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What follows is Aquacide's response to subject Notice. Our comments will be aligned with the format used in the Notice, focusing, where appropriate, on one of the Notice's stated purposes which is to help define what "as effective as Ballast Water Exchange (BWE)" means. See, specifically, Q2 below. We will comment on each of the Goals (G1-G3) and each of the Standards (S1-S4), as well as answering the Questions (Q1-Q6).

Two current reports relate to preliminary comments in the Notice. A recent EPA report (EPA842-F-02-001) December 2001, addresses U.S coastal waters. EPA rates the condition of these waters as fair to poor overall. This supports the view that something more effective than BWE must be found, since by current definition, BWE cannot take place in coastal waters. The other, a paper published by the American Association for the Advancement of Science (Science Vol.295 p1839) addresses decision-making when science is ambiguous, especially when public health is involved. Essentially, the paper concludes that the public should be involved and as well informed as possible. And since public policy is at issue, decision-makers, when faced with incomplete or ambiguous evidence, should err toward the worst-case scenario.

Possible Goals

G1. If "No discharge of zooplankton---etc." means no discharge of living zooplankton etc., and the same interpretation applies to pathogens, then this goal is acceptable.

G2. Drinking water is unacceptable as written. It does not state which drinking water is meant: U.S.? Maine? Country of discharge? Of origin? World Health Organization? Some standards deal only with health (pathogens) but not invasive species. This type of goal, while attractive politically, is unworkable because of its uncertainties.

G3. As stated, direct comparison is not acceptable. Standards by which the direct comparison would be demonstrated are not identified, so there would be no way to compare. However, with qualifications, as will be pointed out later, it would be a logical interim Standard.

Goals and standards should be stated in absolute terms not subject to interpretation. This is especially so because Invasive Species is an international problem, and corrective actions will have to meet internationally understood and accepted standards.

Possible Standards

Before addressing the possible standards, the issue of measurement of the standards must be raised. It was raised in the previous Coast Guard Notice (Docket 8737) and was never answered. Unless a test protocol is established, a stated standard is meaningless and the public and Congress will see through the meaningless standard. At the March IMO meeting in London, the issue was raised and not resolved. There were arguments pro and con on absolute methods, such as Biochemical Oxygen Demand (BOD), and on the use of markers, but no resolution. Given that this is a policy issue involving public health, a timely decision, however painful that may be, must be made. We recommend that an easy to administer, widely recognized procedure, such as BOD, with all its shortcomings, be the agreed protocol. Surrogate markers have not yet been identified, and in any event, the use of these markers would require highly trained personnel and time-consuming lab work to administer.

In any event, since ambiguity exists, the decision should lean in the direction of the most demanding means of measurement. The scientists have had their day in court and it is time for the policy makers to make a calculated risk decision and establish the measurement protocols. These could be identified as "interim" protocols, and modified later, if necessary, as more knowledge becomes available.

But the decision must be made.

We will address the possible standards on the assumption that testing protocols have been established.

S. 95% removal, etc. is an acceptable interim standard as stated. However, it should be noted that the GLOBALLAST proposal, upon which this standard is based, caveats its entire proposal with "to be developed" for both the organisms and the ambient conditions involved. This clearly means that, absent a timely policy decision, it could be years (if ever) before this standard is adopted.

S2. Remove etc., ---- 100 microns is not an acceptable standard. The pathogens that would escape this standard would be unacceptable from a public health point of view. It should be noted that support for the related GLOBALLAST proposal was lukewarm, at best, and with good reason. As the conferees pointed out, among its other shortcomings, this proposal limits remedial technology.

S3. Remove 99% of ---- and 95% of various organisms is, as stated, not an acceptable standard. It does not identify the organisms as markers or representative of all intended target species. Since it does not include killing or inactivating, one has to assume that some mechanism for biologically safe disposal of the removed organisms is included in the standard, but it is not so stated. And as previously stated, it must be assumed that some measurement protocol is included.

S4. Discharge no organisms greater than 50 microns etc., is not an acceptable standard as stated. Some NIS would escape the 50 micron limit. In addition, it requires that dead organisms above 50 microns be removed. This would be an expensive and meaningless requirement.

A few points are appropriate here. In all four proposed standards, nothing is said about the disposal of removed solids. Depending on the Ballast Water Treatment (BWT) employed, these solids would be biologically unsafe and would require careful (and potentially costly) handling for proper disposal. Mere back flushing would not suffice.

It is not clear which workshop(s) are meant in the note after S4, but Aquacide would like to make it clear that, while technology may not be in hand to remove organisms at satisfactory flow rates, technology does exist to kill these organisms while underway, so that flow rates are irrelevant. We also would like to make it clear that technology exists that will provide far better protection than no BWT and measurably better protection than BWE.

Questions

This Notice really answers its own first question. Earlier, the Notice states that the Coast Guard is attempting to find a BWT that, among other things, "Moves toward a goal that expresses the congressional intent to eliminate ballast water discharge as a source of harmful NIS." From this statement, it must be inferred that any goal less than complete elimination is not in compliance with congressional intent. Aquacide concurs with that goal. Lesser goals, even if labeled as "interim," would be logically inconsistent. Lesser interim standards could be established as long as they progress in the direction of the congressionally established goal. We believe that, since public health is involved, Congress will become increasingly impatient if timid goals and standards are established, especially when coupled with the lack of timely and needed decision

In this context, we will answer the Questions.

Q1 (Goals): Clearly, the straightforward answer is that the Goal should be complete elimination of harmful NIS. Of the three stated goals, G1, “No discharge – etc.,” is the most demanding (if, as in our response to this goal above, the stated goal means no discharge of living organisms). Accordingly, if the congressional goal is to be complied with, Aquacide favors this goal for BWT, but only on an interim basis.

Q2 (Interim Standards): Aquacide recommends an interim standard that is equal to or better than BWE. This raises the basic issue of deciding what is meant by “as effective as BWE”. Years of valuable scientific time have already been expended on this question. But logically, it cannot be determined in any scientifically meaningful way because of the limitless combinations of variables inherent in BWE. Therefore, the definition, by default, must be arbitrary, and the Coast Guard, by law, is charged with making that decision.

Since this is an interim standard, its level is not critical as long as it supports the congressional intent. It should be expressed in absolute, quantitative terms, perhaps using a percentage reduction of the highest expected natural concentration as its basis. Measurement protocols must be a part of the standard.

Q3 (Effectiveness): While we cannot comment on the effectiveness of other technologies, Aquacide’s thermal pasteurization process can meet any standard proposed to date. By increasing the thermal input, this process can meet later, more demanding standards (including those involving pathogens) which will likely be imposed as knowledge of the threat improves. Tests performed to date on the process clearly support this view. This makes the proposed standards “practical and realistic initial targets.”

Q4 (Cost-benefit analysis): Aquacide applauds the Coast Guard’s efforts to perform a cost-benefit analysis of BWT.

As to the costs to industry, we do not take issue with the cost estimates in Table 1. They appear to be consistent with other published studies, including a comprehensive analysis performed for the Northeast Midwest Institute by Royal Haskoning.

Two significant calculations should be included in the analysis. The first is life cycle costs: these include both the initial cost and the operating costs. The latter costs must include the disposal costs of harmful residue, if any, created by the treatment.

The second additional calculation may be difficult to quantify, but an attempt must be made. Where on-shore facilities are used, the cost to the shipper caused by the inability to take on or discharge ballast because such facilities are lacking should be included. The missed opportunity costs to the shipper could be substantial. In addition, at those ports where such facilities are available, there could well be costs to the shipper caused by the ship’s inability to get to the treatment facility immediately upon arrival – there may be a waiting line.

When referring to costs to industry of the four “proposals,” we assume “standards” is what was meant. As stated above, we take no issue with the estimates in Table 1. What ought to be a factor, if possible, in the cost-benefit analysis is the cost of a change from a less demanding interim standard to a more demanding final standard, which is a logical progression. With some technologies, this could well be a major cost, while with others, the additional cost would be quite modest. For example, increased filtration and/or UV could require expensive new equipment. Stronger chemicals could require stainless steel plumbing. Thermal treatment, by contrast, merely requires the addition of already available heat to meet any higher standards.

As to the benefits to society of reducing NIS, we cannot disagree with the relevant cost statements in the Notice. Of course, it is impossible to quantify costs of the yet to be discovered NIS, nor is it possible to measure the public health costs of introduced pathogens, which in terms of dollars, could be substantial. The political costs could be more than substantial.

Thus, the total annual dollar benefits to society of reducing NIS are in the hundreds of billions and the public health benefits of reducing pathogens are incalculable. Therefore, the Coast Guard should consider that the benefits to society of BWT are directly proportional to the stringency of the standards.

However, in order to maximize the benefits to society of BWT, Aquacide recommends that the Coast Guard impose interim treatment standards as soon as possible. Only then will industry invest in treatment technology. Without BWT, society will not reap the benefits of reducing the rate of invasion, only the costs of not doing so.

Q5 (Small Business). The costs of BWT impact shippers of all sizes. We have taken as a given that, with the possible exception of R&D and testing related to the establishment of standards, the cost of BWT would be borne by the shippers. Depending on the sense of urgency (and merely in terms of dollars, the costs to society of invasive species probably runs into billions), consideration might be given to forms of government subsidies. With foreign shippers, this may already be the case. With the low margins in most segments of the shipping industry, the cost of BWT could be a make-or-break issue, small business or otherwise. If the costs of BWT are subsidized for one category or carrier but not for another, the first could easily drive the second out of business. Subsidies may well be a topic for some other forum

Q6 (Environmental Impact). Clearly, the whole issue of Invasive Species is its environmental impact, and the intent of congress is to eliminate ballast water discharge as a source of this impact. Accordingly, anything less than the unattainable 100% purification will have an adverse environmental impact and will violate the intent of Congress

G1: If this Goal were to be met, assuming, as we brought out earlier, that it means no discharge of living matter, the environmental impact should be acceptable to the public.

G2: Because of the difficulties mentioned earlier regarding unknown standards and the possibility of introduction of NIS, the impact of this Goal would probably be unacceptable to the public.

G3: The impact of this Goal, as stated, would probably be unacceptable to the public. As written, it would not prevent the introduction of NIS and pathogens.

S1: If presented as an interim Standard, pending improvements in the science of the threat and in available technology with which to meet the threat, the environmental impact would probably be acceptable to the public. At the very least, the public would see that after years of inaction, the Government is finally taking positive steps to solve the problem.

S2: The environmental impact of this Standard would probably be unacceptable to the public. Our earlier comments on this Standard pertain.

S3: Our earlier comments on this Standard pertain here. The impact would probably be unacceptable to the public

S4: Our earlier comments pertain, and the impact would probably be unacceptable to the public.

Issues for Future Consideration

We believe that some additional issues should be considered now, rather than at some undetermined time in the future. The stated intent of Congress is to eliminate NIS as a problem. The sooner that concrete steps are taken, even if they are interim steps, the sooner Congressional intent will become a reality.

One way to expedite the process is to promulgate interim standards and measurement protocols that are stated in absolute terms which are not subject to interpretation. An example is "drinking water." Many legitimate definitions exist as to what drinking water is, and lengthy debates would take place by well-meaning scientists as to what is meant were that to be a standard

Interim measurement protocols should be stated in absolute terms, as well. BOD was mentioned earlier. Oxygen Uptake Rate (OUR) is another such protocol. Again, while it has its own shortcomings, it is not subject to interpretation and is widely used and accepted.

These two examples illustrate Aquacide's view that the Regulatory process should reduce uncertainty to an absolute minimum. Uncertainty puts an unreasonable burden on those who must bear the financial brunt of BWT, the shippers.

Another uncertainty that imposes a severe burden on the shippers is the inconsistencies among the individual States and NISA, and within NISA itself (on which side of the George Washington Bridge is the ship?). This must be addressed quickly, and probably would have to be dealt with, in some cases, by Congress. Federal preemption over States is probably not within the Executive Branch's authority. This issue is referred to in the Notice under the heading Federalism.