WELCOME TO THE

Ballast Water Rulemaking Advisory Committee

MEETING #1
DECEMBER 2015
International (IMO BWM Convention)

- Federal
  - USCG NPRM
  - EPA Vessel General Permit
  - VIDA (Federal legislative proposals)

- West Coast Regional
Oregon BWP Update

- 2015 Legislative Recap
  - SB 261 – Fee Increase
  - HB 2207
    1. Penalty distributions
    2. NOBOB
    3. BWE + BWT
- Status of BW inspector position
- Coastal Port Proposals
DEQ’s Rulemaking Objectives:

1. **Prevent discharge of high-risk ballast water.**
2. **Enhance ballast management strategies for Oregon to ensure reduction in risk of introducing AIS.**
3. **Support implementation of federal BWDS**
4. **Develop adaptive management options with adequate risk-reduction efficacy to allow for ballast discharge originally sourced from high-risk locations.**
5. **Develop outreach and enforcement practices that elevates awareness and averts disruption to business operations.**
Two areas of high-risk concern for ballast discharge to Oregon waters

1. ‘NOBOB’ vessels that have not adequately managed the risk from residual water and sediment in ‘empty’ ballast tanks by properly implementing elements of EPA VGP 2.2.3.6.

2. Federal adoption of weak ballast discharge standards and implementation of rules that effectively replace mid-ocean ballast water exchange (BWE) with first generation shipboard treatment systems (BWT).
**Summary:** Amend ORS 783.630-635 to adopt EPA Vessel General Permit requirements for salt-water flushing of empty ballast tanks (VGP 2.2.3.6.3). In essence, adopt federal requirement into state regulations in order to allow state to inspect and enforce.

**Supporting rationale:**
- Residual ballast and sediments in ‘NOBOB’s vessels are known vectors for wide variety of aquatic invasive species.
- Salt-water flushing is particularly effective at removing FW or brackish water organism.
2.2.3.6.4.1 Nearshore Saltwater Flushing Requirements

For those tanks which are empty or contain unpumpable residual water, you must either seal the tank so that there is no discharge or uptake and subsequent discharge of ballast water within waters subject to this permit or conduct saltwater flushing of such tanks in an area 50 nm from any shore and in waters at least 200 meters deep prior to the discharge or uptake and subsequent discharge of any ballast water to or from any waters subject to this permit. For purposes of Part 2.2.3.6.4, saltwater flushing means the addition of water from the coastal exchange zone to empty ballast water tanks; the mixing of the flush water with residual water and sediment through the motion of the vessel; and the discharge of the mixed water, such that the resulting residual water remaining in the tank has either a salinity greater than or equal to 30 parts per thousand or a salinity concentration equal to the ambient salinity of the location where the uptake of the added water took place. In order to conduct saltwater flushing, the vessel should take on as much coastal exchange zone water into each tank as is safe (for the vessel and crew).

Vessels engaged in voyages that take them further than 200 nm from any shore and who will remain outside 200 nm for a sufficient period to flush ballast water, are not allowed to exchange ballast water between 50 and 200 nm from shore to meet the requirements of Part 2.2.3.6.3 (unless the master determines that flushing farther than 200 nm from shore would interfere with essential vessel operations or safety of the vessel but the master determines that the vessel is able to safely flush more than 50 nm from shore) and instead, must conduct flushing more than 200 nm from shore in accordance with Part 2.2.3.6.3 of this permit. Vessels engaged in the coastwise trade who are not outside 200 nm for a sufficient period to conduct flushing may flush outside 50 nm (even if they voyage beyond 200 nm) to meet the requirements of this permit.

For all vessel owner/operators subject to this part that contain some empty ballast water tanks and some full ballast water tanks, if you elect to seal those empty tanks, you must not allow water from the full tanks to commingle with waters from the empty tanks if it will subsequently be discharged into waters subject to this permit.
Salt-water flushing for ‘NOBOB’s

Rule Elements:

- For ballast tanks that are empty upon arrival to state waters to be used for ballasting and subsequently de-ballasting while in state waters, salt-water flushing of tanks must be performed:
  - At least 200 nm from shore if vessel, or
  - At least 50 nm from shore if tanks were last filled.

- Oceanic salt-water flushing of tanks must achieve residual ballast water salinity of at least 30 ppt.
- Safety exemptions apply.
‘NOBOB’ ORS Amendment
(as originally proposed under HB 2207 2015)

(1) (a) The owner or operator of a vessel with empty ballast tanks that will enter the waters of this state must, prior to entering the waters of this state, conduct a saltwater flushing of the empty ballast tanks in an area no less than 200 nautical miles from any shore.

(b) The residual ballast water remaining in the ballast tanks after saltwater flushing must have a salinity greater than or equal to 30 parts per thousand or a salinity concentration equal to the ambient salinity of the location where the vessel took on the added ocean water. In order to conduct saltwater flushing, a vessel should take on as much ocean water into each ballast tank as is safe for the vessel and crew.

(2) This section does not apply to empty ballast tanks that underwent a complete open sea exchange prior to discharging ballast water from a voyage at another port and are empty for arrival in the waters of this state if the vessel’s ballast water log or record book contains sufficient detail to show that the unpumpable residual ballast water in the empty ballast tanks has a salinity greater than or equal to 30 parts per thousand.
Ballast Management Management: Paradigm Shift > BWT

Oceanic Ballast Water Exchange (BWE)

Ballast Water Discharge Standards via Shipboard Treatment (BWT)
Figure 10. Accumulation of non-indigenous species in the lower Columbia by year of discovery.
## New BWM Paradigm: Discharge Standards

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<thead>
<tr>
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<tbody>
<tr>
<td>&gt; 50 µm in minimum dimension</td>
<td>&lt; 10 viable organisms per cubic meter</td>
<td>No detectable living organisms</td>
</tr>
<tr>
<td>10 – 50 µm in minimum dimension</td>
<td>&lt; 10 viable organisms per ml</td>
<td>&lt; 0.01 living organisms per ml</td>
</tr>
<tr>
<td>&lt; 10 µm in minimum dimension</td>
<td>&lt; 250 cfu[2]/100 ml[4]</td>
<td>&lt; 10^7 bacteria/100 ml</td>
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<tr>
<td></td>
<td>&lt; 100 cfu[2]/100 ml[4]</td>
<td>&lt; 10⁴ viruses/100 ml</td>
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<tr>
<td><em>Escherichia coli</em></td>
<td></td>
<td></td>
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<tr>
<td>(01 &amp; 0139)</td>
<td>&lt; 1 cfu[2]/100 ml or &lt; 1 cfu[2]/gram wet weight zooplankton samples</td>
<td>&lt; 1 cfu[2]/100 ml or &lt; 1 cfu[2]/gram wet weight zoological samples</td>
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</table>

[1] Final discharge standard for California, beginning January 1, 2020, is zero detectable living organisms for all organism size classes
[2] Colony-forming-unit is a measure of viable bacterial numbers

### Federal implementation timeline:

**Effective 2014 for new build vessels;**

**For existing vessels, effective January 2016 (following 1st drydock)
Vessels utilizing an approved ballast water treatment system must also conduct ballast water exchange or saltwater flushing (as applicable) in addition to treating their ballast water if:

- The ballast tanks were sourced from a coastal, estuarine, or freshwater ecosystem that has a salinity of less than 18 parts per thousand, and
- The approved BWTS is certified to meet IMO D-2 discharge standards but not a discharge standard at least 100 times more stringent, and
- Ballast tank(s) were sourced from outside the state of Oregon common waters zone before the vessel enters state waters.

A vessel operator affected by these requirements may request — and the Department may approve — an exemption to the BWE provision if the vessel is using a BWT system has minimum holding times or other operational constraints that would make BWE infeasible due to short voyage times or engineering limitations.
Why?

- Mitigates concerns over low-efficacy of federally adopted BW discharge standards;
- BWE is highly protective for low-salinity harbors;
- BWE improves efficacy of treatment systems.
- Provides safeguard during management practice transition;
- Does not require anything of vessel operators; and
- Can be used to strategically target only those vessels that are considered to be high-risk.
**BW Exchange + BW Treatment**

*(especially valuable for protecting low-salinity ports)*

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**Federal BWDS allow for release of up to 10 (high-risk) organisms per m³**

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**Organism type**

- Red: Freshwater or Low-Salinity
- Blue: Oceanic/Marine

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**Source Ballast Tank Contents**

(>50um size class)

- ~20,000 / m³

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**BW Treatment**

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**Ballast Discharged**

(>50um size class)

- 0.10 / m³

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Note: Density values are for descriptive purposes only and not proportionately represented in drawings)
With BWE+BWT, the discharged ‘up to 10 organisms per m3’ are low-risk.

BW Exchange + BW Treatment

(especially valuable for protecting low-salinity ports)

Source Ballast Tank Contents
 (>50um size class)

~20,000 / m³

BW Exchange

~2,000 / m³

BW Treatment

Note: Density values are for descriptive purposes only and not proportionately represented in drawings)
Benefits of BWE+BWT

Based on Ruiz and Reid 2007, J. Cordell (unpublished), and Briski et al. 2013
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**Supporting rationale:**

- Preliminary evidence suggests that many BWTS have been designed and verified for saltwater conditions but may be less effective when used in low salinity or high turbidity environments.
- EPA determined that ‘Exchange + Treatment’ was necessary to protect Great Lakes from AIS threats (also via state 401 certifications).
- Interim strategy to bridge the transition in BWM strategies while new technologies are being adopted, tested and verified.
- Represents a more widely available approach toward achieving highly protective BWM strategy than higher BWTS standard.
- As proposed, would affect a relatively small subset of vessels entering Oregon waters.
Oregon BWD (volume) – Source Environment
(12.9 Million m³ per year)

- BWD - marine: 75.0%
- BWD - FW/Brackish: 17.6%
- BWD - source unknown: 3.0%

Oregon BWD (annual arrivals) – Source Environment
(n= 1550 per year)

- BWE + BWT provision

~ 2 Million m³ per year of ballast discharged to state waters would be subject to BWE + BWT provision

~ 10.4% of vessel arrivals to state waters (~ 162 per year) may be subject to BWE + BWT requirement

(Adapted from Noble 2007)
Supporting rationale (continued):

- Would ensure that paradigm shift in management strategies represents a significant reduction in AIS risks for all port conditions, not just marine ports.
- Land-based results show significant boost in efficacy for zooplankton, phytoplankton, and bacteria groups (Briski et al. 2013).
- Shipboard trial publications under review (Bailey, Gollasch, et al.).
- Canada intends to ratify IMO with Exchange + Treatment requirement for all vessels entering all FW waterbodies (not just GL).
- Washington State DOE/DFW showed interest in adopting Exchange + Treatment condition for Columbia River as part of VGP 401 certification pending comparable policy development by Oregon.
What has changed since TF report?

1. Recent increases in number of vessel arrivals to Oregon with new BW treatment systems installed.
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1. Recent increases in number of vessel arrivals to Oregon with new BW treatment systems installed.

2. Increased concerns regarding ballast treatment system engineering for use in freshwater.

3. Scientific results supporting momentum to implement BWE+BWT concept in additional jurisdictions.

4. DEQ drafted a 1-year enforcement guidance grace period aimed at addressing implementation concerns voiced by industry representatives.

5. HB 2207 clarified EQC rule authority.
For Discussion:

- Mirror EPA VGP regulations for GL?
- Or, focus on West Coast coordination/consistency.
- Affected voyages/tanks defined by:
  - Source port salinity?
  - Destination (receiving) port salinity?
- Exemptions foré é ?
- BWT design that can‰ accommodate BWE
- Voyages with duration that is shorter than BWE+BWT operational specifications can accommodate.
- Implementation schedule and enforcement grace-period options
- Other?
Objectives (revisited)......

- Support implementation of federal BWDS, but mitigate concerns of transition with locally tailored solutions to ensure AIS prevention.
- Develop ballast management strategy for freshwater ports that could facilitate west coast regional consistency.
- Develop outreach and enforcement practices that elevates awareness and averts disruption to business operations.
- Develop strategies that enable adaptive management over time.
1. What works? What doesn't?
2. How can proposals be amended to be more acceptable?
3. Are there alternative management strategies that you can recommend in lieu of BWE+BWT?

Ten of the Most Unwanted

Marine plants, animals and microbes are being carried around the world attached to the hulls of ships and in ships’ ballast water. When discharged into new environments, they may become invaders and seriously disrupt the native ecology and economy.

Introduced pathogens may cause diseases and death in humans.

Some of the areas these species have been introduced to:

- North American Comb Jelly
- North Pacific Seastar
- Zebra Mussel
- Asian Kobe
- European Green Crab
- Round Goby
- Caissoniella
- Toxiscus (Red/Brown/Green Tides)
- Blenny Crab
- Closers
- Caspian Water Flea

Further Information:
Global Invasive Water Management Programme
International Maritime Organization, London, UK
www.giwm.org

The species presented here are for illustrative purposes only. Their introduced ranges may be greater than depicted. There are numerous other examples of serious marine bio-invasions around the world.