



# Primer

## Office of Science and Technology

# A MESSAGE FROM THE DIRECTOR

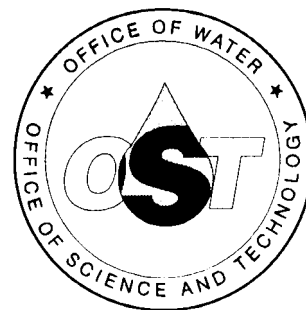
**T**he Water Program is evolving beyond its foundation as a command and control, highly centralized, technology-based regulatory program. By and large, we have reduced large-scale water pollution problems caused by industrial discharges and urban development. While we can claim this as a significant success, we have much work to do to fulfill the objective of the Clean Water Act: to restore and maintain the chemical, physical and biological integrity of the nations waters.

The mission of the Office of Science and Technology is both service oriented and strategic in nature. As a service organization, we provide scientific and technical tools to aid EPA Regional, State, and Local environmental managers implement the Clean Water Act and Safe Drinking Water Act programs. We are also a creative scientific organization whose products form the foundation of a very complex regulatory system.

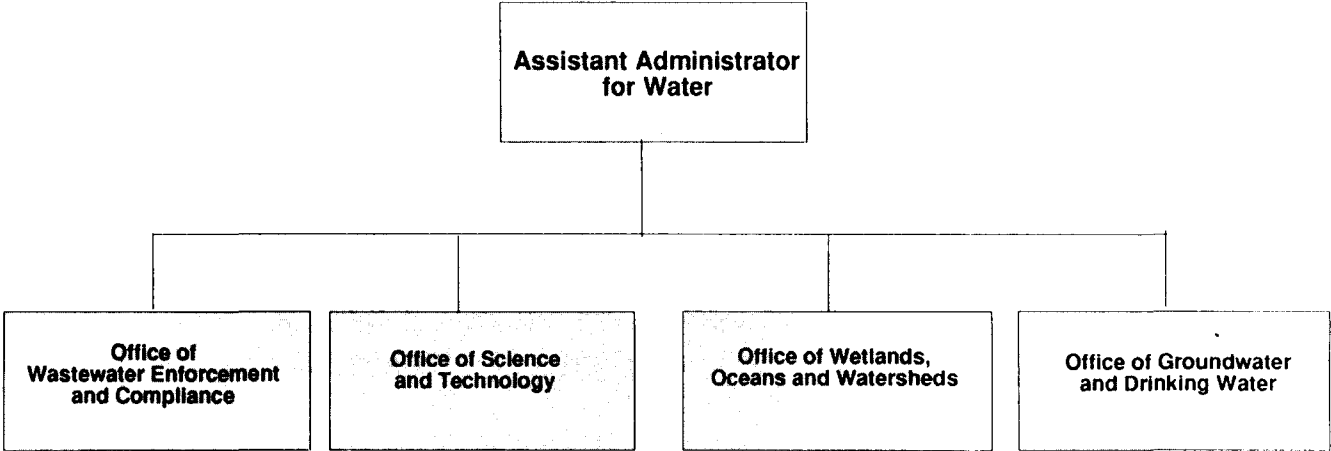
The work ahead is just as critical as the work we have completed, but the remaining problems pose vastly different challenges for people at all levels of government involved in protecting our water resources. To be most effective, we must understand the real risks to ecosystems and human health that pollution presents and balance these risks with the needs and concerns of our customers.

Sound science must be an integral component of both the development and implementation of water regulatory programs. We must continue to work within the framework of the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) programs and design our efforts to fill the science gaps that still exist.

Tudor T. Davies, Director  
Office of Science and Technology



# OFFICE OF WATER

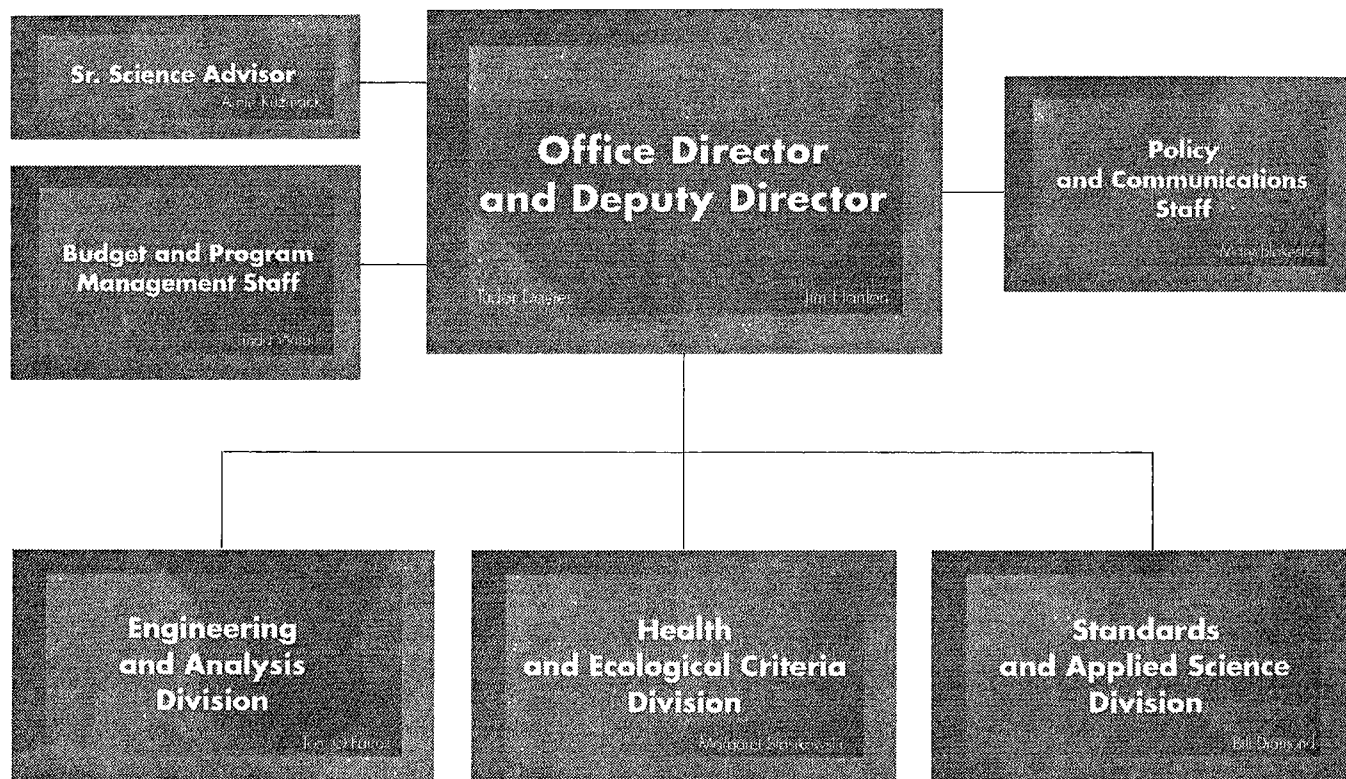


# INTRODUCTION

***F**or the next three to five years, OST will continue its major role in developing the science to protect human health and ecological systems from water-borne risks. The Office will also develop and implement a cross-media strategy to reduce ecological impacts caused by contaminated sediments. OST will focus on:*

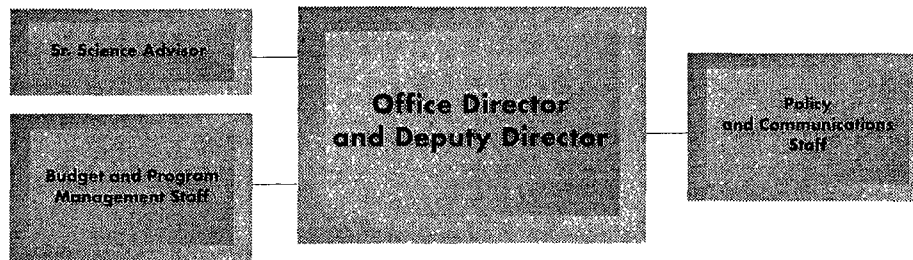
- ★ developing sound, scientifically defensible standards, criteria, advisories, and guidelines under the Clean Water Act and the Safe Drinking Water Act and provide implementation support to the EPA Regional Offices, Regions, States, and Local governments;*
- ★ developing effluent guidelines according to the schedule set forth in the consent decree. The guidelines program will continue to be expanded to include pollution prevention and cooperative efforts with other EPA offices to develop multi-media guidelines;*
- ★ developing a national inventory of contaminated sediment sources and sites required under WRDA; and*
- ★ determining the fate and transport of chemicals through aquatic ecosystems to develop criteria that are protective of aquatic life and wildlife.*

*The Office of Science and Technology consists of the following offices: Engineering and Analysis Division; Health and Ecological Criteria Division; Standards and Applied Science Division; Policy and Communications Staff; and Budget and Program Management Staff.*



# OFFICE OF SCIENCE AND TECHNOLOGY

The Office of Science and Technology (OST) provides policy and management leadership for developing the scientific foundation of the Office of Water's regulatory and non-regulatory programs. OST staff work with representatives of other organizations to develop scientifically-based criteria, guidelines, and advisories that serve as the regulatory framework for (1) restoring and maintaining the physical, chemical and biological integrity of the nation's water resources; (2) protecting the nation's drinking water; and (3) achieving technology-based industrial and municipal wastewater treatment requirements. OST staff also develop risk assessment methodologies and risk management support for the Office of Water.



## SENIOR SCIENCE ADVISOR

The Senior Science Advisor to the Assistant Administrator for Water resides in the Immediate Office of the Office of Science and Technology. He represents the Office of Water (OW) in working with the Office of Research and Development on planning and budget processes. The advisory is involved in risk assessment issues and represents the Office on the Council of Science Advisors and is closely involved with other scientific aspects related to OW programs.

## BUDGET AND PROGRAM MANAGEMENT STAFF

The Budget and Program Management Staff (BPMS) assists the Office of Science and Technology (OST) in carrying out its mission by planning, developing, and presenting the OST annual budget, annual operating guidance, the Strategic Target Activities for Results System and the Quarterly Management Reviews. The staff also oversees contract management, compliance with the Federal Managers' Financial Integrity Act (FMFIA) and resource management within the Office. The staff also maintains liaison with the Regional Offices and coordinates Regional visits and Branch Chiefs' meetings.

## POLICY AND COMMUNICATIONS STAFF

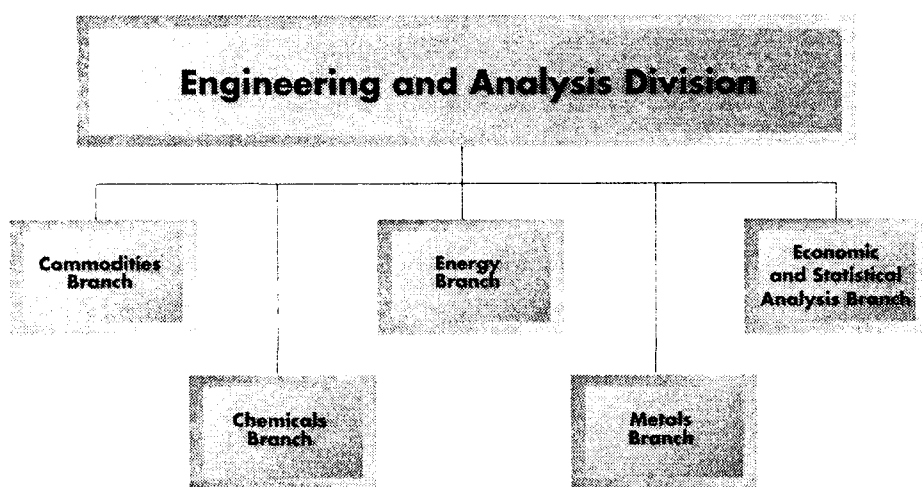
The Policy and Communications Staff is responsible for long-term program planning, computer resource management, and communications support for the Office of Science and Technology. This includes developing the long-term OST strategic plan and integrating it into the OW strategic plan; conducting OST's legislative activities; incorporating changes in OST policies to reflect changes in Agency policy; conducting special analyses and studies; managing OST's software resources to ensure effective use; and providing support to OST divisions in developing major briefings and public communications. The staff also assists the OST divisions in preparing documents for printing and distribution and managing their distribution through the Office of Water Resource Center (see page 14 for a description of the OW Resource Center).

# ENGINEERING AND ANALYSIS DIVISION

The Engineering and Analysis Division develops national technology-based limitations and standards to control or eliminate the discharge of pollutants from industrial sources into waterways and publicly owned treatment works and identifies appropriate wastewater treatment technologies.

Effluent guidelines involve extensive industry-specific engineering and economic studies, wastewater analyses, treatment option assessments, and economic analyses of potential impacts of the regulations on the regulated industries. Effluent guidelines set national standards for regulated industries. They ensure that wastewaters discharged, either directly into surface waters or indirectly into sewage treatment plants, will achieve levels of pollutants based on the best technology that is economically possible.

The EPA has developed many technology-based guidelines, regulating over fifty industrial categories (such as oil and gas extraction and pulp and paper manufacturing). Conventional pollutants are regulated, such as oil and suspended solids; pollutants that are identified as toxic (like lead and benzene); and nonconventional pollutants, including many pesticides. See page 15 for a list of the regulated industrial categories.



## EFFLUENT GUIDELINES DEVELOPMENT

The Clean Water Act (CWA) required EPA to publish effluent guidelines for both direct and indirect industrial dischargers and provided specific factors to be considered for conventional pollutants (BPT, BCT), toxic pollutants (BAT), and new sources (NSPS). EPA uses these factors in developing regulatory options.



Developing a guideline for any industrial category begins with a study of the industry and of the actual performance of technologies already in place, including pollution prevention, reuse, recycling, and wastewater treatment. EPA analyzes wastewater samples, and prepares an economic analysis to help assess the potential impact of any proposed guideline. This combination of economic, engineering, and wastewater databases enables EPA to develop guideline options for the industrial category being considered.

#### ANALYTICAL METHODS STAFF

The Analytical Methods Staff provides analytical services support and develops analytical methods for detection of pollutants in wastewaters.

#### ECONOMIC AND STATISTICAL ANALYSIS BRANCH

The Economical and Statistical Analysis Branch conducts economic and statistical analyses and studies. The Branch prepares economic impact and regulatory analyses to identify national, regional, and international impacts and benefits of regulations developed by Office of Water. It also develops statistical sampling and survey schemes.

#### COMMODITIES BRANCH

The Commodities Branch develops effluent guidelines for specific industries: pulp and paper, leather, foundries, textiles, timber, painting, hazardous waste treaters, laundries, hospitals. It also provides technical assistance to discharge permitting authorities.

#### ENERGY BRANCH

The Energy Branch develops effluent guidelines for the following: mining; metals manufacturing; metals finishing; plating and painting; and the manufacturing of specialty products, such as batteries and photographic supplies.

#### CHEMICAL INDUSTRY BRANCH

The Chemical Industry Branch develops effluent guidelines for the following industries: organic chemicals, inorganic chemicals, oil and gas, soaps and adhesives, pesticides manufacturing.

# HEALTH AND ECOLOGICAL CRITERIA DIVISION

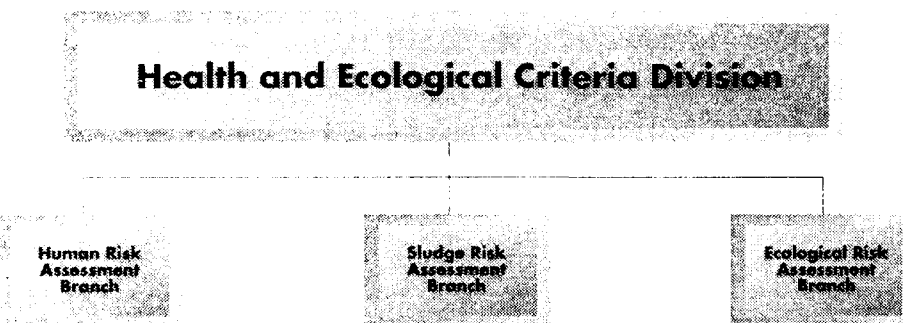
The Health and Ecological Criteria Division develops sound, scientifically defensible criteria for surface water, drinking water, and sewage sludge under the Clean Air Act and the Safe Drinking Water Act. The Division is also responsible for the development and refinement of the methodologies and risk and exposure assessment tools which are the basis for various criteria.

## HUMAN RISK ASSESSMENT BRANCH

The Human Risk Assessment Branch is responsible for developing human health criteria for deriving maximum contaminant level goals (MCLGs) and health advisories for contaminants in drinking water; developing health-based levels for use by the Office of Ground Water and Drinking Water in unreasonable risk to health guidance, providing human health toxicological and exposure assessment documentation to support drinking water standards, ambient water quality criteria, sediment quality criteria, and sewage sludge criteria; assisting in emergency situations by providing scientific and toxicological advice; developing risk assessment and exposure assessment methodologies applicable to Office of Water programs; coordinating OW research needs with ORD regarding human health, risk assessment, exposure assessment, and criteria development activities, in consultation with OW and Regional offices; providing support for OW to the Risk Assessment Council; providing support to the Risk Assessment Forum; coordination of OW interactions with other offices and agencies regarding science and risk assessment issues.

## SLUDGE RISK ASSESSMENT BRANCH

The Sludge Risk Assessment Branch is responsible for the development of technical regulations and guidelines on municipal sludge under Section 405 of the Clean Water Act (CWA). These regula-



tions identify the uses for sludge disposal, including determining the measures and practices applicable to each such use and identification of pollutants which interfere with each such use or disposal practice.

The Branch also develops new risk assessment methods and/or utilizes existing models to determine which pollutants should be regulated and the method of regulation and develops and issues technical regulations pursuant to Section 405(d) of the Clean Water Act.

#### ECOLOGICAL RISK ASSESSMENT BRANCH

The Ecological Risk Assessment Branch is responsible for the development and publication of water quality criteria and advisories and sediment criteria which reflect the latest scientific knowledge on the kind and extent of identifiable effects of pollutants on health and welfare. These include plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, aesthetics and recreation in and on the water as they relate to section 304(a) of the Clean Water Act.

# STANDARDS AND APPLIED SCIENCE DIVISION

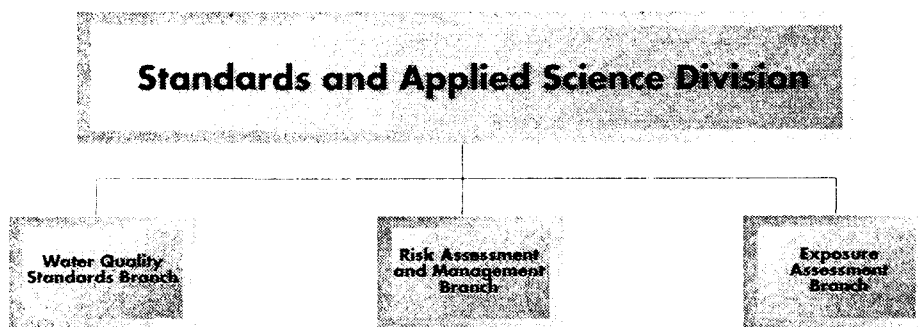
The Standard and Applied Science Division directs the national program for adoption of water quality standards. It develops policies and guidance and provide assistance to EPA Regional Offices and States on the translation and use of criteria in specific waterbodies, and on development of total maximum daily loads to meet water quality standards. It also develops and manages cross-media, agencywide policies to ensure specific exposure goals are attained. The Division also conducts environmental assessments to help assess the effects of regulations on water quality.

## WATER QUALITY STANDARDS BRANCH

The Water Quality Standards Branch provides guidance, direction, and support to the national water quality standards program, in which States adopt water quality standards in accordance with EPA regulations and guidance. The Branch is responsible for developing and implementing changes to the national program where necessary to help ensure that the goals of the Clean Water Act are met. The Branch is also responsible for coordinating water quality standards activities as they relate to the Endangered Species Act.

## RISK ASSESSMENT AND MANAGEMENT BRANCH

The Risk Assessment and Management Branch develops and manages cross-media, agencywide policies to address specific problems causing high risk to human health and the environment, with particular emphasis on problems arising from contaminated sediments and contaminated fish and shellfish. The Branch also develops methodologies and guidance to assist EPA Regional Offices, States, and local authorities assess risk from these sources, establish programs to reduce or eliminate the risks, and communicate the risks to the public.



## EXPOSURE ASSESSMENT BRANCH

The Exposure Assessment Branch directs and manages health and environmental exposure assessment programs, including environmental assessments for effluent guidelines, environmental benefits for Regulatory Impact Analyses, and other assessments on the extent and severity of pollution problems. The Branch also manages programs to develop technical guidance and provide training in support of water quality-based controls, including total maximum daily loads technical, wasteload allocations and load allocations, develops methodologies and technical guidance on the application and implementation of water quality standards.



## OFFICE OF WATER RESOURCE CENTER

The Resource Center maintains a reference file consisting of one copy of every document that has ever been published by OST and two other offices in the Office of Water. The Resource Center is the central point of contact for all requests for documents and coordinates document distribution through two national clearinghouses. While all documents are physically stored in the National Center for Environmental Publications and Information (NCEPI) facility in Cincinnati, Ohio, the Resource Center provides protected storage for all camera-ready boards, original artwork, negatives, color separations, and other similar items.

The Resource Center distributes copies of documents that are requested by attendees at conferences and also maintains a file of handouts, viewgraphs, photographs, and slides that may be used to prepare presentations and publications.

*The Office of Water Resource Center*

*Mail Code (4100)*

*Room G099 East Tower, Basement*

*8:30 a.m. — 5:00 p.m.*

*Monday — Friday*

*(202) 260-7786*

# **PUBLISHED (OR EXISTING) GUIDELINES**

INDUSTRIES	40 CFR	YEAR	INDUSTRIES	40 CFR	YEAR
Aluminum Forming	467	1983	Metal Finishing	433	1983
Asbestos Manufacturing	461	1984	Metal Molding and Casting (Foundries)	464	1985
Battery Manufacturing	461	1984	Mineral Mining and Processing	436	1977
Builder's Paper and Board Mills	431	1982	Nonferrous Metals Forming and Metal Powders	471	1985
Carbon Black Manufacturing	458	1978	Nonferrous Metals Manufacturing	421	1984
Cement Manufacturing	411	1974	Oil and Gas Extraction	435	1993
Coal Mining	434	1985	Ore Mining and Dressing	440	1982/88
Coil Coating	465	1982	Organic Chemicals, Plastics and Synthetic Fibers	414	1987
Copper Forming	468	1983	Organic Chemicals (Remand)	414	1993
Dairy Products Processing	405	1974	Paint Formulating	446	1976
Electroplating	413	1981	Paving and Roofing Materials (Tars & Asphalt)	443	1975
Electrical and Electronic Components	469	1983	Pesticide Chemicals	455	1993
Explosive Manufacturing	457	1976	Petroleum Refining	419	1982
Feedlots	412	1974	Pharmaceutical Manufacturing	439	1983
Ferroalloy Manufacturing	424	1974	Phosphate Manufacturing	422	1976
Fertilizer Manufacturing	418	1974/79	Photographic Processing	459	1976
Fruits and Vegetables Processing	407	1974	Plastics Molding and Forming	463	1984
Glass Manufacturing	426	1974/86	Porcelain Enameling	466	1982
Grain Mills Manufacturing	406	1974	Pulp, Paper and Paperboard	430	1982
Gum and Wood Chemicals Manufacturing	454	1976	Rubber Manufacturing	428	1974
Hospitals	460	1976	Seafood Processing	408	1974
Ink Formulating	447	1975	Soap and Detergent Manufacturing	417	1975
Inorganic Chemicals	415	1982	Steam Electric Power Generating	423	1982
Iron and Steel Manufacturing	420	1982	Sugar Processing	409	1974
Leather Tanning and Finishing	425	1982	Textile Mills	410	1982
Meat Products	432	1974/76	Timber Products Processing	429	1981



# NOTES