

Nickel

Human Health Risk	L
Ecological Risk	M - L
Socioeconomic Risk	L

Nickel is a naturally abundant metallic element that is ubiquitous in the environment. It is also used industrially for a variety of purposes. As an alloy, nickel is combined with other metals to form consumer products such as kitchen utensils, coins, and jewelry. Some nickel compounds formed as by-products from industrial processes using nickel as a catalyst are human carcinogens, but are of little concern for non-occupational exposures in New Jersey. Nickel is also a common skin allergen, and inhalation of low concentrations of nickel can contribute to asthma and respiratory infections.

What's at risk?

Because of the ubiquitous nature of nickel and its use in everyday household items, the statewide population is exposed on a daily basis. Risks to human and non-human populations will be greater in areas of increased nickel release (manufacturing facilities, oil and coal combustion sources, sewage sludge incinerators). Smokers and occupationally-exposed individuals are also at increased risk. Individuals with skin allergies to nickel may constitute 2-5% of the population.

What are the human health impacts in New Jersey?

Assuming that New Jersey ambient air concentrations of nickel are of the carcinogenic form, total air releases for New Jersey could be expected to add 5.1 lifetime cancers per million population, which is equivalent to a total of 40 excess cases, or less than one additional cancer per year. This assumption, however, is highly uncertain and is likely to result in a large overestimation of cancer risk. There have been no exceedences of the Maximum Contaminant Level (MCL) for nickel in New Jersey public drinking water supplies. Individuals with skin allergies to nickel may experience contact dermatitis, symptoms of which (e.g., itching) are mild and reversible.

What are the ecosystem impacts in New Jersey?

Nickel occurs regularly in river, marine, and estuarine sediments at levels greater than benchmark values but the impacts from these concentrations are not known. At toxic levels, nickel affects photosynthesis and/or growth in aquatic plants and animals. However, average concentration of nickel in surface waters are generally below levels of concern.

What are the socioeconomic impacts in New Jersey?

Medical costs associated with the additional cancer burden attributable to nickel are estimated at about \$30,000 per year. There are no hypothesized impacts to property values, employment, aesthetics, or psychological well being.

What's being done?

Quantities of nickel in drinking water are regulated by federal law, with a Maximum Contaminant Level set at 0.1 milligrams per liter. Workplace exposures are regulated by OSHA. DEP has established that residential-use soils contain less than 50 parts per million of nickel.