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Canada Gazette, Part I, Volume 153, Number 23: Ballast Water Regulations

June 8, 2019

Statutory authority

Canada Shipping Act, 2001

Sponsoring department

Department of Transport

REGULATORY IMPACT ANALYSIS STATEMENT

(This statement is not part of the Regulations.)

Issues: Ballast water, which is important for the safety and stability of vessels, can also introduce aquatic invasive species (e.g. Zebra mussels) into receiving waters. In 2010, Canada acceded to the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the Convention). Revised ballast water regulations would give effect to Canada's obligations under the Convention and further protect Canadian waters from the introduction and spread of aquatic invasive species and pathogens by Canadian and foreign vessels.

Description: This regulatory proposal would repeal Canada's *Ballast Water Control and Management Regulations* (the existing Regulations) and replace them with new *Ballast Water Regulations* (the proposed Regulations). The proposed Regulations would apply to Canadian vessels everywhere and vessels in waters under Canadian jurisdiction. Subject vessels would be required to develop and implement a ballast water management plan and comply with a performance standard that would limit the number of organisms discharged by 2024. Vessels would need to obtain a certificate, keep records of ballast water operations, and be subject to inspections to verify compliance. While most vessels would need to install a ballast water management system (BWMS) to comply with the proposed Regulations, smaller vessels would have the option of an equivalent compliance regime more tailored to their operations. The proposed Regulations would take into account differences between the United States regime and the Convention, providing sufficient time for vessel owners to install BWMS for use in the North American market, and certainty that capital investments would be respected given the challenging water quality conditions on the Great Lakes and the St. Lawrence River.

Rationale: The proposed Regulations would give effect to Canada's international obligations under the Convention, which entered into force in 2017, and would further reduce the environmental risks posed by ballast water. The implementation of the Convention's performance standard by foreign and domestic vessels would reduce the environmental and economic impacts of invasive species introduced to Canada by foreign vessels, introduced to foreign waters by Canadian vessels, and spread within Canada by domestic vessels. In so doing, the proposed Regulations would contribute directly to a clean and healthy environment, align with the need for a strong and mutually beneficial North American partnership, and support a prosperous Canada through global commerce. The proposed Regulations would impose a total present value cost of \$632.39 million. Private vessel owners would carry the majority of the costs associated with the proposed Regulations (approximately 96%). The present value total benefits would be \$1,296.11 million, resulting in a net benefit of \$663.71 million.

Issues

Canada has yet to amend its regulations to give effect to the international obligations it took on in acceding to the Convention in 2010. In addition, the existing Canadian regulations exempt domestic vessels, which pose economic and environmental risks associated with the spread of invasive species throughout Canada (and in inland waters shared with the United States).

Background

Ballast water is water taken on board a vessel to control the trim, list, draught, stability or stresses of the vessel. For example, it may be taken up or discharged when cargo is unloaded or loaded, or when a vessel needs extra stability in poor weather. Ballast water carried on board a vessel is also a vector by which harmful aquatic organisms and pathogens are unintentionally transported around the world. Invasive species have been implicated in vast reductions in, or

outright extinction of, indigenous fish and the devastation of local fisheries. Invasive species also harm plants and animals, facilitate algal blooms, degrade beaches, impair fisheries, disrupt infrastructure, lower property values, and create prevention and control expenses. In addition, ballast water has been shown to transport pathogens, such as cholera, that could potentially have significant impacts on human health.

Canada first introduced voluntary guidelines to address the introduction of invasive species to the Great Lakes by international shipping in 1989. In June 2006, mandatory national rules were introduced pursuant to the former *Canada Shipping Act*: the *Ballast Water Control and Management Regulations*. There have been no substantive policy changes to the 2006 regime since its introduction. The existing Regulations were updated on October 27, 2011, to bring them under the regime of the new *Canada Shipping Act, 2001*, which had entered into force in the interim. On February 22, 2017, the Regulations received minor amendments to address issues that were raised by the Standing Joint Committee for the Scrutiny of Regulations to correct discrepancies between the English and French versions.

As shipping is a global industry and the movement of aquatic invasive species is a global issue, a uniform global approach is needed for its regulation. In 1989, Canada initiated the discussion concerning invasive species in ballast water at the International Maritime Organization. Canada then actively participated in the development of the Convention, which was adopted in 2004 in order to prevent, minimize and ultimately eliminate the risks to the environment, human health, property and resources arising from the transfer of harmful aquatic organisms and pathogens. In 2010, Canada acceded to the Convention, which entered into force on September 8, 2017.

In 2014, a peer-reviewed national risk assessment, prepared by Fisheries and Oceans Canada for Transport Canada, found that all ballast water movements represent a risk for introducing and spreading aquatic invasive species in Canada. This study found that the international vessels travelling to the Great Lakes from overseas represented the lowest risk category of vessels, due to full compliance with requirements that they replace ballast water contents with water taken up from the open ocean. By comparison, international vessels visiting Canada's Atlantic and Pacific coasts posed a high risk; international vessels visiting the Arctic currently posed an intermediate risk; and domestic Great Lakes vessels posed a high risk of spreading invasive species to new areas, exacerbating associated negative effects.

Objective

The objectives of the proposed Regulations are to

- reduce the risk to Canada's environment and economy associated with the introduction and spread of aquatic invasive species released through the ballast water of foreign and domestic vessels;
- give effect to the Convention in Canada and address Canada's international obligations, including the protection of foreign environments;
- maximize compatibility with the differing and evolving United States ballast water regime; and
- mitigate, to the extent feasible, technical uncertainty associated with the Convention, notably in the Great Lakes–St. Lawrence River region.

Description

This regulatory proposal would repeal the existing Regulations and replace them with a new set of regulations, the proposed *Ballast Water Regulations*. These proposed Regulations would

- apply to Canadian vessels everywhere and all vessels in waters under Canadian jurisdiction;
- incorporate by reference the Convention's requirements;
- impose requirements based on the vessel's length, its ballast water capacity, its date of construction, and its area of operation; and
- maintain some requirements from the existing Regulations.

Vessels to which the proposed Regulations would apply are divided into three groups. ¹

1. International vessels

Vessels that operate internationally would be required to be in compliance with the Convention regime, which requires that vessels

- have on board and implement an approved vessel-specific Ballast Water Management Plan;
- be surveyed and carry a Ballast Water Management Certificate;
- meet a performance standard that limits the number of organisms capable of reproducing in order to reduce the risk of aquatic species invasions (vessels are expected to use a BWMS to meet the performance standard);
- record ballast water operations and maintain a Ballast Water Record Book on board; and
- be subject to inspections in ports or offshore terminals to ensure compliance.

These vessels will also be subject to certain provisions of the existing Regulations that remain relevant and are not part of the Convention regime

- to flush otherwise empty ballast tanks with open ocean water in order to reduce the risk posed by any residual ballast water and sediments;

- to exchange and flush ballast tanks in addition to meeting the performance standard when travelling to Canadian freshwater ports (from outside of waters under Canadian jurisdiction, the Great Lakes and the high seas) until at least September 8, 2024; and
- to report on the provenance and management of ballast water discharged in Canada.

The proposed Regulations would require all vessels travelling internationally to comply with the Convention's requirements. The Convention requires vessels travelling internationally and built on or after September 8, 2017, to meet the performance standard when the vessel is launched. Conversely, vessels built before September 8, 2017, would be required to meet the performance standard between 2019 and 2024, prior to which date these vessels are required to exchange their ballast water in mid-ocean in order to reduce the number and viability of organisms discharged.

2. Domestic and Great Lakes vessels

These vessels include Canadian vessels that operate exclusively in waters under Canadian jurisdiction, and, if applicable, on the high seas or in the United States waters of the Great Lakes Basin. To address the spread of species within Canada, domestic and Great Lakes vessels would be required to comply with the same applicable requirements as vessels in Group 1 above, except those vessels will have until September 8, 2024, to come into compliance with the performance standard. Non-party vessels (e.g. U.S. vessels) that transit through Canadian waters of the Great Lakes Basin without loading or unloading ballast water would be exempt from the proposed Regulations (see "Regulatory Development," below).

3. Vessels subject to the equivalent compliance regime

The Convention allows Canada to establish equivalent compliance requirements for certain international pleasure and search and rescue craft that carry less than 8 m³ of ballast water and are less than 50 m in length. The proposed Regulations would do so for these vessels by giving effect to the International Maritime Organization guidelines for equivalent compliance. For reasons of practicality and feasibility, the proposed Regulations would also allow vessels less than 50 m in length to follow the equivalent compliance regime if they operate exclusively in waters under Canadian jurisdiction, or in those waters and on the high seas.

Regulatory development

Consultation

Transport Canada has consistently engaged stakeholders concerning ballast water through public meetings of the Canadian Marine Advisory Council since before Canada's 2010 accession to the Convention. In addition, the proposed Regulations reflect years of dialogue with industry, scientists, engineers, U.S. legislators and regulators, and international partners, notably with

- Canadian and U.S. vessel owners, business associations, scientists, legal associations, landowner associations, U.S. jurisdictions, and BWMS manufacturers who submitted public comments in March 2013 in response to an October 2012 Transport Canada discussion paper on a proposed regulatory approach to give effect to the Convention;
- Vessel owners and academics who participated as scientific peer reviewers for a national risk assessment on ballast water and aquatic invasive species in March and June 2013, as well as for a scientific assessment of ballast water exchange plus treatment in February 2018;
- Expert engineering consultants who undertook studies commissioned by Transport Canada in 2013 on the availability of BWMS for the Great Lakes, and whose subsequent technical dialogue with Canadian and U.S. vessel owners was published by Transport Canada in 2015;
- Members of a Government-Industry Working Group on Ballast Water formed in early 2017, which included representatives of Canadian owners of domestic and international vessels, and which held eight in-person meetings culminating in an agreement in principle to the proposed regulatory approach.

Through these consultations and processes, as well as dozens of International Maritime Organization meetings and many informal and bilateral discussions held with Canadian and U.S. vessel owners, the following notable issues were discussed and taken into consideration during the development of the proposed Regulations.

1. Efficacy of ballast water management systems in Great Lakes conditions

Great Lakes vessel owners expressed concern that the BWMS would not consistently meet performance standards when treating ballast water drawn from the Great Lakes and the St. Lawrence River. The best conditions for BWMS include the slow uptake of clear, temperate ocean ballast water. Great Lakes vessels, in contrast, often contend with rapid ballasting of murky, cold, fresh water.

While Canada recognizes the challenges of managing ballast water in this region, the proposed Regulations would respond to vessel owner concerns by deeming ballast water drawn from the Great Lakes and the St. Lawrence River to be compliant with the performance standard if an approved BWMS is installed, operated and maintained correctly. On the assumption that the performance of this technology would become clearer with time, the approach of deeming compliance would be restricted to vessels that fit a system prior to September 8, 2024. Should experience demonstrate ongoing challenges in treating ballast water in this region, this date could be reconsidered in the future.

2. Feasibility of installing approved BWMS on Great Lakes vessels

Great Lakes vessel owners also expressed the challenge of selecting and fitting BWMS on their vessels. Studies commissioned by Transport Canada concluded that feasible approaches can be found to install BWMS on Canadian and U.S. Great Lakes vessels. However, the United States has only recently begun to approve systems that are also accepted under the Convention, and is currently developing methods to align its performance standards for BWMS with those of the International Maritime Organization. As a result, vessel owners have expressed concern that the Convention timeline for meeting the performance standard would not allow them sufficient time to comply with the requirements of both jurisdictions.

Canada acknowledges that Great Lakes vessels have been particularly delayed in selecting, piloting and installing BWMS. Accordingly, the proposed Regulations would not require Great Lakes vessels to comply with the performance standard of the Convention until September 8, 2024.

3. Exemptions

The Convention provides a mechanism for internationally coordinated time-limited, renewable, risk-based exemptions under its Regulation A-4. Because unmanaged ballast water discharges have been found to pose a high risk in all areas of Canada, Transport Canada does not anticipate that Canada would grant significant numbers of exemptions. Therefore, Transport Canada would accept applications from vessel owners for exemptions that meet Regulation A-4 and are in the public interest. These applications would be considered on a case-by-case basis. Transport Canada would develop guidelines for applicants, and envisions that applications would be reviewed in conjunction with Fisheries and Oceans Canada. The applicant would be responsible for consulting any other countries that could be adversely affected by an exemption (as required by the Convention) with a view to resolving any identified concerns.

Consultations with the United States

Canada and the United States regularly discuss ballast water issues in accordance with the Great Lakes Water Quality Agreement and through other fora. Based on these discussions, the following issues have been explored or approaches adopted to maximize regulatory compatibility.

1. Transiting Great Lakes vessels

The United States government has requested that Canada not apply the Convention to its Great Lakes vessels during transits through Canadian waters while carrying cargo between U.S. ports. While the unmanaged ballast water of these vessels poses environmental risks to the shared natural resources of Canada and the United States, it would be better left to the United States to regulate these vessels.

The Convention requires Canada to apply the requirements of the Convention to vessels of non-parties, to ensure that no more favourable treatment is given to such vessels. The Convention's requirements include the development of approved ballast water management plans for meeting the Convention's performance standard wherever ballast water is discharged, even if the ballast is ultimately discharged into waters of non-parties. The proposed Regulations would therefore require that vessels that load or discharge ballast water in Canada hold and keep on board a document of compliance issued by, or on behalf of, their flag state that certifies that the vessel meets the requirements of the Convention.

2. Same location exception

In accordance with the Convention, the proposed Regulations would not require the management of ballast water loaded and discharged at the same location, providing that no mixing with unmanaged ballast water has occurred. The Convention does not define the term "same location." The proposed Regulations would align with the U.S. Environmental Protection Agency's definition in referring to locations within 10 NM, without crossing an obstruction or barrier. This definition would encompass short-distance ferry routes, as well as the operation of support vessels within many Canadian ports.

Modern treaty obligations and Indigenous engagement and consultations

In accordance with the Cabinet Directive on the Federal Approach to Modern Treaty Implementation, an analysis was undertaken to determine whether the proposed Regulations are likely to give rise to modern treaty obligations. This assessment examined the geographical scope and subject matter of the regulatory proposal in relation to modern treaties in effect.

Treaty provisions are identified in the Nunavut Land Claim Agreement, the Nunavik Inuit Land Claims Agreement and the Eeyou Marine Region Land Claims Agreement, which obligate the federal government to consider advice and recommendations regarding marine areas.

Transport Canada has responded to interest from Indigenous groups and rights holders concerning ballast water over an extended period of time. This includes an extended dialogue with the Nunavut Impact Review Board in 2012 during hearings on the Mary River Mine Project, including several in-person appearances by Transport Canada officials, and briefings given to the Chiefs of Ontario by Transport Canada, Ontario Region in the context of the Canada-Ontario Agreement.

Transport Canada has also consulted and is continuing to consult on the proposed Regulations through the regional Canadian Marine Advisory Council, which includes representatives of Indigenous groups. In terms of environmental benefits and impact on vessel owners, the proposed Regulations are expected to affect Indigenous peoples in the same ways as non-Indigenous Canadians.

Instrument choice

For this regulatory initiative, no other options were considered, as its intent is to align Canadian regulations with the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, to which Canada is a party.

Regulatory analysis

Benefits and costs

The estimated total present value cost of the proposed Regulations is \$632.39 million. Private vessel owners would carry the majority of the costs associated with the proposed Regulations (approximately 96%). The benefits quantified in this analysis represent the minimum benefits derived from the proposed Regulations, since they are based only on a Zebra mussel case in Ontario. The present value total benefits would be \$1,296.11 million, resulting in a net benefit of \$663.71 million.

The information provided in this section is meant only to summarize the findings of the analysis. A full cost-benefit analysis (CBA) report is available upon request.

Affected stakeholders

The proposed Regulations would apply to Canadian vessels everywhere and non-Canadian vessels in waters under Canadian jurisdiction and would impose requirements based on the vessel's length, the ballast water capacity, and where the vessel operates. The Canadian owners of vessels are grouped into three categories

(a) Canadian vessels operating internationally (excluding the United States)

According to the Convention, all vessels travelling internationally that use ballast water are anticipated to install a BWMS to meet the Convention's performance standard consistent with the Convention compliance date. This analysis includes no procurement costs for these vessels, given they must carry these in order to operate in other countries that are parties to the Convention. For the same reasons, the costs associated with sediment management, the training of crews, the approval of the Ballast Water Management Plan, the ballast water record book, survey and certification are expected to be nil.

In terms of operation costs, the existing Regulations would be repealed and replaced with the proposed Regulations. As a result, after September 8, 2024, Canadian vessels operating internationally would no longer need to exchange their ballast water (except those travelling to Canadian freshwater ports from beyond Canadian waters), but would be required to treat ballast water before entering Canada. The expected change in operational costs would be negligible. International vessels discharging their ballast water in the Great Lakes and St. Lawrence Seaway would be required to exchange and treat their ballast water. Only 17 Canadian-flagged vessels fall into this category.

(b) Canadian vessels operating in Canada and the United States

Under the existing Regulations, Canadian vessels that operate in both Canada and the United States, but not in the Great Lakes Basin, are required to exchange their ballast water. The proposed Regulations would require this category of vessels to manage their ballast water as required under the Convention.

Under the existing Regulations, Canadian vessels that operate exclusively in Canada and the Great Lakes Basin are exempted from managing their ballast water. The proposed Regulations would require this category of vessels to manage their ballast water as required under the Convention.

(c) Canadian vessels operating exclusively in Canadian waters

Under the existing Regulations, Canadian vessels operating exclusively in Canadian waters are exempted from managing their ballast water. The proposed Regulations would require vessels operating within Canada that are longer than 50 m in length to manage their ballast water as required under the Convention. Vessels operating within Canada that are less than 50 m in length would be required to comply with the best-effort equivalent compliance regime.

Baseline scenario and regulatory scenario

The cost-benefit analysis evaluates incremental changes for vessel owners and how these changes would impact the environment due to the proposed Regulations. Requirements and their impacts have been examined so that costs and benefits can be compared in both the baseline and regulatory scenarios. Table 1 shows the incremental number of affected vessels based on the vessel's length, ballast water capacity, operating area and the type of incremental requirement these vessels would incur.

Table 1: Affected vessels based on the length and where the vessels operate

Vessel Category	Number of Vessels	Existing Regulations	New Regulations	Incremental Requirements
Canadian vessels operating internationally (excluding the United States), discharging ballast water in the Great Lakes Basin	17	Exchanging ballast water before entering Canada	The Convention requirements, plus exchanging ballast water before entering Canada	Only treatment costs
Canadian vessels operating internationally (excluding the United States), discharging ballast water in coastal waters	4	Exchanging ballast water before entering Canada	The Convention requirements	Incremental cost is negligible

Canadian vessels operating in Canada and the United States (excluding the Great Lakes Basin)	102	Exchanging ballast water before entering Canada	The Convention requirements	Procurement and operating cost, excluding treatment costs
Canadian vessels operating in Canada and the United States (exclusively in the Great Lakes Basin)	182	Exempted from managing their ballast water	The Convention requirements	Procurement and operating costs
Canadian vessels operating domestically that are 50 m in length or longer	829	Exempted from managing their ballast water	The Convention requirements	Procurement, and operating costs
Canadian vessels operating domestically that are less than 50 m in length ²		Exempted from managing their ballast water	Equivalent compliance regime	Incremental cost is negligible

As vessels affected by the proposed Regulations are only a small portion of all Canadian vessels, the overall growth rate cannot be applied to this category of vessels. Based on the expert opinion of Transport Canada officials, it is expected that the total number of vessels affected by the proposed Regulations would not change over the analytical time frame of this study. However, some of the current vessels might be replaced with new vessels. As per the Convention, all vessels built after 2017 that carry ballast water are required to have a BWMS on board; the cost of acquisition and installation of the BWMS for those vessels is not considered as an incremental cost. The operation cost of those vessels is already included in the analysis.

Costs

The costs associated with the proposed Regulations would be carried by two groups: private vessel owners and government. The estimated total present value cost of the proposed Regulations over the 25-year analytical time frame is \$632.39 million. Private vessel owners would carry 95.75% of the total cost associated with the proposed Regulations.

Costs to private vessel owners

Vessel owners would carry costs for acquisition, installation, and operation of ballast water management equipment, as well as costs for developing an approved Ballast Water Management Plan, training crew members, record keeping, and certification of surveys. The total present value cost to vessel owners is estimated to be \$605.51 million.

The acquisition, installation and operation costs are driven from two different studies (described below), while costs associated with the approval of a management plan, record book and certification were informed by consulting stakeholders and subject matter experts.

(a) Acquisition, installation and operation costs

I. Average cost per vessel longer than 50 m (excluding barges)

The acquisition, installation and operation costs associated with BWMS would vary depending on the type of vessel, the type of treatment, the ballast water capacity, and the level of difficulty associated with the installation and operation.

The estimated cost for vessels that are 50 m or longer was informed by a study commissioned by Transport Canada, ³ which examined the technical feasibility and costs of acquiring, installing and operating a range of BWMS options for the vessels that could potentially be affected by the proposed Regulations. In total, four different types of BWMS were examined. ⁴ Each of those has been designed into the following sample of vessels: self-unloader with accommodation aft, self-unloader with accommodation forward and aft, tanker, straight decker, geared bulk carriers, and gearless bulk carriers.

A breakdown of the average acquisition, installation, and operation costs of BWMS is presented in Table 2. Three estimates were provided for each type of vessel, with a low, high and most probable value. The most probable value is based on cost quotations and commercial experience, while the low and high estimates account for the potential variability in actual outcomes.

Table 2: Average acquisition, installation, and operation costs for vessels longer than 50 m (in millions of 2017 dollars)

Vessel Type	Acquisition/Installation Costs		Annual Operation Costs	
	Low	High	Low	High
Self-unloader with accommodation aft	\$2.79	\$7.92	\$0.15	\$0.34
Self-unloader with accommodation forward and aft	\$2.39	\$4.95	\$0.11	\$0.27

Tanker	\$0.75	\$2.08	\$0.01	\$0.09
Straight decker	\$2.13	\$4.85	\$0.08	\$0.23
Geared bulk carriers	\$0.76	\$2.27	\$0.02	\$0.41
Gearless bulk carriers	\$1.88	\$4.34	\$0.10	\$0.07

These average cost estimates have been assigned to Canadian vessels longer than 50 m (except barges) based on the vessels' characteristics.

II. Average cost per vessel shorter than 50 m

The costs associated with the BWMS of vessels that are shorter than 50 m in length come from a study prepared for Isle Royale National Park (Houghton, Michigan).⁵ This study examined seven existing BWMS, based on their compatibility with smaller vessels and ability to meet the performance standard described in Regulation D-2 of the Convention. Among them, only one of the systems was available and compatible with International Maritime Organization standards (Hyde Guardian). The costs associated with that system are used as a proxy for average acquisition, installation, and operation costs of each vessel that is shorter than 50 m.

III. Average cost per barge

Non-self-propelled barges make up the majority of Canadian domestic vessels longer than 50 m and can carry significant amounts of ballast water, posing the same environmental risks as self-propelled vessels. However, barges often lack electrical generation systems and the ballast water piping necessary for the use of a BWMS. Approximately 67% of the Canadian vessels that are longer than 50 m are non-self-propelled barges, and will be required to comply with the proposed Regulations.

Due to the lack of information on the ballast water piping and electrical systems of barges, the costs associated with compliance are not available. It is likely that barges will adopt a case-by-case approach to compliance that cannot be estimated by Transport Canada. However, the cost would not likely exceed that of installing the Hyde Guardian on the M/V Ranger. This cost has therefore been used for barges in this CBA as a conservative estimate of the maximum cost that barge owners could face. It is likely that other less expensive means of compliance would be used for barges.

Considering the expected number of affected vessels and the average acquisition, installation and operation costs, the total present value of costs is estimated. Table 3 summarizes the most probable present value (PV) of total costs for all affected privately owned Canadian vessels.

Table 3: Present value of acquisition, installation and operation costs to privately owned Canadian vessels (in millions of 2017 dollars)

Vessel Type	Number of Affected Vessels	Type of Treatment	PV of Acquisition/Installation Costs	PV of Operation Costs	PV of Total Costs
			Probable (\$)	Probable (\$)	Probable (\$)
Vessel longer than 50 m					
Self-unloader with accommodation aft	24	Electrolysis	\$103.83	\$43.72	\$147.55
		Ozone	\$73.12	\$19.61	\$92.73
		UV	\$82.87	\$27.59	\$110.45
		Chemical injection	\$51.75	\$33.31	\$85.06
Self-unloader with accommodation forward and aft	10	Electrolysis	\$20.99	\$13.27	\$34.26
		Ozone	\$21.15	\$7.58	\$28.74
		UV	\$20.49	\$9.34	\$29.84
		Chemical injection	\$14.73	\$8.53	\$23.26

Tanker	24	Electrolysis	\$20.52	\$11.00	\$31.53
		Ozone	\$16.14	\$9.82	\$25.96
		UV	\$10.61	\$2.54	\$13.15
		Chemical injection	\$16.27	\$8.80	\$25.07
Straight decker	10	Electrolysis	\$27.02	\$11.58	\$38.60
		Ozone	\$25.26	\$6.63	\$31.88
		UV	\$25.79	\$7.39	\$33.18
		Chemical injection	\$16.88	\$9.90	\$26.78
Geared bulk carriers	77	Electrolysis	\$106.15	\$42.24	\$148.40
		Ozone	\$75.04	\$37.20	\$112.24
		UV	\$50.30	\$11.98	\$62.28
		Chemical injection	\$71.73	\$39.09	\$110.82
Gearless bulk carriers	13	Electrolysis	\$34.70	\$28.67	\$63.37
		Ozone	\$31.60	\$11.11	\$42.70
		UV	\$28.82	\$9.31	\$38.13
		Chemical injection	\$21.57	\$22.75	\$44.32
Total cost			\$173.10	\$75.57	\$248.67
Vessel shorter than 50 m and barge					
Vessel shorter than 50 m and barge	972	Hyde Guardian	\$250.42	\$25.06	\$275.48

Given that all treatment options meet the requirements of the proposed Regulations, in the central analysis, it is assumed that vessel owners would always choose the lowest cost option.

In this scenario, the total present value acquisition, installation, and operation costs to vessel owners would be approximately \$524.15 million.

(b) Training costs

Vessel crew would require training to operate a BWMS. Initial training may be delivered by the system vendor as part of their delivery service to the vessel. Over the long term, vessel owners would need to develop training materials and train new crew members.

Training costs are estimated to be between \$15,000 and \$30,000 per vessel for initial training on delivery of a BWMS (material preparation, trainers, staff time, and travel as needed). Updates and refreshers would be part of ongoing training for crews and are estimated to be an additional \$2,000 to \$5,000 per vessel, annually. The total present value training costs would be around \$46.56 million.

(c) Survey and certification costs

All vessels in scope of the proposed Regulations would be subject to an initial survey before the vessel is put in service, or before the required certification is initially issued. Ballast water management certification is endorsed following a satisfactory annual survey to maintain the validity of the certification. The initial certification would be reissued every five years. Based on the industry consultation, it is estimated that the initial issuance and reissuance (every five years) of the survey would cost between \$1,500 and \$2,650 per vessel, while the annual endorsement of the survey would additionally cost between \$1,500 and \$2,650 per vessel (regardless of vessel type). The total cost for this requirement would be approximately \$22.92 million.

(d) Record-keeping and reporting costs

All vessels affected by the proposed Regulations would be required to have a separate record book on board for ballast water operations in a prescribed format. Based on the industry consultation, it is estimated that this requirement would cost between \$800 and \$1,200 per vessel. The total cost associated with record keeping and reporting would be approximately \$7.32 million.

(e) Ballast water management plan costs

Canadian vessels would need to develop and implement an approved ballast water management plan. This plan must comply with the Convention provisions, and include matters relating to safety, sediment management, ballast water operations, coordination procedures, and crew responsibilities. Transport Canada delegated approval of the ballast water management plan to recognized organizations in autumn 2017. Vessels owners/operators would develop the initial management plan (cost varies between \$1,500 and \$2,000 per vessel) and provide recognized organizations with the designed plan to make sure that it meets performance standards. Reviews may take recognized organizations between two and eight weeks, and cost between \$3,400 and \$4,600 (for up to two reviews). The total costs to vessel owners associated with developing an approved ballast water management plan are approximately \$4.56 million. The cost of approval is considered to be negligible, as it is done by recognized organizations that develop the plans.

Costs to Government

The total present value costs to Government are estimated to be \$26.88 million over the 25-year analytical time frame.

(a) Acquisition, installation and operation costs for public vessel owners

There are 39 government vessels (federal and provincial) that would be affected by the proposed Regulations. The present value of total acquisition, installation, and operation costs of a BWMS for those vessels would be approximately \$21.11 million.

(b) Compliance promotion, enforcement and regulatory administration costs

The total Government costs associated with the development, promotion, awareness of the regulation, and general administration of the program would be approximately \$5.77 million.

There would be no incremental Government costs for Port State Control inspections because the existing inspection program under the *Canada Shipping Act, 2001* is not specific to any regulation. Ballast water inspections would be included within the existing Port State Control regime and would be subject to prioritization with the other regulatory areas, within the overall resources available for Port State Control.

Benefits

The benefits associated with the proposed Regulations are presented as monetized and qualitative benefits. To monetize the benefits of the proposed Regulations, the expected reduction in the number of aquatic invasive species is used, together with the economic impact that they would have on Canadians, and the severity of those invasions based on their maturity level. The estimated present value total monetized benefit of the proposed Regulations over the 25-year analytical time frame would be \$1,296.11 million. Qualitative benefits consist of avoided environmental and biodiversity impacts to the Canadian marine ecosystem.

Monetized benefits

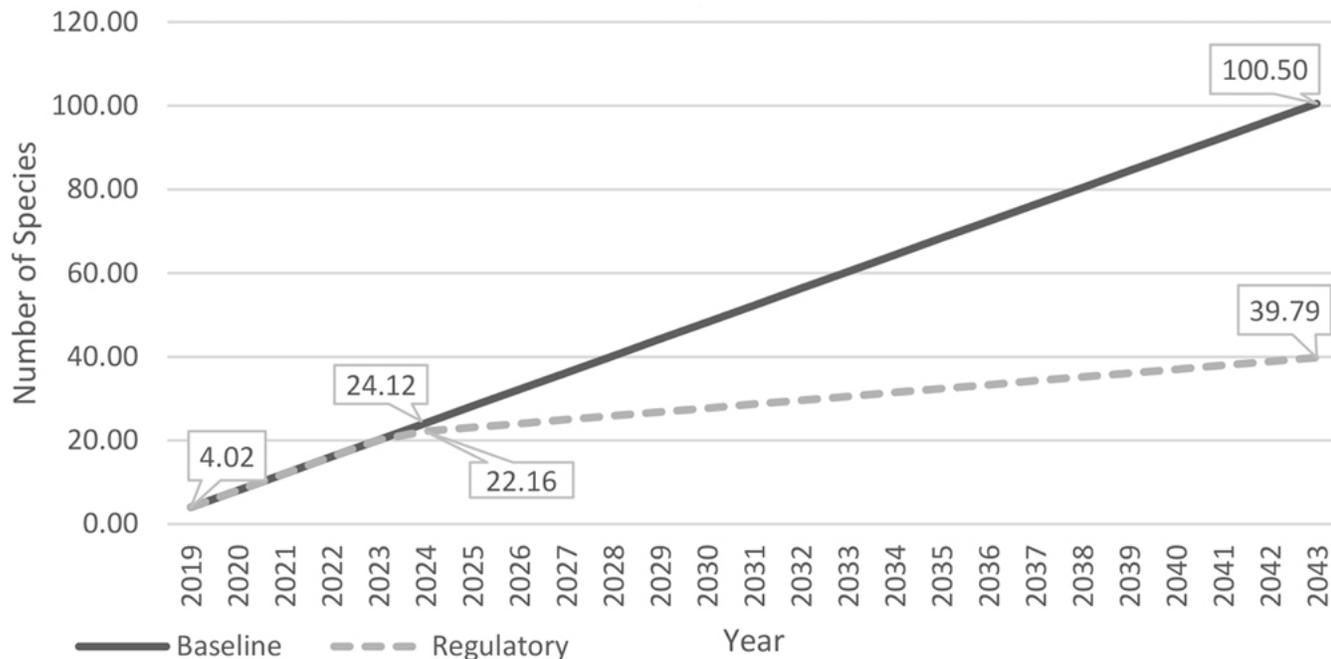
The monetized benefits analysis focuses on the cost savings that would result from preventing the establishment of invasive species in Canadian waters and how it would result in the avoidance of costs to Canadians.

(a) Expected avoided invasive species

In the baseline scenario, it is expected that at least 100.5 non-native species would invade Canadian waters over the next 25 years. In the regulatory scenario, where vessels are complying with required D-2 standards of the Convention (by September 2024), this number would be reduced to 39.79. ⁶ The proposed Regulations would result in a reduction of 60.71 invasive species, 9.11 of which are expected to cause severe economic or environmental damage. ⁷ Figure 1 shows the number of invasive species in the baseline and regulatory scenarios over the 25-year analytical time frame.

Figure 1: Number of expected invasive species under the regulatory and baseline scenarios

Expected Invasive Species 2019–2043



(b) Cost saving per expected avoided species

The costs related to a species that has not invaded an ecosystem cannot be known. As a precautionary basis for estimating potential cost savings, the impact from species that have already invaded an environment is used as a proxy for the costs of future invasions. Zebra Mussel, for example, is an invasive species that has had significant consequences on Canadian industries which rely on access to water supply.

To monetize the expected cost savings associated with the proposed Regulations, this cost-benefit analysis adopts an avoided cost approach, using the case of Zebra Mussel invasions in Canada. In doing so, a number of Zebra Mussel studies have been evaluated to determine the impact of this introduced species to Canadians.

Marbek (2010) estimated the cost of Zebra Mussels in the Ontario Great Lakes region to determine how a new invasive species could possibly impact different industries. The results suggested that preventing a non-native species from entering the Great Lakes would be more cost-effective than carrying mitigation costs after invasion. ⁸ The CBA focused its cost-reduction estimates on the Marbek (2010) study, as it was found to be precise and detailed in estimating the impact of Zebra Mussels, in addition to being specific to Canadian context. The framework used to quantify the impact of Zebra Mussels focused on determining the costs carried by Canadians and industries that depend on the Ontario Great Lakes. ⁹

(c) Severity curve of the cost associated with invasive species over years

To estimate the severity of an invasion for different years and to account for maturity levels with respect to the establishment of a species, the spread and density of Zebra Mussels population was used. The dynamic impacts of the introduction of this species are taken as a proxy for the expected costs associated with varying maturity levels of an invasion with significant impact.

Using findings from a study done by the National Research Council ¹⁰ and expert opinion from Transport Canada officials, it was determined that the costs associated with an invasion will vary depending on its maturity level. For this reason, the severity rate, which was based on the level of maturity, ¹¹ is applied to the annual cost savings of an invasion. As a conservative measure, it is assumed that the calculated annual costs (for the Zebra Mussels case) are the maximum costs associated with an invasion. ¹²

(d) Total cost savings

Using the expected annual cost saving and the severity curve, this analysis estimated how preventing invasion of a species like Zebra Mussels would benefit Canadians in the next 25 years. Since the cost savings are only quantified for Ontario, this analysis accounts for a conservative estimate of the entire cost savings associated with the proposed Regulations.

Using the estimated cost of Zebra Mussels, the monetized cost saving has been calculated, taking into account that it is expected that the proposed Regulations would avoid 0.46 species with severe economic or environmental damage per year.

Assuming each major invasion has the same severity as Zebra Mussels could result in an overestimation of the cost saving. An analysis conducted by the United States Coast Guard in 2012 ¹³ showed that the cost of an invasive species with severe economic or environmental impact would be on average 34.43% of the cost associated with Zebra Mussels. This parameter is therefore taken into account to calculate the final cost saving that would result from the proposed Regulations.

Of 1 169 Canadian vessels that are expected to comply with the requirements of D-2 Regulation of the Convention, 21 of them travel internationally and are assumed to be in compliance with the proposed requirements already. As such, only 98.20% of the Canadian vessels affected by the proposed Regulations are taken into account to monetize the cost savings.

Table 4 presents the total cost savings associated with the avoided invasions with significant impacts at different years. The present value total cost savings resulting from the proposed Regulations are estimated to be \$1,296.11 million over the 25-year analytical time frame.

Table 4: Total present value of cost saving of expected avoided severe invasions at different years ¹⁴

PV of Cost Saving of Prevention of Expected Avoided Severe Invasion at Different Years			
Year	PV of Cost Saving	Year	PV of Cost Saving
2024	\$59.02	2034	\$60.92
2025	\$163.75	2035	\$49.15
2026	\$150.85	2036	\$37.71
2027	\$138.35	2037	\$26.61
2028	\$126.24	2038	\$15.84
2029	\$114.50	2039	\$5.37
2030	\$103.12	2040	\$0.21
2031	\$92.08	2041	\$0
2032	\$81.38	2042	\$0
2033	\$71.00	2043	\$0

Qualitative benefits

Non-indigenous species pose a risk to native species, resulting in species reduction and in some cases extinction. Many fish species, such as the blue pike and the Lake Ontario Atlantic salmon, have declined significantly in population, or even disappeared from the Great Lakes due to non-indigenous species. These non-indigenous aquatic organisms are a threat to native species as they can be a direct competition for food and space.

Zebra Mussels, for example, feed on plankton and compete directly with small fish, which then results in fewer food sources for larger fish. Only eight years after the introduction of Zebra Mussels in the Great Lakes, over 20 mollusk species were lost. Another aquatic invasive species believed to have been introduced and spread via ballast water discharge is the Ruffe, a freshwater fish commonly found in Europe and Asia. Its introduction has disrupted Lake Superior's ecosystem as they are able to reproduce quickly and compete with other species (like the yellow perch) for food supply.

Ballast water can also carry invasive species that were not introduced through ballast water, like the Sea Lamprey and the Alewife, facilitating their spread to different water bodies. The proposed Regulations would prevent or delay the spread and establishment of invasive species, preventing associated environmental and economic impacts, including control and management costs.

Consolidated cost-benefit statement

The benefits quantified in this analysis represent the minimum benefits derived from the proposed Regulations, since they are based only on the case of Zebra Mussels in Ontario. In the central scenario, the net benefit would be at least \$663.71 million over the 25-year time frame. Table 5 presents the expected benefits and costs in the central analysis.

Table 5: Consolidated cost-benefit statement (in millions of 2017 dollars)

Dollar Year: 2017	Base Year: 2019	Discount Rate: 7%	Final Year: 2043	Net Benefit: \$663.71
				Total (2019–2043)

	Average Annual Compliance Years: (2022–2024)	Annual Average: (2025–2042)	Final Year: 2043	
Monetized costs				
Costs to vessel owners				
Procurement	\$142.22	\$5.27	\$2.61	\$524.15
Training	\$5.95	\$1.55	\$0.77	\$46.56
Certificate of surveys	\$1.52	\$0.00	\$0.00	\$4.56
Record keeping and reporting	\$0.08	\$0.38	\$0.19	\$7.32
Ballast water management plan	\$1.10	\$1.07	\$0.46	\$22.92
Total industry	\$150.87	\$8.27	\$4.02	\$605.51
Costs to Government				
Procurement	\$5.48	\$0.25	\$0.12	\$21.11
Administrative	\$0.35	\$0.18	\$0.09	\$5.63
Training	\$0.00	\$0.00	\$0.00	\$0.14
Total Government	\$5.82	\$0.43	\$0.21	\$26.88
Total cost	\$156.69	\$8.70	\$4.23	\$632.39
Monetized benefits				
Total	\$0.00	\$64.57	\$133.89	\$1,296.11
Net present value	–\$150.87	\$56.30	\$129.87	\$663.71
Qualitative benefits				
<ul style="list-style-type: none"> Prevent or delay the spread and establishment of invasive species in Canadian waters. Transport Canada expects that the proposed Regulations would avoid approximately 60.71 total invasions over the 25-year analytical time frame. However, the cost saving has been monetized only for avoided invasive species with significant impact (9.11 species) and for the Great Lakes region. The cost saving associated with avoided species with low and medium impact (51.60 species) has not been monetized. 				

Sensitivity analysis

A sensitivity analysis is used to test the effect on the output of selected variables used in the analysis. Uncertainty around these variables can be better contextualized through the use of a sensitivity analysis. The following variables were analyzed: BWMS acquisition, installation and operation costs, severity of expected invasions, analytical time frame, and discount rates. The results are shown below.

Acquisition, installation, operation costs, and severity of expected invasions

Three cost estimates were provided for vessels, with a low, high and most probable value. The most probable value is based on cost quotations and commercial experience, while the low and high estimates account for the potential variability in actual outcomes. The reason for variability could include the fact that competition among manufacturers in future years may reduce equipment costs. Also, the difficulty of installation may be much higher than for the central case. In terms of variability in benefits, in the central case it is assumed that the cost of an invasive species with severe economic or environmental

impact would be on average 34.43% of the cost associated with Zebra mussels. ¹⁵ For the purpose of the sensitivity analysis, lower (24.43%) and higher (44.43%) rates of severity of the impact of invasions are considered. The central scenario is based on the most probable estimates. Different cost and benefit values were used in the sensitivity analysis, and the results are presented in Table 6.

Table 6: Net benefit for low, probable, high scenarios (present value in millions of 2017 dollars)

		Benefits		
		Low	Probable	High
Cost	Low	\$370.22	\$746.65	\$1,123.08
	Probable	\$287.29	\$663.71	\$1,040.14
	High	\$163.10	\$539.52	\$915.95

Analytical time frame

A 25-year analytical time frame was used for the central analysis to properly represent the expected lifespan of the BWMS technology. The BWMS lifecycle is primarily based on an estimated usage. Considering Canadian-flagged vessels and their average number of voyages, it is expected that a BWMS would last approximately 25 years. As treating ballast water is costly, it is expected that vessel owners would only start treating their ballast water after the compliance date (September 8, 2024). Operational benefits and costs would start only after full implementation of the proposed Regulations. Therefore, the 25-year analytical time frame would imply that the BWMS has been operating for only 20 years. A 30-year time frame was not used for the central analysis, as vessel owners would be required to do major maintenance of the ballast water system and there are many uncertainties about future technological upgrades and the costs associated with them. However, reinstallation costs are expected to be significantly lower than initial installation costs.

It is expected that vessels will install systems over the years 2022, 2023, and 2024, with a uniform number of installations taking place each of the three years. The acquisition and installation of the BWMS is the main portion of the costs that vessel owners would carry (approximately 70% of the total costs). A sensitivity analysis of a 15-year analytical time frame was used to examine the effect of the proposed Regulations in a shorter time framework. The resulting net present value is presented in Table 7.

Discount rate

The central analysis used a 7% discount rate as recommended by the Treasury Board Secretariat. For the purpose of the sensitivity analysis, Table 7 presents the results should a 3% discount rate have been used, as well as a 10% discount rate.

Table 7: Sensitivity analysis (present value in millions of 2017 dollars)

Parameter	Total Benefits	Total Cost	Net Benefit
Analytical Time Frame			
15 years	\$1,029.30	\$572.43	\$456.88
Discount Rates			
3%	\$2,677.55	\$819.56	\$1,857.99
10%	\$775.46	\$530.87	\$244.59

Distributional impact analysis

The impact of proposed Regulations would affect the Pacific, Ontario, and Quebec regions the most. Approximately, 51% of vessels that would be impacted by the proposed Regulations operate in the Pacific Region, 21% in the region of Ontario, and 12% in Quebec. In terms of costs, these three regions would bear around 84% of the total costs together. A total of 1 130 privately owned Canadian-flagged vessels would be required to manage their ballast water by September 8, 2024. Table 8 shows a breakdown of the number of privately owned affected vessels along with the total cost by different regions over the 2019–2043 period.

Table 8: Distributional analysis — Costs of privately owned vessels by different regions (in millions of 2017 dollars)

Region	Number of Existing Vessels Longer than 50 m	Number of Existing Vessels Shorter than 50 m Travelling to the United States	Total Cost (in Millions of Dollars)
Atlantic	78	19	\$61.04
Ontario	112	121	\$184.68
Pacific	522	51	\$216.79
Prairies	18	0	\$6.93
Quebec	96	45	\$110.00
The North	68	0	\$26.07
Total	894	236	\$605.51

Of 1 169 vessels affected by the proposed Regulations, 39 are owned by provincial governments or the federal government, while the rest (1 130) are privately owned. Table 9 shows a breakdown of the costs to privately and publicly owned vessels.

Table 9: Distributional analysis — Costs of privately/publicly owned vessels (in millions of 2017 dollars)

	Number of Existing Vessels	Total Cost (in Millions of Dollars)
Privately owned	1 130	\$605.51
Publicly owned	39	\$21.11

Small business lens

The majority of the affected companies are large businesses. In order to minimize the burden on all businesses, a transition period of five years from the coming-into-force date was included and some flexibility has been considered in the management plan.

In the case of certain small vessels that travel internationally (e.g. recreational and rescue vessels), Transport Canada intends to use flexibility provided by the Convention to establish a best-effort equivalent compliance regime. However, such vessels (and those that do not qualify for the Convention's flexibility) would need to comply with any foreign requirements that are not under Transport Canada's control. It is not expected that small vessels travelling internationally would be owned by small businesses.

With respect to small vessels that operate only in Canada (or there and on the high seas), Transport Canada intends to apply the equivalent compliance regime to all domestic vessels that are less than 50 m in length (the costs associated with implementing these requirements would be negligible). While the size of the vessel cannot be used as an indicator of the size of the business that operates it, this flexibility is expected to cover most domestic vessels operated by small businesses, dramatically reducing their cost of compliance.

One-for-one rule

The proposed Regulations would require vessel owners to have on board a separate record book for ballast water operations in a prescribed format, keep the record book up to date, and retain data of ballast water intakes, treatments, and discharges. Although the record book would be used by Port State Control inspectors to verify compliance, its main purpose is to help vessel owners keep a log of their ballast water actions for their own operational purposes. Therefore, the cost associated with this requirement is not considered an administrative burden on businesses under the one-for-one rule. As a result, the one-for-one rule does not apply to the proposed Regulations.

Regulatory cooperation and alignment

This regulatory proposal is being introduced to align Canadian regulations with the Convention, fulfilling Canada's obligations as a party to it. In so doing, it also aims to align to the extent feasible with the differing U.S. regimes for ballast water.

The United States is not a party to the Convention. Instead, multiple overlapping federal and state-level regimes currently apply in U.S. waters, in addition to a performance standard that requires organisms in ballast water discharge to be dead (not merely unable to reproduce, as is the case in the international regime). The United States also requires that any BWMS operated in its waters be approved by the United States Coast Guard using different tests than

internationally approved standards. Canadian, U.S. and international vessels will need to comply with the relevant U.S. regimes as well as the Convention when operating on the Great Lakes.

Strategic environmental assessment

In accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*, a preliminary scan concluded that a strategic environmental assessment is not required.

Gender-based analysis plus

No gender-based analysis plus (GBA+) impacts have been identified for this proposal.

Implementation, compliance and enforcement, and service standards

Implementation

The coming-into-force date of the proposed Regulations would follow the date of its approval by the Governor in Council.

These Regulations will apply to vessels depending on their operations, ballast water capacity and size. For vessels remaining in waters under Canadian jurisdiction and the U.S. waters of the Great Lakes, the proposed Regulations, to meet the performance standard, would apply as of September 8, 2024. For vessels that operate in waters not under Canadian jurisdiction (or outside of the U.S. waters of the Great Lakes), the proposed Regulations would apply to a vessel following its first vessel-specific international oil pollution prevention renewal survey date after 2019.

Compliance and enforcement

The enforcement of the proposed Regulations by Transport Canada, Marine Safety will continue under the overall established compliance and enforcement mechanisms; therefore, marine safety inspectors will continue to enforce the Regulations during normal periodic inspections.

In addition, Canada and the United States continue to co-operate on the implementation of compatible ballast water requirements in accordance with the vessel discharge provisions of the 2012 Canada–United States Great Lakes Water Quality Agreement. This includes annual meetings between responsible authorities.

Contact

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PROPOSED REGULATORY TEXT

Notice is given that the Governor in Council, pursuant to subsections 35(1) ^a and 35.1(1) ^b, section 190 ^c and paragraphs 244(f) ^d to (h) ^e of the *Canada Shipping Act, 2001* ^f, proposes to make the annexed *Ballast Water Regulations*.

Interested persons may make representations with respect to the proposed Regulations to the Minister of Transport within 90 days after the date of publication of this notice. All such representations must be in writing and cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be sent to Valérie Jennings, Acting Senior Policy Advisor, Legislative, Regulatory and International Affairs, Marine Safety and Security, Department of Transport, Place de Ville, Tower C, 330 Sparks Street, 10th Floor, Ottawa, Ontario K1A 0N5 (tel.: 613-941-6187; fax: 613-993-8196; email: valerie.jennings@tc.gc.ca (<mailto:valerie.jennings@tc.gc.ca>)).

Ottawa, May 30, 2019

Julie Adair
Assistant Clerk of the Privy Council

Ballast Water Regulations

Interpretation

Definitions

1 (1) The following definitions apply in these Regulations.

Act means the *Canada Shipping Act, 2001*. (Loi)

Annex means the annex to the Convention. (Annexe)

ballast water has the same meaning as in article 1 of the Convention. (eaux de ballast)

ballast water capacity has the same meaning as in regulation A-1 of the Annex. (capacité en eaux de ballast)

ballast water exchange standard means the standard set out in regulation D-1 of the Annex. (norme de renouvellement des eaux de ballast)

ballast water management has the same meaning as in article 1 of the Convention. (gestion des eaux de ballast)

ballast water management system has the same meaning as in the BWMS Code. (système de gestion des eaux de ballast)

ballast water performance standard means the standard set out in regulation D-2 of the Annex. (norme de qualité des eaux de ballast)

BWMS Code means the *Code for Approval of Ballast Water Management Systems*, published by the International Maritime Organization. (Code BWMS)

Canadian pleasure craft means a pleasure craft that

(a) is licensed under Part 10 of the Act; or

(b) is principally maintained or operated in Canada, is not a Canadian vessel and is not registered or licensed under the laws of another state.
(embarcation de plaisance canadienne)

Convention means the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004. (Convention)

Great Lakes Basin means the waters of the Great Lakes, their connecting and tributary waters, and the St. Lawrence River as far east as the lower exit of the St. Lambert Lock at Montréal, Quebec. (bassin des Grands Lacs)

Guideline G3 means the *Guidelines for Ballast Water Management Equivalent Compliance (G3)*, published by the International Maritime Organization. (lignes directrices G3)

IBWM Certificate means the International Ballast Water Management Certificate issued under regulation E-2 or E-3 of the Annex. (certificat IGEB)

Minister means the Minister of Transport. (ministre)

residual amounts means the quantity of ballast water that cannot be removed from a ballast tank using the equipment installed on the vessel for that purpose.
(quantité résiduelle)

sediments has the same meaning as in article 1 of the Convention. (sédiments)

TP 13617 means the document entitled *A Guide to Canada's Ballast Water Regulations*, published by the Department of Transport. (TP 13617)

waters under Canadian jurisdiction means Canadian waters and waters in the exclusive economic zone of Canada. (eaux de compétence canadienne)

Authorized representative

(2) For the purposes of these Regulations, a reference to the authorized representative of a pleasure craft that is not a Canadian vessel is to be read as a reference to the owner and operator of the pleasure craft.

Incorporation by reference — as amended from time to time

2 (1) Except as otherwise provided, any reference in these Regulations to a document is a reference to the document as amended from time to time.

Administration

(2) For the purpose of interpreting a document incorporated by reference into these Regulations, "Administration" is to be read as "Minister" in respect of

(a) Canadian vessels;

(b) Canadian pleasure craft; and

(c) floating platforms engaged in the exploration or exploitation of the seabed and subsoil in waters under Canadian jurisdiction, including floating storage units and floating production, storage and off-loading units.

Ship

(3) For the purpose of interpreting a document incorporated by reference into these Regulations, “ship” is to be read as “vessel”.

Same location

(4) For the purpose of interpreting regulation A-3.5 of the Annex, **same location** means within 10 nautical miles from another location without crossing a physical barrier or obstruction.

Viable organisms

(5) For the purpose of interpreting regulation D-2 of the Annex, **viable organisms** has the same meaning as in the BWMS Code.

Application

Application

3 (1) Except as otherwise provided, these Regulations apply in respect of the following vessels if they are designed or constructed to carry ballast water:

- (a) Canadian vessels everywhere; and
- (b) vessels that are not Canadian vessels and are in waters under Canadian jurisdiction.

Oil and gas operations

(2) These Regulations apply in respect of vessels that are capable of engaging in the drilling for, or the production, conservation or processing of, oil or gas except when the vessel is on location and engaged in the exploration or drilling for, or the production, conservation or processing of, oil or gas, as defined in section 2 of the *Canada Oil and Gas Operations Act*, in an area described in section 3 of that Act.

Non-application

(3) These Regulations do not apply in respect of

- (a) vessels operating under the authority of a state that is not a party to the Convention if they operate exclusively in the Great Lakes Basin and if they do not load or release ballast water into waters under Canadian jurisdiction;
- (b) vessels that are owned or operated by a state and used only in government non-commercial service; or
- (c) vessels that carry only permanent ballast water in sealed tanks such that it is not subject to release.

Quantity

(4) For greater certainty, these Regulations apply to the management of any quantity of ballast water that may be released from a vessel.

Compliance

Authorized representative and master — Annex

4 (1) Except as otherwise indicated in these Regulations, the authorized representative and the master of a vessel must ensure that the requirements of the Annex are met in respect of the vessel.

Authorized representative and master — certain provisions

(2) The authorized representative and the master of a vessel must ensure that the requirements of section 8, subsections 14(1), 15(1) and 16(1), sections 17 to 20, 22 and 23 are met.

Master — ballast water record book

(3) The master must ensure, in respect of the ballast water record book, that

- (a) the requirements set out in the Annex to make entries are met;
- (b) the signature requirements set out in regulation B-2 of the Annex are met;
- (c) all entries are maintained on board the vessel in accordance with the requirements set out in regulation B-2 of the Annex; and
- (d) the record book is kept readily available for inspection in accordance with the requirements set out in regulation B-2 of the Annex.

Authorized representative — ballast water record book

(4) The authorized representative of a Canadian vessel or a Canadian pleasure craft must maintain the entries made in the ballast water record book, in accordance with regulation B-2 of the Annex, after the period required by that regulation to maintain the entries on board the vessel.

Authorized representative and master — regulation E-1

(5) The authorized representative and the master of a Canadian vessel or a Canadian pleasure craft must ensure that the following requirements set out in regulation E-1 of the Annex are met:

- (a) the reporting requirements if an accident occurs to a vessel or a defect is discovered;
- (b) the maintenance requirements; and
- (c) the requirement to obtain approval of a change that is made after an inspection.

Regulation A-4 of the Annex — Exemptions

Exemption

5 On application by the authorized representative of a vessel, the Minister must exempt the vessel from the requirements of sections 15 and 16 and those set out in regulation B-3 of the Annex if

- (a) the application establishes that the applicable conditions described in regulation A-4 are met; and
- (b) the exemption is in the public interest.

Regulation A-5 of the Annex — Equivalent Compliance

Application

6 (1) This section applies in respect of vessels

- (a) that are less than 50 m in overall length and that operate exclusively in
 - (i) waters under Canadian jurisdiction, or
 - (ii) waters under Canadian jurisdiction and on the high seas; and
- (b) described in regulation A-5 of the Annex.

Guideline G3

(2) A vessel described in subsection (1) may, instead of complying with these Regulations, elect to comply with the requirements set out in Guideline G3.

Guideline G3 — recommendations

(3) For the purposes of interpreting Guideline G3, “should” is to be read as “must” and recommendations are mandatory.

Regulation B-1 of the Annex — Ballast Water Management Plan

Approval

7 (1) On application by the authorized representative, the Minister must approve the ballast water management plan of a Canadian vessel or a Canadian pleasure craft if the plan meets the requirements set out in regulation B-1 of the Annex.

Language of plan

(2) Despite subsection (1), the ballast water management plan must be written in English or French, or in both.

Keeping up to date

8 A vessel must ensure that its ballast water management plan remains up to date and reflects the means by which the vessel complies with the requirements of these Regulations.

Submission to Minister

9 (1) The authorized representative of a Canadian vessel or a Canadian pleasure craft must submit to the Minister any amendment to the ballast water management plan.

Approval of amendments

(2) The Minister must approve any amendment to the ballast water management plan if the amendment meets the requirements in respect of the plan set out in regulation B-1 of the Annex.

Regulation B-2 of the Annex — Ballast Water Record Book

Language of record book

10 Despite the requirements set out in regulation B-2 of the Annex, entries made in the ballast water record book of a Canadian vessel or a Canadian pleasure craft must be written in French or English, or in both.

Regulation B-3 of the Annex — Ballast Water Management

Compliance Timeline

Certain waters

11 (1) Despite the requirements set out in regulation B-3 of the Annex, a vessel that is constructed before September 8, 2017 is not required to conduct ballast water management to meet the ballast water performance standard before September 8, 2024 if it operates exclusively in

- (a) waters under Canadian jurisdiction and, if applicable, the United States waters of the Great Lakes Basin; or
- (b) waters described in paragraph (a) and on the high seas.

Interpretation — *constructed*

(2) For the purposes of subsection (1), *constructed* has the same meaning as in regulation A-1 of the Annex.

Ballast Water Performance Standard

Deemed compliance

12 (1) A vessel using a ballast water management system to meet the ballast water performance standard is deemed to have met that standard in respect of ballast water loaded on the Great Lakes or the St. Lawrence River if

- (a) the vessel's ballast water management system was installed before September 8, 2024;
- (b) the vessel meets the requirements of section 8;
- (c) the vessel holds and keeps on board a valid IBWM Certificate or an equivalent document referred to in section 23;
- (d) the vessel's ballast water management system is in good working order and has been maintained and operated in accordance with the manufacturer's instructions; and
- (e) ballast water is managed in accordance with the manufacturer's instructions for the vessel's ballast water management system, subject to any limiting operating conditions or other restrictions identified in the system's type approval certificate issued under the BWMS Code.

Interpretation — *St. Lawrence River*

(2) For the purposes of subsection (1), *St. Lawrence River* means the waters of the St. Lawrence River as far seaward as a straight line drawn from Cap-des-Rosiers to West Point, Anticosti Island, and from Anticosti Island to the north shore of the St. Lawrence River along the meridian of longitude 63° W.

Alternative Methods of Ballast Water Management

Approved methods

13 A vessel may, instead of conducting ballast water management to meet the ballast water exchange standard or the ballast water performance standard, as applicable, conduct ballast water management in accordance with an alternative method referred to in regulation B-3.7 of the Annex if that method has been approved in accordance with the requirements of that regulation.

Regulation B-4 of the Annex — Ballast Water Exchange

Designated areas for exchange — regulation B-4

14 (1) If a vessel entering waters under Canadian jurisdiction from waters other than the United States waters of the Great Lakes Basin cannot conduct a ballast water exchange in the areas set out in regulation B-4.1 of the Annex, it must conduct the exchange in one of the areas designated by the Minister in TP 13617.

Record-keeping

(2) If a vessel does not comply with subsection (1), the master of the vessel must enter the reasons in the ballast water record book.

Regulation C-1 of the Annex — Additional Measures

Discharges at Canadian Freshwater Ports

Exchange requirement

15 (1) In addition to the requirements of the Convention, before September 8, 2024, a vessel conducting ballast water management to meet the ballast water performance standard must not discharge ballast water at a Canadian freshwater port listed or described in TP 13617, unless that ballast water was exchanged in accordance with the ballast water exchange standard

- (a) in the areas referred to in regulation B-4 of the Annex, if the sequential method was used; or
- (b) on the high seas, in any other case.

Exception

(2) Subsection (1) does not apply if the ballast water to be discharged was taken on board in waters under Canadian jurisdiction, in the United States waters of the Great Lakes Basin or in waters referred to in regulation B-4, and has not been mixed with residual amounts taken from waters elsewhere than from those waters.

Exception — extraordinary conditions

(3) A vessel is not required to comply with subsection (1) if the master determines, on reasonable grounds, that the exchange would threaten the safety or stability of the vessel, its crew, or its passengers because of adverse weather, vessel design or stress, equipment failure, or any other extraordinary condition.

Record-keeping

(4) If a vessel does not comply with subsection (1), the master of the vessel must enter the reasons in the ballast water record book.

Saltwater Flushing

Residual amounts

16 (1) In addition to the requirements of the Convention, a vessel conducting ballast water management to meet the ballast water exchange standard must conduct a saltwater flushing of tanks that contain only residual amounts of ballast water unless those residual amounts were taken on board in accordance with the ballast water exchange standard and the requirements set out in regulation B-4 of the Annex.

Interpretation — *saltwater flushing*

(2) For the purposes of subsection (1), *saltwater flushing* means, in the following order,

- (a) the addition of water to the ballast water tanks in accordance with the requirements for ballast water exchange set out in regulation B-4 of the Annex and, if applicable, section 14;
- (b) the mixing, through the motion of the vessel, of the water added under paragraph (a) with the residual amounts of ballast water and any sediments that have settled out of them in the tanks; and
- (c) the release, in accordance with the requirements for ballast water exchange set out in regulation B-4 of the Annex and, if applicable, section 14, of the waters mixed under paragraph (b) so that the salinity of the resulting residual amounts of ballast water in the tanks exceeds 30 parts per thousand or is as close as possible to 30 parts per thousand.

Regulation D-3 of the Annex — Ballast Water Management Systems

Minister's approval

17 Any ballast water management system used on a Canadian vessel or Canadian pleasure craft must be approved by the Minister in accordance with regulation D-3 of the Annex.

Type approval certificate

18 A vessel must keep on board a copy of the type approval certificate referred to in the BWMS Code issued in respect of a ballast water management system installed on the vessel.

Regulation D-4 of the Annex — Prototype Ballast Water Treatment Technologies

Statement of compliance

19 A vessel that is participating in a program referred to in regulation D-4 of the Annex must hold and keep on board a valid statement of compliance referred to in the *Guidelines for approval and oversight of prototype ballast water treatment technology programmes (G10)*, published by the International Maritime Organization.

Section E of the Annex — Inspection and Certification Requirements

Certificates

Hold and keep on board

20 Every vessel to which regulation E-1 of the Annex applies must hold and keep on board a valid IBWM Certificate.

Regulation E-2 — Issuance of IBWM Certificate

Issuance of certificate

21 On application by the authorized representative of a Canadian vessel or a Canadian pleasure craft, and subject to paragraphs 16(4)(b) to (d) of the Act, the Minister must issue an IBWM Certificate to the vessel if the requirements of an initial or renewal inspection set out in section E of the Annex are met.

Endorsements

22 A Canadian vessel or a Canadian pleasure craft that holds an IBWM Certificate must ensure that the certificate is endorsed by the Minister as required by section E of the Annex.

Vessels of Non-Parties to the Convention

Equivalent document

23 A vessel that is entitled to fly the flag of a state that is not a party to the Convention must not load or release ballast water in waters under Canadian jurisdiction unless that vessel holds and keeps on board a document issued by or on behalf of the government of that state that certifies that the vessel meets the requirements of the Convention.

Reporting

Ballast Water Reporting Form

24 The master of a vessel that is bound for a port, offshore terminal or anchorage area in Canada must, in the manner specified by the Minister, submit a completed Ballast Water Reporting Form.

Consequential Amendments, Repeal and Coming into Force

Consequential Amendments

Aquatic Invasive Species Regulations

25 (1) Paragraph 17(1)(a) of the *Aquatic Invasive Species Regulations* ¹⁶ is replaced by the following:

(a) in respect of ballast water and sediments, to the persons referred to in subsection 4(1) of the *Ballast Water Regulations*; or

(2) Paragraph 17(2)(a) of the Regulations is replaced by the following:

(a) ballast water and sediments, in the case of any vessel to which section 3 of the *Ballast Water Regulations* applies or any vessel exempted under subsection 3(3) of those Regulations from the application of those Regulations; or

Administrative Monetary Penalties and Notices (CSA 2001) Regulations

26 Part 9 of the schedule to the *Administrative Monetary Penalties and Notices (CSA 2001) Regulations* ¹⁷ is replaced by the following:

PART 9

Violations of the Ballast Water Regulations

Violations of the Ballast Water Regulations

Item	Column 1	Column 2	Column 3
	Provision of the <i>Ballast Water Regulations</i>	Range of Penalties (\$)	Separate Violation for Each Day
1	Subsection 4(1)	1,250 to 25,000	
2	Paragraph 4(3)(a)	1,250 to 25,000	
3	Paragraph 4(3)(b)	600 to 12,000	
4	Paragraph 4(3)(c)	1,250 to 25,000	
5	Paragraph 4(3)(d)	600 to 12,000	
6	Subsection 4(4)	600 to 12,000	
7	Paragraph 4(5)(a)	600 to 12,000	
8	Paragraph 4(5)(b)	1,250 to 25,000	
9	Paragraph 4(5)(c)	1,250 to 25,000	
10	Section 8	1,250 to 25,000	X
11	Subsection 14(1)	1,250 to 25,000	X
12	Subsection 14(2)	600 to 12,000	
13	Subsection 15(1)	1,250 to 25,000	X
14	Subsection 15(4)	600 to 12,000	
15	Subsection 16(1)	1,250 to 25,000	X
16	Section 17	1,250 to 25,000	X
17	Section 18	600 to 12,000	
18	Section 19	600 to 12,000	X
19	Section 20	600 to 12,000	X
20	Section 22	600 to 12,000	X
21	Section 23	600 to 12,000	X
22	Section 24	600 to 10,000	

Repeal

27 The *Ballast Water Control and Management Regulations* ¹⁸ are repealed.

Coming into Force

Registration

28 These Regulations come into force on the day on which they are registered.

Footnotes

- 1 For the purposes of this Regulatory Impact Analysis Statement, a vessel that could be part of more than one group has been assigned to the last such group in the order listed here.
- 2 This analysis does not study this category of vessels, as the cost associated with the requirement is negligible.
- 3 Assessing The Feasibility Study of Ballast Water Treatment System Installation and Operation by Existing Vessels in the Great Lakes and St. Lawrence
- 4 Side-stream electro-chlorination, ultraviolet sterilization, ozone injection, and chemical injection
- 5 "[Ballast Water Treatment System Evaluation for Small Vessels \(https://www.nps.gov/isro/learn/nature/upload/10141-01-btws-eval-for-sm-vessels-2.pdf\)](https://www.nps.gov/isro/learn/nature/upload/10141-01-btws-eval-for-sm-vessels-2.pdf)"
- 6 Derived from data in: Department of Fisheries and Oceans. (2019). Proceedings of the peer review of the assessment of the ballast water exchange plus treatment protocol. Canadian Science Advisory Secretariat.
- 7 This figure was determined using the conventional factor that 15% of invasive species cause severe economic or environmental damage. Windle, P. (1998). The OTA Report on Harmful Non-indigenous Species. In: Tennessee Exotic Pest Plant Council. USDA Forest Service. (1997). Exotic Pests of Eastern Forest (pp. 71-77). Nashville, TN.
- 8 Marbek. (2010). *Assessing the Economic Value of Protecting the Great Lakes: Invasive Species Prevention and Mitigation*. Ottawa.
- 9 For a detailed analysis on the cost per industry, see section 13.1 of the CBA report.
- 10 Martel, A., and Madik, J. (2018). Twenty-six years (1990–2015) of monitoring annual recruitment of the invasive zebra mussel (*Dreissena polymorpha*) in the Rideau River, a small river system in Eastern Ontario, Canada. *Canadian Journal of Zoology* 96(10), 1071–1079.
- 11 Level of maturity depends on years after initial introduction.
- 12 For a detailed analysis on the severity of the cost associated with an invasion, see section 7.1.3 of the CBA report.
- 13 United States Coast Guard. (2012). *Final Rule - Regulatory Analysis and Final Regulatory Flexibility - Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters*. Washington, DC: U.S. Department of Homeland Security.
- 14 For detailed calculations, see Table 19 of the CBA report.
- 15 United States Coast Guard. (2012). *Final Rule — Regulatory Analysis and Final Regulatory Flexibility — Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters*. Washington, DC: U.S. Department of Homeland Security.
- 16 SOR/2015-121
- 17 SOR/2008-97; SOR/2012-246, s. 1
- 18 SOR/2011-237
- a S.C. 2012, c. 31, s. 159
- b S.C. 2018, c. 27, s. 692
- c S.C. 2018, c. 27, s. 707

d S.C. 2014, c. 29, s. 75(1)

e S.C. 2018, c. 27, s. 709

f S.C. 2001, c. 26

Government of Canada activities and initiatives

#YourBudget2018 – Advancement



([https://www.budget.gc.ca/2018/docs/themes/advancement-en.html?](https://www.budget.gc.ca/2018/docs/themes/advancement-en.html?utm_source=CanCa&utm_medium=Activities_e&utm_campaign=620ABudget8)

Advancing our shared values

#YourBudget2018 – Reconciliation



[https://www.budget.gc.ca/2018/docs/themes/reconciliation-en.html?](https://www.budget.gc.ca/2018/docs/themes/reconciliation-en.html?utm_source=CanCa&utm_medium=Activities_e&utm_campaign=620ABudget8)

Advancing reconciliation with Indigenous Peoples

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Supporting Canada's researchers to build a more innovative economy