

## Submarine Acoustic Countermeasures Launcher Discharge Summary

### Description of Discharge

**How is this discharge generated?** This intermittent discharge is comprised of seawater that mixes with acoustic countermeasure device propulsion gas after launching an acoustic countermeasure device, and subsequently discharged either through exchange with the surrounding seawater or while draining from an expended device being removed from the submarine.

Navy submarines have the capability to launch acoustic countermeasures devices to improve the survivability of a submarine by generating sufficient noise to be observed by hostile torpedoes, sonars, or other monitoring devices. The only countermeasures systems that generate a discharge within 12 n.m. are the countermeasures set acoustic (CSA) Mk 2 systems, which launch the countermeasure devices by gas propulsion through a launch tube. Following the launch, a metal plate closes the launch tube forming a watertight endcap. To equalize pressure, a one-way check valve allows water to flow into the tube after launch, but does not allow any of the water to be released through the opening. The launch tube cap contains three, 3/8 inch, bleed hole plugs that dissolve approximately three days after the launch. This allows exchange between the launch tube and the surrounding seawater while the submarine is moving. The bleed holes also allow some launch tube water to drain into the surrounding water when the assembly is removed from the submarine for replacement.

**Which vessels generate this discharge?** The CSA Mk2 system is installed on 24 Navy submarines.

**How often and where is this discharge generated?** This discharge can occur within and outside 12 n.m.

### Analysis

**Nature of Discharge:** Constituents found in the CSA Mk2 launch tubes after launching countermeasures devices include copper, cadmium, lead, and silver. The discharge may also contain constituents from the propulsion gas including hydrochloric acid, carbon dioxide, carbon monoxide, nitrogen, alumina, iron (II) chloride, titanium dioxide, hydrogen, and iron (II) oxide. Sampling indicates that copper, cadmium, and silver concentrations are above both Federal acute water criteria and the most stringent State acute water quality criteria; lead concentrations are above the most stringent State acute water quality criteria. The total annual mass loadings from all discharges from submarine CSA Mk2 countermeasure launcher systems are estimated at 0.0005 lbs/year cadmium, 0.0009 lbs/year lead, 0.0007 lbs/year copper, and 0.00009 lbs/year silver.

## Submarine Acoustic Countermeasures Launcher Discharge Summary (continued)

### Analysis (continued)

The following table provides a summary of the analytical results obtained from sampling the launch tube water following a simulated launch of a countermeasures device. Where a concentration value was found to be below the detection level (BDL), the mean concentration value was calculated using one-half the detection limit. The mass loading was calculated using the total annual discharge volume and sampling data.

Constituent	Mean Dissolved Concentrations Five Days Following Launch ( $\mu\text{g/L}$ ) <sup>A</sup>	Annual Mass Loading (lbs/yr)
<b>Metals</b>		
Lead	100 (BDL <sup>B</sup> )	0.0009
Copper	80	0.0007
Cadmium	60	0.0005
Silver	10 (BDL <sup>C</sup> )	0.00009

*BDL = Below detection limit*

<sup>A</sup> *Assuming BDL values are equal to one-half the detection limit*

<sup>B</sup> *Detection limit for lead is 200 mg/L*

<sup>C</sup> *Detection limit for silver is 20 mg/L*

### Discussion and Discharge Determination

**Discussion:** Because of the low annual mass loading, the low frequency at which the discharge occurs, and the volume of the individual discharge event (17 gallons), discharges from submarine CSA launcher systems have a low potential for causing adverse environmental impacts. Therefore EPA and DOD determined it is not reasonable and practicable to require a MPCD to mitigate adverse impacts on the marine environment for this discharge.

**Determination:** A marine pollution control device is not required.