

6. The development of monitoring equipment capable of operating fail-safe devices if purification equipment fails to operate or treatment facilities fail to produce a water of satisfactory quality.

The Public Health Service, on the basis of its long experience in matters related to human health and water supply, is the agency best equipped to undertake the investigations in the first three studies outlined. State health agencies that are charged with local water supply responsibility have traditionally looked to the Public Health Service to provide the leadership and guidance in matters related to the protection and purification of public water supplies. The Water Supply and Sea Resources Program of the National Center for Urban and Industrial Health and the Division of Environmental Health Sciences of the National Institutes of Health would require from 3 to 4 years, after adequate funds are made available, to complete the work necessary to establish initial criteria.

The Federal Water Pollution Control Administration, on the basis of its work and experience in advanced waste water treatment systems and in the development of monitoring equipment, is best qualified to undertake the investigations in the next two areas outlined. The Administration is best qualified to indicate the time required to develop the equipment and devices outlined.

The development of suitable monitoring equipment seems to be an area where there will be some overlapping of research interest. Research undoubtedly will be undertaken by the Federal Water Pollution Control Administration to develop devices to ensure the continuous operation of waste treatment plants so that poor operation or bypassing will not endanger aquatic life in receiving waters. We also must upgrade the operation of water treatment plants to ensure that disease outbreaks do not continue to occur. Equipment design for both of these purposes would be usable for waste water renovation plants. The research might differ as to the degree of precision required or as to the parameters measured. It is anticipated that the liaison developed under the interdepartmental agreement would ensure that research is not duplicated, but that each study complements other research.

The use of reclaimed waste water for drinking purposes should be planned only if no other suitable fresh water source is available. It should be pointed out that waste water for purposes other than drinking and culinary use could be reclaimed more quickly, particularly where separate systems for irrigation, fire protection, cooling water, and street flushing are appropriate.

Since drinking water is only a small portion of our total water need, possibly it can be provided more economically if it is separated from the total supply and delivered to the consumer in a special distribution system. When more is known about cost of water renovation and the cost of monitoring the operation, an economic analysis of alternative methods of supply may indicate the best solution. There also will be an interest, however, in treating the water only to the degree necessary. Standards can not be overly conservative and must be justified. But, on the other hand, surveillance for health protection must be included, as there always will be the urge to economize too much.

*Question 2. The health effects of nitrates in air, food and water have been considered recently. What do we know about the sources, persistence, mobility and effects of nitrate nitrogen? What would abatement entail? What priority should this contaminant receive? Since nitrate nitrogen moves in both air and water, which Federal agency is responsible for obtaining the facts?*

*Answer.* We do not feel that nitrate problem is interrelated with all aspects of environmental pollution. The problem is to determine the contribution, if any, from each source. We have checked with epidemiologists of the National Center for Air Pollution, and their similar-sounding problem is one of oxides of nitrogen produced during combustion. These gases, nitrogen dioxide and nitrogen tetroxide, in high concentrations are toxic to humans; the effects of trace concentrations are under investigation. High concentrations of these gases in air overlying water would result in some nitrates and nitrites being absorbed by the water. Trace concentrations, however, that are involved with air pollution would result in an insignificant uptake by water.

A 1966 Monograph by the National Academy of Sciences—National Research Council, *Toxicants Occurring Naturally in Foods*, reviews the nitrates and nitrites problem. Addition of these chemicals to a limited number of meat and fish products is permitted. Their use must continue to be controlled, however, inasmuch as poisonings from misuse have occurred.