "many narrative criteria and anti-degradation and general policies of applicable state water quality standards do seek to prevent the types of degradation that is associated with the introduction of ANS into receiving waters." Draft VGP Fact Sheet at 121.
[115] Draft VGP Fact Sheet at 149.
[116] 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d)(5).
[117] Draft VGP Fact Sheet at 120.

few individuals, any solution must achieve complete prevention.[118] Further, as noted above, EPA is not allowed to consider economic or technological feasibility in making determinations as to what WQBELs are necessary in the VGP to protect water quality standards.[119]

EPA's failure in the draft VGP to identify the criteria that must be evaluated to determine WQBELs for invasive species in ballast water discharges contrasts with the efforts that States have made to identify those criteria and adopt standards to ensure their water quality is fully protected. In 2006, California adopted stringent water-quality based standards recommended by the California Advisory Panel on Ballast Water Performance Standards.[120] The California panel found that its recommended standards "are significantly better than ballast water exchange, . . . are in-line [sic] with the best professional judgment from the scientific experts participating in the IMO Convention, and . . . approach a protective zero discharge standard."[121]

The New York Department of Environmental Conservation ("NYS DEC") agreed with California's assessment, adopting California's standards as conditions to the VGP under its CWA Section 401 authority to certify that the VGP would comply with state water quality standards.[122] As NYS DEC found, "there is overwhelming evidence that water quality, including fish, shellfish, and wildlife propagation and survival, has been impaired in recent decades" in the Great Lakes by the introduction and spread of invasive species through vessels' ballast water discharges, and only a stringent water quality-based standard is adequate to ensure that those existing and designated uses are protected from invasive species introduced and spread through ballast water.[123]

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[118] *See* Anthony Ricciardi & Hugh J. MacIsaac, *Evaluating the Effectiveness of Ballast Water Exchange Policy in the*
Great Lakes, 18 Ecological Applications 1321, 1322 (2008).

[119] *See* 33 U.S.C. §§ 1341(a)(1), 1341(d); 40 C.F.R. § 122.44(d)(1); *see also Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1163 (9th Cir. 1999) (noting that, under CWA, permitting authority "is under specific obligation to require that level of effluent control which is needed to implement existing water quality standards *without regard to the limits of practicability*") (emphasis added) (internal citations omitted); *In re Moscow*, 10 E.A.D. 135, NPDES Appeal 00-10, 2001 WL 988721, at *24 (E.A.B. July 27, 2001) ("[S]ection 301(b)(1)(C) of the CWA requires unequivocal compliance with applicable water quality standards, and does not recognize an exception for cost or technological infeasibility.").

[120] California State Lands Commission, *Report on Performance Standards for Ballast Water Discharges in California Waters* (2006), *available at*
http://www.slc.ca.gov/spec_pub/mfd/ballast_water/Documents/CSLCPerformanceStndRpt_2006.pdf.

[121] *Id.* at 37.

[122] Letter from William R. Adriance, Chief Permit Administrator, New York State Department of Environmental Conservation, to Barbara Finazzo, Director, Division of Environmental Planning and Protection, U.S. Environmental Protection Agency (Dec. 17, 2008), *available at* http://www.epa.gov/npdes/pubs/401_newyork.pdf. The New York Supreme Court, Appellate Division recently found that "ample scientific evidence and expert opinion exists in the record to support DEC's determination that [New York's Section 401] conditions are necessary to ensure federal permittees' compliance with New York's existing narrative water quality standards." *Port of Oswego Auth. v. Grannis*, 70 A.D.3d 1101, 1103 (N.Y. App. Div. 3d Dep't 2010). "These existing standards aim to protect the state's waters from pollution and the conditions are reasonable restrictions intended to reduce the unintentional discharge of invasive aquatic species and other pathogens, thereby protecting the state's waters from the harm that such species and pathogens inflict." *Id.*

[123] Letter from William R. Adriance, Chief Permit Administrator, New York State Department of Environmental Conservation, to Barbara Finazzo, Director, Division of Environmental Planning and Protection, U.S. Environmental Protection Agency (Dec. 17, 2008), *available at* http://www.epa.gov/npdes/pubs/401_newyork.pdf.

EPA's failure to establish a meaningful WQBEL, in conjunction with its extended schedule for compliance with the TBELs applicable to oceangoing vessels, means that a substantial percentage of vessels likely will not be required to meet any numeric effluent limitations during the term of the next VGP. This is unacceptable.

Overall, we believe that EPA must set zero detectable living organisms as a numeric goal, unless EPA is able to determine with confidence that there is a level of invasive species above zero that could be discharged into differing receiving water bodies without causing establishment of reproducing populations of the species. Such a zero detectable living organisms approach has the benefit of being "technology-forcing," *i.e.*, it would encourage the development of technology to better protect aquatic ecosystems.[124] This includes, for example, the development of novel ballasting technology and techniques, such as flow through ballast tanks or other mechanisms that would result in no ballast-mediated movement of live organisms, or possibly even water, from one bioregion to another. This approach is consistent with the one taken by California and New York, which were unable to find any valid scientific basis to recommend less stringent standards.[125]

In deriving WQBELs for the VGP, we urge EPA not to conflate the issue of what level of invasive species can be detected and quantified with the issue of how a narrative water quality standard (*e.g.*, that invasive species shall not be discharged in amounts that impair existing or designated uses) can be defined and implemented. The technical limitations of the current state of sampling and detection capabilities of invasive species in ballast water has no place in that consideration.

This does not mean that EPA should not consider the limitations on sampling and detection methods in the development of WQBELs – only that EPA should not consider them until after it has determined what the numeric goal for the receiving water body should be. It is only once EPA has decided on that biologically protective numeric goal that EPA should consider how limitations on the ability to sample and detect invasive species should affect the translation of that numeric goal into WQBELs for the next VGP. The practical significance of this is that it would make clear that, as the sampling and detection methods improve, the permit limit would have to decrease along with them – and it should create a stronger mandate to improve upon existing sampling and detection methods over time.

We further urge EPA to include WQBELs in the VGP that prevent introductions of pathogenic organisms through ballast water. The ability of commercial vessels to transport pathogens is a serious concern for regions across the United States for reasons including, but not

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[124] *See, e.g.*, *U.S. Steel v. Train*, 556 F.2d 822, 838 (7th Cir. 1977); *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1163 (9th Cir. 1999); *In re Moscow*, 10 E.A.D. 135, NPDES Appeal 00-10, 2001 WL 988721, at *24 (E.A.B. July 27, 2001).

[125] *See* California State Lands Commission, *Report on Performance Standards for Ballast Water Discharges in California Waters* (2006), at App. A-4, *available at* http://www.slc.ca.gov/spec_pub/mfd/ballast_water/Documents/CSLCPerformanceStndRpt_2006.pdf; Letter from William R. Adriance, Chief Permit Administrator, New York State Department of Environmental Conservation, to Barbara Finazzo, Director, Division of Environmental Planning and Protection, U.S. Environmental Protection Agency (Dec. 17, 2008), *available at* http://www.epa.gov/npdes/pubs/401_newyork.pdf.

limited to, risks to plant and animal health, to human health and recreation, and to freshwater/drinking water reservoir protection.

Microorganisms are transported in large volumes in ballast water. There is a general understanding that due to the sheer number of microorganisms in water, combined with unique survival strategies, microorganisms possess a "great capacity to invade new environments."[126] For an example of the tremendous number of microorganisms being transported, one study quantified microorganisms in ballast water of international commercial vessels arriving at Chesapeake Bay from overseas ports and reported mean abundances of 8.3×10^8 bacteria and 7.4×10^9 virus-like particles per l–1.[127]

While little is known of the potential significance of commercial vessel movement of pathogens via ballast, researchers are raising the alarm that ballast water may be an important way waterborne diseases move around the globe. Researchers have asked,

> Are we playing Johnny Appleseed with aquatic micro-organisms as global shipping inadvertently spreads them around the world in discharged ballast water? And if so, need we be concerned that some of those microbes are harmful? Certainly these questions are ones of considerable interest to microbial ecologists, but given the context, are pertinent to water quality managers and regulatory agencies as well.[128]

And in 2005, the National Oceanic and Atmospheric Administration determined that microbial pathogens were found in ballast tank residuals of international vessels transiting to the Great Lakes (including cholera and giardia). While the researchers said tanks carrying pathogens are not a likely health risk to humans, they recommended more investigation.[129] These calls for greater understanding of the issue are underscored by irregular, but tragic, outbreaks of waterborne disease, which some postulate were sparked by contaminated ballast discharges.[130]

Finally, EPA should consider whether regional or waterbody-specific WQBELs are appropriate for the VGP. We are concerned that "interacting mechanisms" may differ across ecosystems and may influence the likelihood of a live organism's successful population establishment differently, for example there may be different interacting mechanisms influencing the likelihood of species establishment from a ballast discharge in closed freshwater ecosystems versus a brackish coastal embayment or a saltwater coastal ecosystem. If EPA is aiming to set a

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[126] Drake, L. et al (2002) "Microbial ecology of ballast water during a transoceanic voyage and the effects of open-ocean exchange" Mar Ecol Prog Ser, Vol. 233: 13–20

[127] Ruiz GM, et al (2000) "Global spread of microorganisms by ships" Nature 408:49–50

[128] Dobbs, F.C., "Ships ballast tanks: How Microbes Travel the World," *Microbiology Today* (2008), *available at* http://www.sgm.ac.uk/pubs/micro_today/pdf/050805.pdf.

[129] Johengen, T. et al. (2005) "Assessment of Transoceanic NOBOB Vessels and Low-Salinity Ballast Water as Vectors for Non-indigenous Species Introductions to the Great Lakes" NOAA Great Lakes Environmental Research Laboratory.

[130] In 1991 in Peru, a ship carrying contaminated water from Asia in its ballast tanks sparked off a cholera epidemic that spread rapidly throughout South and Central America. About 11 000 people died. World Health Organization, "Removing Obstacles for Healthy Development" 1999. http://www.who.int/infectious-disease-report/pages/ch13text.html.

single, nationally applicable set of WQBELs in the VGP, we believe that those WQBELs should be set to protect the most sensitive receiving waterbody, which will in turn protect less sensitive receiving waterbodies.

VII. EPA must improve the VGP's monitoring and reporting requirements to make compliance with the permit enforceable by the agency and citizens

"[T]o assure compliance with permit limitations," an EPA regulation specifies that each NPDES permit "shall include . . . when applicable . . . requirements to monitor . . . [t]he mass (or other measurement specified in the permit) for each pollutant limited in the permit."[131] EPA has erroneously relied on the "when applicable" language in this regulation to justify monitoring only of ballast water treatment system functionality and compliance with the numeric limitations on two biological "indicator" organisms, rather than compliance with the numeric limitations on organisms in ballast water discharges.[132] EPA claims that practical constraints on monitoring living organisms in ballast water discharges, by mass or any other measure, makes such monitoring inapplicable.[133]

EPA's interpretation of the "when applicable" language is not reasonable, nor is it consistent with the requirement that NPDES permits "assure compliance" with effluent limitations.[134] The natural reading of the "when applicable" language is that monitoring is required when a permit specifies a measurement for a pollutant limited in the permit. Only when a permit does not specify any measurement for a pollutant would a monitoring requirement be inapplicable. For example, a narrative limit on a pollutant is not one capable of measurement.

The "when applicable" language does not relieve EPA of the responsibility to require monitoring because of practical constraints. Such an interpretation renders the inclusion of numeric limits on ballast water discharges meaningless because it makes enforcement of those limits impossible.

Even if monitoring the functionality of a treatment system is a legally acceptable alternative to monitoring the discharge directly, EPA appears to assume that the draft VGP's requirement that ballast water treatment systems be operated "in accordance with all manufacturer's specifications"[135] is sufficient to ensure that a vessel will use its treatment system on each and every discharge of ballast water. EPA has failed to demonstrate or find, however, that once a treatment system is installed and approved, that proof that it is functioning means that it is in fact being used. If EPA makes such a demonstration and finding, it should expressly require that the treatment system be engineered to ensure that it is automatically engaged whenever ballast water is discharged and that it cannot be disconnected. This is essential if EPA

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[131] 40 C.F.R. § 122.44(i)(1)(i).
[132] *See* VGP §§ 2.2.3.5.1.1.2, 2.2.3.5.1.1.4.
[133] VGP Fact Sheet at 83 n.18 ("[L]iving organism monitoring of vessel ballast water discharges, by mass or any other measure, is not required in this permit due to practical constraints on the ability to collect and analyzed the volumes of ballast water necessary to directly detect and quantify such organisms at the levels of concern. Such requirements, therefore, are not "applicable" to this situation and are not included in today's permit.").
[134] 33 U.S.C. § 1342(a)(2).
[135] VGP § 2.2.3.5.1.1.

is going to rely on monitoring the functionality of the system, instead of monitoring the ballast water itself, to assure compliance with the effluent limitations.

Assuming for the sake of argument that monitoring functionality and fewer than all categories of organisms were legally permissible, EPA has given no reason for not requiring operators to report the results of monitoring more frequently than once a year.[136] Operators are required to monitor system functionality at least once per month,[137] and "[m]any ballast water treatment system manufacturers require that the BWTS monitoring and recordkeeping are operated continuously to assure the system is functioning as designed."[138] Requiring operators to report the results of monitoring at least once per month therefore does not impose an unreasonable burden in light of the consequences of noncompliance. Such a requirement also facilitates enforcement, allowing EPA and citizens to take timely action to stop operators who fail to comply with permit requirements.

In addition, the permit should require reporting within twenty-four hours of any incident of a discharge or uptake of ballast water contrary to the terms of the permit. Such a requirement is preferable to the proposed requirement – that the operator report within twenty-four hours any noncompliance that may endanger health or the environment – because it is more definite, giving less leeway for operator interpretation.[139] Of course, this requirement would unfortunately be of little value unless EPA imposes a practically enforceable WQBEL, rather than the meaningless one it has proposed.

Finally, there are other limitations in the VGP monitoring requirements. For example, monitoring is required for total heterotrophic bacteria, in order to "establish better information about how bacterial communities respond to ballast water treatment"[140] , yet there is no discharge standard for this organism group, leading to potential for discharge while still being in compliance. For the two parameters for which monitoring is required (*E. coli* and enterococci bacteria), monitoring is required only two or four times per year (depending on vessel category with respect to type-approved devices). This type of schedule may allow for abuse (e.g., avoidance of monitoring following ballasting in harbors known or thought to be particularly contaminated with pathogens). And in this type of scenario, a larger concern in any case would be the presence of pathogenic organisms, rather than the indicator organisms which are the focus of the monitoring requirements, thus raising further questions on the effectiveness of the VGP in protecting against discharge of harmful disease-causing organisms.

VIII. EPA should require vessels entering the Great Lakes to conduct ballast water exchange even after they are required to meet numeric effluent limitations for invasive species, but cannot characterize this TBEL as a WQBEL

We support EPA requiring in the VGP, as an additional TBEL, that vessels entering the Great Lakes continue conducting ballast water exchange even after they also are required to meet

[136] *See* VGP § 4.4.1.
[137] VGP § 2.2.3.5.1.1.2.
[138] Draft VGP Fact Sheet at 85.
[139] *See* VGP § 4.4.4.
[140] Draft VGP Fact Sheet at 87.

numeric TBELs for invasive species based on ballast water treatment. Ballast water exchange should improve the performance of ballast water treatment systems being used in freshwater environments, enhancing protection of the receiving waterbody. This combination approach should reduce the overall number of non-indigenous freshwater species being released in the Great Lakes, even if the absolute number of individuals released after treatment remains the same.[141] Moreover, requiring vessels to exchange their ballast water in the open ocean before treating it would potentially allow some treatment systems to operate more effectively as open ocean water contains less debris and plankton than coastal port waters. This combination of ballast water exchange and treatment should be required for all oceangoing vessels that enter the Great Lakes or otherwise operate in freshwater environments, regardless of their origin, as an additional TBEL, consistent with the CWA's mandate that BAT represent "a commitment of the maximum resources economically possible" to reducing or eliminating pollutants,[142] including invasive species in ballast water.

EPA errs, however, in characterizing these proposed requirements in the draft VGP as "WQBEL requirements."[143] As explained above, an effective WQBEL for invasive species in ballast water discharges must assure compliance with water quality standards, including state narrative criteria as well as existing and designated uses, which in the invasive species context means preventing the introduction and spread of harmful new species, not just reducing their risk. EPA points to no evidence that its proposal to require vessels entering the Great Lakes to combine ballast water exchange with implementation of treatment will effectively eliminate the risk of further harmful species invasions and thus ensure that state water quality standards are fully and meaningfully protected. Rather, the best that EPA can claim for this approach is that it would "add another measure of protection against invasive species."[144] While that finding provides a strong rationale for this requirement being adopted in the next VGP as a TBEL, the mere fact that such a requirement represents another step in the right direction does not mean that this provision is sufficient to assure compliance with water quality standards. Thus, EPA's inclusion in the draft VGP of requirements that ballast water exchange be combined with ballast water treatment for vessels entering the Great Lakes, while positive, does nothing to cure the draft VGP's legally deficient approach to WQBELs.

IX. EPA's failure to determine BAT for lakers violates the Clean Water Act

EPA has decided not to subject vessels built before January 1, 2009, operating exclusively within the Great Lakes to the numeric discharge limitations in § 2.2.3.5 of the VGP.[145] EPA justifies this decision on the "challenges of installing ballast water treatment systems appropriate for these vessels."[146]

Curiously, these "challenges" failed to spur EPA to consider one of the treatment alternatives it acknowledged, but summarily dismissed, in selecting the BAT for oceangoing

[141] Development of Guidelines and Other Documents for Uniform Implementation of the 2004 BWM Convention. Submitted by Canada to the International Maritime Organization. December 10, 2010.
[142] *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 74 (1980).
[143] Draft VGP Fact Sheet at 127.
[144] Draft VGP Fact Sheet at 126.
[145] Draft VGP Fact Sheet at 111.
[146] *Id*.

vessels: onshore treatment. For all the reasons stated above with respect to oceangoing vessels, EPA must evaluate this method in its BAT determination for lakers and require the most stringent effluent limitation achievable.

Furthermore, it is important to note that the SAB panel did not exhaustively examine the issue of ballast water treatment in lakers, and thus did not conclude anything about a "lack of currently available ballast water treatment systems appropriate for these vessels."[147] A number of existing shipboard treatment systems could potentially be applicable on lakers (e.g., deoxygenation, filtration/UV treatment),[148] and even if in some cases adequate hold times were not available (e.g. on shorter voyages) for a particular technology, differential requirements could potentially be adopted. The SAB panel did not evaluate in any detail whether any of these treatment systems are available to lakers; the SAB panel simply listed (in a single paragraph, without any supporting citations) several "limitations" that may prevent lakers from utilizing shipboard ballast water treatment systems.[149] As the SAB panel did not analyze this issue, EPA must do its own independent analysis of whether these ballast water treatment systems are in fact available for lakers.

In addition, EPA notes in the Fact Sheet that shipboard testing of a ballast water treatment system was conducted in August 2011 on a laker vessel by the Great Ships Initiative.[150] As data from a "relevant pilot plant," or from just one operational source, could supply the requisite support for the availability of a BAT standard,[151] EPA must consider the findings of this research as soon as they become available – as well as any other research or data on the ability of lakers to implement ballast water treatment systems collected before the draft VGP is finalized – and modify its BAT determination accordingly.

Although laker vessels do not play a primary role in introducing invasive species into the Great Lakes, these vessels take up and discharge billions of gallons of ballast water every year as they travel from port to port within the Great Lakes, thus playing a significant role in spreading invasive species after they have been introduced.[152] Roughly 90% of the commercial shipping operations in the Great Lakes area are domestic, and lakers account for over 95% of the volume of ballast water transferred.[153] Thus, although lakers may not introduce nonindigenous species to the Great Lakes ecosystem as a whole, they transport invasive species to portions of the

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[147] Draft VGP Fact Sheet at 111.

[148] *See, e.g.*,Tamburri, M.N. & Ruiz, G.M, 2005, Evaluations of a Ballast Water Treatment to Stop Invasive Species and Tank Corrosion. Paper No. 2005-D09; Albert, R., R. Everett, J. Lishman, and D. Smith, 2010, *Availability and Efficacy of Ballast Water Treatment Technology: Background and Issue Paper*, U.S. EPA and U.S. Coast Guard, Washington, D.C.

[149] SAB Report at 40.

[150] Draft VGP Fact Sheet at 111.

[151] *Ass'n of Pac. Fisheries v. EPA*, 615 F.2d 794, 816 (9th Cir. 1980); *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1058 (3d Cir. 1975).

[152] *See* Michigan Department of Environmental Quality (MDEQ), Comments Received on the Draft Section 401 Water Quality Certification (Dec. 8, 2008), *available at* http://www.michigan.gov/documents/deq/wb-swas-401cert-response_258951_7.pdf (Response to Comment 2); Rup et al., *Domestic Ballast Operations on the Great Lakes: Potential Importance of Lakers as a Vector for Introduction and Spread of Nonindigenous Species,* Can. J. Fish. Aquat. Sci. 67(2): 256–268 (2010).

[153] *Id*.

ecosystem where they were not found, dispersing them wider and faster that those species could have spread on their own.[154]

Lakers are especially suited to transport invasive species for two reasons. First, they move the water over relatively short distances and thus do not keep it in their ballast tanks for a long time, leading to a high survival rate for the organisms inside.[155] Secondly, empirical evidence shows that 30% of the ballast water for lakers is loaded in Detroit, Nanticoke (Ontario), Indiana Harbor and Cleveland, while most of it (56%) is discharged in Superior, Duluth, Two Harbors, Stoneport and Calcite ports.[156] This leads to a conclusion that a lot of ballast water transfer goes upstream, transporting invasive species at a rate far greater than they could achieve on their own.[157]

A report by the Canadian government shows that lakers could serve as a vector for primary introduction of non-indigenous species to ports on the Great Lakes by moving ballast water sourced from ports on the St. Lawrence River, if taxa native to ports on the St. Lawrence River are non-indigenous to the Great Lakes, or if ports on the St. Lawrence River serve as sites for the primary introduction and establishment of taxa that are non-indigenous to both regions.[158] Just as importantly, while only 1% of lakers transport water from St. Lawrence River ports to Great Lakes, the absolute volume is equivalent to the contribution by coastal and transoceanic vessels combined.[159]

X. EPA must consult with the Fish and Wildlife Service and National Marine Fisheries Service under Section 7 of the Endangered Species Act

As EPA notes in its Economic and Benefits Analysis for the draft VGP, "[i]nvasions have had especially adverse impacts on threatened and endangered species by predation, alteration of habitat, or further competition for limited resources."[160] EPA cites studies estimating that invasive species "are a contributing factor to the endangered status of 70 percent of listed fish species, and more than half of combined endangered and threatened listings," as well as having "contributed to 68 percent of fish extinctions in the last 100 years."[161]

Accordingly, before issuing the final VGP, EPA must initiate and complete Endangered Species Act (ESA) Section 7 consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) regarding the effects of the permit on threatened and endangered species and critical habitat.[162]

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[154] *Id*.
[155] *See id.* (With many intra-regional transits taking less than 24 hours, and typical inter-regional sailing times of 3–4 days, plankton survival in ballast tanks of lakers is expected to be very high).
[156] *Id*.
[157] *Id*.
[158] S.A. Bailey, Fisheries and Oceans Canada, *Report on Domestic Ballast Water Study – Phase 2* (Fiscal Year 2008-2009) at 7, *available at* http://www.piersystem.com/posted/443/Appendix3FisheriesandOceansCanadaRoleofDomesticBallastWaterStudyPhase2.355926.pdf.
[159] *Id*.
[160] Economic and Benefits Analysis at 133.
[161] *Id*.
[162] 16 U.S.C. § 1536(a)(2).

Under ESA § 7(a)(2), 16 U.S.C. § 1536(a)(2), federal agencies must, in consultation with either FWS or NMFS, insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.[163] ESA § 7 and the implementing regulations set out a process for determining the biological impacts of a proposed activity.[164]

An agency proposing an action must first determine whether the action "may affect" species listed as threatened or endangered under the ESA.[165] If it is determined that the action "may affect" listed species or designated critical habitat, the action agency must pursue some form of consultation, either "formal" or "informal." Informal consultation is "an optional process that includes all discussions, correspondence, etc., between the Service and the Federal agency . . . designed to assist the [action agency] in determining whether formal consultation . . . is required."[166] "If during informal consultation it is determined by the [action agency], with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is terminated, and no further action is necessary."[167] If an action agency chooses to forego informal consultation, or the informal consultation concludes that the proposed action is likely to adversely affect listed species or critical habitat, the agency must participate in "formal consultation."[168] Formal consultation entails the formulation of a Biological Opinion ("BiOp") by either FWS or NMFS. In a BiOp, a federal agency is advised as to whether the proposed action, taken together with its cumulative impacts, is likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat.[169]

EPA concluded that the previous iteration of the VGP "may affect" all aquatic and aquatic-dependent species that live in waters of the United States.[170] Consultation under the ESA is therefore required.[171] EPA has conceded that consultation is necessary, having executed an agreement with several of the undersigned organizations to settle litigation over the previous

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[163] *Id*.
[164] 16 U.S.C. § 1536; 50 C.F.R. Part 402.
[165] 50 C.F.R. § 402.14.
[166] 50 C.F.R. § 402.13(a).
[167] *Id.*
[168] 50 C.F.R. § 402.14.
[169] 50 C.F.R. § 402.14(h)(3). If it is determined that a "take," 16 U.S.C. 1538(a)(1)(B), 16 U.S.C. 1532(19), 50 C.F.R. § 17.3, may occur incidental to the proposed action, but that the action and associated incidental take will not violate the Section 7 jeopardy standard, then FWS or NMFS includes an incidental take statement with the BiOp. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i)(1)(i-v). The incidental take statement specifies the predicted impact to the species, the reasonable and prudent measures that FWS or NMFS determines necessary to minimize take, and the terms and conditions required to implement the reasonable and prudent measures. *Id.* If the action complies with the terms and conditions of the incidental take statement, ESA Section 7(o)(2) exempts the incidental taking from the prohibitions contained in ESA Section 9. 16 U.S.C. § 1536(o)(2).
[170] U.S. Environmental Protection Agency, Office of Wastewater Management, *Biological Evaluation for the United States Environmental Protection Agency's (EPA) General Permit for Discharges Incidental to the Normal Operation of Commercial Vessels and Large Recreational Vessels (VGP) and General Permit for Discharges Associated with Recreational Vessels (RGP)*, Docket No. EPA-HQ-OW-2008-0055-0008, at 245 (May 7, 2008).
[171] 50 C.F.R. § 402.14.

iteration of the VGP to "initiate consultation under the Endangered Species Act" for this permit.[172]

At this time, however, EPA does not appear to be making expeditious progress toward completing the required ESA consultation. The only apparent step that EPA has taken in connection with issuing the current draft VGP was to send an email to FWS and NMFS requesting a meeting to initiate informal consultation discussions.[173] Although formal consultation will likely also be required, due to the indisputable adverse impacts that invasive species discharged in vessels' ballast water have on threatened and endangered species, EPA's initial steps regarding consultation do not appear calculated to successfully complete the consultation process, including issuance of a BiOp, before the draft VGP is finalized in November 2012.

We remind EPA that issuing a final permit without completing the required ESA consultation violates the ESA.

XI. Conclusion

We urge the EPA to accept our recommendations to comply with the Clean Water Act by issuing a permit that will prevent non-indigenous species from invading the Nation's waters.

Thank you for the opportunity to submit these comments. Please do not hesitate to contact Neil Kagan from National Wildlife Federation (kagan@nwf.org), Thom Cmar from Natural Resources Defense Council (tcmar@nrdc.org), or Nina Bell from Northwest Environmental Advocates (nbell@advocates-nwea.org) if you have any questions or need clarification of our position.

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[172] Settlement agreement between 12 environmental organizations and the U.S. Environmental Protection Agency regarding Vessel General Permit litigation, ¶ 6,(Mar. 8, 2011).
[173] Email from Deborah Nagle, U.S. EPA, to Jim Lecky, NMFS, and Gary Frazer, FWS, dated Nov. 29, 2011, Docket No. EPA-HQ-OW-2011-0141-0303.

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