

Leaks in groundwater protection

In releasing a recent report from the Congressional Office of Technology Assessment (OTA), Sen. Dave Durenberger (IR-Minn.) said, "I believe we are launching a public issue that will be the principal environmental concern for the rest of this decade." The issue is groundwater contamination, now detected in every state. The OTA report warns that the risks of groundwater contamination by organic and inorganic chemicals, radioactive elements and microorganisms will probably increase because current federal and state laws are too narrowly defined to adequately protect against contamination.

According to OTA, groundwater is the source of drinking water for about half of the U.S. population, and supplies 40 percent of the nation's irrigation needs and 80 percent of water used in rural environments. Withdrawals of U.S. groundwater have grown from 34 billion gallons a day in 1950 to 90 billion gallons a day in 1980.

Only a small portion, 1 to 2 percent, of the nation's groundwater resource is thought to be contaminated. But OTA maintains that this estimate is probably low because there has been no comprehensive or uniform testing of all groundwater sources. Moreover, concludes OTA, the increased usage of groundwater and the proliferation of a wide range of contaminating sources — from septic tanks and pesticide spraying to uranium mining — will probably lead to increased human exposure to contaminants. Some of the contaminants have been linked to cancers and damage to the liver, kidney and central nervous system, OTA reports. The ef-

fects of many other substances and mixtures of substances are not known.

According to Paula Stone, director of the study, many of the chemicals now showing up in groundwater entered commercial production just after World War II. But because they move slowly in groundwater, and because awareness of their potential impacts is fairly recent, these contaminants are just now being looked for and detected.

"Historically, the scientific community has believed that soil and subsurface processes had the capacity of assimilating these contaminants, of somehow neutralizing their effects," says Stone. "It's only in recent years that we've begun to recognize the limited capacity of the soil processes... to do that."

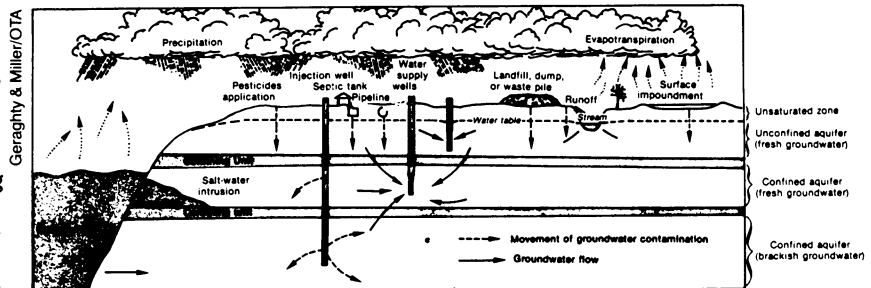
As a result, groundwater has not received the kind of protection that surface water has. There is no explicit national legislative mandate to protect groundwater quality, says the report. Although the Environmental Protection Agency (EPA) established an Office of Ground-Water Pro-

tection last April, it is limited to coordinating EPA activities. And, says OTA, while EPA acknowledges the need for comprehensive resource management, its strategy does not fully provide for it.

OTA also notes that only 18 of the reported 200 substances found in groundwater are covered by federal water quality standards. And, says the report, "These Federal standards, developed under the National Interim Primary Drinking Water Regulations of the Safe Drinking Water Act, are inadequate."

According to OTA, government programs tend to focus on point sources of contaminants such as landfills while ignoring more diffuse sources such as the use of fertilizers. Moreover, government efforts are directed at the protection of public drinking water supplies while as much as 20 percent of the U.S. population may rely on private wells for drinking water.

Durenberger said that the OTA report gives Congress its marching orders on environmental action, and he expects a flurry of bills in the next Congress to patch up the leaks in government protection of groundwater. —S. Weisburd



Depending on the source, pathways of groundwater contamination can vary.

More kudos for interferon

Interferon burst upon the scientific scene in 1957, billed as a possible cure for everything from cancer to the common cold. But widespread use of this naturally occurring protein was stymied by production difficulties and high costs. By 1980, when mass production of interferon was achieved (SN: 1/26/80, p. 52), its precarious promise gained a toehold on reality.

Following some preliminary successes using the protein against a variety of cancers (SN: 4/3/82, p. 230), scientists have now found it effective against a blood cell cancer called non-Hodgkin's lymphoma. In the Nov. 1 *NEW ENGLAND JOURNAL OF MEDICINE*, scientists from the National Cancer Institute (NCI) in Frederick, Md., and Hoffmann-La Roche in Nutley, N.J., report that "recombinant leukocyte A interferon may be an effective new therapy for some patients with low- and intermediate-grade non-

Hodgkin's lymphoma."

Lymphomas are cancers that affect the white blood cells of the immune system. They are characterized by the abnormal growth of lymphocytes, the infection-fighting cells in the lymph nodes, spleen and thymus. Lymphomas are usually classified as either Hodgkin's disease or the less common non-Hodgkin's lymphomas. Approximately 23,000 new cases of non-Hodgkin's lymphomas turn up each year in the United States.

NCI researcher Kenneth Foon and co-workers treated 37 patients who had non-Hodgkin's lymphoma and were no longer benefiting from chemotherapy, the standard treatment for the disease. The patients were given intramuscular injections of leukocyte A (or alpha) interferon, one of the three known human forms of the substance, three times a week for three months or longer. Only one person with high-grade cancer was helped. But of 30 patients with low- or intermediate-grade lymphoma, 10 showed partial responses and five had complete remissions.

The disease returned, however, within a few months after the interferon injections were halted. Foon speculates that long-term maintenance therapy may be needed to hold it in check. "It's hard to say how long the effects will last," Foon says. "We haven't followed patients long enough to be able to tell whether interferon treatments are going to have a major impact on the overall course of the disease. But these results are encouraging."

It's not clear exactly how the interferon works, says NCI immunologist Ronald Herberman. But he notes that interferon's apparent antilymphoma powers may be due to a combination of directly slowing down lymphoma cell growth while boosting the body's immune response.

"It's difficult to generalize about interferon's use in treating cancer," says Herberman. "It's very promising for the lymphomas and leukemias, but so far the results in other types of cancers, like breast and colon, have been disappointing." —S.I. Benowitz