OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

James M. Donald, Ph.D.
Chief, Reproductive and Ecological Toxicology Unit
OEHHA’S ROLE IN PROTECTING THE PUBLIC FROM MERCURY CONTAMINATION

- Issue sport fish consumption advisories for state’s water bodies – water, food
- Develop toxicity guidelines
  - Toxic Air Contaminants – air
  - Children’s Environmental Health Protection Program (SB 25) – air
  - Public Health Goals – drinking water
- Identification and warnings of toxic effects
  - Proposition 65
Fish consumption is the primary non-occupational exposure to methylmercury.

Advisories are associated with runoff from mercury or gold mining.

The first California advisory was due to methylmercury in striped bass in the Delta (1971).

Most recent state advisories have included consumption restrictions based on methylmercury in sport fish.

12 out of 26 advisories include consumption restrictions based on methylmercury.
CONSUMPTION ADVICE FOR SPORT FISH CONTAMINATED WITH METHYLMERCURY

- Protect frequent consumers from neurotoxic effects of methylmercury
- Incorporate current studies measuring subtle neurobehavioral effects on developing fetuses and young children
- Special concern and advice for pregnant women and young children
OEHHA summarized scientific studies on mercury compounds showing children’s sensitivity to mercury exposure.

ARB Science Review Board placed mercury in the second tier of compounds due to relatively low air exposure.
MERCURY UNDER THE TOXIC AIR CONTAMINANT PROGRAM

- OEHHA developed toxicity criteria for airborne mercury compounds
- Reference Exposure Levels (REL) for inorganic mercury and mercury compounds for neurotoxic effects
  - Chronic REL = 0.9 µg/m³
  - Acute REL = 1.8 µg/m³
MERCURY UNDER THE PUBLIC HEALTH GOALS PROGRAM

- Mercury chloride a possible human carcinogen
- Public Health Goal (PHG) for inorganic mercury is based on kidney toxicity
- PHG = 0.0012 mg/L (1.2 ppb) in drinking water
Chemicals are listed under Proposition 65 if they are known to cause CANCER or REPRODUCTIVE TOXICITY (including developmental, male reproductive and female reproductive effects)

- Methylmercury compounds – listed for cancer 5/1/96
- Methylmercury – listed for developmental toxicity 7/1/87
- Mercury and mercury compounds – listed for developmental toxicity 7/1/90

Two provisions of the statute apply to listed chemicals:
- WARNINGS are required for deliberate exposures above specified levels
- DISCHARGES to sources of drinking water are PROHIBITED above the same specified levels
The specified levels that are the thresholds for the warning requirement and discharge prohibition are:

- **CANCER** – a $10^{-5}$ risk level (i.e., a level of exposure that is expected to cause no more than one excess case of cancer per 100,000 exposed individuals in a population with lifetime exposure)

- **REPRODUCTIVE TOXICITY** – a level at which there would be no observable reproductive effect given an exposure 1,000 time higher (i.e., a NOEL/1,000)

To date, all issues that have arisen under Proposition 65 have related to the warning requirement – no issues so far have been related to discharges to sources of drinking water
"Methylmercury compounds" are listed as carcinogens in California

- Methylmercury chloride caused kidney tumors in three studies of male mice
- Methylmercury compounds were observed to be genotoxic, causing primarily chromosomal damage
- No cancer potency estimate for methylmercury has been promulgated by OEHHA