f. Polychlorinated Biphenyls (PCB's)

Maximum acceptable concentrations of PCB's in water are 0.002 ug/l, ppb and maximum acceptable levels of residues in general body tissues of any aquatic organism are 0.5 ug/g. = 0.5 ppm

Rationale (Polychlorinated Biphenyls):

PCB residue levels of 0.5 mg/l in whole salmon eggs have been suggested as the threshold for egg mortality (4). Such levels in eggs are associated with levels in the body tissue of 2.5 to 5.0 ug/g (1). PCB's are highly cumulative with accumulation factors of up to 200,000 indicated by long term exposure of fish to low PCB concentrations in water (1). Consequently, in order to provide adequate protection for egg development, and to provide an adequate safety factor to protect against excessive accumulations in tissue, the 0.002 ug/l maximum concentration limit in waters shall be observed.

(3). Polychlorinated biphenyls (PCB's)

The body burdens of PCB's in birds and mammals should not be increased over present levels in order to maintain acceptable levels.

Rationale (Polychlorinated biphenyls):

Although PCB's are widespread environmental containments, their biological effects at present environmental concentrations are not known (1). Because of the persistence of PCB's and their susceptibility to biological magnification, the body burdens of PCB's in birds and mammals should not be permitted to increase and monitoring programs should be instituted.

5. Temperature

Changes in natural freezing patterns and dates should be avoided as far as possible in order to minimize abnormal concentrations of wintering waterfowl.

g. Phthalate Esters

No limit of acceptability is prescribed for phthalate esters in raw water for drinking water supplies at this time.

Rationale (Phthalate Esters):

Phthalates in water represent a potential but unknown health problem and have been implicated in growth retardation, accumulation and toxicity. Insufficient information on their effects on man is available (1).

h. Polychlorinated Biphenyls (PCB's)

No limit of acceptability is prescribed for acceptable concentrations of polychlorinated biphenyls in raw water used for drinking water supplies.

Rationale (PCB's):

Too little is known about the levels in water, the retention and the accumulation in humans and the effects of very low rates of ingestion to permit the establishment of acceptable PCB limits.

6. Pesticides

Pesticides are comprised of numerous organic compounds that are used for specific and general purposes. Included are the chlorinated hydrocarbons and organophosphorus compounds, as well as the chlorophenoxy and other herbicides. They have been reported as generally useful in improving agricultural yields, reducing the mass growth of nuisance causing aquatic plants, and controlling disease vectors. Pesticides differ widely in chemical and toxicological characteristics, and their biochemistry is only partially known. Their toxicity to man and biodegradability vary considerably between compounds, and because of this they will be considered separately as follows (1):

Rationale (Other Chlorinated Hydrocarbons):

Other chlorinated hydrocarbon insecticides include lindane, chlordane, endosulfan, methoxychlor, mirex, and toxaphene. Hexachlorobenzene is likely to have increased use as a fungicide as mercury compounds are phased out. This compound is toxic to birds and is persistent (164). With the possible exception of hexachlorobenzene, recommendations that protect the invertebrate and fish life of estuaries from injudicious use of these pesticides will also protect the wildlife species. In the light of the experience with DDT and dieldrin, the large scale use of a compound such as mirex can be expected to have adverse effects on wildlife populations.

d. Polychlorinated Biphenyls (PCB's)

The maximum acceptable concentrations of PCB in any sample consisting of a homogenate of 25 or more whole fish of any species that is consumed by fish-eating birds and mammals, within the size range consumed is 0.5 mg/kg (0.5 ppm) on a wet weight basis.

Rationale (PCB):

Evidence is accumulating that PCB does not contribute to the shell thinning that has been a major symptom of the reproductive failures and population declines of raptorial and fish-eating birds (3). A PCB effect could not be associated with the thinning of Brown Pelican (Pelecanus occidentalis) eggshells (165) nor did dietary PCB produce any effect on the eggs of Mallard Ducks (Anas platyrhynchos) (166) or Ring Doves (Streptopelia risoria) (167). PCB may increase susceptibility to infectious agents such as virus diseases (168) and like other chlorinated hydrocarbons PCB increases the activity of liver enzymes that degrade steroids, including sex hormones (156, 169). Laboratory studies have indicated that PCB, with its derivatives or metabolites, causes embryonic death of birds (170, 171, 172, 173). Because exceptionally high concentrations are occasionally found in fish-eating and raptorial species (156, 174), it is highly probable that PCB has had an adverse effect on the reproductive capacity of some species of birds that have shown population declines (3). Median PCB concentrations in whole fish of eight species from Long Island Sound, obtained in 1970, were in the order of one mg/kg (158), and comparable concentrations have been

1 ppm

reported from southern California (175). On the basis of the high probability that PCB in the environment has contributed to the reproductive failures of fish-eating birds, it is desirable to decrease these levels by at least a factor of two (3).

MONS 034019