# Use of Non-Potable Water for Retardant Mixing

**Use of retardant mixed with non-potable water is outside of policy.**

- The existing approval process addresses retardant mixed with potable water only.
- The range of quality of non-potable water is wide.
- Blanket statements are of questionable validity.

**Health Impacts**

- Currently approved retardants do not generally contain bactericides.
- Fertilizer salts are nutrient chemicals for many bacteria.
    - Health concerns for personnel mixing and loading the retardant.
    - Health concerns for firefighters on the fire line near the retardant drop.
    - Health concerns for general public who may be in the area – their property is threatened.

**Environmental Concerns**

- Possible introduction of bacterial contaminants into the environment.
    - Direct health concerns for wildlife under or near a retardant drop.
    - Impacts on vegetation.
    - Safety of animal consumption of vegetation coated in retardant.
    - Impacts of drops into waterways – beyond that of retardant caused problems.
    - Affects on animals/aquatic organisms feeding on/in contaminated waterways.
    - Amphibians may be especially sensitive to contamination of the environment.
    - Potential harm to T&E species.

**Effectiveness Concerns**

- Effectiveness may decrease if retardant salts are consumed by bacteria.
- The balance of phosphate to sulfate salts may change causing unpredictable effectiveness.

**Stability Concerns**

- Gums may be depleted, i.e. the retardants may lose the cohesive effects of the gum thickener..

**Visibility Concerns**

- Decreased viscosity will impact the visibility of the retardant because the higher viscosity holds colorant in suspension.
- Iron eating bacteria may cause decreased visibility as iron oxide colorant is consumed.

**Corrosion Effects**

- There are common bacteria that cause increased corrosion. Some of these are specialized to consume sulfates or thrive in a sulfate-rich atmosphere.
- Bacteria colonies can act as a patch, decreasing solution mobility and holding retardant in contact with a single portion of a tank. The chemistry in that micro-environment may be significantly different from the overall tank contents.

# Use of Sea Water for Mixing Long-Term Fire Retardant

**Use of retardant mixed with seawater is outside of policy**

**Human Health Impacts**

- None likely
- Possibility of sensitivity reactions to contaminants in sea water
- Remove retardant residues by showering as soon as feasible

**Other Safety Concerns**

- Retardant contains 10-15% fertilizer salts. Sea water contains approximately 4.25% chemical salts that are different from the fertilizer salts.
    - The increased salt content may contribute to a slight increase in weight per volume for the mixed retardant. This is not likely to require downloading.
    - These salts may have an impact on corrosion.
    - Corrosion to airtankers is likely to be minimal due to the large amount of aluminum used in airtanker construction.
    - Steel corrosion is most likely to be affected by the increased salt content and resulting change in pH. This would affect pumps and storage tanks if components were constructed of steel.
    - Brass corrosion is unlikely to be an issue since brass is the alloy of choice in marine environments.
    - Corrosion affects can be minimized by using fresh water to thoroughly rinse the coated areas. Do not scrub any metallic surfaces.
    - If time allows a preseason coating of wax on exposed surfaces will also minimize retardant clinging to surfaces.

**Environmental Concerns**

- Little or no impact is expected on either flora or fauna because of existing marine environment.

**Effectiveness Concerns**

- Probably no impact on effectiveness; possible slight increase if sea water salts have any retarding ability.

**Mixing and Handling**

- Use the approved mix ratios. These can be found on the Qualified Products List (1/5/2001) and in the Lot Acceptances, Quality Assurance, and Field Quality Control for Fire Retardant Chemicals publication (NWCG, NFES 1245/PMS 444-1. Also available at www.nwcg.gov).
- There should be no differences in mixing, pumping, and loading; use procedures appropriate for the specific retardant.
- The sea salts may have an impact on the thickener effectiveness and/or stability. Manage materials to minimize the amount of mixed retardant in storage. Use retardant as soon as possible after mixing.