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SPECIAL RE-ENTRY

FINAL DETERMINATION

DECLASSIFICATION CONTINUED

BY AC BAKER DATE 3-1-82

BY DATE

PM Eick 3-5-92

CLASSIFICATION CANCELLED

DATE 6-28-50

FOR THE ATOMIC ENERGY COMMISSION

Anthony C. Vallado
Chief, DECLASSIFICATION BRANCH

TO: S. T. CANTRELL, M.D.
Asst. Superintendent
Plant Medical

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HW--7-2119

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August 4, 1945

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INV.
9-4

TOLERABLE CONCENTRATION OF PRODUCT

IN DRINKING WATER

The plant permissible amount of product deposited in bone has been provisionally accepted as 0.5 μ g. The absorption of product from the gastro-intestinal tract is of the order of 0.05 percent. Consider the permissible concentration M μ g/cc of product in drinking water.

Village Water

Assume a life span of 70 years and that the limiting deposition of 0.5 μ g would not produce observable damage in 10 years. Then 60 years is the relevant maximum drinking span. Assume an intake of 5 liters of water per day:

$$\begin{aligned} \text{Then } M \times 3000 \times 365 \times 60 \times 5 \times 10^{-4} &= 0.5 \\ \text{or } M &= \sim 10^{-5} \mu\text{g/cc.} \end{aligned}$$

Plant Water

Assume a maximum work span of 30 years and a daily intake of 2 liters:

$$\begin{aligned} \text{Then } M \times 2000 \times 300 \times 30 \times 2 \times 10^{-4} &= 0.5 \\ \text{or } M &= \sim 5 \times 10^{-5} \mu\text{g/cc.} \end{aligned}$$

A combination of active plant water with active village water at 10^{-5} μ g/cc would give a plant limit of 2×10^{-5} μ g/cc.

INVENTORY

APR 27 1961

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H. I. Parker
to
S. T. Cantrill

-2-

8/14/43

The following temporary limits are proposed:

Village Water:

Permissible concentration of product = 10^{-5} μ g/cc.

Plant Water if Village Water is pure:

5×10^{-5} μ g/cc.

Plant Water if Village Water is contaminated:

2×10^{-5} μ g/cc.

The present H. I. procedure for the detection of product in water is sensitive to 10^{-7} μ g/cc. The opportunity for action between the first detection of contamination and its growth to a dangerous level should be ample.

There is some possibility that the tolerable limit for water activity would be set by the absorption through minor cuts. Consider that the body has an average cut of 0.2 cm² area. In the course of a day 20 cc. of water could come in intimate contact with the wound and 25 percent of the product might be absorbed. The total absorption in 60 years of exposure to safe drinking water could be:

$$10^{-5} \times 20 \times 0.25 \times 365 \times 60 = 1.1 \mu\text{g}$$

Experimental tests on the absorption of product from dilute solutions by skin wounds would be useful.

H. M. Parker
H. M. Parker, Chief Supv.
H. I. Section

HMP:sws

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5 / 14 / 92