



MERCURY REDUCTION and the IMPACT OF FUTURE REGULATION

FREQUENTLY ASKED QUESTIONS

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Why has mercury reduction become a priority?

The EPA has publicly expressed concern over the current and future mercury concentration in the nation's lakes and rivers resulting from bioaccumulation of mercury within the food chain. The National Academy of Sciences has scientifically justified the concerns of toxic mercury accumulation and its effects.

What are the typical human effects of mercury exposure?

The EPA indicates loss of sensory or cognitive ability, tremors, inability to walk, convulsions or possible death as the potential results of mercury exposure. Other known symptoms include memory loss, blurred vision, deafness as well as impact to the cardiovascular, autoimmune and reproductive processes.

What are the current sources of mercury in the environment?

Mercury is naturally occurring in the earth's crust and released with volcanic activity. Industrial activity such as the burning of fossil fuels, ore processing, medical and municipal waste incineration, the use of dental amalgams, mercury switches and fluorescent light bulbs contribute to the amount of mercury in the environment.

What is the current EPA target?

The EPA is focused on the reduction of mercury in consumer products, recycling of mercury wastes and also reducing emissions from industrial activities such as waste incineration, coal fired furnaces and Chlor-Alkali facilities that use mercury cells in the production of chlorine, caustic soda and related basic chemical products.

What regulations currently exist?

The EPA and other agencies regulate the amount of mercury in pesticides, consumer products, air and water emissions, and also the amount allowed in materials requiring land disposal. The amount of mercury in ambient air is also regulated to ensure safe workplace exposure levels. Mercury in low concentrations within industrial waste can make that waste a regulated hazardous waste require documented transportation and disposal.

What are exposure limits for fresh and salt water discharges?

Current chronic exposure limits are 12 ppt (part per trillion) for freshwater and 25 ppt for marine (saltwater) exposure to mercury. Many industrial facilities have higher limits due to mixing zone allowances that will expire in the coming years. Local discharge limits will be decided on a case by case basis, but industrial facilities may have lower discharge limits than those stated above if mercury is already present at the local discharge point.

What is a mixing zone?

Previous regulations allowed discharges of higher levels of contaminants into mixing zones to blend discharge from multiple facilities and waterways to dilute the higher concentrations in the environment. Many new agreements, such as the Great Lakes Initiative, will eliminate mixing zones in many areas of the United States.

What is the Great Lakes Initiative and how could it potentially impact the required mercury level discharges from my facility?

The Great Lakes Initiative was adopted to reduce the level of waste that could contaminate the waterways in the midwestern United States. Mercury is a concern but the initiative also targeted the amount of PCB, Dioxin and DDT that also bioaccumulate. It is estimated that the elimination of mixing zones under the initiative will remove 700,000 lbs of total wastes annually and specifically reduce the levels of mercury by 90%.

Other complementary laws under revision with the EPA include the Clean Air Mercury Rule (CAMR) and Clean Air Interstate Rule (CAIR). These rules are designed for air emissions and control of mercury, SO_x and NO_x in the atmosphere. Although these laws were recently overturned, a revised version of the laws is expected from the EPA in the coming years. Future air emission restrictions may require scrubbing technologies that transfer the mercury into an aqueous discharge stream that requires secondary treatment.

What are the types of mercury in the environment and what is the mercury cycle?

Mercury is typically released into the environment as elemental and ionic mercury. Ionic mercury is quickly washed from the atmosphere near the release site. Elemental mercury, however, can travel in the atmosphere for 3 to 24 months as it slowly converts to other forms and is washed from the atmosphere, thereby contaminating soil and waterways. Once it travels into the ecosystem it will convert to an organo-mercury that has toxic bioaccumulation effects to the plants and animals in the food chain.

Can Siemens help remove mercury compounds from industrial wastewaters?

Siemens Water Technologies has an understanding of mercury contamination in the environment and can employ many different technologies for mercury reduction. Existing technologies such as precipitation, carbon or resin-based solutions were typically used to achieve ppb (part per billion) levels but may not reach the new strict ppt (part per trillion) level discharge guidelines. Siemens offers new technologies for pretreatment and removal of mercury contaminants from aqueous wastestreams near the detectable limits of current instrumental techniques. Some specific applications have been developed for removal to less than 1.3 ppt levels. A local Siemens Water Technologies Sales and Technical Support specialist can assist in determining the next step for handling your mercury removal needs.