

*Protecting the Nation's Groundwater from
Contamination—Vol. I*

October 1984

NTIS order #PB85-154201

**Protecting the Nation's
Groundwater From
Contamination**

Volume I



OFFICE OF THE
OFFICE OF TECHNOLOGY ASSESSMENT
U.S. CONGRESS

Recommended Citation:

Protecting the Nation Groundwater From Contamination (Washington, DC: U.S. Congress, Office of Technology Assessment, OTA-O-233, October 1984).

Library of Congress Catalog Card Number 84-601126

For sale by the Superintendent of Documents
U.S. Government Printing Office, Washington, D.C. 20402

Foreword

Contamination of groundwater is the focus of public attention nationwide—it is being detected with increasing frequency, it has been detected in every State and often near heavily populated areas, and it is linked to adverse health, economic, environmental, and social impacts. At the same time, groundwater is being increasingly relied on for many types of uses and currently supplies the Nation with one-half of its drinking water. The sense of public urgency is reflected in the hearings and debates of the 98th Congress to reauthorize major environmental laws including the Resource Conservation and Recovery Act, the Safe Drinking Water Act, the Clean Water Act, and the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund").

The objective of the OTA study, as requested by the Senate Committee on Environment and Public Works, is to assess the current status of the Nation's knowledge about and experience in dealing with groundwater contamination problems. Overall, the study shows that much information is available about sources of contamination, impacts, and technologies to guide national policy. In particular, the analysis indicates that, despite the establishment and expansion of numerous Federal and State programs in recent years, these efforts have a narrow focus from a groundwater perspective and, consequently, are limited in their ability to protect groundwater quality.

The study itself focuses on existing contamination problems because of the absence of a coherent technical foundation for understanding—i.e., integrating, analyzing, and interpreting—information about the problems caused by groundwater contamination from a national policy perspective. At the same time, OTA recognized that the prevention of *future* contamination would also need to be explicitly considered in order to develop a policy framework for comprehensive resource protection; for example, as experience with hazardous wastes has shown, the cost to clean up contamination can be *enormously* greater than the cost to prevent contamination. Thus, the structure of the study evolved around the concept of *protecting* groundwater quality—comprised of activities to detect, correct, and prevent groundwater contamination—even though the details focus on the detection and correction of existing problems.

Many individual topics related to groundwater contamination, such as prevention alternatives, the effects of specific sources on groundwater contamination, and the effectiveness of specific laws and programs have been explored in greater detail in other OTA studies. Interested readers are referred to, among others, *Assessment of Technologies for Determining Cancer Risks From the Environment* (June 1981), *Use of Models for Water Resources Management, Planning, and Policy* (August 1982), *Technologies and Management Strategies for Hazardous Waste Control* (March 1983), *The Information Content of Premanufacture Notices—A Background Paper* (April 1983), *Water-Related Technologies for Sustainable Agriculture in U.S. Arid and Semiarid Lands* (October 1983), *Managing Commercial High-Level Radioactive Waste* (in press), *Cleanup of Uncontrolled Hazardous Waste Sites Under Superfund* (in progress), and *Hazardous Materials Transportation: Technology Issues* (in progress).

The viewpoints of the private sector, environmental groups, academia, the technical community, and public interest organizations were sought in conducting the study. In

addition, over two dozen Federal agencies and offices were contacted for the analysis of Federal laws and programs, and each of the States responded to the OTA State survey. OTA thanks the numerous people—advisory panel members, reviewers, advisors, and consultants— who gave so generously of their time and expertise in support of the study. As with all OTA studies, the content of the report is the sole responsibility of OTA.

A handwritten signature in black ink that reads "John H. Gibbons". The signature is written in a cursive style with a large initial "J" and a long horizontal flourish at the end.

JOHN H. GIBBONS
Director

OTA Project Staff— Protecting the Nation’s Groundwater From Contamination

John Andelin, *Assistant Director, OTA
Science, Information, and Natural Resources Division*

Robert W. Niblock, *Oceans and Environment Program Manager*

Project Staff

Paula J. Stone, *Project Director*

Joan Ham Howard Levenson Francine Rudoff

Administrative Staff

Kathleen A. Beil Jacquelynne R. Mulder Kay Senn

Contractors

Woodward-Clyde Consultants, Inc., Walnut Creek, CA

Environ Corp., Washington, DC

The University of Oklahoma, Norman OK

GeoTrans, Inc., Herndon, VA

Peter N. Davis, University of Missouri-Columbia Law School, Columbia, MO

Protecting the Nation's Groundwater From Contamination Advisory Panel

Thomas Maddock, III, Chairman
Professor, Department of Hydrology and Water Resources
University of Arizona, Tucson

Harvey Banks
Consulting Engineer

Rodney DeHan
Administrator, Groundwater Program
State of Florida Department of Environmental
Regulation

Robert Harris
Professor
Center for Energy and Environmental Studies
Princeton University

Allen V. Kneese
Resources for the Future

Jay H. Lehr
Executive Director
National Well Water Association

Perry McCarty
Chairman and Professor
Department of Civil Engineering
Stanford University

James Mercer
President
GeoTrans, Inc.

David W. Miller
President
Geraghty & Miller, Inc.

Mary Lou Munts
State Representative
76th Assembly District
State of Wisconsin

Michael A. Pierle
Director, Regulatory Management
Monsanto Co.

Anthony Z. Roisman
Executive Director
Trial Lawyers for Public Justice

Lawrence Swanson
Director
Great Plains Office of Policy Studies

James T. B. Tripp
Environmental Defense Fund

NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The views expressed in this OTA report, however, are the sole responsibility of the Office of Technology Assessment.